Coso Operating Company Hay Ranch Water Extraction and Delivery System

Conditional Use Permit (CUP 2007-003) Application

SCH# 2007101002

Final EIR

Inyo County, California

December 2008

Prepared for:
Inyo County Planning Department
168 N. Edwards Street
P.O. Drawer L
Independence, California 93526

Prepared by:
MHA Environmental Consulting, an RMT Business
4 West Fourth Avenue, Suite 303
San Mateo, California 94402

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1: INTRODUCTION

1.1 Project Overview

1.1.1 PROJECT DESCRIPTION

The Coso Operating Company, LLC (Coso) is seeking a 30-year Conditional Use Permit (CUP No. 2007-03) from the Inyo County Planning Commission (County) for the Coso Hay Ranch Water Extraction and Delivery System project.

The proposed project includes extracting groundwater from two existing wells on the Coso Hay Ranch, LLC property (Hay Ranch) in Rose Valley, and delivering the water to the injection distribution system at the Coso geothermal field in the northwest area of the China Lake Naval Air Weapons Station (CLNAWS). Table 1.1-1 lists the elements of the proposed project.

Table 1.1-1: Project Elements

Component	Component Location	Associated Features and Description
Hay Ranch Production Wells	Hay Ranch Property	• Two existing groundwater production wells • Vertical shaft turbine pumps installed in each of the two ground water production wells
Lift Pump Station	Hay Ranch Property	• Lift pumps to pump water from a collection tank to a high point storage tank • Mechanical control building • Distributed monitoring and control system to monitor and operate the water extraction, delivery, and injection systems from a centralized control room in the mechanical control building • A surge protection system for the main pumped pipeline • Electrical equipment/switchyard

Table 1.1-1 *(Continued)*: Project Elements

Component	Component Location	Associated Features and Description
Substation	Hay Ranch Property	• A 5-megavolt-ampere (MVA) 115-12 kV SAS Automated substation including electrical equipment such as 115kV low profile switchrack with four bays, two 5MVA transformers (one normally in service and one spare) with isolating disconnects, surge arrestors and neutral CTs, and a 12kV low profile switchrack consisting of three positions with provisions to expand to four additional positions. • A prefabricated mechanical and electrical equipment room (MEER) • An electrical distribution line to supply power to the well down hole pumps and to the lift pump station
Pipeline	Hay Ranch Property & Hay Ranch to Coso Road, along BLM lands, to the CLNAWS Geothermal Field	• Piping from groundwater wells to a collection tank at the lift pump station • A main pumped transmission pipeline from the lift pump station to a high point tank • A main gravity transmission pipeline to transfer water from the high point tank to the injection well
Storage Tank	Hay Ranch Property & CLNAWS	• A 250,000-gallon storage tank located at the pump station • A 1.5-million-gallon high point storage tank along Coso Road within CLNAWS
Injection System	CLNAWS Geothermal Field	• Wellhead piping and valving for delivering and controlling injection water to the Coso injection well system

1.1.2 PROJECT OBJECTIVE

The objective of the proposed project is to provide supplemental injection water to the Coso geothermal field in order to minimize the annual decline in reservoir productivity due to evaporation of geothermal fluids from power plant cooling towers.

1.2 Environmental Review Process

The County prepared a Draft Environmental Impact Report (Draft EIR) for the purpose of examining the potential environmental impacts associated with the proposed project prior to making a discretionary decision on the CUP application. The Draft EIR was released for public review on July 23, 2008. A 45-day review period was provided, through September 6, 2008. The purpose of the review period was to allow the public and agencies to comment on the adequacy of the Draft EIR.

Responses to public and agency comments are provided in this Final EIR. Inyo County Planning Department, prior to making a decision on the project, must consider these responses to comments and Final EIR in conjunction with the Draft EIR. No substantial revisions that would merit recirculation of the EIR, as defined by 15073.5(b) of Title 14 of the California Environmental Quality Act (CEQA), were made to the project or analyses after public comment.

The Draft EIR was also sent to the State Clearinghouse (State Clearinghouse #2007101002) for review by participating State agencies, pursuant to CEQA Guidelines. A letter was received from the Clearinghouse stating that the project has complied with its review requirements for draft environmental documents under CEQA.

1.3 Organization of the Final EIR

Volume 1 and Volume 2, in combination, form the complete Final EIR. The Final EIR is organized as follows:

Volume 1

- Chapter 1 (Introduction) contains background information on the project and environmental review process.
- Chapter 2 (Comments and Responses) outlines the format of the comments and responses, provides a list of commenters, provides Master Responses for comments of general concern, and then provides copies of all of the written and oral comments, each followed by responses. Text added to the EIR is underlined and deleted text is ~~stricken~~.
- Chapter 3 (Revisions and Errata) summarizes the revisions to the Draft EIR made by County staff or as a result of response to comments, including corrections, modifications of text, tables, and figures and references.
- Appendix 1 includes the Mitigation Monitoring and Reporting Plan (MMRP) for the project, outlining all of the proposed mitigation measures and assigning responsibility for implementation and monitoring as well as timing for verification.

Volume 2

- The entire Draft EIR, as distributed on July 23, 2008.

2: COMMENTS AND RESPONSES

2.1 Introduction

2.1.1 COMMENTS RECEIVED

Forty-six letters were received concerning the Draft Environmental Impact Report (Draft EIR) for the proposed Coso Hay Ranch Water Extraction and Delivery Project. Letters were received as follows:

- Three letters were received from federal agencies;
- Eight letters were received from State agencies;
- One letter was received from a municipality;
- Seven letters were received from non-governmental organizations;
- One letter was received from the applicant;
- Eighteen letters were received from members of the public;
- Four individuals spoke at a public meeting held on August 20, 2008 at Statham Hall, Lone Pine, Inyo County, California, providing an additional 44 comments; and,
- Four letters were received from Native American tribes.

2.1.2 RESPONSES

A list of all letters and comments received is presented in Section 2.2 of this chapter. Master Responses are provided in Section 2.3 for several issues that are predominant concerns expressed in the comments, including Hydrology and Water Quality; Air Quality; Biological Resources; Traffic and Transportation; Agriculture; Mitigation; Cumulative Impacts; and, Alternatives. The full text of each written and transcribed oral communication appears in Section 2.4. Each comment is identified by a letter and a number, and the responses to each comment immediately follow the letter or transcription. Some comments, including those paragraphs not identified by a letter and a number, state the commenter's opinions about the merits of the project, or restate facts about the project. These opinions are noted but do not receive specific responses. Responses are focused on the comments made on environmental issues.

2.1.3 TEXT REVISIONS

Summaries of revisions to the text and/or graphics (tables and figures) of the Draft EIR were made where appropriate and necessary to clarify and further enhance the adequacy and readability of the EIR. The page number of the text change refers to the page in the Draft EIR. The changes are included in Chapter 3: Errata of this Final EIR.

2.2 List of Persons and Agencies Commenting

The comments received on the Draft EIR have been grouped by federal agencies, State agencies, municipalities, non-governmental organizations, the applicant, public individuals, public meeting attendees, and Native American Tribes, and have been given a letter designation (i.e., F, S, M, NG, A, P, PM, T), as listed below in Table 2.2-1.

Table 2.2-1: Comment Numbers for Persons and Agencies Commenting

Comment Number	Commenter	Organization (If Applicable)	Date
Federal Agencies			
F1	Andrew E. Sabin	United States Department of the Navy	July 31, 2008
F2	Howard P. “Buck” McKeon	United States House of Representatives	September 3, 2008
F3	Linn Gum	United States Bureau of Land Management	September 8, 2008
State Agencies			
S1	Dave Singleton	California Native American Heritage Commission	August 1, 2008
S2	Jean Fuller	California State Assembly	August 8, 2008
S3	Gayle J. Rosander	California Department of Transportation	August 18, 2008
S4	Bob Dutton	California State Senate	August 18, 2008
S5	Jim Battin	California State Senate	August 20, 2008
S6	Roy Ashburn	California State Senate	August 20, 2008
S7	Brad Henderson	California Department of Fish and Game	September 5, 2008
S8	John Morales	California Regional Water Quality Control Board, Lahontan Region	September 5, 2008
Municipality			
M1	Thomas M. Erb	City of Los Angeles Department of Water and Power	September 5, 2008
Non-Governmental Organizations			
NG1	Gregory S. Yarris	California Waterfowl Association	August 18, 2008
NG2	Karl Gawell	Geothermal Energy Association	August 25, 2008
NG3	Rudolph A. Rosen	Ducks Unlimited	August 29, 2008
NG4	Bill Gaines	California Outdoor Heritage Alliance	August 29, 2008
NG5	Jan Smutny-Jones	Independent Energy Producers	September 4, 2008
NG6	Gregory S. Yarris	California Waterfowl Association	September 4, 2008
NG7	Terri Middlemiss	Kerncrest Chapter National Audubon Society	September 5, 2008

Table 2.2-1 (*Continued*): Comment Numbers for Persons and Agencies Commenting

Comment Number	Commenter	Organization (If Applicable)	Date
Applicant			
A1	Chris Ellis and Steve Brooks	Coso Operating Company, LLC	September 5, 2008
Public			
P1	Stuart R. Hemphill	Southern California Edison	August 12, 2008
P2	Gary D. Arnold	Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP	August 13, 2008
P3	Gary D. Arnold	Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP	August 15, 2008
P4	Gary D. Arnold	Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP	August 22, 2008
P5	Andrew Zdon (attachment to P4)	Golden State Environmental, Inc.	August 22, 2008
P6	Terry Metcalf	Deep Rose, LLC	August 25, 2008
P7	Gary D. Arnold	Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP	August 26, 2008
P8	Andrew Zdon (forwarded by Gary D. Arnold)	Golden State Environmental, Inc.	September 3, 2008
P9	Ronald DiPippo (forwarded by Gary D. Arnold)	Geothermal Consultant for Little Lake Ranch LLC	September 3, 2008
P10	Gary D. Arnold	Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP	September 3, 2008
P11	Gary D. Arnold	Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP	September 3, 2008
P12	Deborah Hess	Southern California Edison	September 4, 2008
P13	Anna O. Zacher	Individual	September 4, 2008
P14	Terry Metcalf	Deep Rose, LLC	September 5, 2008
P15	Tom Schneider	Individual	September 5, 2008
P16	Gary D. Arnold	Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP	September 5, 2008
P17	Janet Westbrook	Individual	September 6, 2008
P18	Jennifer Duncan	Individual	September 8, 2008
Public Meeting Attendees			
PM1	Gary D. Arnold	Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP	August 20, 2008
PM2	Wilfred J. Nabahe	Deep Rose, LLC	August 20, 2008
PM3	Saeed M. Jorat	City of Los Angeles Department of Water and Power	August 20, 2008
PM4	Bill Helmer	Individual	August 20, 2008
Native American Tribes			
T1	Virgil Moose	The Big Pine Paiute Tribe of the Owens Valley	September 5, 2008
T2	Joe Kennedy	Timbisha Shoshone Tribe	September 5, 2008
T3	Sanford K. Nabahe	Lone Pine Paiute-Shoshone Reservation	September 5, 2008
T4	Monty Bengochia	The Bishop Paiute Tribe	September 8, 2008

2.3 Master Responses to Comments

2.3.1 INTRODUCTION

Inyo County Department of Planning (County) has prepared Master Responses to address issues that are repeated in several comment letters. These responses are organized by environmental topic, including:

- General Comments
- Project Description
- Hydrology and Water Quality
- Geology and Soils
- Biological Resources
- Cultural Resources
- Agricultural Resources
- Aesthetics
- Hazards and Hazardous Materials
- Air Quality
- Cumulative Impacts
- Alternatives
- Mitigation
- Out-of-Scope Comments

The Master Responses include a summary of the comments on each topic and subtopic, followed by the response.

2.3.2 MASTER RESPONSES

Inyo County has prepared Master Responses to address issues that are repeated in several comment letters. These responses are organized by environmental topic. The Master Responses include a summary of the comments on each topic and subtopic, followed by the response.

A. GENERAL COMMENTS

The topics below are related to issues discussed throughout the EIR. Multiple comments were received related to:

1. The Life of the Power Plants
2. Compliance under the National Environmental Policy Act (NEPA)
3. Preparers' Qualifications
4. Scope and Timeframe for Impact Analysis
5. Regulatory Compliance
6. Baseline Studies
7. CEQA Adequacy

A1. The Life of the Power Plants

Comments

Several comment letters raise questions regarding the life of the geothermal power plants at the Coso geothermal field. Comments and questions included:

- How are the lives of the geothermal power plants determined to be “indefinite?”
- Would injection increase production of geothermal fluids and extend the life of the power plants and all associated impacts of the power plants
- Describe the water losses and operation of the power plants over the last 20 years.

Responses

The lifetimes of the power plants are analyzed in the previous environmental documentation, as listed in Table 1.1-1 on page 1-4 of the Draft EIR.

The lifetime was originally calculated based on the amortization of the power plant equipment (30 years). Permits were issued based on this timeframe. Many permits are associated with the power plants and can be obtained from the resource agencies that issued the permits. The list of permitting agencies includes:

- US Department of the Navy - China Lake Naval Air Weapons Station, California
- US Bureau of Land Management - Ridgecrest, California
- Great Basin Unified Air Pollution Control District, Bishop, California
- California Division of Occupational Safety and Health - Fresno, California
- California State Water Resources Control Board - Sacramento, California
- Inyo County Health Department - Bishop California
- Department of Toxic Substance Control - Sacramento, California
- Lahontan Regional Water Quality Control Board - Victorville, California
- California Energy Commission - Sacramento, California

Permits can be renewed after the expiration date. The permit timeframe does not reflect the amount of time that the reservoir could be utilized before the geothermal resource is exhausted. The injection proposed in the Draft EIR would not increase production of geothermal fluids above existing levels. Injection would only stop the decline in production, but would not increase production. The existing power plants are currently permitted. Power plants have been operating for more than 30 years at other geothermal fields. Accordingly, the lifetime of the geothermal resource is indefinite.

The power plants were built with wet cooling towers and therefore a loss of reservoir mass over time was predicted (NWC 1979; BLM 1980). The 1980 Environmental Impact Statement (EIS) identifies Rose Valley as a potential location for make-up water and the effects of pumping were broadly addressed in that document.

Water losses for the proposed project are described on pages 3.2-53 to 3.2-54 of the Draft EIR and in the ITSI report (2007) as described below:

> “Typical increases in steam thicknesses averaged around 300 m. Production resulted in bottom hole pressure declines of between 1.0 and 12 MPa. The cumulative monthly production and injection rates are presented in Figure 18. The fluid produced per well is about 17 kilograms per second (equivalent to about 336 gallons per minute (gpm) assuming a fluid density of 800 kg/m^3 or 0.8 g/ml). The mass of re-injected of cooler (24^oC), produced

> fluids are about half the mass produced. Production and injection fluid temperatures are presented in Figure 19. The lack of substantial recharge combined with the net difference between fluid production and injection results in a net withdrawal of fluid from the Coso system. The net yearly fluid withdrawals are on the order of 2.5 million cubic meters of water. If this were spread uniformly over the Coso geothermal field (about 2 km by 5 km), this would result in a yearly water level decline of 0.25 m. (about 4 m over 15 years)."

The annual loss of water from the geothermal reservoir establishes the need for the proposed project; however, a full description of the operation of the plants over the last 20 years is not relevant to the proposed project analysis because the power plants are currently operational, and Inyo County is not relicensing or otherwise re-permitting the power plants as part of the proposed project. The proposed project would not increase production of the power plants beyond the existing levels. The proposed project would just serve to stop the decline in production (see Master Response A6).

A2. Compliance under the National Environmental Policy Act

Comments

Comments related to NEPA compliance included questions about the status of the U.S. Bureau of Land Management's (BLM's) Environmental Assessment (EA), because a portion of the project would be located on BLM managed lands, and why a joint California Environmental Quality Act (CEQA)/NEPA document was not prepared. Questions were also raised regarding the US Department of the Navy's (Navy's) review under NEPA.

Responses

The BLM has prepared an EA under NEPA; however, the public release EA was delayed in order to complete the Section 106 consultation process, including Native American consultation. The consultation process has since been competed, and a Programmatic Agreement between the Advisory Council on Historic Preservation (ACHP), BLM, and State Historic Preservation Office (SHPO) has been prepared. The approval of the Draft EIR does not depend on the BLM's EA revisions or status; however, the Hay Ranch EIR has been incorporated by reference into the EA. The EA will be distributed for a 30-day public review with an unsigned Finding of No Significant Impact (FONSI) and Record of Decision.

Local and State agencies are encouraged to prepare joint environmental documents; however, it is not required in this instance (CEQA Guidelines §15221) because the EIR was prepared before the NEPA document, and the EA does not meet all CEQA requirements. A joint document would not, in this instance, result in greater efficiency or a better analysis. The Draft EIR states on page 1-3 that the BLM and Navy will each use the EA to determine independently whether to prepare an Environmental Impact Statement or a FONSI. The Navy may also determine that the project is categorically exempt because the action is to grant Coso Operating Company, LLC (Coso) a right-of-way. The EIR for the proposed project has been independently prepared by Inyo County, in consultation with the BLM and the Navy.

The BLM has provided additional information (since the distribution of the Draft EIR for public review) to reflect the current status of consultation with the SHPO, the ACHP, and the tribes. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revisions were made to the EIR:

> *Page 3.5-5*
>
> The BLM ~~is currently consulting~~ has completed consultation with the State Historic Preservation Office, the tribes, and the Advisory Council on Historic Preservation (ACHP)

for impacts associated with the proposed project (see Regulatory Setting, below) and is proceeding under an approved Programmatic Agreement (PA). The County is also currently consulting directly with the tribes via letters and plans to conduct in-person government-to-government communication. Tribal members attended the scoping meeting in Lone Pine in October 2007.

A3. Preparers' Qualifications

Comments

Concerns were raised about the qualifications of the preparers of the Hydrology Model in the EIR. Comments also pertained to the peer review process and legal requirements surrounding the preparation of the Hydrology Model used in the EIR.

Responses

The Hydrology Model was originally developed by Brown and Caldwell, an environmental engineering and consulting firm. The Rose Valley groundwater model (Hydrology Model) was adapted and modified by Dan Matthews. He also prepared the groundwater analysis in the EIR in consultation with Dr. Galen Kenoyer and Inyo County Water Department staff. Senior review was conducted by Dr. Kenoyer, although his name was inadvertently left off of the List of Preparers in Chapter 6 of the Draft EIR. Dr. Kenoyer and Mr. Matthews professionally peer reviewed each others' work for this project. Mr. Matthews and Dr. Kenoyer are qualified hydrologists through training and experience. The State of California, Department of Consumer Affairs Geologists and Geophysicist Act, Code of Professional Geologist and Geophysicists Professional Standards (as amended, 2008), Section 7835 states:

> "All geologic plans, specifications, reports or documents shall be prepared by a professional geologist, or registered certified specialty geologist, or by a subordinate employee under his or her direction. In addition, they shall be signed by the professional geologist, or registered certified specialty geologist or stamped with his or her seal, either of which shall indicate his or her responsibility for them."

A "certified specialty geologist" means either a registered Certified Engineering Geologist or a registered Certified Hydrogeologist; however, the requirements read a "professional geologist" or "registered certified specialty geologist". The understanding is that registered geologists have the proper training in hydrogeology.

Mr. Matthews is a Washington State Registered Geologist, a Washington State Registered Hydrogeologist, and a California Registered Geologist. Mr. Matthews has nearly 25 years of experience providing hydrogeologic services on a wide range of projects. He has directed hydrogeologic characterization studies of a number of sites in Washington and California. He has used groundwater flow models to evaluate ground water development potential, to delineate well head protection areas, to design construction dewatering systems, and to optimally locate extraction wells for contaminant plume capture and treatment. Mr. Matthews has a Master's Degree in Hydrology and Water Resources from the University of Arizona and completed groundwater modeling coursework with Dr. Shlomo Neuman. A registration as a hydrogeologist in California is not required to perform the modeling or the CEQA analysis presented in the Draft EIR.

Additional review was provided by Dr. Kenoyer, who is a Senior Hydrogeologist with MHA|RMT. Dr. Kenoyer is a California Registered Professional Geologist. Dr. Kenoyer received his PhD in Hydrogeology from University of Wisconsin under the renowned groundwater modeling expert Dr. Mary Anderson. Dr. Kenoyer has also taught graduate level courses on groundwater modeling for 5 years as an Assistant Professor at Wright State University. He served on the American Society for Testing and Materials (ASTM) committee for writing standards for groundwater modeling, and has led the groundwater modeling group at RMT for 17 years, conducting many modeling projects over that time period.

Jill Haizlip is a geochemist and prepared the water quality analysis and analysis of impacts to the Coso Hot Springs. She has been working in the geothermal industry for 27 years. Ms. Haizlip has consulted with the previous Coso geothermal field operators to address issues related to the Coso geothermal reservoir fluid chemistry. She worked with non-condensable gas data and evaluated management plans to mitigate the effects of reservoir gasses. She also evaluated production processes to avoid scaling and precipitation effects on production facilities. More recently she has helped the Navy to compile the Coso Hot Springs Monitoring Program annual reports.

Chapter 6: Report Preparers has been updated as shown below.

Page 6-1

6.1.3 CONSULTANT TEAM

This EIR was prepared for and under the direction of the Inyo County Department of Planning by MHA Environmental Consulting, an RMT Business, of San Mateo, California. The following staff contributed to this report:

Contributor	**Position/Role**
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Tania Treis	Deputy Project Manager
Galen Kenoyer, PhD	Senior Hydrogeologist
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Chrissy Spanoghe	Environmental Scientist
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Roger Luc	Document Production Specialist

The following subcontractors contributed to the preparation of this document:

Contributor	**Position/Role**
Jill Haizlip	Principal ~~Hydrologist~~ Geochemist – Geologica, Inc.
Dan Matthews	Senior ~~Geo~~Hydrogeologist – Geologica, Inc.
Gary McKay	Geothermal Power Generation Specialist – Geologica, Inc.
Varinder Oberoi	Engineering Hydrologist
Denise LaBerteaux	Biologist – EREMICO

A4. Scope and Timeframe for Impact Analysis

Comments

Several comments were received claiming that project impacts were only addressed for 1.2 years and should be addressed for the full pumping rate (i.e., 4,839 ac-ft/yr) for 30 years.

Responses

The entire Draft EIR addresses impacts of the proposed project (i.e., pumping at 4,839 ac-ft/yr for 30 years). Please refer to Chapter 3: Environmental Impact Analysis for discussion of potential impacts associated with the proposed project. All impacts of the proposed project are analyzed by environmental parameter. The impacts may be significant in many cases, but are mitigated to a less than significant level by measures Hydrology-1 through Hydrology-4, which call for reduced pumping over a reduced timeframe if certain trigger points are reached.

Some examples of how the Draft EIR addresses impacts for the proposed project without mitigation are included below. This is not a comprehensive list; however, the entire analysis in the Draft EIR was written to address impacts of the proposed project, which is pumping at 4,839 ac-ft/yr for the 30 years.

- **3.2 Hydrology and Water Quality:** Page 3.2-34, fourth paragraph, "The predicted groundwater table drawdown developed after 30 years of pumping the Hay Ranch wells at the full projected development rate of 4,839 acre-feet per year is depicted in plan view on Figure 3.2-14. Predicted drawdown in groundwater levels in various wells after full project development is shown in Table 3.2-5."
- **3.3 Geology and Soils:** Page 3.3-14, first paragraph, "Concern has been expressed that reductions in surface waters would increase soil erosion in the valley. Mitigation has been included in Section 3.2 Hydrology and Water Quality to monitor groundwater drawdown, with contingency plans to prevent surface water impacts (primarily at Little Lake) from groundwater drawdown. With implementation of the mitigation in Section 3.2 Hydrology and Water Quality, surface waters would not be significantly impacted and wind blown soil erosion would not increase."
- **3.4 Biological Resources:** Page 3.4-40, second paragraph, "Operation has the potential to impact vegetation and sensitive communities in Rose Valley that are dependent on the groundwater table. Wetlands and riparian vegetation at Little Lake Ranch could be impacted by drawdown of groundwater that supplies the surface water flows at the lake. Impacts would not occur right away, but would occur over time; adverse effects would be significant. Mitigation is closely tied to hydrologic monitoring and mitigation. A monitoring program would be implemented that includes trigger points for implementing mitigation to prevent significant effects to water levels and impacts to habitats at Little Lake. With implementation of mitigation, impacts to the habitat at Little Lake would be less than significant."

A5. Regulatory Compliance

Comments

Comments were received that questioned the proposed project's compliance with various regulations, including several regulations of Inyo County Code §18.77 and the Geothermal Ordinance of Inyo County (1973).

Responses

The proposed project would be in compliance with applicable regulations.

Inyo County Code §18.77.000 (H.)

Inyo County Code §18.77.000 (H.) pertains to water transfers undertaken pursuant to California Water Code §1810 (Sales of Surface Water or Groundwater by the City of Los Angeles, and the Transfer or Transport of Water from Groundwater Basins Located in Whole or in Part Within). This section of the Inyo County Code is discussed on page 3.2-31 of the Draft EIR under the heading Inyo County Code §18.77.000 (H.). The regulation pertains to the transfer or transport of groundwater from a groundwater basin in whole or in part within Inyo County to an area outside of the groundwater basin, or a transfer or transport of groundwater extracted from within Inyo County from a groundwater basin located partially within Inyo County for use in an area within the same basin, but outside the boundaries of Inyo County. Inyo County Code states that either of these transfers would have the potential to adversely affect the economy and environment of Inyo County.

The proposed project would transfer groundwater from the Rose Valley Basin to the Coso Groundwater Basin. The Inyo County Code states that this action would have the potential to adversely affect the economy and environment of Inyo County; in §18.77.000 (I.) and §18.77.000 (J.) authority is relegated to Inyo County to regulate the extraction of water from groundwater basins within Inyo County in a manner that provides for the protection of the overall environment and economy of Inyo County.

The section in question does not prohibit a groundwater transfer from one basin to another; rather, it requires that Inyo County Code regulate the extraction of water with the intent of preventing adverse impacts to the economy and environment of Inyo County. The applicant has applied for a CUP to transfer water, in compliance with the regulations.

Inyo County Code §18.77.010 (B.)

Inyo County Code §18.77 is discussed on page 3.2-31 of the Draft EIR. The project is not exempt from Inyo County Code §18.77, according to criteria listed under §18.77.010 (B.). Projects that would be considered exempt, according to Inyo County Code §18.77.010(B.), include: certain transfers and transports of water by the City of Los Angeles; transfer or transport of water during periods of emergency for specific purposes; a transfer or transport of water in the form of manufactured goods or products, agricultural products, water in bottles or portable containers; or, a transfer or transport of water over which Inyo County does not have jurisdiction to regulate. The proposed project does not qualify under any of these categories, and is not exempt from the regulation.

Inyo County Code §18.77.045 and Inyo County Code §18.77.055

The Draft EIR states on page 3.2-50 that Coso is subject to all regulations as stated in the Inyo County Code, §18.77.045 and §18.77.055, which allow for the Conditional Use Permit (CUP) to be challenged if at any time the conditions of the permit are not being implemented or if pumping is proven to be the cause of unreasonable effects on the overall economy or environment of Inyo County. The permit could be modified or revoked as a result of a violation of permit terms or the occurrence of adverse impacts as described above. This code would also help to minimize the potential for potentially significant impacts associated with the proposed project. The final decision on any modifications to the CUP would also be in compliance with the Inyo County Code.

Geothermal Ordinance of the County of Inyo (Inyo County Ordinance 239, Title 19)

The Geothermal Resource Development ordinance of the Inyo County Code requires permits for geothermal exploration and development activity and requires that geothermal development comply with various regulations. The intent of the ordinance is to ensure that geothermal activity is regulated in such a manner so as to:

- Insure the public health, safety, comfort and convenience, and general welfare;
- Provide for the optimum use of the land;
- Protect the environment;
- Provide for cooperation in the development of a geothermal element to the general plan;
- Encourage geothermal resource development which is compatible with the above. (Ord. 239 § 1.30, 1973.)

The ordinance also requires the protection of the living environment when geothermal development is permitted, and that development shall occur with the "least amount of impact on any historical, cultural, aesthetic or environmental site."

This ordinance was not discussed in the Draft EIR because the project does not include permitting of a new geothermal exploration or development project. The power plants are already permitted and constructed and the proposed project would not expand the power plants size or output beyond that for which it is already permitted. The proposed project is the transfer of water from one groundwater basin to another and the protection measures ensured by the Inyo County Code have similar requirements for protection of the living and cultural environment. The project, as proposed, includes many mitigation measures (refer to Chapter 4 of the Draft EIR) that ensure the project would meet the requirements of Inyo County Code §18.77, regarding the transfer of groundwater from one groundwater basin to another.

A6. Baseline Studies

Comment

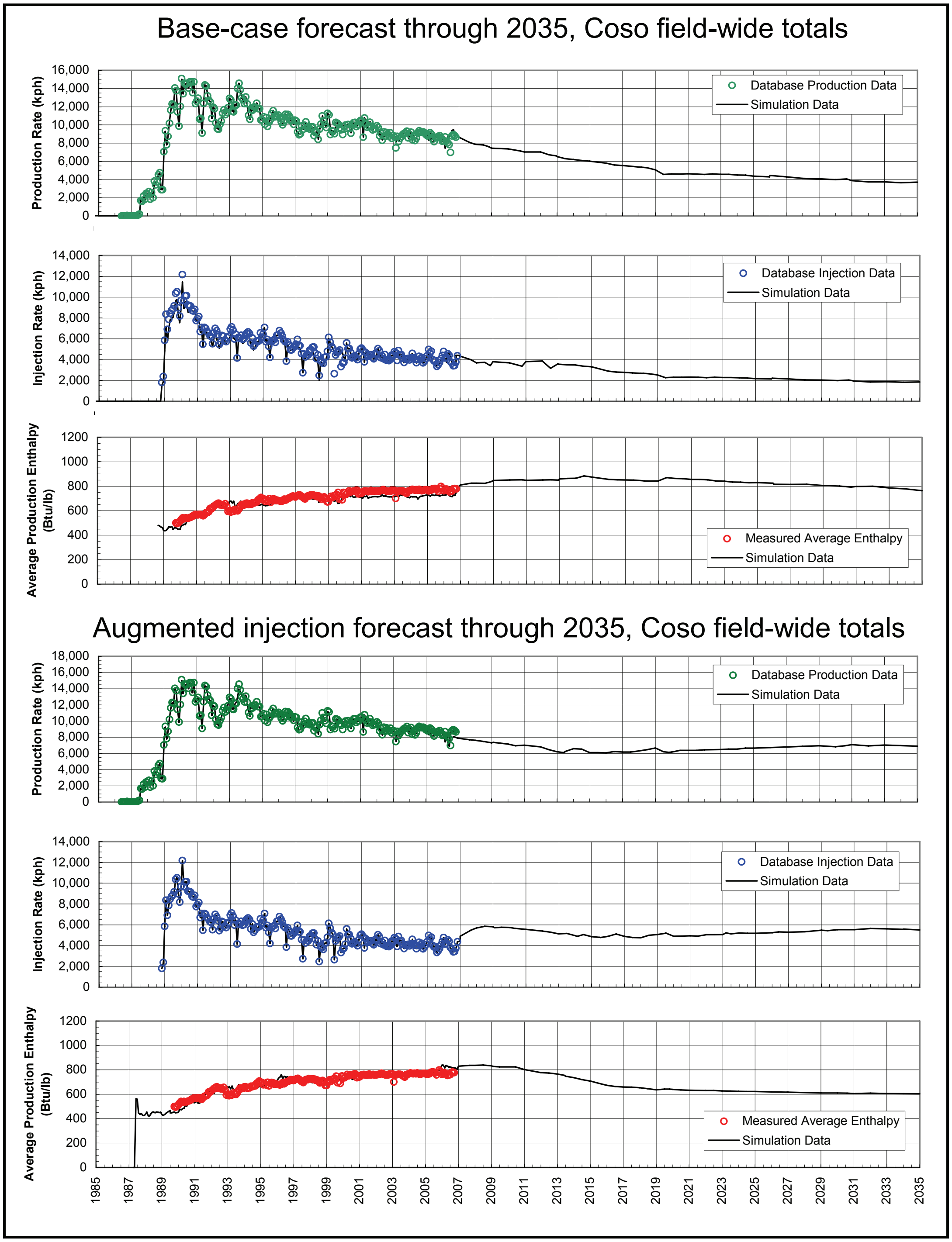
Comments were received regarding the reliance on baseline studies and data from previous documents prepared in the 1980s, such as biological and hydrologic studies used to describe baseline conditions. The commenter asked why the document relies on such dated studies. Other comments were received on the use of permitted conditions at the power plant as baseline when addressing potential increases in power generation as a result of the proposed project.

Response

The assessment of the environmental resources of the project area is based on several previously prepared studies and reports, as well as studies performed specifically for the proposed project. Although all baseline studies were not completed specifically for or as a result of the proposed project, the studies are relevant to the project area, and accurately reflect the baseline conditions on and around the project site as required by CEQA Guidelines §15125. All biological surveys were updated between 2007 and 2008. A new pump test and hydrologic studies were performed. Research to obtain updated laws, regulations, air data, population data, traffic data, etc. was performed as appropriate as required by CEQA Guidelines §15125.

The potential increase in power production at the power plants was not addressed because the project as proposed ***would not increase power production*** at the plants beyond the existing conditions (established at the time of issuance of the Notice of Preparation [NOP]). The relevant baseline in this discussion is the amount of energy that is produced by the plants. The plants were evaluated under NEPA, and have already been permitted.

The proposed project would only stop the decline in reservoir productivity. The Coso Reservoir Model was used to test the geothermal reservoir's potential response to adding 3,000 gallons per minute (gpm) of additional injection. A base-case forecast with no field improvements was used to compare with a forecast with 3,000 gpm of additional injection. Production would not increase over existing levels. Production would decrease and then stabilize (graphic provided by Coso, January 2008), as shown in the following supporting graph.



A7. CEQA ADEQUACY

Multiple comments were received on the following topics:

1. Public Review of the Draft EIR
2. Recirculation of the Draft EIR

A7.1 Public Review of the Draft EIR

Comments

Several comments were received pertaining to public review of the Draft EIR. One commenter suggested that a court recorder should be present for meetings held to accept public commentary on the proposed project. Many commenters suggested that the length of the review period was not sufficient to collect comments on the Draft EIR.

Responses

Public hearings can be conducted to solicit public comments on environmental documents, either in separate proceedings or in conjunction with other proceedings of the public agency. The use of a court reporter at a public meeting, however, is not required in the CEQA process (CEQA Guidelines §15087(i)). Inyo County regulations require that a public hearing be held on the EIR during the Planning Commission review, during which time testimony and evidence are taken. This is prior to approval of the EIR, and is required by Inyo County Code. There is no requirement, however, for a public hearing to be held at either the scoping or the public review period for the Draft EIR. There is also no requirement for a court reporter to be present at either a public meeting or a public hearing.

Verbal comments made during the public meeting were summarized by the EIR team during the August 20, 2008 meeting. The comment summary from the meeting is included in the project record. The public comment period ended on September 6, 2008. There were 17 days between the time of the public meeting and the end of the comment period, allowing for additional written comments to continue to be received after the public meeting.

The public was provided the statutory 45-day comment period during which comments could be submitted in writing to Inyo County. The lead agency must provide a public Notice of Availability (NOA) of the Draft EIR as required in the CEQA Guidelines and the Inyo County Code. The NOA must include:

- A brief description of the proposed project and the project location;
- The starting and ending dates for the review period during which the lead agency will receive comments;
- The date, time, and place of any scheduled public meetings to be held by the lead agency regarding the proposed project;
- A list of the significant environmental effects anticipated as a result of the proposed project as the lead agency is aware at the time of the notice;
- Any toxics sites on the proposed project location;
- And, the address where copies of the EIR and all documents referenced in the EIR will be available for public review (CEQA Guidelines §15087(c), Inyo County Code 15.36.060).

The NOA for the proposed project meets all of these standards.

CEQA requires that lead agencies use the State Clearinghouse to distribute the Draft EIR to State agencies for review, make copies of Draft EIRs available to public library systems serving the area involved, and hold copies in its own offices (CEQA Guidelines §15087(f), §15087(g)). Inyo County submitted a Notice of Completion to the State Clearinghouse, as required by CEQA (CEQA Guidelines §15085). Inyo County has provided the Draft EIR to the State Clearinghouse, all six County libraries, and has housed copies of the Draft EIR in its offices.

The public review period of 45 days is adequate under CEQA and is consistent with Inyo County regulations. The public review period for a Draft EIR must be at least 30 days under CEQA, but not longer than 60 days (CEQA Guidelines §15105(a)). Inyo County regulations require that the Inyo County Planning Department establish a review period of 45 days for projects that require State Clearinghouse review, such as the proposed project (Inyo County Code 15.36.070). Public review began on July 23, 2008, and ended on September 6, 2008.

The Inyo County Planning Department determined that a 45-day review period would be sufficient. The 45-day review period is consistent with applicable regulations. The public review period for the proposed project's Draft EIR was adequate to receive meaningful comments, as evidenced by the many comment letters received by Inyo County. The Planning Commission will also conduct a public hearing on the EIR, and is required to accept comments prior to and during the hearing. The County, however, is not required to formally respond to late comments.

A7.2 Recirculation of the Draft EIR

Comments

Several comments were received calling for the recirculation of the Draft EIR, and an additional public review period. Commenters requested that the Draft EIR be recirculated for a variety of reasons, such as allegations of unreliability of the Hydrology Model, claims of significant new information, and inadequacy of the public review period.

Responses

A lead agency must recirculate a Draft EIR when significant, new information is added to the Draft EIR after public notice of availability of the Draft EIR for public review has been given, and before certification of the EIR. "Information" can include changes in the project, environmental setting, or additional data or other information. "Significant" information is information that would change the EIR in a way that would deny the right of the public of a meaningful chance to provide comments on substantial adverse environmental impacts of the proposed project, or on feasible mitigation or project alternatives that would lessen such an impact (CEQA Guidelines §15088.5).

Significant new information that would require the recirculation of the Draft EIR includes (CEQA Guidelines §15088.5(a)(1), §15088.5(b)(2), §15088.5(c)(3)):

- A significant new environmental impact that would result from the proposed project or from a new mitigation measure that would be implemented
- A substantial increase in the severity of an environmental impact that would result unless mitigation measures were devised to reduce the impact to less-than-significant
- A feasible project alternative or mitigation measure that would clearly reduce environmental impacts of the proposed project and is considerably different from other alternatives that were analyzed

Recirculation would be required if the Draft EIR is so fundamentally and basically inadequate and cursory in nature that the public was not given a chance for a meaningful review and comment (CEQA Guidelines §15088.5(a)(4)). Recirculation of a Draft EIR is not required if additional information clarifies, amplifies, or insignificantly modifies an already adequate EIR (CEQA Guidelines §15088.5(d)).

None of the factors that would require a recirculation of the Draft EIR pertain to the proposed project's Draft EIR. The Hydrology Model is accurate as found in the Draft EIR. Please refer to Master Response D for discussion of the Hydrology Model. No significant new information that would require the recirculation of the Draft EIR has been added to the Draft EIR; all revisions made to the Draft EIR clarify, amplify, or insignificantly modify the already adequate Draft EIR. Inyo

County's original conclusion in the Draft EIR that all impacts would be less than significant after mitigation still applies.

B. PROJECT DESCRIPTION

Multiple comments were received on the following topics:

1. Project Purpose, Need and Objectives
2. Project Components
3. Required Permits
4. Terms of the CUP

B1. Project Purpose, Need, and Objectives

Comments

Several comments were received requesting clarification on the need for the proposed project. The comments also included questions regarding the validity of the project objective (to maintain energy production) under CEQA, and claimed that the project objectives are narrow and self-serving. A commenter asked about the timeframe of the project objectives. Several comments were also made asking if the objectives were to increase power production at the Coso geothermal field. and to provide the evidence of the effectiveness of the proposed project to reach Coso's stated objectives.

Responses

The requirements for the statement of project objectives under CEQA are fairly broad. CEQA Guidelines §15124(b) states the following should be included in an EIR:

> A statement of objectives sought by the proposed project. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project.

The project purpose and need is stated on page 2-1 of the Draft EIR, under Section 2.1.2: Purpose and Need. The purpose of the project is to supply supplemental injection water to the Coso geothermal field, which is experiencing annual reservoir decline due to the loss of fluid through the cooling towers.

The project objectives are included in the purpose and need discussion, and are restated on page 5-1 of the Draft EIR under Section 5.1.2: Project Objective. The Draft EIR states on page 5-1 that the objective of the proposed project is to provide supplemental injection water to the Coso geothermal field to minimize the annual decline in reservoir productivity due to evaporation of geothermal fluids from the power plant cooling towers. This injection would sustain the production capacity and useful economic lives of the existing power plants. The length of the CUP is proposed to be 30 years. The project objective has also been added to the Executive Summary as a revision to the Draft EIR, as shown below.

Page ES-1

ES.1.1 PROJECT DESCRIPTION

Overview

The Coso Operating Company, LLC (Coso) is seeking a 30-year Conditional Use Permit (CUP No. 2007-03) from the Inyo County Planning Commission (County) for the Coso Hay Ranch Water Extraction and Delivery System project.

The proposed project includes extracting groundwater from two existing wells on the Coso Hay Ranch, LLC property (Hay Ranch) in Rose Valley, and delivering the water to the injection distribution system at the Coso geothermal field in the northwest area of the China Lake Naval Air Weapons Station (CLNAWS).

The project elements are described in Table ES.1-1 and shown in Figure ES.1-2. The project would occupy approximately 60.5 acres, as shown in Table ES.1-2. The project location is shown in Figure ES.1-1.

Project Objective

The proposed project's objectives are ~~is needed~~ to provide supplemental injection water to the Coso geothermal field in order to minimize the annual decline in reservoir productivity due to evaporation of geothermal fluids from power plant cooling towers.

The statements above are valid descriptions of the project purpose and need and objectives. The objective is broad enough to allow for consideration of other alternatives (e.g., alternative water sources) and is specific enough to state what Coso proposes to accomplish with the proposed project (i.e., minimize the annual decline in reservoir productivity due to evaporation of geothermal fluids from the power plant cooling towers). The objectives did not inhibit consideration of a wide range of alternatives. Several other alternatives that would meet the objectives of the project were considered in Chapter 5, including alternative sources of injection water. Refer to Master Response L for more discussion of project alternatives.

The objectives were established through Coso's application to the County. Coso is seeking to minimize the decline in productivity of their facilities through a means that is directly related to solving the issue of the decline in reservoir pressure.

B2. Project Components

Comments

Several comments were received that requested clarification of the project components. An explanation of need for a new injection system was requested. Other questions regarding the injection system included inquiries on the uses of injection water, when injection would occur, and how many wells would be used for injection of supplemental fluids.

Responses

The project components are described in detail in Chapter 2: Project Description. Table 2.3-1 on pages 2-2 and 2-3 of the Draft EIR provides a summary of the project components. Note that a formatting error resulted in the omission of one row of the table that summarized the pipeline component. A full description of the pipeline is provided from pages 2-11 to 2-13, although the component is missing from Table 2.3-1 in the Draft EIR. The missing table row is provided below, and has been added to the Final EIR:

Pipeline	Hay Ranch Property &Hay Ranch to Coso Road, along BLM lands, to the CLNAWS Geothermal Field	• Piping from groundwater wells to a collection tank at the lift pump station • A main pumped transmission pipeline from the lift pump station to a high point tank • A main gravity transmission pipeline to transfer water from the high point tank to the injection well

The injection system is described on page 2-14 of the Draft EIR. The proposed pipeline would connect to the existing injection system with control valves to provide controlled injection. No new injection system would be required. The existing injection system includes several wells. The imported water would be dispersed to different wells through the existing metering system. Fluid to be injected would be distributed in the same fashion as it is currently distributed, and no changes to that process have been proposed. No new wells, pipes, or controls would be needed for the injection system.

B3. Required Permits

Comments

Several comments were received that requested the inclusion of copies of the permits for the existing power plants.

Responses

Copies of existing permits can be obtained through the appropriate issuing agencies, which are listed in Master Response A1. Inyo County is not re-permitting the geothermal operations, but is instead issuing a CUP for water transfer. Accordingly, the permits did not need to be circulated with the Draft EIR. The lifetimes of the power plants were based on amortization of power plant equipment. At the time of expiration of existing permits, it is possible for Coso to renew the permits. The project would not increase production from the power plants beyond what is currently being produced. Production would likely decline slightly and then remain constant over the life of the proposed project with project implementation.

B4. Terms of the CUP

Comments

Comments were received that questioned why the CUP would be issued for 30 years when the Draft EIR suggests that pumping at the proposed rate could have significant impacts after just 1.2 years. Comments regarding the allowable pumping rate of the CUP were also raised.

Response

The County would issue the CUP for a 30-year term. Implementation of mitigation would be required, which may shorten the life of the project; however, the CUP would still be issued for 30 years.

The CUP, if issued, would be subject to all of the provisions of Inyo County Code Chapter 18.77, and would presumably contain the mitigation measures in the Draft EIR as conditions.

The analysis in the Draft EIR establishes a threshold of significance for the project. The project life is not based on a specific timeline related to the timeframe of other permits, but is based on trigger levels that would be reached prior to causing a significant impact. Coso would be legally obligated to respond according to stipulations included in the CUP and mitigation in the Final EIR once trigger levels are reached, regardless of the amount of time left before expiration of the CUP. All potentially significant impacts would accordingly be reduced to a less than significant level with the implementation of mitigation.

Trigger levels that would determine whether pumping is reduced or stopped are based on groundwater levels, not time. The model indicates it would take 1.2 years to reach the trigger levels pumping at the maximum amount allowed. It would not be appropriate to limit the permit to a 1.2 year period for several reasons. Most importantly, the model is conservative. It may be that Coso can pump for a number of years without reaching a trigger level or threatening to exceed the significance criteria at Little Lake reservoir. The model assumes a direct connection between the northern portion of the Rose Valley aquifer and the southern. It could develop that the connection is not direct and that more water could be removed from the north without affecting the south, which would require a major revision of the trigger levels. Finally, assuming Coso must cease pumping at 1.2 years, it may develop that the aquifer regenerates more quickly than assumed and that Coso could resume pumping after some period of time. This could entail periodic pumping for the full 30-year period. Therefore, it is appropriate and protective to approve a 30-year CUP, even if it currently appears that pumping will not be allowed for that length of time.

The Inyo County Planning Commission, under recommendations of the Inyo County Water Commission, would have the discretion to approve and incorporate, as appropriate, a monitoring, groundwater management and/or reporting program into the CUP terms. The monitoring, groundwater management and/or reporting program would focus on ensuring that the proposed water transfer would not unreasonably affect the overall economy or the environment of Inyo County.

Inyo County Code requires that the groundwater management and/or reporting program may include, but shall not be limited to:

- Instream flow measurements;
- Reports of the amounts of surface water diverted and/or amounts of groundwater pumped;
- Monitoring of wells;
- Monitoring of groundwater levels;
- Monitoring of spring and seeps;
- Monitoring of vegetation, wildlife, fish.

The plan should include economic effects and thresholds and/or trigger points which, if reached, would require modification to the extraction of groundwater (Inyo County Code §18.77.035).

The Hydrologic Monitoring and Mitigation Plan (HMMP) provides the aforementioned information and would be included in the CUP as the monitoring and groundwater management program. All mitigation measures in the Draft EIR, including the HMMP, would presumably be included as stipulations in the CUP, or would be adopted as part of any project approval.

C. HYDROLOGY AND WATER QUALITY

Multiple comments were received on the hydrologic analysis for the project. Key topics included:

1. Mitigation for Impacts to Wells
2. Comments on the Hydrology Model
3. Comments on Springs
4. Comments on Mitigation and Monitoring
5. Comments on the Coso Hot Springs
6. Water Quality and Isotope Studies Results

7. Water Rights

C1. Mitigation for Impacts to Wells

Comments

Comments were received that include questions about mitigation measure Hydrology-2, part of which pertains to the lowering of wells that have been affected by groundwater pumping. Questions were raised about the economics of deepening wells or setting pumps at a lower level in the well, including who would pay for adjustments to wells that are affected by the groundwater pumping related to the proposed project.

Other comments were raised questioning the review process for determining the cause of impacts to private wells, if impacts are seen. The commenter suggested that there should not be a review process because the applicant would be withdrawing water and causing a net deficit in the water balance of the groundwater basin.

Responses

Mitigation measure Hydrology-2 on page 3.2-39 of the Draft EIR specifies that the applicant would fund any well adjustments through the life of the proposed project for any existing wells that lose their current functionality as a result of the proposed project. The mitigation would minimize impacts of the proposed project on access to and use of existing wells in the Rose Valley to less than significant levels. Monitoring would also track groundwater drawdown as a result of the proposed project in order to determine when and if mitigation for effects to private well owners would be needed.

The review process is necessary because groundwater drawdown could be the result of processes other than the proposed project, or could be anomalous in certain wells based on other factors (e.g., seismicity). Mitigation measure Hydrology-2 requires the analysis and review by the applicant and the County using monitoring and modeling data to support claims of groundwater drawdown in individual wells. The County would ultimately determine whether mitigation would be necessary. This ensures a fair process for all parties, with unbiased review by the County.

C2. Comments on the Hydrology Model

The topics below are related to issues discussed in Appendix C2 (Numerical Groundwater Flow Modeling Rose Valley, Inyo, County, California) of the EIR. Comments were received on the following topics:

1. Aquifer Thickness Represented in the Hydrology Model
2. Aquifer Hydraulic Properties
3. Southern Extent of Hydrology Model Domain
4. Boundary Conditions Represented in the Model
5. Hydrology Model Calibration Procedures
6. Hydrology Model Documentation
7. Hydrologic Impact Analyses

C2.1 Aquifer Thickness Represented in the Model

Comments

A commenter questioned the aquifer thickness represented in the numerical model stating that the values of up to 3,000 feet (ft) extend the aquifer to "artificial and unrealistic depths." The commenter claimed that this is a deviation from the Owens Valley numerical groundwater flow model developed by Danskin (1998).

Response

The thickness of the unconsolidated sedimentary deposits represented in the Hydrology Model is mainly based on the interpretation presented in the report prepared by GeoTrans (2004), entitled Revised Hydrogeologic Conceptual Model for Rose Valley. GeoTrans reviewed lithologic logging data from four deep uranium exploration wells advanced in 1979 (Schafer 1981), gravity data collected by the Navy, logs of water supply wells in Rose Valley, and previous reports on regional and local geology to develop a map of sediment thickness. Brown and Caldwell (2006) used the sediment thickness map developed by GeoTrans to specify the bottom elevation of deepest model layer in the numerical simulation model described in their 2006 report, Rose Valley Groundwater Model, Coso Operating Company, LLC, Rose Valley, California. Geologica (2008) adopted the same bottom elevation configuration specified in the 2006 groundwater model developed by Brown and Caldwell. The assigned sediment thickness in the model developed for the EIR varied from approximately 100 ft near Little Lake to approximately 3,500 ft near Hay Ranch, primarily based on the GeoTrans (2004) analysis. The inclusion of sediments deeper than the depth from which the pumping would occur was done for two reasons:

1. In case Coso desired to evaluate deeper pumping in the future
2. Some portions of the groundwater discharging into Little Lake is believed to come from deep groundwater.

The numerical model developed for the EIR uses four layers to represent the water saturated sediment deposits in Rose Valley. Model layers 1 and 2 are “active” (present and saturated) throughout the model domain and represent the generally permeable, shallow groundwater-bearing zone tapped by water supply wells in the valley. Model layers 3 and 4 are active from the north end of Rose Valley through the central part of the valley, and, consistent with the sediment thickness map developed by GeoTrans, pinch out (meaning, are not present) on the south side of the Red Hill cinder cone. As simulated in the model developed for the Draft EIR, model layers 3 and 4, representing geologic strata at depths ranging from approximately 700 to up to 3,500 ft below ground surface (bgs), were specified with hydraulic conductivity values that are 100 to 1,000 times lower than corresponding values of layers 1 and 2 in the model. This is based on soil descriptions from the available well log data. The fact that the model represents these lower layers as 100 to 1,000 times less permeable implies that they will yield far lower quantities of groundwater than the upper layers. This is consistent with the statements of Danskin (1998) that were cited by one commenter. Danskin originally had a deeper layer in his model, and later removed it to reduce the model run time (for efficiency), though there was possibly some loss of accuracy by not including it. The possible error would be minor compared to other inputs of the Owens Valley model. The conceptualization of the Hydrology Model is consistent with the Owens Valley model of Danskin, and is not flawed.

C2.2 Aquifer Hydraulic Properties

Comments

The specific yield and storativity values used in the model were raised into question. The City of Los Angeles Department of Water and Power (LADWP) commented that hydraulic conductivity values used in the northern end of the model grid were too low and suggested installing additional monitoring wells, conducting a pumping test in that area, and recalibrating the model using that data. Comments were also made on the vertical hydraulic and horizontal conductivity values used in the model and questioned the basis for assuming that horizontal hydraulic conductivity is isotropic in all layers.

Responses

Specific Yield. The model was initially calibrated to time-drawdown data collected during the 21-day aquifer pumping/recovery test conducted in the Hay Ranch South well in November/December 2007. Results of that analysis indicated a short-term specific yield value of 3% for the water table aquifer near Hay Ranch. The consultant hired by Little Lake Ranch LLC (Little Lake Ranch) noted that that value is "well within the range cited by Freeze and Cherry. However, it is likely that this value may not be representative of a specific yield over several years" (Zdon, September 2, 2008 letter). Appendix C2 of the Draft EIR notes the pumping portion of the test represented only a 14-day period, and that the specific yield value over a longer time period of pumping (months to years) would likely be higher. It is a well known phenomenon that, during the early stages of pumping tests, an unconfined aquifer commonly acts like a confined aquifer, with corresponding low apparent values of specific yield. The soil pores start to drain later and then the aquifer starts to act like an unconfined aquifer. The apparent specific yield values become larger. The 3% specific yield value is believed to be representative of the apparent specific yield for short duration pumping, as clearly stated in the Draft EIR.

Danskin (1998) summarized data from many pumping tests and notes that the specific yield "was difficult to calculate from the available tests" in the Owens Valley. None of these values reach the 10 to 15% range that is characteristic of a true specific yield of these aquifer materials (Hollett et al. 1991; Davis 1969)." Danskin states, "Aquifer tests, even those extending several days…..are affected very little by actual drainage of aquifer materials. This drainage, which accounts for nearly all of the specific yield value, is delayed and occurs over a period of weeks, months, or years. As a result, storage coefficients obtained from model calibration of long-term conditions are actually much more indicative of actual values than those calculated from aquifer tests." Danskin used a specific yield value of 10% in the Owens Valley groundwater model, based on calibration to an extensive database of long-term aquifer response. Values of 10, 20, and 30% were used in sensitivity analysis for the Draft EIR because of the uncertainty in specific yield. Simulation runs conducted to identify trigger levels for evaluation of pumping impacts and to evaluate potential cumulative impacts from other groundwater development projects in the valley used the 10% specific yield value identified by Danskin. As stated in the Draft EIR, the 14-day pumping duration accomplished in the November/December 2007 Hay Ranch aquifer test was not long enough to reliably estimate aquifer specific yield; consequently, Appendix C4: Rose Valley Hydrologic Monitoring and Mitigation Program describes procedures for monitoring groundwater table drawdown resulting from pumping the Hay Ranch wells, data evaluation procedures, and provides a time table for recalibrating the groundwater model to improve the estimate of specific yield.

Storativity. The specific storage of a saturated aquifer is defined as the volume of groundwater that a unit volume of aquifer releases from storage under a unit decline in hydraulic head (water level). Specific storage has units of 1/length (ft^{-1}). Storativity of a saturated aquifer, also known as storage coefficient, is defined as the volume of groundwater that an aquifer releases from storage per unit surface area of the aquifer per unit decline in water level and is dimensionless. Below the groundwater table in layers 2, 3, and 4, where present in the Hydrology Model, groundwater is released from storage by a combination of decompression of water and decompression of the aquifer matrix under the reduced pressure resulting from a water level decline. The Hydrology Model was constructed to utilize specific yield values for the layer in which the groundwater table resided (layer 1), and specific storage values for all layers wholly below the groundwater table (layers 2, 3, and 4). Appendix C2 of the Draft EIR incorrectly termed this parameter "storativity", when in fact the parameter specified in the model was specific storage; this error has been corrected in the Final EIR.

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C2-3.4 <u>Model</u> Initial Aquifer Parameters

Aquifer horizontal hydraulic conductivity for the revised model was initially specified with the distribution developed by Brown and Caldwell which ranged from values of 0.28 to 100 ft/day in layers 1 and 2, 0.03 to 2.8 ft/day in layer 3, and 0.28 ft/day in layer 4. Confined aquifer specific storage ~~storativity~~ was initially specified as 2 x 10^{-6}/ft based on the storage coefficient of 0.001 estimated from the 2003 pumping test (GeoTrans, 2003) and an average effective aquifer thickness of 600 ft. Layer 1 specific yield was initially specified as 10 % as specified in the original model, equal to that specified for Owens Valley by Danskin (1998). Aquifer vertical hydraulic conductivities were initially specified as the same value as horizontal hydraulic conductivity except near the Hay Ranch where the vertical hydraulic conductivity was reduced to 1 ft/day to be more consistent with the lower vertical hydraulic conductivity indicated by the November/December 2007 pumping test results.

Page C2-16

C2-3.5.1 INITIAL CALIBRATION, TO 2007 PUMPING TEST DATA

Time-water level measurements from the Hay Ranch North and the Coso Ranch North wells were first used to calibrate the revised numerical model. Boundary groundwater discharge inflow and outflow rates were fixed for this evaluation. A model simulation of the Hay Ranch South well pumping at a rate of 1,925 gpm for 14 days was developed with monitoring points at the Hay Ranch North and Coso Ranch North well locations and other locations in Rose Valley. Then horizontal and vertical hydraulic conductivity, confined aquifer specific storage ~~storativity~~, and unconfined aquifer specific yield were adjusted until a best fit was obtained between observed and model predicted groundwater level drawdown. Plots of predicted versus observed groundwater level drawdown versus time for the Hay Ranch North and Coso Ranch North wells are shown on **Figure C2-149**. A good fit was obtained to the Hay Ranch North well data; the observed water level response of the Coso Ranch North well was complicated by unmetered wells pumping in the area and barometric pressure induced water fluctuations, neither of which are readily reproduced in the numerical model so the model fit to these data was more difficult to assess.

Page C2-19

- Lack of transmissivity or ~~storativity~~ specific storage data outside the Hay Ranch area. It should be noted that estimated aquifer hydraulic parameters were initially evaluated by conducting a pumping test at the Hay Ranch. As noted previously, drawdown was only observed near the Hay Ranch, so estimates of aquifer parameters elsewhere in Rose Valley are heavily dependent on assumptions and parameters built into the numerical model.

A consistently low uniform specific storage value of 7 x 10^{-7}/ft was used for all layers. This implies an assumption that the water present in all layers was equally compressible, which is a reasonable assumption. A uniform specific storage also implies that the aquifer matrix was equally compressible in all layers. Sediments present in deeper layers 3 and 4 may be substantially less compressible than sediments encountered closer to the ground surface. None of the Rose Valley wells penetrate below the strata represented by layer 2; as such, no lithologic logging data or water level response data are available to evaluate specific storage values for sediments in layers 3 and 4 of the model. The Hydrology Model sensitivity analysis indicated that the model calibration was insensitive to the specific storage values in layers 3 and 4, and consequently there was no evidence from the model calibration to warrant raising or lowering the specific storage values from the default value identified.

The Hay Ranch production wells fully penetrate layers 1 and 2 of the Hydrology Model and do not penetrate layers 3 and 4 at all. Based on lithologic logging and pumping test response, the Rose Valley aquifer is vertically anisotropic (horizontal hydraulic conductivity is much greater than vertical hydraulic conductivity); consequently, the Hay Ranch production wells derive more than 95% of their water from the model layers 1 and 2. This is consistent with the conceptual model that recognizes the substantially higher permeability of the upper two layers, with a corresponding higher ability to yield water to pumping wells.

Hydraulic Conductivity. The LADWP commented that hydraulic conductivity values in the northern part of Rose Valley may be too low. The groundwater table gradient throughout the central and southern part of Rose Valley averages approximately 20 ft per mile (mi). From the Pumice Mine well (approximately 1 mi north of Hay Ranch) to the LADWP wells and to Haiwee Reservoir, the groundwater table gradient increases to approximately 280 ft per mi, more than 10 times the gradient elsewhere in the valley. The groundwater levels measured in the LADWP V816 and V817 wells (3,435.2 and 3,433 ft above mean sea level [amsl] in November 2007) are nearly 170 ft higher than groundwater levels measured in the Cal-Pumice Mine well 0.6 mi to the south. From a hydrologic standpoint, the only possible explanation for the large difference in hydraulic head between the LADWP wells and the Cal-Pumice Mine well are perched water at the LADWP wells and a much lower transmissivity around the LADWP wells. The most plausible reason for the increase in groundwater gradient in this area is lower aquifer transmissivity. Sensitivity analysis during model calibration indicated that lowering the hydraulic conductivity of sediments in layers 1 and 2 gave the best fit to observed groundwater levels in this region. Although the fit to observed water levels in the area is not nearly as good as in the main portion of the valley, it is not uncommon for model head results to be less accurate in areas of lower permeability because the head gradients are very large. The key objective for the northern portion of the Hydrology Model was to match the overall hydraulic gradient from the model boundary to the Hay Ranch. This was completed successfully.

The LADWP commented that the Hay Ranch project analysis should include: installing additional monitoring wells on the LADWP property at the north end of Rose Valley; conducting a pumping test in that area; and, recalibrating the model using that data to evaluate the potential for the Hay Ranch project to increase seepage from Haiwee Reservoir. This work would seem to be necessary for demonstrating the feasibility of the proposed seepage recovery project by the proponents of that project (LADWP); however, that is not the purpose of the modeling conducted for the Draft EIR. The hydrologic modeling analysis conducted for the Draft EIR indicated that the Hay Ranch project would increase seepage from southern Owens Valley/Haiwee Reservoir by, at most, 26 acre-feet/yr (ac-ft/yr), or fewer than 3% of the current estimated groundwater inflow from the north (see Table 3.2-6). Although the model accuracy, in matching specific hydraulic heads, is not as high in the northern end of Rose Valley, the model predicted heads are lower than observed values, suggesting that the hydraulic conductivity may be even lower than modeled. Decreasing the hydraulic conductivity would decrease the amount of additional inflow from the north during pumping to less than 26 ac-ft/yr. Because of the low projected increase in groundwater inflow from the north (26 ac-ft/yr or fewer) this issue does not constitute a significant impact or a new impact under CEQA. It has been identified as a data gap, and measures for further evaluating the groundwater inflow rate from Owens Valley and Haiwee Reservoir are laid out in the Hydrologic Monitoring and Mitigation Plan which would be implemented after approval of the CUP as part of the baseline monitoring program.

Zdon (2008) implies in his comment letter that alluvial fan deposits, basin fill deposits, and volcanic rock are represented in the model as having identical aquifer characteristics throughout the region and for each layer. This is not the case. Both the model appendix text and figures indicate that lower values of hydraulic conductivity were assigned to volcanic deposits in the south end of Rose Valley compared to adjacent alluvial deposits. Deeper fine-grained basin fill deposits in the north and central parts of the valley were assigned lower hydraulic conductivity values than overlying sands and gravels.

The horizontal hydraulic conductivity of sediments in all layers was specified as isotropic (equal in all directions) in the model developed for the Draft EIR. This is a standard assumption for groundwater modeling and aquifer test analysis unless data are available that indicate otherwise. No data were identified to suggest that horizontal hydraulic conductivity in sediments of Rose valley is anisotropic (not equal in all directions).

C2.3 Southern Extent of Hydrology Model Domain

Comments

Reviewers questioned why the hydrologic model grid was not extended south past Little Lake into the Little Lake Gap area and why the model did not explicitly represent all of the ponds, springs, wells, and other surface water features on the property.

Responses

The hydrologic model of Rose Valley developed for the Draft EIR is intended to provide a management tool for evaluating potentially significant impacts to beneficial uses of groundwater throughout Rose Valley using readily available information. The model grid was extended to the south side of Little Lake, which is a large, readily identifiable surface water feature at the south end of the valley. No attempt was made to simulate water level fluctuations or conduct detailed mass balance calculations for the lake. Insufficient information is available regarding the degree of connection between lake and aquifer, current and historic water level trends, discharge rates, or records of management practices to conduct a detailed calibration of the model to the lake/groundwater interaction in this area. Nor was it possible to explicitly simulate specific surface water features on the property such as Coso Spring, the various ponds south of Little Lake, the siphon well, and other features because little to no historical data were identified regarding flow rates and water levels needed to represent these features. The primary objective of the model as it relates to Little Lake is to simulate how pumping from the wells at Hay Ranch may impact groundwater flowing into Little Lake, not how surface water flows out of Little Lake. The intended objective has been met.

Section 3.2 and Appendix C2 describe the conceptual basis for evaluating potential impacts to surface water features at Little Lake by assessing changes in the amount of groundwater flowing towards the property, water table drawdown, and, the amount of groundwater available to enter the lake. The model results provide detailed information on the expected change in groundwater levels; historical data (limited data available) on the relationship between groundwater level and flow/water level in major springs and Little Lake are then used to evaluate the likely effect of groundwater level changes on surface water bodies. Extending the model grid beyond Little Lake is not necessary for assessing potential impacts to surface water features on the property and is not justified by the available data.

C2.4 Boundary Conditions Represented in the Hydrology Model

Comments

Reviewers from the LADWP and Little Lake Ranch commented that the boundary conditions for the model were improperly specified, non-conservative, or erroneous. Boundary conditions comments included those regarding mountain front recharge rates, the type of boundary condition (constant head) and groundwater inflow rate at the northern end of the Rose Valley, type of boundary condition (general head boundary) at the southern end of Rose Valley, and evapotranspiration rate specified on the Little Lake Ranch property.

Responses

Mountain Front Recharge. Regarding the comments on precipitation and mountain front recharge, it should be understood that because he had considerably more observation data in Owens Valley, Danskin developed separate recharge components for recharge resulting from precipitation on alluvial fan heads, mountain front recharge along the areas between streams, and recharge from stream channels. The data set is much less extensive for the Hydrology Model, and all of these components were grouped together as “mountain front recharge.” The County’s model assumed to total 10% of total precipitation in the high Sierras. Danskin used a value of 6% for just mountain front recharge, and excluded other components which were estimated by other means.

The reviewer is correct that mountain front recharge was only specified in layers 2, 3, and 4, and not in layer 1, as stated in Appendix C2. The text in Section C2-2.5.1: Groundwater Inflow Components has been revised to note this.

Page C2-8

For the purposes of the initial evaluation of potential impacts of groundwater development at Hay Ranch, they further assumed that only 10 % (4,200 acre-ft/yr) of the potential mountain front precipitation recharge actually reaches Rose Valley. Danskin (1998) used a value equivalent to 6% of Sierra Nevada range precipitation for the mountain front recharge component of the numerical groundwater flow model developed to evaluate groundwater development in Owens Valley. It should be noted that in the Rose Valley model, additional recharge components were incorporated into mountain front recharge term that resulted in a larger (10%) recharge term, including recharge on the alluvial fans, and recharge beneath and between stream channels, whereas in Danskin's model mountain front recharge alone was equal to 6%; the other components were also added into Danskin model, but were treated separately. Williams (2004) estimated that mountain front precipitation recharge in Indian Wells Valley amounted to approximately 8% of precipitation in the Sierra Nevada range to the west. However, Williams noted that the Maxey-Eakin Method for estimating precipitation recharge in the Sierra Nevada range conservatively neglects areas receiving less than 8 in/yr of precipitation; consequently, higher recharge rates are possible. Because the mountain front precipitation recharge rate as assumed for the Brown and Caldwell groundwater flow model yielded reasonable calibration results in the steady state model, a recharge rate of 4,200 acre-ft/yr was also used in the revised numerical model developed for this EIR. The recharge was added to model layers 2, 3, and 4, and model sensitivity analysis showed that the results were not sensitive to the layer to which the recharge was added.

The comparison to the Danskin model for Owens Valley is not straightforward because Danskin eliminated representation of deeper sediment deposits in Owens Valley, so that all precipitation-related recharge in the Owens Valley model is applied in the upper two model layers. The Rose Valley model distributes recharge in proportion to aquifer thickness across layers 2, 3, and 4. As a basin-scale water balance model, sensitivity testing (included in more detail now in the Final EIR) has shown that there is essentially no difference in the model results whether the recharge is added in the upper layer, or is distributed across layers 2, 3, and 4 as was done in the model described in the Draft EIR. The main factor in the simulations is the amount of recharge, not the vertical location of recharge input.

Northern Boundary Condition. The LADWP reviewer commented that with the exception of cells in model layer 1 that represent seepage from Haiwee Reservoir, the remaining cells in layers 2, 3, and 4 of the northern boundary of the model would be more appropriately specified as General Head Boundary (GHB) cells rather than Constant Head Boundary (CHB) cells because this forces more groundwater inflow from the north. The same reviewer commented that the model appeared to underestimate seepage from Haiwee Reservoir into Rose Valley, an apparent contradiction. The groundwater inflow rate from the north is not well known, as stated in the Draft EIR and identified as a data gap needing further investigation during baseline monitoring studies for the proposed project. A review of the model water balance presented in Section 3.2 of the Draft EIR indicates that the groundwater inflow rate from the northern boundary only increased 26 ac-ft/yr (fewer than 3%) if pumping at Hay Ranch at the full project development rate was implemented for a 30-year duration. A simulation has not been conducted with GHB cells on the northern boundary instead of CHB cells; however, this observation indicates that model predicted drawdown values are likely to be relatively insensitive to the choice of boundary condition because the amount of flow from the north is relatively low already.

Southern Boundary Condition. The reviewer is correct that care must be exercised when using the GHB package to represent outflow from the southern end of Rose Valley. The GHB package will allow groundwater inflow into Rose Valley from Indian Wells Valley to the south if the groundwater elevation north of the boundary cell were to drop below the boundary head estimate. The groundwater elevation in model grid cells north of the GHB boundary was monitored in all simulations, and never dropped below the boundary head estimate in any simulation attempted; consequently, use of the GHB package did not have a negative impact on simulation results.

Evapotranspiration Rate. The reviewer notes that the evapotranspiration rate was specified in the model as 2.5 x 10^{-2} ft/day or 9.2 ft/year and comments that this is “apparently a data input error” because page C2-4 of the Draft EIR states that the area’s annual evapotranspiration rate is reported to be 65 inches (in) per year (5.5 ft/year). The assertion that the evapotranspiration rate used in the Hydrology Model is 2.5 x 10^{-2} ft/day or 9.2 ft/year is not an error. The evapotranspiration package was configured with an “extinction depth” of 15 ft. This selection of extinction depth (15 ft) is a typical value and consistent with that used in the Danskin model for Owens Valley. MODFLOW adjusts the actual evapotranspiration rate during a simulation run based on the depth of groundwater below ground surface, using the maximum value when the water table is at ground surface and reducing the evaporation rate proportionately to a minimum (no evapotranspiration) when the water table is 15 or more ft bgs (i.e., below the extinction depth).

The evaporation rate from Little Lake has been estimated as ranging from 65 to 80 in per year (CWRCB 1993, Bauer 2002). Plants in the area may transpire an additional 20 to 36 in per year (Danskin 1998). Section 3.2 and Appendix C2 of the Draft EIR state that evapotranspiration processes operating near Little Lake, including evaporation from the lake and transpiration from plants nearby, was estimated to total approximately 700 ac-ft/yr. The coarseness of the model grid (0.25 mi by 0.25 mi cells) does not allow for accurate representation of wetland and other plant types near the lake. All evapotranspiration was assumed to occur from two model cells that overlapped the location of Little Lake in order to be conservative. The evapotranspiration rate specified in the evapotranspiration package was adjusted incrementally during the steady-state model calibration until the evapotranspiration rate calculated by the model for the depth to groundwater calculated at Little Lake yielded a total evapotranspiration loss of 700 ac-ft/yr. The Hydrology Model will calculate lower evapotranspiration losses when groundwater levels near Little Lake decrease in response to pumping elsewhere in Rose Valley.

C2.5 Hydrology Model Calibration Procedures

Comments

Reviewers commented that:

- The purpose of transient model calibration was unclear.
- Model calibration process failed to utilize 5 years of available groundwater elevation data to develop a transient model calibration.
- Vertical hydraulic conductivity values were improperly adjusted during the model calibration process.
- Hydraulic conductivity values in the northern end of Rose Valley were improperly adjusted during model calibration.
- Predictive scenario simulation runs were conducted with an uncalibrated model.

Responses

Purpose of Transient Calibration. A steady-state groundwater flow model does not utilize aquifer storage parameters. There is no data to evaluate vertical groundwater gradients or infer aquifer vertical hydraulic conductivity because there are no clustered or adjacent monitoring wells or water supply wells screened at different depth intervals within the aquifer. The purpose of calibrating the Rose Valley groundwater model to the November/December 2007 pumping test time-drawdown data ("the transient calibration") was to obtain preliminary estimates of aquifer storage properties that are used in long-term predictive transient simulations, including specific yield and specific storage and aquifer vertical anisotropy of hydraulic conductivity. The values of the "Initial Aquifer Parameters" on page C2-15, Section C2-3.4 of the Draft EIR were initial values used during the early stages of model calibration, as described. These initial values were adjusted during the calibration process to be more consistent with pumping test data first, and then further adjusted to provide a better fit to both the pumping test and the steady-state calibration. This is standard practice in calibrating a hydrology model, with iterative changes that are made to improve the "fit" of the model results to the observed data. The process for estimating specific yield, specific storage, and vertical anisotropy and limitations of the available data are discussed at length in the Draft EIR, and in previous other responses to comments on this Draft EIR. See Master Response C2.2 for an additional response.

Use of Groundwater Data to Calibrate Model. Using long-term groundwater elevation data to calibrate the model was considered during preparation of the Draft EIR, and was rejected for reasons discussed below. There are currently no significant pumping stresses, that is, groundwater extraction, occurring in Rose Valley, and no records to document groundwater level changes over time in the past when there was substantial pumping for irrigation, as stated in the Draft EIR. The groundwater elevation hydrographs for wells in Rose Valley show little variation with time, and are not caused by a large well-documented stress such as pumping, These characteristic make the data not useful for long-term, transient calibration. The groundwater elevation fluctuations observed in the 5-year monitoring record, presented in the Draft EIR, are primarily the result of fluctuations in mountain front recharge related to seasonal and long-term variations in precipitation in the Sierras, barometric pressure fluctuations, measurement error, undocumented groundwater extraction or recovery, and other factors. The largest groundwater level fluctuations were observed in the LADWP wells at the north end of the valley, as discussed in the Draft EIR; the origin of these fluctuations is unknown, but they are not associated with groundwater pumping. Groundwater elevation and discharge rates from Little Lake, Little Lake spring, and various other surface water features on the Little Lake Ranch property were measured intermittently in 1998; however, groundwater elevations were not measured in the rest of the valley. There has been insufficient stress imposed on the Rose Valley basin, with the exception of Hay Ranch pumping for alfalfa farming in the 1970s (during which there were no widespread water level measurements), to be able to conduct long-term transient calibration. Future data collection modeling updates would resolve this. Considering that the current total annual groundwater extraction rate in Rose Valley is estimated to be approximately 40 ac-ft/yr, the 120 ac-ft of groundwater pumped during the November/December 2007 pumping test represents a significant pumping stress that is appropriate to use for transient calibration. Limitations are discussed below.

A plan for obtaining additional data on background (pre-pumping) groundwater levels in the valley is described in the HMMP. The plan describes monitoring of new wells within Rose Valley and at the northern and southern ends of the valley, precipitation data evaluation, and surface water monitoring at Little Lake before pumping is started at Hay Ranch, and after commencement of the project.

Vertical Hydraulic Conductivity Calibration. Vertical hydraulic conductivity was set equal to horizontal hydraulic conductivity in all model layers in the 2006 model of groundwater flow in Rose Valley. Geologica deemed that assumption physically unrealistic for the upper portion (layers 1 and 2) of the model given the layering of low permeability (clay) and high permeability (sand/gravel) sediments present. Geologica staff did not change the one-to-one ratio of horizontal to vertical hydraulic conductivity initially specified for deeper fine-grained sediments in represented in layers 3 and 4 because the layers have such low permeability that vertical anisotropy has little impact on groundwater movement. Geologica staff initially set the vertical hydraulic conductivity of sediments in layers 1 and 2 around Hay Ranch to 1 ft/day based on the vertical anisotropy value estimated from graphical analysis of the November/December 2007 pumping test. This estimate was judged not to be entirely reliable because the only well with enough drawdown response to estimate this parameter (the Hay Ranch North well), fully penetrates the upper, approximately 700-ft portion of the water table aquifer, and thus gives little indication of possible anisotropy. The vertical anisotropy of the upper two model layers was increased (vertical hydraulic conductivity was reduced) during detailed calibration of the Hydrology Model to the time-drawdown data generated during the pumping test in order to better represent the low drawdown response observed at wells north (Pumice Mine) and south (Coso Junction #1) of the pumped well that only partially penetrate the aquifer (these wells are screened in Layer 1). The November/December 2007 pumping test data set had its limitations with regard to estimating specific yield and hydraulic conductivity, but it is the best data set available at present, as stated in the Draft EIR. The model calibration was not critically flawed; in fact, the decision to increase vertical anisotropy is conservative in that it reduces the amount of groundwater flow from deeper sediments within the basin consistent with the conceptual model of these units as yielding little water to pumping from (relatively) shallow wells.

Basis for Predictive Scenario Simulations. One reviewer commented that Geologica arbitrarily increased the specific yield values used in predictive scenario simulations, resulting in a groundwater model that unrealistically under-predicts drawdown resulting from pumping at Hay Ranch. The reviewer stated that the specific yield value of 3% identified from the 14-day aquifer test likely is not representative of a specific yield over several years (of pumping).

Geologica concurs that the specific yield estimate of 3% developed from the 14-day pumping test likely underestimates long-term (multi-year) specific yield of the Rose Valley aquifer, as previously stated. The Draft EIR presents a conceptual basis for using more appropriate specific yield values based on sediment description. A value of 10% is routinely used in hydrological modeling as a conservative estimate of specific yield for unconsolidated, sandy alluvium. The specific yield value effective for pumping over a longer time period of months to years would likely be higher. It is a widely-accepted phenomenon that during the early stages of pumping tests an unconfined aquifer commonly acts like a confined aquifer, with corresponding small values of storage coefficient. Later, the soil pores start to drain, the aquifer starts to act like an unconfined aquifer, and the storage coefficient values become larger.

Danskin (1998) summarized data from many pumping tests and notes that the specific yield "was difficult to calculate from the available tests" for Owens Valley. None of these values reach the 10 to 15% range that is characteristic of a true specific yield of these aquifer materials (Hollett et al. 1991; Davis 1969)." Danskin continues, "Aquifer tests, even those extending several days…..are affected very little by actual drainage of aquifer materials. This drainage, which accounts for nearly all of the specific yield value, is delayed, and occurs over a period of weeks, months, or years. As a result, storage coefficients obtained from model calibration of long-term conditions are actually much more indicative of actual values than those calculated from aquifer tests." This is why the storage coefficient derived from the short-term aquifer tests in Rose Valley was considered unrepresentative of true storage coefficients and was not used in the predictive model simulations of long-term aquifer response to pumping. Note that Danskin (1998) used a storage coefficient value of 0.10 (10%) for the upper layer of his model, and it closely simulated the long-term transient response of the aquifer to pumping in Owens Valley. All of the predictive simulations for the Rose Valley model, aside from the sensitivity testing, used the 10% value, which is identical to what was used in the Owens Valley model.

The Draft EIR clearly states that long-term predicted drawdown is very sensitive to specific yield and presented the results of a sensitivity analysis using specific yield values of 10, 20, and 30%. Predictive scenarios used for decision making purposes, including identification of impacts from pumping, drawdown trigger levels, and cumulative impacts from other groundwater extraction projects in Rose Valley were conducted using a specific yield value of 10%. Long-term monitoring, and model calibration efforts for Owens Valley and numerous other modeling efforts in the Basin and Range alluvial basins indicated a specific yield value of 10% was appropriate for predicting impacts from pumping in similar alluvial sediment deposits, even though there is currently insufficient data to accurately estimate specific yield in Rose Valley.

Use of Higher Specific Yield Values for Multi-Year Simulations. The Hydrology Model was used to simulate time-drawdown data from the November/December 2007 pumping test, although it was understood that the pumping test would not yield values of specific yield that were representative of multi-year response to pumping, as stated in Appendix C2 and described above. This simulation process yielded estimates of aquifer hydraulic conductivity (both vertical and horizontal), specific storage, and early-time specific yield. The effective specific yield will increase with pumping duration and slowly approach an asymptotic value as a result of delayed drainage that occurs over a period of months or even years (Danskin, 1998). The hydraulic conductivity and specific storage values of the aquifer are not influenced by delayed drainage and consequently do not change with time. As a result, revising aquifer parameters to simulate the November/December 2007 aquifer test time-drawdown data set using higher specific yields (10% or greater) that are appropriate for multi-year simulations would generate incorrect parameter estimates.

C2.6 Hydrology Model Documentation

Comments

Reviewers requested presentation of sensitivity results and presentation of a detailed groundwater budget for the transient simulation model. The consultant engaged by Little Lake Ranch speculated that the “effects of the proposed pumping would likely result in increased inflow from the northern boundary of the model since that boundary is conceptualized as constant heads” and went on to state that this “means that the model simulates an unlimited ability to send groundwater into the model area based on the hydraulic gradient and aquifer properties.” The reviewer commented that groundwater storage declines would likely be the dominant source of water for the proposed groundwater pumping project and that this is not discussed in the Draft EIR. The reviewer stated that the Draft EIR documentation is incomplete because it fails to discuss the transient groundwater budget, sources and timing of groundwater budget impacts due to pumping. One reviewer questioned the version of the modeling software used to develop the Rose Valley model and whether there is an issue in the creation of model files.

Responses

Extensive sensitivity analysis was performed during the development of the Hydrology Model for the Draft EIR but is succinctly documented in the report. The Final EIR now includes detailed tables and figures in Appendix C2, as necessary, to depict the sensitivity of the model predictions to input parameters and provide a comprehensive summary of the sensitivity analysis results. New tables and figures are shown in Chapter 3: Errata of this Final EIR. The Draft EIR does not present a groundwater budget breakdown table for the transient model prediction scenarios. The transient groundwater budget is not sufficiently different from the steady state budget to warrant a separate table. Predicted changes to the steady state groundwater budget are described on pages 3.2-42 through 3.2-46 and summarized in Table 3.2-6.

The comment that the model simulates an unlimited ability to send groundwater into the model area is incorrect. The amount of additional groundwater drawn across the constant head cells at the north end of the model domain is limited by the relatively low hydraulic conductivity specified for sediments north of Hay Ranch, and by the hydraulic gradient developed between Hay Ranch and the northern boundary. An increase in groundwater inflow across the northern boundary of the model of only 26 ac-ft/yr (approximately 3% increase) was predicted for full project development (pumping at 4,839 ac-ft/yr for 30 years) with less change in inflow for lower pumping rates, shorter pumping durations, or larger values of specific yield (see Table 3.2-6 and page 3.2-42 of the Draft EIR). This small increase in inflow from the northern boundary demonstrates that the flow through the boundary is not unlimited, but is actually strongly limited.

The impacts of various schedules of pumping at Hay Ranch on the transient groundwater budget are discussed on page 3.2-41 through 3.2-46 of the Draft EIR. The predicted timing of delayed impacts of groundwater pumping at Hay Ranch on groundwater levels 9 mi to the south at Little Lake is discussed from page 3.2-46 through 3.2-47 as well as in the HMMP.

The Draft EIR Hydrology Model files were created using MODFLOW 88/96, consistent with the original Brown and Caldwell 2006 model. The modeling project was not started with MODFLOW2000 and then switched to MODFLOW 88/96. The reviewer based his erroneous conclusion on the fact that a file labeled as "MODFLOW2000 discretization package file" was included in the model files provided to GSE. E-mail discussion with technical support staff at Groundwater Vistas on September 15, 2008 indicated that Groundwater Vistas generates a discretization file with the phrase "MODFLOW2000" in the header whenever the model development interface is used to generate input files for MODFLOW, regardless of the version of MODFLOW selected by the user. This discretization file is provided for compatibility with Groundwater Vista's 3-D visualization software, and has no impact whatsoever on the operation of MODFLOW. The modeling appendix is complete with respect to identification of the model version used to generate input files and does not need to be modified to address this non-issue. The MODFLOW version used for hydrologic simulations for the Draft EIR (MODFLOW 88/96) is appropriate for use in this application; MODFLOW2000 would not add features to the Hydrology Model that would significantly change the results and conclusions of the modeling effort for the Draft EIR.

C2.7 Impact Analyses

Comments

Reviewers commented that the discussion of the modeling results was confusing or misleading in that a 30-year pumping duration is discussed in some sections and a 1.2-year pumping duration is discussed in others. Reviewers commented that a simulation scenario should have been conducted with an aquifer specific yield value of 3% based on the aquifer response to pumping during the November/December 2007 pumping test. Reviewers commented that the Draft EIR should clearly state that the proposed project would significantly impact all wells and hydrologic features in Rose Valley. Reviewers commented that the duration of project impacts is understated in the Draft EIR.

Responses

Predicted Project Impact. Hydrologic modeling analysis presented in the Draft EIR indicated that the project, comprised of pumping the Hay Ranch wells at a combined total rate of 4,839 ac-ft/yr for 30 years, would have significant impact on hydrologic features in Rose Valley, unless measures were taken to mitigate these impacts. The hydrologic analysis was based on the proposed amount of pumping (4,839 ac-ft/yr) for the proposed number of years (30). The primary mitigation measure identified for the project was to reduce the pumping duration based on hydrologic monitoring that would rely on trigger levels for specified actions in order to mitigate current or future impacts of the proposed project. The Draft EIR consequently concluded that the project **with mitigation measures** could be implemented without causing significant impacts to hydrologic features in Rose Valley.

Project Duration. Analysis presented in the Draft EIR indicates that groundwater extraction at Hay Ranch would likely need to be curtailed or terminated in substantially less time than 30 years. The recommended project alternative would entail pumping the Hay Ranch wells at the full project rate of 4,839 ac-ft/yr, to be evaluated and possibly reduced or ceased upon reaching trigger levels outlined in the Draft EIR. Project pumping may be curtailed in fewer than 30 years because the Hydrology Model estimates that trigger levels would be reached in fewer than 30 years, depending on the rate of pumping. Monitoring and mitigation requirements for the Project would continue for the full 30-year duration of the CUP, regardless of the duration of pumping. Hydrologic data collected during a planned baseline monitoring period and during the initial operating period of the project would be used to recalibrate the hydrologic model to confirm and/or modify the hydrologic impact predictions described in the Draft EIR because of current uncertainty in several key aquifer parameters in the Hydrology Model. The model recalibration would occur no more than 1 year after start of pumping at Hay Ranch. The model recalibration effort and/or termination or reduction of pumping may be requested by the County earlier if hydrologic monitoring indicates that specified hydrologic trigger levels would be, or likely would be, exceeded earlier than the expected 1.2-year mitigated pumping alternative.

Simulation Using Lower Specific Yield. Several reviewers commented that predictive simulation scenarios should have been performed using a lower specific yield value of 3%, which the November/December 2007 pumping test indicated was the appropriate value to use for short-term pumping. As discussed previously in the response to comments on aquifer parameters and specific yield, above, the specific yield value appropriate for longer duration pumping and the time frame over which the transition from short-term response to long-term response is not known with certainty. The 3% specific yield value was estimated based on a 14-day pumping test conducted at a constant rate of approximately 3,200 ac-ft/yr and extracted approximately 125 ac-ft of groundwater. As noted by several reviewers, the 14-day pumping test represents short-term aquifer response with minimal aquifer dewatering as result of pumping the Hay Ranch South well. In contrast, the mitigated project proposes pumping both Hay Ranch wells at a combined total rate of 4,839 ac-ft/yr which would extract approximately 1,200 ac-ft of groundwater in the first 3 months of operation (nearly 10 times the volume of groundwater extracted in the 2007 pumping test). Significant aquifer dewatering would occur on the Hay Ranch property within a few months of after starting pumping at the higher project rate; consequently, higher specific yield values reflecting greater soil pore drainage would apply. Danskin (1998) recognized this issue and used a specific yield value of 10% for predicting impacts to pumping in Owens Valley. Simulation scenarios consequently were not performed for the Draft EIR using the low short-term specific yield value from the aquifer test, as both the duration and magnitude of pumping would be greater for the mitigated project.

Predicted Duration of Impacts. The predicted duration of hydrologic impacts from the project and the time required for the aquifer to recover from pumping at Hay Ranch is discussed in detail in several locations in Section 3.2 (see page 3.2-36, Figures 3.2-15, 3.2-16, and 3.2-17, Table 3.2-7 and related text, and Appendix C, Subsection C4.2.4, Figure C4-2, and Table C4-1 in the Draft EIR).

The Hydrology Model analysis indicated that the aquifer would recover more quickly at locations close to Hay Ranch than it would farther away from Hay Ranch. The time lag before the maximum drawdown levels are reached is longer, and the time lag increases with pumping duration for locations farther from Hay Ranch. Drawdown resulting from pumping would reach a maximum on the Hay Ranch property at exactly the time that the pumps are turned off, and would decrease steadily thereafter. At Coso Junction, 2 mi south of Hay Ranch, model results indicate that the maximum drawdown levels would be reached 3 or more years after the start of pumping, assuming a 1.2-year pumping duration for the project with mitigation. The maximum drawdown at Little Lake Ranch is predicted to lag 13 years behind the start of pumping (for the 1.2-year project with mitigation). The project would require mitigation in the form of monitoring for its full 30-year duration because of this time lag, and regardless of pumping duration. The project as mitigated is not projected to cause significant impacts at any time during or after the 30-year project duration, however. The majority of water supply wells in Rose Valley are located within a 3-mi radius of Hay Ranch. Groundwater table drawdown in these nearby wells would recover to background levels within the 30-year lifespan of the project if pumping lasts for only 1.2 years, as predicted by the Hydrology Model. Full recovery of groundwater levels would take longer for wells farther away from Hay Ranch, and up to 100 years for the most distant locations (e.g., the Red Hill well and wells on the Little Lake Ranch). However, wells more than 3 mi from the Hay Ranch property would be unlikely to experience enough drawdown to require rehabilitation; the maximum projected drawdown at the Red Hill well and all wells on the Little Lake Ranch property is less than 1 ft for the project with mitigation (Table C4-1). The HMMP details procedures for assessing and mitigating impacts to water supply wells which would be funded by the applicant. The mitigated project design requires that impacts to Little Lake not exceed thresholds of significance at any time during or after the 30-year project lifespan. The Hydrology Model predictions indicate that groundwater table drawdown near Little Lake would approach, but not exceed, detectable levels as early as 10 years after project startup and recover to well below detectable levels beginning as early as 15 years after project startup, even though hydrologic impacts to surface water features at Little Lake would lag behind drawdown impacts closer to Hay Ranch.

C3. Comments on Springs

Several reviewers commented regarding potential impacts to springs in Rose Valley. Concerns raised include:

1. Identifying of Springs in Rose Valley
2. Possible Impact of Historic Agricultural Pumping on Rose Spring
3. Potential Impacts to Currently Flowing Springs

C3.1 Identification of Springs in Rose Valley

Comments

Reviewers commented that there are springs on the Deep Rose geothermal project property that are not identified or discussed in the Draft EIR. A reviewer commented that the Little Lake Canyon Spring is not identified on figures prepared for the Draft EIR.

Responses

No springs are identified on US Geological Survey (USGS) topographic maps covering the Deep Rose project area. The Final Draft EA/Initial Study/Mitigated Negative Declaration for the Deep Rose project (Epsilon Systems Solutions 2005), Section 3.2.1, states, “There are no wetlands, springs, seeps, or designated Jurisdictional Waters of the U.S. in the project area.”

The Little Lake Canyon Spring is identified on Figure 3.2-6 in the Draft EIR, but without the identifier “spring”. This figure in the Draft EIR has been revised to show the location of the spring. The revised figures are shown in Chapter 3: Errata to this Final EIR. This spring would not be affected by the proposed project because it is located above the basin floor and is disconnected from the basin groundwater system.

C3.2 Possible Impact of Historic Agricultural Pumping on Rose Spring

Comments

Reviewers commented that irrigation pumping may have caused Rose Spring to cease flowing.

Response

Zdon (August 13, 2008; September 2, 2008) speculates that Rose Spring is dry because previous pumping in Rose Valley for irrigation might have caused Rose Spring to dry up, but cites no evidence to support this. Rose Spring is mentioned in the publication “Springs of California", USGS Water Supply Paper 338 (1915) which indicates that Rose Spring is "essentially a surface spring" suggesting that it results from perched groundwater related to seepage from the Haiwee Reservoir or shallow groundwater inflow from Owens Valley, or both. It should be noted that the LADWP has had to lower the water level in Haiwee Reservoir approximately 18 ft over the last 2 decades due to seismic safety concerns (LADWP 2008), possibly reducing seepage towards the spring. The only water chemistry data identified for Rose Spring was Total Dissolved Solids (TDS) concentration data (see Figure 3.2-6) that indicated that Rose Spring had lower TDS concentrations than nearby wells completed in the Rose Valley aquifer but higher TDS concentrations than Haiwee Reservoir, which supports the seepage hypothesis. Rose Spring is located at an elevation of approximately 3,600 ft amsl. The groundwater elevation in the LADWP wells, approximately one mile south of Rose Spring, was 3,433 ft amsl in November 2007. It is unlikely that the water table in the Rose Valley would have been lowered sufficiently enough (more than 150 ft) by historic pumping to cause Rose Spring to dry. There is no way to monitor impacts to the spring and the proposed project is unlikely to affect it, regardless of historic impacts, given that the spring is presently dry. This is acknowledged by Zdon in his August 13, 2008 and September 2, 2008 letters.

C3.3 Potential Impacts to Currently Flowing Springs

Comments

Several reviewers questioned whether pumping at Hay Ranch would impact currently flowing springs in Rose Valley including the Tunawee Canyon, Portuguese Bench, and Little Lake Canyon springs. Reviewers requested additional documentation justifying the exclusion of these springs from the numerical groundwater flow model developed for the Draft EIR.

Response

Tunawee Canyon spring is located at an elevation of approximately 5,200 ft. The Tunawee Canyon spring is located approximately 1.5 mi west of the western limit of the alluvial aquifer in Rose Valley; it is not in the same aquifer. Changes in discharge from Tunawee Canyon spring could affect groundwater levels in Rose Valley because seepage from the spring flows down and ultimately recharges the Rose Valley aquifer. The amount of recharge is believed to be low, however, and is accounted for in the mountain front recharge term incorporated into the Hydrology Model. It is not plausible that pumping at Hay Ranch can have any influence on spring discharge because the spring surfaces nearly 2,000 ft higher than the groundwater table in Rose Valley, directly east of the spring; consequently the spring does not need to be represented in the Hydrology Model.

Two springs are identified in Little Lake Canyon on USGS topographic maps for the area. Both springs are located in areas which the USGS (Whitmarsh 1997) has classified as Mesozoic metasedimentary rocks. This confirms that the Little Lake Canyon springs are not in the Rose Valley aquifer, and it is not plausible that they would be influenced by groundwater pumping at Hay Ranch. They do not need to be represented in the Hydrology Model.

The Davis Spring at Portuguese Bench outcrops at an elevation of 3,870 ft; groundwater elevations in the Rose Valley aquifer, located 2 mi east of the Davis Spring average approximately 3,230 ft, which is more than 600 ft lower than the spring. Davis Spring is influenced by a nearby north-south trending fault that would tend to impede groundwater flow from the area of the spring toward the center of the valley, further isolating the spring from the effects of pumping. The hydraulic head gradient between Davis Spring and wells at Coso Junction is approximately 300 ft per mi; the gradient along the north-south axis of the valley is approximately 20 ft per mi indicating much lower permeability sediments between Davis Spring and Coso Junction than at locations along the valley. It is not plausible that the Davis spring at Portuguese Bench would be influenced by pumping at Hay Ranch because of the distance, the low-permeability sediments, and the fact that the spring is more than 600 ft higher than water levels in the valley. The Davis Spring, therefore, does not need to be represented in the Hydrology Model.

Springs closer to Little Lake in the southern end of Rose Valley, such as Coso Spring, are much closer to the water table in the centerline of the valley, rather than perched high on valley walls. This makes them potentially susceptible to impacts from groundwater pumping at Hay Ranch. Corresponding drawdowns in the vicinity of springs near Little Lake would also be managed to prevent drawdowns of 10% or more because the groundwater level at Little Lake would be monitored and managed to allow only a fewer than 10% reduction in flow to the lake. This is expected to have no significant impact on the flow in Coso Spring or other springs in the vicinity of Little Lake. Bauer (2002) found that even when the water table at Little Lake lowered by a foot, there was no corresponding decrease in flow at Coso Spring, during the year of monitoring. This suggests that water flowing to Coso Spring is derived from higher elevations. This is reasonable hydrologically for Coso Spring as well as other nearby springs, as this would give the spring water the hydraulic head needed to rise to the surface as a spring. Even if the water flowing to the springs near Little Lake were closely connected hydraulically to the water table in the centerline of the valley, the impacts to the springs are expected to be insignificant, because the drawdown in the water table would be fewer than 0.3 ft.

The monitoring plan is designed to identify minor impacts to groundwater that feeds springs; therefore, a spring's water supply would not be cut off by the pumping proposed in the Draft EIR.

C4. Mitigation and Monitoring

A number of comments were received on the HMMP. Principal comments on the HMMP addressed the following issues:

1. Baseline Studies
2. Hydrologic Mitigation and Monitoring Program
3. Responsibilities and the Decision Making Process
4. Hydrology Trigger Levels
5. Hydrology Trigger Levels
6. Option of Groundwater Diversion to Augment Little Lake

C4.1. Baseline Studies

Comments

Comments on the Baseline Studies proposed in the HMMP included a recommendation that the baseline study period be extended to a minimum of 12 months instead of the 6 months discussed in Appendix C4; a comment that data gaps identified in the Draft EIR should be filled before project approval is allowed; and, comments that the reference level for calculating drawdown needs to be identified during the baseline monitoring period.

Responses

Baseline Monitoring Duration. The Draft EIR recommends a minimum 6-month monitoring period before initiating pumping from the Hay Ranch wells. A 12-month monitoring period would provide additional data for evaluating hydrogeologic conditions in the valley and setting reference levels for drawdown calculation, but is not necessary. Many of the wells in Rose Valley north of Little Lake Ranch will have several years of periodic monitoring data that would be used to establish baseline conditions and to set reference levels for drawdown calculations. As stated in the HMMP, the decision to terminate pumping at the Hay Ranch wells would be based on review and evaluation of monitoring data gathered at multiple trigger level monitoring wells located throughout Rose Valley. This decision making process would focus on identifying a consistent trend in multiple wells indicating the development and propagation down valley (south) of greater than expected drawdown with a high likelihood of causing a reduction in groundwater flow to Little Lake of 10% or more. Because most of the trigger level wells already have more than 6 months of monitoring data, it would not be necessary to extend the baseline monitoring period beyond the 6 months proposed in the Draft EIR.

Resolution of Data Gaps. No critical data gaps were identified in the Draft EIR that required resolution before a decision can be made to proceed with the project. Data gaps were identified that can be resolved during the baseline monitoring period. Recalibration of the Hydrology Model within the first year after startup would also be required in order to refine aquifer parameter values based on actual aquifer response to pumping.

Reference Level for Drawdown Calculation. Further discussion of the process for setting reference levels is provided below under trigger levels discussion. Text of the HMMP has been modified to clearly state that reference levels will be identified for each monitoring well during the 6-month baseline study period. An addendum to the HMMP would be prepared that lists the reference elevations for calculating drawdown for each trigger point monitoring well at the conclusion of the baseline monitoring period.

Text revisions are shown below and do not constitute significant new information that would require recirculation of the EIR.

Page C4-14

i. **Establish background groundwater levels**. Establishing a pre-pumping statistical background water level for each designated monitoring point is essential, in order to distinguish between natural seasonal variability versus drawdown caused by pumping associated with the project. Establishing a background for each monitoring point will require pre-pumping measurements to be conducted for a sufficient period of time to encompass normal seasonal variations in water level.

A minimum of 6 months of water level data will be required to establish the background water level at each monitoring point, and it is recommended but not required that 12 months of data be collected. <u>For monitoring points with more extensive long-term monitoring data, e.g., the Hay Ranch wells, all groundwater measurements collected to date will be used to evaluate background conditions. The reference levels will be identified for each monitoring well during the 6 month baseline study period. An addendum to this HMMP will be required after the first six months of baseline data collection that lists the reference elevations for calculating drawdown for each trigger point monitoring well.</u>

The applicant shall conduct statistical evaluation of the background water level data by a qualified person approved by Inyo County Water Department and provided by the applicant. An appropriate statistical method to calculate the background water levels shall be proposed by the applicant, subject to approval by Inyo County. Upon approval, the background water level for each monitoring point shall be calculated by the applicant and presented to Inyo County Water Department for review and approval. It is anticipated that statistical methods similar to those used to calculate background concentrations of naturally occurring chemical constituents at RCRA and CERCLA sites may be applicable.

C4.2 Hydrologic Mitigation and Monitoring Program

Comments

Reviewers commented that the HMMP should require monitoring of all wells and springs in Rose Valley. Reviewers questioned who would do the monitoring, who would pay for the monitoring, why wells would not be monitored daily, why there was an automatic reduction in the monitoring frequency after 2 years, and whether an independent water master should be approved by all parties and funded by Coso.

Responses

The HMMP states that the HMMP would be implemented by qualified technical staff hired by the applicant solely at the expense of the applicant. This is a standard requirement under CEQA. A representative network of monitoring points has been identified that provide coverage over a broad area of the Rose Valley. The wells on the Hay Ranch property would be monitored daily. Other hydrologic features are more distant and respond to pumping more slowly, and would be monitored on a frequency suitable to identify significant trends. The Inyo County Water Department is functioning in the role of water master for the project.

C4.3 Responsibilities and the Decision Making Process

Comments

Comments on the responsibilities and roles in the HMMP and decision making process for reducing or terminating pumping at Hay Ranch included:

- Comments that the County should conduct the monitoring at the applicant’s expense;
- Reviewers want a guarantee that Coso would stop pumping if ordered to do so by the County;
- Reviewers want Coso held responsible for damages, if there is loss of water to wells, Little Lake, or other surface water features regardless of the cause and with no right of appeal (or dispute);
- Reviewers requested that a representative of Little Lake Ranch should be included in the monitoring program oversight at Coso’s (sole) expense.

Responses

Inyo County does not have the resources to implement the HMMP using County staff; however it would be responsible for overseeing the monitoring program, approving technical staff proposed to conduct the monitoring, and evaluating the quality and objectivity of the monitoring program. The HMMP is intended to serve as an enforceable guidance document for monitoring hydrologic impacts related to the Project. Inyo County may revoke or limit the CUP or pumping if Coso does not comply with the HMMP.

Water supply wells can stop providing water in desired quantities for a variety of reasons unrelated to potential pumping impacts. Standard practice would include evaluating the nature and causes of the perceived impact. Denying Coso the right of appeal or the right to dispute a claim of damages would be contrary to good practice and fairness.

C4.4 Significance Criteria

Comments

Several comments were made that questioned the rationale for the significance criterion of less than 10% reduction in water flow that discharges into Little Lake. Reviewers requested that the Draft EIR preparation team explain how 10% was arrived at as less-than-significant, and commented that the LADWP is not allowed to remove 10% of water, that Little Lake depends on that 10%, that that amount of groundwater is significant, and predicted that the Lake would dry up as a result. Reviewers also commented that any water loss in Rose Valley is a significant, permanent and irretrievable loss; and that the loss of any water is significant. One reviewer commented that the project does not comply with the Inyo County General Plan, Chapter 8, Policy WR1-1, and noted that the County is required to review development proposals to ensure adequate water is available to accommodate projected growth.

Responses

The 10% criterion is discussed in detail on page 3.2-45 through 3.2-47 of the Draft EIR. The 10% criterion is based on groundwater level monitoring data collected in 1997/1998 (Bauer 2002) indicating an average 3 ft higher groundwater level in the Little Lake North Dock well on the north side of the lake when compared to the water level in Little Lake. Groundwater table drawdown in the North Dock well of 0.3 ft would reduce the groundwater gradient and associated groundwater recharge rate towards the lake by approximately 10% based on this observation. First, it is important to be clear that the 10% reduction refers only to the groundwater that **discharges into Little Lake**, and **not** to the flow of groundwater through the entire thickness of the aquifer. Drawdown predicted to occur at the north end of Little Lake increases slowly following project startup, reaches a maximum of 0.3 ft approximately 11 years after startup, and decreases slowly thereafter for the proposed project (groundwater pumping at 4,839 ac-ft/yr) with mitigation measures, until trigger levels are reached (presumed by the model to be 1.2 years, but in reality may be longer). The predicted reduction in flow towards Little Lake would never exceed the significance criterion of 10%, and would only approach that threshold for a period of 5 years in the middle of the monitoring period required for the CUP. A 10% reduction in groundwater discharge to Little Lake equates to less than a 3% decrease in the overall flow of groundwater through the entire width and thickness of Rose Valley near Little Lake, based on model results; therefore, this is a conservative threshold.

It is important to recognize that a 10% decrease in groundwater discharge to Little Lake equates to a drawdown of the groundwater level of approximately 0.3 ft at the northern end of Little Lake, and less at the southern end. The maximum allowable drawdown criterion of 0.3 ft is extremely small compared to the entire saturated thickness in permeable layers 1 and 2 of the model near Little Lake (approximately 100 ft). The last paragraph on page 3.2-45 of the Draft EIR states, “A 10% maximum decrease in groundwater discharge to Little Lake would still allow for the vast majority of the groundwater to be available for creation of surface water features (e.g., ponds) prior to infiltration back into the aquifer.” Flow from Coso Spring and other small springs near Little Lake that supply water to the wetlands is expected to continue without a substantial change, based on observations at Coso Spring that showed no decrease in spring flow when the water table declined by 1.0 feet in the Little Lake North Dock well (Bauer 2002). Groundwater flow through Rose Valley would continue, as described above, with a decrease of fewer than 3% in the overall groundwater flow near Little Lake.

It is helpful to understand how a 0.3-ft decrease in groundwater level compares to natural variability in groundwater levels. Figure 3.2-3 on page 3.2-10 of the Draft EIR presents Bauer’s (2002) data that show that groundwater elevation near Little Lake varied by approximately 1 ft during the year of measurement. A drawdown of 0.3 ft in the groundwater level near Little Lake is substantially less than the historical range of groundwater level fluctuation near Little Lake over the course of a year (Bauer 2002). Wetland plants near Little Lake have historically adapted to groundwater level changes of 1 ft or more, and it is expected that wetland plants would adapt to the small change in groundwater level anticipated to result from the proposed project.

C4.5 Hydrology Trigger Levels

Comments

Several comments were received regarding the proposed elevation baseline for calculating drawdown after pumping at Hay Ranch starts, and the incorporation of climatic effects or other natural influences on the variability of groundwater and surface water features in Rose Valley. Reviewers requested that baseline elevation consider seasonal and longer term climatic variations, and requested that drawdown be calculated based on highest observed groundwater elevation rather than the lowest or average groundwater elevation. Reviewers commented that trigger levels were not specified for all wells and hydrologic features in Rose Valley, but should have been. The LADWP requested specification of trigger levels for its wells (V816 and V817) at the north end of the valley. One reviewer expressed confusion about the wells to be monitored and associated trigger levels at Little Lake.

Responses

Proposed Elevation Baseline For Calculating Drawdown. Bauer (2002) measured seasonal groundwater elevation fluctuations of up to 1 ft or more in the Little Lake North Dock well in 1997/1998. Using the highest observed groundwater level as the reference level for drawdown calculation and the measured seasonal groundwater elevation fluctuation from Bauer (2002) would result in apparent exceedances of the 0.3-ft drawdown threshold for this well virtually every year, regardless of pumping rates at the Hay Ranch. The lowest groundwater elevation observed during the baseline monitoring period was used as the reference level for groundwater table drawdown calculations for this reason. The entire water year of data should be reviewed for wells with significant seasonal groundwater elevation fluctuations; drawdown impact may be indicated if the seasonal high groundwater elevation begins to drop below the pre-pumping seasonal high elevation; and/or if the seasonal low groundwater elevation falls below the pre-pumping seasonal low after groundwater pumping begins. Plotting and overlaying groundwater elevation hydrographs from successive years on a 12-month water-year basis may help identify drawdown trends that would be harder to distinguish with a time-series plot.

Trigger Levels for Wells. Trigger levels are specified only for wells that are not routinely pumped and that are suitably located and constructed in order to provide early warning of impending groundwater drawdown impacts. A representative network of monitoring points have been identified that provide coverage over a broad area of the Rose Valley. One representative well, which would be located in the Dunmovin area and be identified at the start of the baseline monitoring program, would be monitored for trigger level compliance and for verification of the accuracy of the modeling effort. Six additional monitoring wells would be installed near the Hay Ranch pumping wells, and one new well would be installed between Coso Junction and the Cinder Road Red Hill well. Trigger levels would be identified for these wells after the exact locations and well screen depths are known.

Trigger levels were not set for the LADWP wells at the north end of the valley, even though groundwater levels would be monitored in these wells in order to supplement information for the Hydrology Model. This is because trigger levels established for a well in the Dunmovin area and for the Pumice Mine well would provide sufficient data to evaluate groundwater table drawdown at the north end of the valley.

The Little Lake Ranch House well is routinely pumped for water supply purposes. This makes the well less valuable as a hydrologic monitoring point because better data can be obtained from the Little Lake Ranch North well, which is not pumped. The amount of drawdown expected at the Little Lake Ranch House well (less than 1 ft) is unlikely to impede the routine functioning of the well. The Fossil Falls Campground well and Little Lake Hotel well would be monitored periodically during the project to improve the understanding of hydrologic conditions in the area; however, trigger levels were not specified for these wells because there are other nearby monitored wells identified (Cinder Road Red Hill well near Fossil Falls and Little Lake North well near Little Lake Hotel well).

The Little Lake North Dock well would be intensively monitored during the baseline study period and throughout project operation; however, a trigger level was not specified in Table C4-1 for this well because of concerns that groundwater levels in the well may be affected by water level changes in Little Lake related to management practices. The trigger level for the Little Lake Ranch North well (which is different than the Little Lake North Dock well) located near the north end of the ranch property was conservatively specified as 0.3 ft with a maximum allowable drawdown of 0.4 ft.

C4.6 Option of Groundwater Diversion to Augment Little Lake

Comments

Reviewers commented that the proposed mitigation alternative to pump water on the Little Lake Ranch property to sustain water levels in Little Lake appears unrealistic because additional pumping would only exacerbate the overdraft problem caused by the Hay Ranch project in the first place, and would cause immediate further drawdown of the water table thereby further impacting the natural flow of water through the springs, and it could require pumping in perpetuity. Reviewers questioned where groundwater extraction could occur on the property without impacting Little Lake or other surface water features on the property. One reviewer also questioned whether this alternative was entirely conditioned on the approval of Little Lake Ranch, and whether Little Lake Ranch could withhold its consent.

Responses

Conditions for Augmentation Project. This is an optional task that would only be implemented if the following conditions apply.

- Feasible given the availability of water at Little Lake and would not result in impacts to existing springs (e.g., Coso Spring);
- Agreed upon with Little Lake Ranch and the applicant;
- Funded by the applicant; and,
- Required for a reasonable timeframe (i.e., 20 years) that ensured accountability and funding by the applicant to mitigate all effects.

The augmentation project would not be approved without the Little Lake Ranch's consent, as stated on page 3.2-50 of the Draft EIR. Section 3.2 and Appendix C4 of the Draft EIR state that the augmentation project would not be implemented unless it could be shown to be technically feasible without impacting Little Lake or the springs on the property. The augmentation project's duration must also fall entirely within the 30-year lifespan of the CUP.

Conceptual Basis for Augmentation. The augmentation alternative would involve extracting groundwater from a well on the Little Lake Ranch property and piping it to Little Lake to augment water levels. Little Lake Ranch's legal counsel, Gary Arnold stated in a letter dated September 3, 2008 that Little Lake Ranch members pumped groundwater from a well on the property to restore the water level in Little Lake following seismic activity in the area in 1971, thus demonstrating the conceptual feasibility of this alternative. Mr. Arnold also stated (page 86) that “Little Lake provides water to the Cinder Block facility.” The amount of water provided and method of conveyance is not stated but the comment demonstrates that Little Lake Ranch organization believes that there is sufficient groundwater on the property to allow for export off the property.

Technical Basis for Augmentation. The total reduction in groundwater flow towards Little Lake peaks at approximately 70 ac-ft/yr for the proposed project with implementation of mitigation. The peak groundwater flow would occur approximately 11 years after project startup, and would decrease thereafter. The average reduction in groundwater flow over the duration of the 30-year CUP would be on the order of 50 ac-ft/yr. Little Lake generally has a surplus of water in the winter; Bauer (2002) reported surface water flow rates out of Little Lake of up to 5,000 ac-ft/yr in the winter months, whereas the average flow rate is approximately 3,000 ac-ft/yr. It is unlikely that augmentation would be needed in the winter. The highest evaporation rates and greatest need for water for irrigation purposes on the property occurs in late summer. Actual (annualized) groundwater extraction rates needed may range from 25 ac-ft/yr in the spring months and up to 150 ac-ft/yr in late summer.

The augmentation well would have to be fitted with a manual or automatic flow controller such that only as much water is pumped into Little Lake as is needed to maintain the water level at a height suitable for Little Lake Ranch purposes including management of flora and fauna in the vicinity. Groundwater extraction from a well located south of Little Lake would minimize drawdown beneath Little Lake and impacts to springs on the property because the water, after being discharged into the lake, would infiltrate back into the ground. The principal cost would be for well installation, pumping and conveyance equipment, trenching of a pipeline, and electrical power, which would be paid for by the applicant.

Drawdown Resulting from Augmenting Little Lake Water Levels. The amount of drawdown resulting from groundwater extraction on the property to augment Little Lake water levels would depend on the seasonal and long-term pumping schedule and rate of pumping, the location of the extraction well, and the depth of the well screen interval. The model grid for the Hydrology Model developed for the Draft EIR ends on the south end of Little Lake; consequently, the Hydrology Model would have to be modified to evaluate impacts of groundwater extraction south of the lake. A more practical evaluation of the feasibility of this alternative would be to test pump the former Little Lake Hotel well located on the west side of US 395 south of Little Lake and monitor groundwater and lake levels on the Little Lake Ranch property. Specifications for the Little Lake Hotel well and completion details of the hotel well are not available and have apparently been lost; however, the Little Lake Hotel well presumably pumped for more water than a typical domestic water supply well, with no reported impact on groundwater levels or surface water features at Little Lake.

C5. Coso Hot Springs

A number of comments were received regarding the Coso Hot Springs, as listed below:

1. Excessive Production
2. Coso Hot Springs Connectivity to the Geothermal Reservoir

C5.1 Excessive Production

Comments

Comments were raised suggesting that over-exploitation of the geothermal resource has resulted in the decline in reservoir pressures and fluid production. A commenter suggested that the resource should be protected from exploitation.

Responses

The Geothermal Steam Act of 1970, as amended, governs the leasing of geothermal resources on public lands. *Geothermal resources* include products of geothermal processes; steam and other gases; hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations; heat or other associated energy found in geothermal formations; and, any byproduct derived from them (U.S. Code Title 30 Chapter 23 §1001(c)). This Act authorizes the Secretary of the Interior to issue leases for development of geothermal resources and also prohibits leasing on a variety of public lands, such as those administered by the U.S. Fish and Wildlife Service (USFWS). The geothermal reservoir is not being used in a way that is inconsistent with these regulations. The environmental and other effects of the development and management of the geothermal resource were fully analyzed as part of the original permitting process.

Geothermal fluid extraction related to the development of geothermal power typically reduces reservoir pressure and/or sometimes temperature, depending on the nature of the reservoir and the type of development. The geothermal resource at Coso is a liquid limited rather than a heat limited resource (Monastero 2002). Pressures (rather than temperatures) decline as geothermal fluids are produced. Production at the Coso geothermal field has led to pressure drops and an expansion of a vapor phase (ITSI 2007).

Declines in reservoir pressure are a standard part of geothermal development and mitigation of these impacts are included in development plans. Geothermal resource managers maintain steam supply to the power plant for power generation, and mitigate pressure decline in one or more of the following ways:

1. Obtain additional geothermal fluid production by drilling of additional wells within and adjacent to the original well field,
2. Reduce turbine inlet pressures or other plant efficiencies; and/or,
3. Implement injection strategies.

Increasing steam supply by drilling new wells requires that the resource is of sufficient size to allow for the additional drilling. Coso began operations with extensive acreage and has over 50 acres of leased land per MW dedicated to the existing Coso power plants. Coso has drilled numerous make up wells during the last twenty years of development. Coso has maximized available injection by using 30 to 40 injection wells and moving injection to different wells in order to maximize pressure support and steam from injected water (Monastero 2002) and to minimize breakthrough, or the cooling effect of injecting cold water on production temperatures.

The selection of a dual flash system with cooling towers is the optimal and most efficient use of a high temperature geothermal resource such as at the Coso geothermal field. Coso is optimizing the utilization of the resource by utilizing a high efficiency process to convert geothermal heat to power. Each geothermal power generation system is designed to match a specific geothermal resource and development plan. Coso has made numerous adjustments in order to optimize the power generation from the Coso geothermal field. These include:

1. Modifications to gas extraction systems
2. Piping modifications
3. Turbine modifications

The power plants were analyzed under CEQA and NEPA to identify environmental effects and to mitigate those effects. The potential loss of pressure was identified as a potential impact in previous environmental review, and the proposed project would not result in pressure-related impacts that exceed that prior analysis.

C5.2 Coso Hot Springs Connectivity to the Geothermal Reservoir

Comments

Commenters requested clarification regarding the connection of the Coso Hot Springs to the geothermal reservoir and to resolve any contradictions in the connectivity of the reservoir. Other comments requested that the Coso Hot Springs be returned to a natural state.

Responses

The Coso geothermal system includes the Coso Hot Springs, which are the surface manifestations of the geothermal anomaly that has generated the Coso geothermal reservoir. The Coso geothermal system has been in existence for more than 300,000 years, and it has changed episodically over its existence because of the active tectonic and volcanic setting. The temperature and fluid phase (vapor and liquid) of the subsurface reservoir and surface manifestations (Coso Hot Springs) have varied over time. Their location has also varied over time (Adams et al. 2001). This history of variability is known in other geothermal systems, which suggests that there can be multiple causes for variations in Coso Hot Springs.

The Coso Hot Springs are actually a series of hot springs, fumaroles, and steam vents primarily located along the Coso Wash fault. The Coso Wash fault may provide a conduit from the deeper reservoir to the surface (ITSI 2007). The fluids discharged at Coso Hot Springs appear to have a similar source of water to the geothermal fluids produced from the reservoir.

The geothermal reservoir at Coso has changed as a result of production from a primarily liquid dominated system to one with significant vapor-dominated areas (Monastero 2002; Adams 2004; ITSI 2007). These changes are related to extraction of geothermal fluids. Other aspects of the hydrogeological setting have also changed including the presence of low-salinity groundwater, faulting, volcanism, and intrusions of magmatic gases and meteoric waters (Adams et al. 2001).

Some changes in the Coso Hot Springs appear to correlate with the onset of geothermal production. The water levels in South Pool decreased and the temperatures increased within six months of initiating production in mid-1987. These changes stabilized, however, and did not continue to increase as the total mass of fluid withdrawn has steadily increased. These observations exemplify the complex relationship and a modeling study designed to improve the understanding did not specifically prove that geothermal production of the Coso reservoir led to the changes observed in the South Pool (ITSI 2007).The contribution of steam to many features has increased (Geologica 2003; 2004; 2005; 2006; 2007; 2008). There appears to be a relationship between observed changes in the surface manifestations at Coso and changes in the Coso reservoir; however, the relationship is not a one-to-one correlation and is not fully understood (ITSI 2007). It is possible that changes in other aspects of the geologic setting or hydrothermal system may have caused or affected the Coso Hot Springs, given the changes in surface manifestations over the duration of the Coso geothermal system.

The expansion of the steam zone within the Coso Reservoir, as in other geothermal reservoirs, is related to the decline in reservoir pressure (see response P9-3). Steam zones are developed in geothermal reservoirs as a result of natural venting (e.g., Yellowstone or The Geysers) (Truesdell and White 1973) or man-made production-related pressure drops. Pressure drops generate vapor-dominated or steam zones in geothermal systems with high heat flow (e.g., the Coso geothermal field) and limited real-time re-charge.

Data collected for the Coso Hot Spring Monitoring Program indicates that some of the surface manifestations of the geothermal system are also indicating an increasing influx of geothermal steam relative to hot water. Augmenting injection is anticipated to reduce or stabilize the growth of the pressure drop-related steam zone because it is designed to decrease the negative net withdrawal from the Coso reservoir, thereby reducing or possibly stabilizing reservoir pressure decline. Stabilizing the steam zone is likely to stabilize changes related to the increase in the steam zone.

Cold injection can recharge a geothermal reservoir just as cold groundwater recharges some geothermal systems naturally and prevents or reduces the development of steam zones. Water injection, especially into vapor-dominated portions of geothermal reservoirs, is currently known to increase (or stabilize the decrease of) reservoir pressures and flow rates and enhance energy recovery by increasing the long-term sustainability of production (Pruess 2008). When cold water contacts hot rock the water is heated until it reaches the saturation temperature at the reservoir at which point it may vaporize into steam. Water flows towards lower pressure zones; therefore, cold water injected into a reservoir flows towards the areas of the lowest pressure, which is the steam zone. The Coso geothermal field has sufficient heat to heat the reinjected water because it is one of the hottest geothermal resources currently utilized in the western United States.

No claim is made that enhanced injection would “restore” the Coso Hot Springs. The surface manifestations at Coso have been evolving for 300,000 years (Adams et al. 2000) and it is not clear to what state they could or would evolve if production ceased at Coso. However, some of the geochemical monitoring data reported as part of the Coso Hot Springs Monitoring Program (see reference above) suggests at least some changes are related an increase in the flow of steam to the surface manifestations. The increase in steam flow may be related to the growth in steam zone in the reservoir if the Coso Hot Springs and the exploited portion of the geothermal reservoir are related. Stabilizing the growth of steam zones at Coso may stabilize or reduce further changes in Coso Hot Springs. Issues related to the Coso Hot Springs’ status as a potential cultural resource as well as the Navy’s obligations under the MOA is discussed in the Cultural Resources section of these responses (Master Response F2).

C6. Water Quality and Isotope Studies Results

A number of comments were received requesting additional information and analysis and clarification of impacts to water quality from elements of the proposed project. Comments were made on the following topics:

1. Contamination of Rose Valley Drinking Water
2. Total Dissolved Solids at Little Lake
3. Stagnation of Water at Little Lake
4. Hydrologic and Hydrogeochemical Separation of Waters at Portuguese Bench

C6.1 Contamination of Rose Valley Drinking Water

Comments

Comments were received inquiring if the federal Clean Water Act (CWA) or California Porter-Cologne Water Quality Act applies to the project, and if the contamination of fresh water from the Rose Valley Basin by transferring it to the geothermal reservoir is a violation of the CWA.

Responses

Rose Valley groundwater has contaminants that exceed both primary and secondary drinking water standards in some areas and is only used for drinking water in limited areas, primarily where the influence of Sierran recharge is higher. The proposed application is an industrial use of water and the water would be injected under the Coso injection well permits from the Lahontan Regional Water Quality Control Board. The CWA establishes a goal of eliminating releases of high amounts of toxic substances to waterways. The proposed project does not include release of toxic substances into waters.

The CWA applies to wetlands, streams, and lakes and does not directly protect groundwater reservoirs and drinking water supplies. The idea of transferring groundwater to another groundwater basin with worse water quality is not in the purview of the CWA. The Draft EIR discussed the applicability of the federal Clean Water Act to other aspects of the proposed project in multiple chapters of the Draft EIR (e.g., pages 3.2-20 et seq. and 3.4-23 et seq.).

The Porter-Cologne Water Quality Act applies more broadly than the federal CWA and extends to all the waters of the state. The EIR analyzed the proposed project and found that it would not significantly impact any water bodies, wetlands, or other water resources that might be considered waters of the State. The County also specifically discussed the Porter-Cologne Water Quality Act and its applicability in the Draft EIR (e.g., page 3.4-24). Accordingly, the implementation of the proposed project does not conflict with the provisions of the Porter-Cologne Water Quality Act.

C6.2 Total Dissolved Solids at Little Lake

Comments

Comments were received requesting explanation as to why Little Lake has higher TDS levels and if it is associated with the geothermal brines being injected at Coso. The commenter inquired as to how the geothermal reservoir impacts the groundwater in Rose Valley.

Responses

The stable isotopic composition of Little Lake water indicates that the primary cause of higher TDS in Little Lake is evaporation. The positive correlation of oxygen-18 and chloride values and the predominance of bicarbonate as the largest component in the dissolved solids are consistent with concentration of dissolved solids by evaporation, rather than influx of a geothermal brine with higher dissolved solids. The chemical and isotopic character of Coso Spring immediately east of Little Lake, and some northeast correlation of isotopic and chloride data in groundwaters in the southern part of the valley compared with the chemistry of Coso geothermal fluids, indicate that there may be a component of geothermal water in the deep groundwater. It would be a minor component, if a factor, of the TDS in Little Lake. Any influence of the Coso geothermal groundwater system on the Rose Valley is a naturally occurring phenomenon and unrelated to geothermal development or the proposed project.

C6.3 Stagnation of Water at Little Lake

Comments

Comments were raised questioning if the reduced inflow and outflow of water from the lake could result in stagnation of the lake water and a reduction in the water quality of the lake and the water supplied to the surrounding wetlands.

Responses

Water quality may potentially be affected by stagnation if evaporation and degassing of the lake occur. Water quality could also be impacted if dissolved solid levels increased and dissolved oxygen levels decrease. This is not expected to be an issue at Little Lake because:

- Little Lake represents the surface expression of the groundwater aquifer which would maintain flow through springs in the lake throughout the project; the lake is not expected to stagnate.
- Little Lake already experiences varying degrees of evaporation as evidenced by the observed variations in water isotopes and chemistry discussed above and small increases or decreases are unlikely to be detectable.

- The lake volume would decrease if the water level in Little Lake drops, thereby reducing evaporation.
- Natural springs also provide water to the downstream areas and are thus unaffected by the lake water.

C6.4 Hydrologic and Hydrogeochemical Separation of Waters at Portuguese Bench

Comments

Commenters requested further explanation of how the determination that water perched at Portuguese Bench is differentiated from the groundwater in the Rose Valley Basin. Commenters asked also what would happen if the waters of Portuguese Bench and the Davis' springs were suddenly impacted by the project.

Responses

The stable isotopic composition and the chloride concentration of the spring water discharging at Portuguese Bench suggest that it is related to Sierran recharge, and that it is distinct from the waters immediately down gradient at Coso Ranch and Coso Junction. The location of the discharge point at Portuguese Bench is several hundred feet above the water level at the Coso Ranch and Coso Junction wells. These observations suggest that Portuguese Bench waters are related to Sierran discharge, and not to Rose Valley groundwater.

The Draft EIR analyzed the project's potential impacts to the Davis' springs at Portuguese Bench and concluded that no potentially significant impacts would result (e.g., pages 3.2-5, 3.2-41, 3.4-4, and 3.4-42). This is because both the Portuguese Bench and Davis' springs are located approximately 600 ft higher in elevation than the Rose Valley aquifer (Draft EIR page 3.2-41). These two resources are not hydrologically dependent upon the water in the Rose Valley. No potentially significant impacts to hydrology would occur as a result of the project. The project would not adversely impact any water-dependent vegetation on Portuguese Bench or associated with the Davis' springs.

C7. Water Rights of Coso are Questionable

Comments

Several comments were received that questioned water rights. Commenters expressed that Coso's water rights should be subordinate to the interests of overlying owners. Coso does not have a legal right to significantly deplete the Rose Valley Basin to the detriment of other proper and lawful owners. Commenters also suggested that the appropriation of interbasin water transfers should only be allowed if there are no impacts at all associated with the transfer. The water usage by Coso compared with other users in the Rose Valley should be compared. Coso does not have vested rights to deplete the Rose Valley. Commenters also questioned if the CUP would prevent vested rights if the LADWP wants to pump groundwater from the Rose Valley.

Responses

Water rights issues are beyond the scope of the requirements for analysis under CEQA. Water rights issues are very complex, and can only ultimately be determined by the State Water Resources Control Board or, ultimately, by the courts. Inyo County does not determine or enforce water rights, and they would not be addressed in the CUP. The EIR fully analyzes and addresses impacts to the environment associated with the groundwater pumping project as required under CEQA. Mitigation included in the EIR addresses and minimizes impacts associated with groundwater drawdown and off-site impacts. The proposed project would not have a significant impact on Little Lake or other groundwater users in the Rose Valley with the implementation of mitigation.

D. GEOLOGY AND SOILS

Multiple comments were received on the following topics:

1. Subsidence in Rose Valley
2. Seismicity
3. Volcanism

D1. Subsidence in Rose Valley

Comments

Several comments were received requesting clarification of the potential for subsidence in Rose Valley due to groundwater pumping, and for a discussion of the cumulative impacts of subsidence.

Responses

Subsidence is a downward movement of the ground surface. Subsidence can be caused by groundwater withdrawal. The Draft EIR adequately addresses the potential for subsidence occurring as a result of the proposed project. The Draft EIR describes on page 3.3-8 that subsidence related to groundwater withdrawal is typically associated with basins containing sediment composed of compressible clays. The area around the Hay Ranch property generally contains coarse sediments with few clay lenses. These sediments are well consolidated. The Draft EIR notes on page 3.3-13 that well logs show that soils in the project area are stable alluvial materials typical of alluvial fan and stream deposits. The characteristics of the sediment around the Hay Ranch property make the potential for subsidence very low.

Subsidence is also addressed on the last paragraph on page 3.3-13 of the Draft EIR. Subsidence is a function of drawdown, rather than a function of aquifer volume. The resulting drawdown would differ by location relative to the Hay Ranch wells. Groundwater drawdown in the immediate vicinity of the Hay Ranch wells could cause subsidence only if the soil in the area is composed of compressible clay or unstable sediment; however, as noted above, sediments in the immediate vicinity of the Hay Ranch wells are well consolidated and lacking in clayey sediments. Subsidence would not be expected as a result of the proposed project because of this lack of significant amounts of clay.

Cumulative subsidence is addressed beginning on page 4-4 of the Draft EIR under *Geology and Soils*. The LADWP Haiwee Reservoir leakage recovery project would not result in subsidence because of the nature of the consolidated soils in the region that are not conducive to subsidence. Subsidence would not occur cumulatively with the Deep Rose project because proposed project's contribution to a potential impact from subsidence is so small, and because the soils of the Rose Valley are not conducive to subsidence.

D2. Seismicity

Comments

Comments were received requesting analysis of the potential for the proposed project to induce seismicity. A commenter also inquired if induced seismicity could cause fractures in the geothermal reservoir.

Responses

Microseismicity as a result of injection of water into the geothermal reservoir is addressed on page 3.3-11 of the Draft EIR. This phenomenon has been studied at The Geysers, a geothermal production facility near Santa Rosa, California. A recent White Paper cited in the Draft EIR by E.L. Majer found that there was a correlation between deep induced microearthquakes and injection rates. Another source cited in the Draft EIR showed that injection wells are a focal point for seismic activity, and that these microearthquakes correlate with injection rates. Other factors can also affect seismicity; even the characteristics of a geothermal reservoir, such as heat, low fluid content, and location in a tectonically active area affect the area's seismicity.

Induced seismicity is not a significant impact. Induced seismicity appears to be below the magnitude of earthquake required for significant structural damage in geothermal fields and potential geothermal fields in the United States. The seismicity is even below that level at which humans can readily detect events. This is for a few reasons:

1. There are no faults close enough to the injection area to perpetuate a large, high-damage event.
2. Large seismic events are initiated at depths of 3 to 6 mi bgs, while geothermal injection occurs at depths shallower than 3 mi bgs. This makes inducing a large seismic event very difficult.
3. Many geothermal fields are in remote locations far from developed urban or suburban areas, and most induced seismic events cannot be detected without scientific instruments. People cannot detect most induced seismic events associated with geothermal injection.

The Coso geothermal field is located in an extremely tectonically and seismically active area. Seismic activity at Coso is monitored and reported as part of the Coso Hot Springs monitoring program (Geologica 2004; 2005; 2006). The results of the monitoring suggest seismic activity is related to regional tectonics as well as local geothermal development.

Coso has been injecting cool (relative to the reservoir temperature) fluids for several years without any evidence of significant seismic activity. The remoteness of the project location (the closest residences are over 10 mi from the injection area) and the probable low-magnitude of the seismicity would result in less than significant impacts. There has also been no correlation between seismic activity and changes in Coso Hot Springs for the parameters monitored. The introduction of cool water into hot rock produces fractures or microfractures, which in turn produce permeability; however, this process is currently occurring at Coso and does not cause significant seismicity.

D3. Volcanism

Comments

Comments were received regarding induced volcanic activity as a result of the proposed project. A commenter questioned whether a potential increase in volcanic activity as a result of the proposed project would be significant.

Responses

The Draft EIR states on page 3.3-12 that the last known eruption in the Coso volcanic field was about 40,000 years before present. The area is volcanically active, but the potential for an eruption occurring within the lifespan of the proposed project is low. The injection of water into the geothermal reservoir would not have impacts on volcanism, for the reasons stated on page 3.3-12 of the Draft EIR.

E. BIOLOGICAL RESOURCES

Multiple comments were received on the following topics:

1. Mohave Ground Squirrel
2. Wetlands
3. Duration of Impacts to Biological Resources
4. Significance Criteria
5. Migratory Birds
6. Surveys to Determine Baseline Conditions
7. Animal Movement

E1. Mohave Ground Squirrel

Comments

Comments were received regarding the current status of the allowable land disturbance set by the 1988 Mohave Ground Squirrel Mitigation Plan for development of the Coso Known Geothermal Area (KGRA). Commenters inquired as to the listing status of the MGS at the time of issuance of the plan.

Request for maps of the project area considered by the 1988 Mohave Ground Squirrel Mitigation Plan, and for an explanation of the duration of validity of the MGS Mitigation Plan studies were made.

Responses

The 1988 stipulation effectively preserves more than 43,000 ac for Mohave ground squirrel (MGS) habitat. The Coso development has used 474.69 ac of the allowed surface disturbance within the China Lake Naval Air Weapons Station (CLNAWS) boundary (2,193 ac were allotted), and has used zero acres outside of the boundary (35 ac were allotted) to date. Maps of the lands included in the 1988 CEQA document are depicted in the BLM's Final Environmental Impact Statement for Proposed Leasing Within the Coso KGRA, dated September 1980 at, for example, Figure 2.11.1-4A. (Brock pers. comm. 2008). The Mohave Ground Squirrel Mitigation Plan study was originally to be re-evaluated in 2000; however, the plan was amended in 1997 in order to allow continuance of the plan through the life of the Coso development. The plan allows for 2,193 ac of new surface disturbance inside the boundary of the CLNAWS and 35 ac outside the CLNAWS boundary and provides accompanying incidental take coverage related to those disturbances. It does not include disturbance on private lands. Coso has submitted an application for a 2081 Incidental Take Permit (which would allow the take of the MGS under certain terms and conditions) for activities to be conducted on private land. The California Department of Fish and Game (CDFG) has confirmed in its comment letter dated September 5, 2008 that the 3:1 ratio for the habitat mitigation requirement would apply, and that the requirement can be satisfied through a payment to the Desert Tortoise Preserve Committee, which also acquires and manages habitat for the MGS. The private property is also desert tortoise habitat and the Draft EIR describes mitigation for a 3:1 ratio for permanent habitat loss on private property. Table 3.4-4 on page 3.4-30 was revised to show that the 1988 Mohave Ground Squirrel Mitigation Plan does not apply to the private property; however, the 3:1 ratio for desert tortoise would also suffice as the compensation for MGS because both species occupy the same type of habitat. No additional compensation is required beyond the 3:1 ratio, as this ratio provides compensation for both species.

The CDFG listed the MGS as "Rare" on June 27, 1971. In 1984, the categories of "Endangered" and "Threatened" were added to the California Endangered Species Act (CESA). Species formerly listed as "Rare" were reclassified as "Threatened on" January 1, 1985. The MGS has maintained the same listing of "Threatened" since the preparation of the Mohave Ground Squirrel Mitigation Plan in 1988.

The 1988 stipulation required the establishment of a 43,448.5-ac Coso Grazing Exclosure[1] Mitigation Program, which includes MGS trapping within the exclosure and evaluations every 5 years for the life of the project. The CDFG recognizes that the 1988 stipulation has been grandfathered in under the provisions of the CESA §2081. No additional incidental take authorization or habitat compensation would be required for potential impacts to the MGS resulting from the Hay Ranch project located on the federal lands that are covered by the 1988 stipulation.

The table and text edits are presented below.

Page 3.4-30 of the Draft EIR

Table 3.4-4: Summary of Temporary and Permanent Habitat Losses and Compensation by Land Management Authority

Land Owner	Temporary Habitat Loss	Permanent Habitat Loss	Compensation for Mohave Ground Squirrel	Compensation for Desert Tortoise
Private	~9 acres	~~~5~~6.25 acres	~~Compensation falls under the 1988 Mitigation Plan for geothermal development at CLNAWS. This plan allows for up to 2,193 acres of Mohave ground squirrel habitat disturbance for geothermal development. This project falls within the acreage allowance~~ Compensation for desert tortoise, described in the next column would also suffice as compensation for Mohave ground squirrel. The applicant will provide three acres for every acre that is permanently lost due to project activities.	To compensate for loss, three acres for every acre that is permanently lost due to project activities would be purchased by the project proponent and deeded to the CDFG or the Desert Tortoise Preserve. This provides compensation on private land for both Mohave ground squirrel and desert tortoise. The location of compensation lands would be approved by the CDFG. The project proponent would also pay a one-time endowment fee for the long-term management of these lands. Mitigation can also suffice through a payment to the Desert Tortoise Preserve Committee covering the land cost for a 3:1 compensation ratio and fees for long-term management. Habitat which is temporarily disturbed by project activities would be restored to natural conditions.
BLM	~33.2 acres	0.03 acres (for a 500 foot section of above ground piping)	Compensation falls under the 1988 Mitigation Plan for geothermal development	Compensation falls under the West Mojave Plan and would include a fee payment at a 5:1 fee ratio (pay a fee of five times the average value of an acre of land within the habitat conservation area) for permanently impacted habitat.

[1] An exclosure is an area from which certain animals are excluded from entering, usually to graze.

				Habitat which is temporarily disturbed by project activities would be restored to natural conditions.
CLNAWS	~13,757 acres	0.75 acres	Compensation falls under the 1988 Mitigation Plan for geothermal development	Impacts to tortoise fall under the 2004 China Lake CLUMP and China Lake Desert Tortoise Management Plan, which include habitat compensation and a habitat impact and take allowance for all activities on CLNAWS.

Pages 3.4-28 to 3.4-29

Project operation would result in the temporary loss of 53.5 acres of potential habitat and the permanent loss of about ~~6~~ 7 acres of potential habitat for desert tortoise and Mohave ground squirrel (the entire project area is assumed to be Mohave ground squirrel habitat). ~~5~~6.25 acres of permanent loss would be on private land, 0.03 acres on BLM managed lands, and 0.75 acres would be on CLNAWS land. Compensation for Mohave ground squirrel is included in the existing mitigation plan for the geothermal development for the 0.75 acres of loss on BLM and the 0.03 acres on BLM managed lands. The plan was evaluated under CEQA in 1988 and is applicable for all geothermal projects associated with geothermal development at Coso and within the Coso KGRA. The goal of the mitigation program was to eliminate grazing pressure by cattle on the food source for the Mohave ground squirrel. Cattle can adversely affect the ground squirrels directly by competing for the limited forage or indirectly by trampling ground squirrel burrows and reducing shrub cover necessary for ground squirrel thermoregulation and protection from predators. The plan effectively preserved several acres of Mohave ground squirrel habitat, allowing for 2,193 acres of habitat disturbance associated with geothermal projects. Implementation of this plan minimizes effects to Mohave ground squirrel from the proposed project to less than significant levels. Six acres of land would be debited from the total mitigation credit acreage. Temporarily disturbed habitat would be restored to natural conditions after construction to minimize impacts to Mohave ground squirrel habitat. The mitigation plan does not provide compensation for permanent disturbance on private lands. The approximately 6.25 acres of permanent disturbance on private lands would require an Incidental Take Permit under section 2081 of the Fish and Game Code and compensation for loss of habitat.

The project would also result in temporary and permanent loss of habitat for desert tortoise. Portions of the project fall under different plans for the compensation of lost desert tortoise habitat based on surface management. Table 3.4-4 summarizes the loss of habitat, ownership, and compensation for both Mohave ground squirrel and desert tortoise. With compensation as described, impacts to habitat for desert tortoise and Mohave ground squirrel would be considered less than significant.

Construction

Construction of all project components could have the potential to impact the following federal and/or State listed threatened or endangered species:

- Desert tortoise
- Mohave ground squirrel

The project construction could also impact several special status plant, reptilian, mammalian, and avian species as listed on Table 3.4-1 and Table 3.4-2.

Mohave Ground Squirrel. Mohave ground squirrels are known to occur in areas adjacent to the project site, and the entire project area supports Mohave ground squirrel habitat (all project components). Any ground-disturbing activities could take an indeterminate number of Mohave ground squirrels. Animals could be trapped underground in burrows or in above ground middens, or crushed by project equipment. In addition, approximately 53.5 acres of habitat for these species would be temporarily disturbed during construction of project components. This habitat disturbance may be significant for species with limited ranges such as the Mohave ground squirrel.

Project impacts are expected to be potentially significant for Mohave ground squirrels, a species listed as threatened under the California Endangered Species Act. Although it is unlikely that the loss of habitat for this project would jeopardize the continued existence of Mohave ground squirrels throughout its range, the project site is surrounded by mostly undisturbed native desert habitat, much of which is presumably occupied by Mohave ground squirrels.

Mitigation for Mohave ground squirrel impacts during construction would include a training program as described in mitigation measure Biology-5 and several of the measures listed in mitigation measure Biology-6. Additionally, compensation mitigation for temporary and permanent impacts ~~on~~ to ~~6 acres and temporary impacts on 59.5 acres of~~ Mohave ground squirrel habitat ~~is~~ on public lands is covered under the existing Mohave Ground Squirrel Mitigation Plan for development of the Coso Known Geothermal Area (KGRA). This plan was developed in 1988. The plan effectively preserved several acres of Mohave ground squirrel habitat in anticipation of up to 2,193 acres of disturbance associated with geothermal development in the Coso KGRA. The BLM identified that up to 2,193 acres of land could be disturbed in order to develop the geothermal resources in the Coso KGRA, which could impact the Mohave ground squirrel. The mitigation program was designed by the BLM, CLNAWS, and the CDFG to compensate for the 2,193 acres of Mohave ground squirrel habitat that could be impacted on CLNAWS lands and 35 acres outside of the CLNAWS boundary. The compensation land is located on CLNAWS and includes exclusion of grazing species to enhance the Mohave ground squirrel population over the area. The program has included monitoring over the last 26 years and is still in effect for additional habitat losses associated with geothermal development in the area. ~~As of 1988,~~ To date, ~~about 885~~ 474.69 acres of surface disturbance of the permitted 2,193 acres on CLNAWS, and 0 acres of the 35 acres for public lands off of CLNAWS has been used (~~BLM 1988~~ Brock, personal communication 2008). The 53.5 temporary acres of impact ~~are within the allowed acreage in the mitigation plan.~~ would be restored after construction. The Navy would account for project associated impacts according to the provisions of the plan. Thirty-three acres of the 35 acres of disturbance allowed on public lands outside of CLNAWS would be deducted and 15.8 acres of the remaining 1,718.31 acres of disturbance allowed on CLNAWS lands would be deducted. Impacts from habitat loss would be less than significant. The mitigation plan was evaluated under both NEPA and CEQA in 1988 and remains in effect. Implementation of this plan minimizes effects to Mohave ground squirrels to less than significant levels.

Permanent impacts to 6.25 acres of private lands that include Mohave ground squirrel habitat would be mitigated through providing compensation according to mitigation measure Biology-7. The measure requires a 3:1 replacement ratio for lands permanently disturbed. This ratio incorporates both the impacts to Mohave ground squirrel and desert tortoise. With implementation of this measure, impacts to Mohave ground squirrel would be less than significant. Additionally, an Incidental Take Permit under Section 2081 of the CDFG Code would be required for Mohave ground squirrel.

Page 3.4-32

Biology-7: The applicant shall purchase replacement land occupied by desert tortoise and Mohave ground squirrel at a ratio of 3 acres for every 1 acre disturbed on the Hay Ranch property (for a total of 18 acres). The replacement land shall be deeded to the CDFG for the Desert Tortoise Preserve. The location of compensation lands shall be approved by the CDFG. The project proponent shall also pay a one-time endowment fee for the long-term management of these lands.

E2. Wetlands

Comments

Comments were received regarding the California Executive Order W-59-93 (State Wetland Conservation Policy [SWCP]). Related comments included questions regarding direct and indirect impacts to wetland dependent species including the yellow warbler, common yellowthroat, and the yellow-billed cuckoo. Questions were also posed regarding impacts to Fremont cottonwood habitat from groundwater drawdown, and subsequent foraging/resting for raptors/passerines if trees die from groundwater drawdown. Other comments questioned the potential impacts to the California Native Plant Society (CNPS) listed plant *Spartina gracilis* (alkali cordgrass).

Responses

Executive Order W-59-93 established the SWCP and provides comprehensive direction for the coordination of statewide activities for the preservation and protection of wetland habitats. The Resources Agency and the California Environmental Protection Agency are designated as co-leads to implement the goals of the SWCP. One of the SWCP's central goals is to ensure no overall net loss, and to achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property. The SWCP does not contain regulations; rather, the SWCP is a means by which to work with agencies to achieve the outlined goals.

The Draft EIR states on page 3.4-40 that construction would not impact wetlands or riparian areas because there are no wetlands or riparian areas within the proposed project construction area. Operation of the proposed project has the potential to indirectly impact wetlands and riparian areas. Drought evasive (i.e., groundwater-dependent) species at Portuguese Bench and Rose Spring would not be affected by the proposed project, as discussed on page 3.4-42 of the Draft EIR. Hydrologic studies have shown that artesian springs at Portuguese Bench are not hydrologically dependent on water in the Rose Valley; therefore, the project would have no impacts on riparian or wetland vegetation along Portuguese Bench. Rose Spring is approximately 300 ft above the local groundwater table in the aquifer, and the water for the spring is derived from Sierra Nevada mountain front precipitation and groundwater underflow from Owens Valley, neither of which would be impacted by pumping at Hay Ranch. The spring is currently dry. The project does not violate Executive Order W-59-93 because it would not impact wetlands, and no wetland delineations are required.

Potential impacts to wetland and riparian vegetation at Little Lake are discussed beginning on page 3.4-42 of the Draft EIR. Without mitigation, groundwater withdrawal at Hay Ranch has the potential to reduce the groundwater flow to the Little Lake area, and to affect the sensitive riparian and wetland vegetation around Little Lake, located approximately 9 mi south of the project area. Without mitigation, groundwater inflowing into Little Lake is projected by the groundwater modeling results to be significantly reduced if the project were implemented as proposed (pumping at 4,839 ac-ft/yr for 30 years). Mitigation specifically designed to avoid these potentially significant impacts has been defined in order to avoid significant effects to groundwater and vegetation and would be part of any project approval.

Potential impacts to wetlands are discussed under Potential Impact 3.4-4 beginning on page 3.4-40 of the Draft EIR. Wetlands and riparian vegetation at Little Lake Ranch could be impacted by drawdown of groundwater that supplies the surface water flows at the lake. Impacts would not occur immediately, but would occur over time; adverse effects would be potentially significant without mitigation. The Draft EIR includes an HMMP. The HMMP would be implemented if the CUP is approved. The HMMP would establish trigger points for implementing mitigation that would prevent significant effects to water levels and impacts to wetland habitats at Little Lake. A reduction or cessation of pumping is required if trigger levels are reached. The reduction or cessation in pumping would avoid a greater than 10% reduction in flows into the lake (4-in decline), ponds, and wetlands.

Seasonal fluctuation in surface area and volume currently occurs at Little Lake. The lake is also manipulated or managed to change its surface area and volume. Wetland and riparian species surrounding the lake are closely associated with the lake margin and fluctuate with the lake

(Bagley pers. comm. 2008). Maintaining flows into Little Lake to at least 90% of their current average flow rates would keep flows largely within the range of variation currently experienced at the lake. The maximum drawdown at the north end of the lake would be approximately 0.3 ft (4 in), and would be even less at the south end of the property. Species at Little Lake are mostly either upland species that do not depend on groundwater, or marsh species that require inundation during the growing season (Bagley pers. comm. 2008). The inundation around the lake is closely tied to the wetted margin of the lake and the lateral migration of water at the margin. The wetted margin would contract and the same species would likely maintain the same width but move inward, even with a small decrease in lake size. These changes can be currently seen when the lake size is manipulated with boards in the weir at the south end of the lake. The time that water stops flowing over the weir could increase slightly but would not be outside the range currently experienced. There may be some impacts to marsh species but these are not expected to be significant because the vegetation would not significantly change from its current state. Marsh vegetation normally requires inundation during the growing season (summer). Summer is the time when water currently also does not flow over the weir. Effects to one CNPS listed species, alkali cordgrass (*Spartina gracilis*), were questioned. Alkali cordgrass is not federally or State listed, as stated on page 3.4-16 of the Draft EIR. The species is on the CNPS List 4: Plants of Limited Distribution. This species occurs at Little Lake and currently experiences the seasonal and manipulated fluctuations in surface water levels. The changes in water levels would be within the envelope currently experienced with the implementation of mitigation. Populations of individuals would remain largely the same as they are currently. The project would not reduce or eliminate the occurrence of alkali cordgrass at Little Lake. Loss of a few individuals due to the contraction of the lake perimeter and wetted boundary would not be a significant effect.

The area downstream from the lake is inundated by outflow from the lake as well as water supply from springs. The lower springs would not stop flowing as a result of the project with mitigation. Wetland species would not be significantly impacted.

Phreatophytic[2] species that may occur in the area between the south end of Little Lake and the lower ponds would likely be able to deepen their roots by a few inches if the groundwater table is lowered. Several studies by Inyo County, the LADWP, and the USGS have supported this concept (Bagley pers. Comm. 2008).

Some impacts may still occur to wetland vegetation and habitat at Little Lake Ranch even with implementation of mitigation; however, impacts would be less than significant because they would not result in a change in habitat type or a significant loss of habitat. No other aspects of the proposed project's operation other than groundwater pumping would impact water- dependent habitats in Rose Valley.

Species such as yellow warbler, common yellowthroat, yellow-billed cuckoo depend on wetland vegetation. None of these species were identified around Little Lake in a California Natural Diversity Database search (2007). Refer to page 3.4-19 of the Draft EIR for the list of special status species potentially occurring at Little Lake. If yellow warbler, common yellowthroat, and yellow-billed cuckoo were to occur at Little Lake, they would not be impacted by the project because the project would have minimal impacts to wetlands. Freemont cottonwood occurs on the Little Lake property. Cottonwoods have deeper roots systems than emergent wetland species as found around the lake margin. A study by S.J. Lite and J.C. Stromberg (Lite et al. 2005) that examined surface water and groundwater thresholds for maintaining cottonwood (*Populus-Salix*) forest in Arizona found that Freemont cottonwood (*Populus fremontii*) were dominant over other

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[2] Phreatophytic is used to reference any plant species that obtains a significant portion of the water that it needs to survive from the zone of saturation or the capillary fringe above the zone of saturation.

species when surface flow was present more than 75% of the time, when the inter-annual groundwater fluctuation was fewer than 1.65 ft, and when the average maximum depth to groundwater was fewer than 8.5 ft. Cottonwoods occur along sandy washes, near the surface water supply. The project would not result in significant groundwater drawdown that could impact cottonwoods. Groundwater drawdown of 0.3 ft or less would not significantly impact cottonwood roots. The project would not cause more severe inter-annual groundwater fluctuation than already occurs.

Passerine and raptor species at Little Lake would not be impacted because the project would not result in impacts to trees at Little Lake.

E3. Duration of Impacts to Biological Resources

Comments

Comments were received regarding the duration of impacts to the biological resources at Little Lake and at Rose Valley. Concern was raised that impacts to groundwater levels downstream of Hay Ranch would continue to occur and worsen even after pumping ceases, and the time for groundwater levels to rebound to pre-pumping levels can take as many as 100 years or more.

Responses

Impacts to Little Lake are described beginning on page 3.2-40 of the Draft EIR. Impacts to biological resources are minimized through implementation of the HMMP. The potential for long-lasting groundwater drawdown is identified as potentially significant; however, the mitigation establishes a method for determining trigger points that incorporate the delayed response of groundwater drawdown further down the valley, and would avoid significant effects. The maximum allowable drawdown at Little Lake with the proposed mitigation plan is 0.3 ft. The level of groundwater drawdown is small enough to have less than significant impacts on the wetlands and biological resources at Little Lake, even though it may take over 100 years to regain that 0.3-ft loss in groundwater level. The Draft EIR includes monitoring requirements, both before and during pumping, to track any reductions in groundwater levels and imposes binding mitigation based on specific trigger points for any decreases.

E4. Significance Criteria

Comments

Several comments were made that questioned whether a 10% reduction in outflow to Little Lake can be considered “less than significant.” Commenters stated that any reduction in groundwater at Little Lake would be significant to wetland and riparian habitat.

Responses

Little Lake normally experiences seasonal fluctuation in its surface area and volume, and can and has been manipulated to alter the lake surface area and volume. Wetland and riparian species surrounding the lake are closely associated with the lake margin and fluctuate with the lake. Local plant root zones are likely inundated by lateral migration of water from the surface waters. The area supporting riparian habitat would likely maintain the same width of wetland habitat, but would move with the open water margin, even with a small reduction in lake area/volume. Maintaining flows into Little Lake to at least 90% of their current average flow rates would keep flows largely within the range of natural variation currently experienced. The 10% decrease in outflow to Little Lake was based on this value of natural variation and was determined to be the vegetation “tolerance” level at the lake in order to prevent significant impacts to water availability at the lake. The justification for the significance criteria is presented on page 3.2-45 and C4-5 of the Draft EIR.

Little Lake currently exports 6 ac-ft/yr of groundwater, which is provided to the nearby pumice mine. This withdrawal, while small, does have some effects on the lake and water available to the lake. Modeling demonstrated that this withdrawal could equal 0.1 ft of drawdown at the lake. The export and sale of water to the pumice mine suggests that there is some flexibility in the water management at Little Lake, and possibly some amount of excess water beyond what is needed to manage the habitat at the lake.

E5. Migratory Birds

Comments

Comments were received regarding potential impacts to migratory birds from project construction and operation, particularly related to ground disturbance, noise, and loss of habitat. Comments were also raised regarding potential indirect impacts to birds from groundwater drawdown throughout the Rose Valley. Comments were received requesting that the Migratory Bird Treaty Act and Bald Eagle Protection Act be addressed in the EIR.

Response

Special status species are protected under federal and State regulatory acts including: federal Endangered Species Act (ESA), Migratory Bird Treaty Act, Bald Eagle Protection Act, CESA, and CDFG Code. These regulations are discussed in Section 3.4.2: Regulatory Setting, beginning on page 3.4-23 of the Draft EIR.

Construction activities could have a potentially significant impact on migratory birds without mitigation. Noise and ground disturbance during construction could temporarily impact migratory birds by discouraging them from the construction area.

Impacts to ground-nesting birds are discussed on page 3.4-35 of the Draft EIR. Ground nesting birds, including the burrowing owl, could occur across the project area. Any burrowing owls occupying burrows within the project site may become trapped in underground burrows and become injured or die during construction activities. If ground-disturbing activities occur during the breeding season, then nests and their contents may be destroyed. Ground nesting birds are protected by the Migratory Bird Treaty Act of 1918 and by the CDFG Code, which are described in Section 3.4.2 beginning on page 3.4-23 of the Draft EIR. Mitigation measure Biology-9, found beginning on page 3.4-35 of the Draft EIR, would be implemented to minimize construction impacts to ground nesting birds to less than significant levels.

Impacts to raptors are discussed on page 3.4-35 of the Draft EIR. Construction of all project components would have a temporary impact on birds of prey through removal of foraging habitat from potential breeding and wintering territories of individuals. Breeding species include three special status species, and wintering species include one special status species. Temporary habitat lost was assumed to include the entire of 60.5-ac project site. This loss for all species would not be significant because large areas of similar, suitable foraging habitat occur in other areas.

Project construction would not remove nesting areas or sites and would not impact trees or cliffs where birds of prey could be nesting. Construction noise would be limited to the active construction sites. Raptors would not be significantly impacted because raptor nesting is not expected to occur near the project right-of way, and noise associated with trucks and operations and the CLNAWS currently exists in the vicinity.

Most other birds occupying the site would probably flee the area during construction. Bird nests and their contents may be destroyed if ground-disturbing activities occur during the breeding season. These impacts would not be significant because most of the birds that occur on the project site are fairly common and similar suitable habitat occurs over large areas on adjacent parcels to project construction. The Draft EIR sets forth survey, avoidance, and relocation mitigation for ground-nesting birds such that impacts will be less than significant.

Little Lake Ranch designed an extensive Habitat Restoration and Enhancement Program for Little Lake. The overall objective of the program was to create and restore wetlands, and to enhance riparian habitat and foraging habitat and cover for many different wildlife species, including waterfowl and neotropical migratory songbirds. The proposed project, with mitigation, would have no impact to the available migratory bird habits at Little Lake because groundwater drawdown would be limited to a maximum of 0.3 ft at the north end of the lake, with less groundwater drawdown at the south end of the lake. The lake would not dry up, variations in lake level would not exceed those caused by natural variation, and no significant impacts to wetland or riparian vegetation would occur.

E6. Surveys to Determine Baseline Conditions of Biological Resources

Comments

Comments were received questioning why old studies such as the previous environmental documents for the power plants (i.e., BLM 1980) were relied upon. Commenters requested that more recent biological survey work be performed.

Response

The Draft EIR utilizes four recent (past 4 years) surveys to establish the baseline setting of the proposed project's biological resources, described on page 3.4-1 of the Draft EIR. These surveys include:

- A biological survey conducted by UltraSystems in 2004: This survey of the project area included a 50 ft wide corridor around the proposed pipeline route and high point tank and a 20-ac area on the Hay Ranch property around the proposed facilities.
- A 2007 survey for the Coso Road Improvements project: This survey included a 99-ft corridor on either side of Coso Road from the intersection with Highway 395 up to the entrance to the CLNAWS, and also included desert tortoise surveys.
- 2007 reconnaissance surveys: Baseline data collection for the Draft EIR included reconnaissance surveys of areas beyond the areas of direct surface disturbance for the project. These areas included Portuguese Bench, Rose Spring, and Little Lake Ranch. These areas would experience no direct effects from surface disturbance, but were considered to have the potential to experience some indirect effects associated with potential groundwater drawdown.
- A 2008 botanical and general reconnaissance survey of the entire project area including a 99-ft buffer around the project pipeline route.

These studies are adequate to determine baseline biological conditions of the proposed project area because they were performed by qualified biologists, covered the entire project area, followed standard biological and survey practice, and are all recent. The earliest survey utilized was completed in 2004; however, supplemental surveys conducted in 2007 and 2008 included the entire area surveyed in 2004. The supplemental surveys include resurvey of the entire project area and a reconnaissance level survey of off-site locations including Little Lake.

E7. Animal Movement

Comments

Comments were received questioning the analysis of impacts to animal movement due to the installation of the proposed pipeline. Animal movement may be restricted during construction and post construction for segments of pipeline that would be located above the ground surface.

Response

Wildlife movement would not be impacted during project construction or operation. The pipeline construction would occur in segments, and most animals would be able to travel around or over the construction site during night or early morning when construction activity is not occurring. The majority of the pipeline route would be buried and disturbed areas not permanently used for facilities would be reclaimed and reseeded. About 500 ft of 20-in diameter pipeline would be installed above ground. The pipeline would be installed so that it is elevated above the ground surface, allowing enough room for small animals, such as the desert tortoise, to move freely under and around the pipeline. The Draft EIR assumed that the 0.03 ac occupied by this above ground pipeline would be permanent habitat loss and so required mitigation in the form of fees as required and administered under the West Mojave Plan and the 1998 Mitigation Plan for the geothermal development. The project would not result in a potentially significant impact to animal movement.

F. CULTURAL RESOURCES

Multiple comments were received on the following topics:

1. Native American Prayer Site near Gill Station Coso Road
2. The Memorandum of Agreement and Coso Hot Springs

Several other comments were raised regarding potential and continued impacts to Coso Hot Springs. This topic is also addressed in the *Hydrology and Water Quality* analyses. Hydrologic impacts to Coso Hot Springs are addressed in Master Response D5.

F1. Native American Prayer Site near Gill Station Coso Road

Comments

Some comments were received regarding the sacred Native American prayer site. Commenters expressed concern that construction would impact the traditional use of the prayer site, and that project components would be visible from the prayer site.

Responses

The above-ground section of the pipeline would be approximately 500 ft in length and would be located at the entrance to the CLNAWS. This above-ground location of the pipeline is not in close proximity to the Native American prayer site and would not be visible from the prayer site. The prayer site is located approximately 1,600 ft from the terminus of the proposed project pipeline route into the injection system at the Coso geothermal field. The prayer site is located approximately 13,720 ft west of the location where the above-ground section of the pipeline would be located. A discussion of potential impacts to the prayer site can be found on page 3.5-15 of the Draft EIR under *Construction*. The site is accessed from the west along Gill Station Coso Road, where construction would occur. Construction would begin more than 0.25 mi away from the prayer site and would end at an existing well pad system. Project construction could affect activities at the prayer site. Mitigation measure Cultural Resources-9 would be implemented to minimize impacts, including those to aesthetics as viewed from the prayer site. Traffic (within a reasonable distance of the religious activity) shall be halted during ceremonial and religious observations in order to minimize impacts to Native Americans utilizing the prayer site. Consultation with Native American tribes regarding potential impacts to cultural resources was undertaken by the BLM and a programmatic Memorandum of Agreement (MOA) was executed to ensure that cultural resources are adequately protected, as described below.

F2. The Memorandum of Agreement and Coso Hot Springs

Comment

Commenters noted that the Draft EIR identifies that changes at Coso Hot Springs are related to geothermal development; however, the existing MOA states that the Navy will cease those activities if changes to Coso Hot Springs resulting from geothermal development activities are observed. Letters received from the tribes noted that changes have been observed and therefore geothermal activity should have ceased. The question was raised as to why no additional mitigation for Coso Hot Springs is proposed.

Response

Refer to Master Response D5 for a discussion of the correlation between Coso Hot Springs and the geothermal development at the Coso geothermal field. There is likely some correlation between development and the manifestation at Coso Hot Springs; however, this relationship is not one-to-one and various other natural factors also impact the hot springs. The proposed project, if it affects the hot springs, would be expected to result in reduced temperatures at the springs as the vapor cap is reduced. Monitoring will continue at Coso Hot Springs and the Navy will continue to consult with the tribes.

The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR, although the EIR did consider it for purposes of cumulative analysis and concluded that no potentially significant cumulative impacts would result from the project. The measures in the MOA as established were agreed upon by the signatory parties and remain valid. The Navy has consulted with the tribes regarding the changes at Coso Hot Springs and various types of mitigation measures have been suggested. There has been no agreement on mitigation to implement.

G. AGRICULTURAL RESOURCES

Multiple comments were received on the following topics:

1. Prime Farmland Designation
2. Conversion of Farmland to Non-agricultural Use
3. Water Use for Prior Agricultural Operation

G1. Prime Farmland Designation

Comments

Comments were received requesting that the EIR address the possible designation of the Hay Ranch property as Prime Farmland or Farmland of Statewide Importance in the future. Other questions were raised regarding the description of the agricultural history of the Hay Ranch parcel and the accuracy of the claim that alfalfa has not been grown on the property in 15 years.

Responses

The Draft EIR states on page 3.8-1 (under *Agricultural Activities in the Vicinity of Hay Ranch*) that the Hay Ranch property has been fallow for over 15 years. The Hay Ranch parcel produced more than seven tons of alfalfa per acre when it was used for alfalfa production. It became economically infeasible to farm alfalfa on the property in the early 1990s due to the cost of electricity to pump water from 600 ft bgs, and the low price of alfalfa. The parcel is owned by Coso and has not been farmed since the early 1990s.

The Hay Ranch property could be considered Prime Farmland in the future if enough water becomes available for irrigation and if it becomes economical to grow alfalfa on the property, as stated on page 3.8-2 of the Draft EIR. It is not currently economical to grow alfalfa on the Hay Ranch property (based on the current price of alfalfa). The parcel meets the production criteria for designation as Prime Farmland, which is having the capability to produce greater than seven tons per acre of alfalfa; however, the Hay Ranch property does not meet the requirement of having an adequate moisture supply needed to produce sustained high yield.

There is minor potential for Hay Ranch property to be designated as Prime Farmland; however, this is unlikely to happen. The Hay Ranch parcel historically produced more than 7 tons of alfalfa per ac, as stated on page 3.8-1 of the Draft EIR. No agricultural activities have taken place on the Hay Ranch property since the early 1990s. The Hay Ranch property is small compared to active farms in Inyo County (e.g., Lubkin Ranch at 760 ac) and would require deep groundwater pumping to reach water supplies, as explained on page 3.8-7 of Draft EIR. Further analysis of whether the Hay Ranch parcel would be designated as Prime Farmland in the future is speculative. A lead agency can note that an impact is too speculative for evaluation and end the discussion of the impact if, after thorough investigation, a lead agency reaches this conclusion (CEQA Guidelines §15145). The Draft EIR notes on page 3.8-8 that the discussion of potential designation as Prime Farmland is speculative. Analysis to determine whether the Hay Ranch parcel could be considered Farmland of Statewide Importance is also speculative. The baseline condition at the time of the NOP is that the property was not Prime Farmland. There is no Prime Farmland or Williamson Act land in Inyo County. The project would not result in any potentially significant impacts to agricultural resources, as stated in the Draft EIR.

G2. Conversion of Farmland to Non-agricultural Use

Comments

Several comments were received expressing that the impacts of the loss of land that could otherwise be farmed should be addressed. The commenters claim that the proposed project would permanently remove the 300-ac Hay Ranch property from agricultural use.

Responses

The Hay Ranch property is not currently in use for agricultural purposes nor is it designated as agricultural lands or farmland. The proposed project would not remove all 300 acres of the Hay Ranch parcel from potential use as farmland, as discussed under Potential Impact 3.8-2 beginning on page 3.8-4 of the Draft EIR. The proposed project would permanently remove about 5 ac (1.7%) of the 300-ac Hay Ranch parcel, which would not be considered a significant conversion of farmland.

Approximately 295 ac would remain after construction that could be used for agricultural purposes in the future. Operation of the project facilities on the Hay Ranch property would not significantly impact the use of the property as farmland, as the proposed project would not directly convert the majority of the property to another land use. New wells could be established on the Hay Ranch property if agricultural operations were to resume. The new wells would have to undergo appropriate environmental permitting, but it is not infeasible that new wells could be established. The parcel is privately owned and it is the right of the land owner to use the property as they choose. The landowner is within his or her rights when deciding whether or not to farm the property.

The potential for indirect conversion of farmland is described under Potential Impact 3.8-3, beginning on page 3.8-5 of the Draft EIR. Indirect conversion of farmland could result from removal of water, electricity, or transportation needed to farm. The proposed project could result in some groundwater drawdown in the Rose Valley. The nearest agricultural land that is currently irrigated is a commercial alfalfa farm located at Cactus Flats approximately 13 mi northeast of the project site; the farm is located in a different groundwater basin than the proposed project. There are currently no irrigated croplands in the Rose Valley. Mitigation measure Hydrology-1 requires that any wells impacted by project operation be deepened or have pumps set lower if impacted by the proposed project; these modifications would be funded by Coso. Mitigation would reduce indirect impacts to private wells to less than significant levels.

G3. Water Use for Prior Agricultural Operation

Comments

Comments were received regarding the amount of water pumped from the Hay Ranch wells for prior agricultural use, which in the Draft EIR was estimated at 3,000 ac-ft/yr.

Responses

The value for previous agricultural pumping at 3,000 ac-ft/yr from the wells on the Hay Ranch property is based on what would be needed to sustain alfalfa production on a field of approximately 300 ac, such as the Hay Ranch parcel. This value can be calculated to formulate a reasonable estimate of the amount of water that was pumped for prior alfalfa production on the Hay Ranch parcel. The Draft EIR does not compare the impacts of agricultural pumping at this rate to the impacts of the proposed project; rather, the previous pumping rate stated on page 3.11-5 of the Draft EIR is mentioned to provide historical context for the use of the Hay Ranch wells.

H. AESTHETICS

Multiple comments were received regarding aesthetic and visual resource assessments and impacts associated with:

1. Little Lake
2. Rose Valley
3. Bureau of Land Management Visual Resource Management Guidelines

H1. Little Lake

Comments

Comments were received regarding general aesthetic impacts to views of Little Lake from US 395 due to changes in vegetation that could potentially occur as a result of the proposed project. The commenters claimed that if Little Lake dries, or if there is a significant change in vegetation, the view from US 395 would be significantly impacted and this significant impact should be addressed in the EIR.

Responses

The aesthetic qualities as seen by sensitive viewers on US 395 are described under the heading *Scenic Roads* beginning on page 3.9-1 of the Draft EIR. US 395 is eligible for designation as a scenic highway. The Coalition for Unified Recreation in the Eastern Sierra, a non-profit organization, has designated US 395 as a part of the Eastern Sierra Scenic Byway. The Draft EIR describes on page 3.9-3 that sensitive viewers in the project area are largely limited to the western portion of the project along US 395 in view of Hay Ranch. Sensitive viewers include motorists along US 395 in the project area vicinity.

Operational impacts, with mitigation, are not likely to affect the aesthetic quality of the Rose Valley by affecting the vegetation at Little Lake. Vegetation at Little Lake is dependent on groundwater.

These impacts are discussed under the *Little Lake* subsection of Potential Impact 3.4-4, beginning on page 3.4-42 of the Draft EIR. If the project were implemented without mitigation, potential impacts could include vegetation changes around the margin of the lake if the water table is greatly reduced. Habitat restoration efforts could also be impacted by the proposed project.

As discussed on the last paragraph of page 3.9-8 of the Draft EIR, however; mitigation has been outlined to minimize impacts to vegetation at Little Lake due to potential groundwater drawdown, such as mitigation measure Hydrology-1, the HMMP and mitigation measures Hydrology-3 and -4, which would require cessation of groundwater pumping at certain trigger points. Little Lake would not experience a greater than 10% reduction in flows into the lakes, ponds, and wetlands with implementation of mitigation; the 10% reduction translates to less than 0.3 ft of drawdown. Little Lake normally experiences seasonal fluctuation in its surface area and volume, and can be manipulated through adjusting the weir on the lake. Maintaining flow at 90% of the current average flow rate would keep flows largely within the range of variation currently experienced at Little Lake. Wetland species on the lake margin fluctuate with the surface extent of Little Lake and the appearance of the lake would not change dramatically.

The project would not result in drying Little Lake and its associated ponds with implementation of mitigation. Visual impacts would be less than significant.

H2. Rose Valley

Comments

Comments were received regarding visual impacts to the Rose Valley from project construction and operation and from the potential drawdown of water due to the proposed project. Specific concerns that were raised were related to impacts to vegetation, habitat, and wildlife in viewsheds of residents and motorists in Rose Valley. Clarification was requested on whether or not the high point tank would be visible from US 395.

Responses

Aesthetic impacts to Rose Valley vegetation are discussed throughout Section 3.9: Aesthetics. Visual impacts to the Rose Valley would vary depending on the stage of the project.

Visual impacts from construction are discussed beginning on page 3.9-5 of the Draft EIR. Visual impacts during construction would be related to the presence of crews and heavy machinery on the Hay Ranch property. Some of these activities could be visible from US 395. Construction could introduce bright colors, tall machinery, and material stockpiles. These features may be viewed from US 395, and could reduce the overall quality of the viewshed. Mitigation measure Aesthetics-1 would require that construction components on the Hay Ranch property be screened with cloth construction fencing, which would help to minimize visual impacts. Construction would last approximately 110 days, and impacts due to construction would be temporary. Aesthetic impacts due to construction would be less than significant with implementation of mitigation.

The operation and maintenance stage would introduce new structures to the viewshed and is discussed beginning on page 3.9-7. The lift pump station would be visible from US 395. The lift pump station would be in the background, and would be landscaped with native vegetation for screening. Impacts would be less than significant. The substation and other facilities would be located about 0.5 mi from US 395 and would be set back far enough that it would not dominate or conflict with the viewshed. The substation mechanical electrical equipment room (MEER) would be painted a desert almond color to blend with the natural scenery of the area. One tank would be installed on the Hay Ranch property and painted a desert almond color to blend in with the existing landscape and avoid glare. Visual impacts would be less than significant. Figure 3.9-1 on page 3.9-10 of the Draft EIR shows a visual simulation of the project components on the Hay Ranch parcel, as viewed from US 395. Impacts to general vegetation throughout the Rose Valley are addressed in the Biological Resources section of the Draft EIR, on page 3.4-40. Much of the vegetation in the Rose Valley is comprised of drought tolerant species. Common species include shadscale; (*Atriplex confertifolia*), Nevada ephedra; (*Ephedra nevadensis*), and California buckwheat; (*Eriogonum fasciculatum*). At the northern end of the valley there are large stands of blackbrush; (*Coleogyne ramosissima*) as well as such Great Basin species sagebrush; (*Artemisia tridentata*), and bitterbrush; (*Purshia tridentata*), creosote bush; (*Larrea tridentata*), and burro bush; (*Ambrosia dumosa*).Water is often a limiting factor for plant growth in arid environments. Drought tolerant plants have developed strategies to maximize their efficiency in use of water. This allows them to thrive in areas where moisture is not adequate for most species to survive at all. Alluvial fans and slopes of desert mountains are characteristic landforms for drought tolerant species. Some local examples are shadscale and creosote bush.

The groundwater table could be lowered as much as 30 to 35 ft in the areas closest to the Hay Ranch parcel without mitigation measure Hydrology-1 through Hydrology-4, and less with implementation of this mitigation (reduced pumping rates and duration). However, the groundwater levels in Rose Valley already range from 140 to 240 ft bgs in the north and central parts of the Valley to approximately 40 ft bgs near the south end of the Valley. These existing groundwater table depths are too great to support any plant species and further drawdown of the water table should not impact the existing drought tolerant vegetation throughout most of the valley.

The 1.5-million-gallon tank would be constructed on the CLNAWS property and would also be painted a desert almond color. Potential visual impacts due to the tank on the CLNAWS property are addressed beginning on page 3.9-7 of the Draft EIR. The tank on the CLNAWS property would be would be painted a desert almond tan color to blend with the existing landscape. The paint used would also prevent glare. The Draft EIR states in the eighth full paragraph on page 3.9-7 that the tank would not be visible to sensitive viewers because of its location on the CLNAWS property. Sensitive viewers, as defined in the eighth full paragraph page 3.9-3 of the Draft EIR, include motorists along US 395 in the project vicinity. The Draft EIR states beginning in paragraph seven on page 3.9-7 that permanent visual impacts due to the high-point tank on the CLNAWS property would be limited to workers performing periodic inspections and using various types of equipment. These impacts would be temporary in nature and less than significant.

The pipeline would be buried except a 500-ft portion near the entrance of the CLNAWS. This exposed portion would be painted a desert almond color to blend with existing landscape and minimize glare. Above-ground sections would also have a low profile, and would not be visible to sensitive viewers. Viewers along the road adjacent to the pipeline would see the pipeline, but this would not be considered a significant impact or the scenic quality of the viewshed. Maintenance of the pipeline could introduce crews to the area in performing periodic inspections. These impacts would be temporary and less than significant. The pipeline would not be visible from US 395.

Decommissioning would cause minor visual impacts as components of the facility are being removed. Mitigation measure Aesthetics-1 would be utilized during decommissioning. Visual impacts would be less than significant.

H3. Bureau of Land Management Visual Resource Management Guidelines

Comments

Comments were received regarding the BLM assessment of the scenic quality of the project area, and the use of the BLM rating system that was used in the BLM's Draft Geothermal Leasing Programmatic EIS (BLM 2008) for analysis of scenic quality and visual impacts. A suggestion was made to follow the Best Management Practices (BMPs) outlined in the BLM's Geothermal Leasing Programmatic EIS.

Responses

The BLM's Visual Resource Management system guides visual resources management on public lands managed by the BLM. A description of the BLM's rating system for visual appeal of tracts of land is found on page 3.9-4 of the Draft EIR. Visual ratings can be *A*, *B*, or *C*, with *C* being the lowest rating for scenic quality. The rating is based upon vegetation, landform, water, color, adjacent scenery, scarcity, and cultural modifications.

An assessment of visual resources is provided for this project in the BLM's EA. The Draft EIR states under *BLM Assessment of Scenic Quality* on page 3.9-3 that the scenic quality of visual resources in the project area results in a rating of C for both the eastern portion of the project on Hay Ranch and the western portion along Coso Road and the CLNAWS. The study also included an assessment of sensitive viewers, described on page 3.9-4 of the Draft EIR under *BLM Assessment of Sensitive Viewers*, which considered viewer sensitivity and viewer distance to the project site. Viewer sensitivity for the eastern and western portions of the project was determined to be low due to the presence of water wells and electrical transmission lines, as well as the infrequent use of Gill Station Coso Road by sensitive viewers.

The system used in the BLM Geothermal Leasing Programmatic EIS is the BLM Visual Resource Management System. The Draft EIR utilizes this management system because the project would partially occur on BLM lands. Management of visual resources on private lands utilizes local guidelines. This would include, for the proposed project, the Inyo County General Plan. The BLM guidelines are described beginning in the fourth full paragraph on page 3.9-4 of the Draft EIR. Inyo County General Plan guidelines pertaining to visual quality are described beginning in the eighth full paragraph on page 3.9-4 of the Draft EIR. The threshold at which impacts to the scenic quality of the area are considered adverse is based on the BLM guidelines and the Inyo County guidelines, and analysis of impact significance is carried forth in the Draft EIR using these guidelines.

The use of BMPs outlined in the BLM Geothermal Leasing Programmatic EIS is not required for the proposed project because the Programmatic EIS does not apply to the proposed project, which consists only of providing supplemental water to the existing geothermal field via a pipeline. The mitigation and plans for the proposed project are consistent with Programmatic EIS's BMPs to reduce impacts to aesthetics. Examples of consistency include:

> *BMP:* Use appropriately colored materials for structures or appropriate stains and coatings to blend with the project's backdrop. Use non-reflective or low-reflectivity materials, coatings, or paints whenever possible.
>
> *Proposed Project:* The Draft EIR states in various sections under Potential Impact 3.9-1 on page 3.9-5 that the tanks, lift pump station, MEER, and the above-ground portion of the pipelines would be painted a desert almond color to blend well with the background landscape and reduce glare.
>
> *BMP:* Revegetate with native vegetation establishing a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape.
>
> *Proposed Project:* The Draft EIR states in the second full paragraph on page 3.9-6 that, after construction, any disturbed ground that is not part of the substation, MEER, or lift pump station facilities and access roads would be recontoured and reclaimed with a native seed mix. The Draft EIR states in the sixth full paragraph on page 3.9-6 that, after pipeline construction is complete, any disturbed ground would be recontoured and reclaimed with a native seed mix.
>
> *BMP*: Implement dust abatement measures to minimize the impacts of vehicular and pedestrian traffic, construction and operation, and wind on exposed surface soils.

Proposed Project: Mitigation measure Air Quality-2 on page 3.13-7 of the Draft EIR requires that any project personnel, during both construction and operation, who is required to drive vehicles on unpaved roads, shall obey a speed limit of 25 mi per hour.

The mitigation measures and project components included in the Draft EIR mitigate all visual impacts to less than significant levels. No additional BMPs or mitigation measures are required for the proposed project.

I. Hazards and Hazardous Materials

Comments

Comments were received requesting analysis of the additional hazardous material generation such as non-condensable gases resulting from increased steam flow and gaseous emission hazards associated with increasing the power generation at the Coso geothermal field.

Responses

The proposed project would not increase power generation at the Coso geothermal field beyond existing levels. Production rates would, in fact, decrease slightly and then stabilize, whereas the rates would continue to decrease without the project. The project would not result in greater production than is occurring at the time of issuance of the NOP for the project.

The impacts of changes in gas due to use of Rose Valley groundwater for injection may actually decrease the hazardous material and non-condensable gases produced. Reservoir pressure and/or sometimes temperature typically decline during the production of a geothermal resource. Production has led to pressure drops and an expansion of a vapor phase at the Coso geothermal field (ITSI 2007). Injection into the reservoir of spent brine, cooling tower blowdown, and other fluids can mitigate pressure decline to some extent and therefore injection has become a standard practice within the geothermal industry. The value of injection as pressure support varies with the reservoir and the amount and method of injection because every geothermal reservoir is unique. Production rates decline with a decline in reservoir pressure because production rates depend on reservoir pressure in addition to other reservoir characteristics, such as permeability.

Coso performed reservoir simulation of the Coso reservoir to evaluate the potential impacts of increasing injection using a standard geothermal reservoir modeling program and assuming that a) current rates of injection would continue, or b) injection was increased by 3,000 gpm. Based on reservoir simulation results provided by Coso, increased injection into the Coso geothermal reservoir is predicted to stabilize reservoir pressure decline in some areas. The total production rate is expected to stabilize at a level slightly lower than current production levels.

The impacts of producing geothermal power from Coso geothermal fluids at the originally permitted power production rate has been addressed in the power plant environmental documents and the effects were found to be less than significant; it is not necessary to address further. The project would not generate more power output than was previously evaluated and produced at the power plants.

Injection fluids consisting of spent brine, steam condensate or imported groundwater would have significantly lower gas content than Coso geothermal fluids. Geothermal reservoir injection programs are typically designed to maximize boiling of injectate (injection derived steam). Injection fluids in geothermal systems rarely have the same chemistry (including hydrogen sulfide and non-condensable gas concentrations) as the original reservoir fluids. The gas concentrations of steam produced from boiling of injectate are typically low because the gas was removed in the power production process. Non-condensable gas concentrations may actually decrease to the extent that the amount of production that is derived from injection-derived steam increases. The project's implementation would not result in any significant impacts.

J. AIR QUALITY

Multiple comments were received on the following topics:

1. Fugitive Dust Generation
2. Baseline Conditions

J1. Fugitive Dust Generation

Comments

Comments were received regarding the proposed project's potential to generate fugitive dust. Potential avenues for fugitive dust generation noted in comments included the loss of ground moisture from groundwater drawdown. Comments were also received requesting analysis of dust generation from construction activities.

Responses

A discussion of the potential for the proposed project to violate air quality standards or contribute substantially to air quality violations related to fugitive dust can be found under Potential Impact 3.13-2 beginning on page 3.13-6 of the Draft EIR. Fugitive dust emissions due to construction of the proposed project are limited to ground disturbance and access over unpaved roads during construction. Disturbance of soil in construction of the lift pump station, substation and associated facilities, tanks, and pipeline would generate fugitive dust. The amount of dust generated would depend on many factors, including soil characteristics, wind speed, and construction density. The Great Basin Unified Air Pollution Control District maintains that fugitive dust does not have to be quantified to determine significance; however, all fugitive dust emissions from construction activities could be potentially significant and can be mitigated to less than significant levels.

Mitigation measures Air Quality-1 and -2 would be implemented to minimize fugitive dust emissions. These measures include methods to keep soils moist during construction, as well as limit vehicle speed on unpaved roads. These mitigation measures would also apply to the operation phase of the project.

Effects of the generation of fugitive dust due to loss of soil moisture from groundwater pumping are discussed in the Draft EIR beginning on page 3.13-7. The majority of Rose Valley contains drought-resistant plants that do not rely on the water table for water, as the water table can be over 240 ft bgs in certain areas of Rose Valley. Areas with drought-resistant plants would be largely unaffected by the proposed project and no impacts with regard to increased fugitive dust generation would occur.

Water-dependent vegetation is located in a few places in Rose Valley, including Portuguese Bench, Rose Spring, and Little Lake. Hydrologic studies have shown that artesian springs at Portuguese Bench are not hydrologically dependent on water in the Rose Valley; therefore, the project would have no impacts on riparian, wetland, or related biological vegetation along Portuguese Bench. Rose Spring is approximately 300 ft above the local groundwater table in the aquifer, and the water for the spring is derived from Sierra Nevada mountain front precipitation and groundwater underflow from Owens Valley, neither of which would be impacted by pumping at Hay Ranch. The Rose Spring is currently dry. The effects to vegetation at Portuguese Bench and Rose Spring are discussed on page 3.4-42 of the Draft EIR. Little Lake vegetation could be impacted by groundwater pumping, but impacts would be mitigated to less than significant levels by mitigation measures Hydrology-1, -3, and -4. These measures would prevent drying of the lake and vegetation, and would avoid or minimize the generation of fugitive dust.

J2. Baseline Conditions

Comments

Comments were received regarding dust generation from the current fallow state of the Hay Ranch parcel. A commenter suggested that, because the Hay Ranch parcel is fallow, it is contributing to the fugitive dust budget and these impacts should be mitigated.

Responses

Current generation of fugitive dust at the Hay Ranch parcel is considered part of the environmental baseline condition, and is used in part to analyze the significance of an environmental impact. CEQA requires that an EIR describe the physical environmental conditions in the vicinity of the project as they exist at the time an NOP is published. The environmental setting typically makes up the baseline physical conditions, and provides the lead agency with a condition to determine if an impact of the proposed project is significant (CEQA Guidelines §15125). The baseline environmental conditions for air quality pertaining to fugitive dust emissions can be found on page 3-13-1 under *Baseline Air Quality*.

Coso is not required to mitigate, as part of the proposed project, baseline environmental conditions. CEQA does not require mitigation for anything other than project related impacts that are found to be potentially significant (CEQA Guidelines §15126.4(a)(3)). Fugitive dust generation as described for the baseline air quality is not an impact of the proposed project. The parcel supports considerable vegetation and scrub brush cover and is not noticeably contributing to dust generation in the valley as the commenter states.

K. CUMULATIVE IMPACTS

Multiple comments on the cumulative effects of the proposed project were received. Several comments encompassed the following questions:

1. What are the cumulative groundwater impacts considering that Deep Rose will also require extraction of water?
2. What are the cumulative impacts on groundwater drawdown when considered with the proposed LADWP pumping?

K1. Deep Rose

Comments

Comments suggested that data on the Deep Rose project presented in Chapter 4 of the Draft EIR is outdated, and that the entire Deep Rose project should be evaluated with the cumulative impacts discussion. The commenter also notes that Deep Rose owns a parcel of land adjacent to the Hay Ranch property that would be used for water extraction for exploration purposes.

Response

A brief description of the Deep Rose project is presented on page 4-3 of the Draft EIR. The Draft EIR does not specify project acreage. The description on page 4-3 of the Draft EIR has been edited, as shown below, for clarification.

Page 4-3

> Deep Rose, LLC is conducting some exploration for geothermal resources ~~in southern Inyo County~~ on State Lands Commission lands near the West Coso Geothermal leasing Area on three geothermal lease applications pending with the BLM, covering approximately 4,500 acres of public lands. ~~If a resource is located, Deep Rose, LLC would apply for permits for geothermal development.~~ The area of exploration is located in the southern McCloud Flat

region within Section 16, Township 21 South, Range 38 East, Mount Diablo Meridian, Inyo County, California, within the West Coso Geothermal Leasing Area. ~~This is~~ Current exploration is located approximately 5.75 miles northeast of Hay Ranch.

The currently proposed Deep Rose exploration project must be evaluated separately from a subsequent geothermal project and any additional exploration activities for purposes of the cumulative impacts analysis. Deep Rose has submitted an application to the County to conduct geothermal exploration activities on a limited amount of acreage. Deep Rose proposes to use a maximum of 55 ac-ft of water to conduct that exploration. Deep Rose has not proposed to develop the site as a geothermal plant, and would not do so until it has explored the area and determined there is potential for geothermal power generation. Deep Rose would have to undertake an extensive additional permitting process and the associated CEQA analysis based on the much more extensive impacts of a geothermal project, as opposed to an exploration project if Deep Rose determines there is potential for geothermal power generation. The geothermal project is entirely speculative at this time and is not subject to this cumulative impacts analysis.

Deep Rose is apparently negotiating with the BLM for leases of further land for possible development as geothermal resources. This additional project is even more speculative. Deep Rose would be required to apply with Inyo County for permits for exploration of that site and water export and would be required to conduct CEQA analysis of those additional analyses if Deep Rose successfully leases the land. Only after this additional exploration could an additional geothermal power plant be evaluated. Use of this additional acreage is speculative and cannot be analyzed in the cumulative impact analysis for the proposed Hay Ranch project. No environmental impact beyond that identified for the current exploration project is possible, absent application for permits and extensive additional CEQA analysis.

The comment noted that an initial provision for water for exploration activities could be obtained from a property adjacent to the Hay Ranch property in the Rose Valley. The exploration phase, described in the Deep Rose Project Negative Declaration project, cites that 55 ac-ft would be needed. The proposed drilling locations for Deep Rose are located in the Coso Basin. Deep Rose applied for a CUP for an interbasin water transfer, which is currently in process. The amount of water needed for exploration is a fraction of the proposed pumping amounts for the Hay Ranch project.

Development of the Deep Rose project is speculative at this time. Exploration does not always result in development of a geothermal resource. The size of a power plant, type of power plant, timing of operation, and the water needs of the Deep Rose project are all largely unknown and too speculative at this time to evaluate. A lead agency can note that an impact is too speculative for evaluation and end the discussion of the impact if, after thorough investigation, a lead agency reaches this conclusion (CEQA Guidelines §15145). This guideline prevents a lead agency from participating in idle speculation. Where future development is unspecified and uncertain, there is no reason to require an EIR to engage in speculation about future environmental impacts (*Laurel Heights Improvement Association v. Regents of the University of California* (1988)).

The discussion of hydrology on page 4-7 of the Draft EIR has been revised to include additional discussion of potential impacts from the Deep Rose project and potential future geothermal leasing projects.

Page 4-7:

Hydrology and Water Quality

The proposed project could cause groundwater table drawdown throughout Rose Valley. With monitoring to provide early warning of potential impacts and mitigation in the form of reducing pumping rates, the impacts of the proposed project would be less than significant.

Construction and operation of the Crystal Geyser project is not expected to significantly aggregate impacts to Rose Valley groundwater resources project because of the smaller rate of extraction proposed for the plant and the fact that the extraction would occur outside Rose Valley.

Deep Rose, LLC has pending applications for the leasing of approximately 4,500 acres of BLM-managed lands and has requested leasing of an additional 17,600 acres. The BLM is beginning to prepare the environmental review for leasing in the area. The BLM has acknowledged that water, potentially from the Rose Valley, would be required for these leases and water usage would be addressed in a leasing document pursuant to NEPA (Haggerty 2008). The amount of water that may be required for exploration of the additional acreage and development of a geothermal plant is speculative at this time; however, any withdrawal from the Rose Valley would compound with withdrawals associated with the proposed project. Deep Rose would be required to submit applications with the County for any additional water export from Rose Valley as well as for exploration activities and for future development of a geothermal plant. If submitted, these applications would be subject to CEQA review. The baseline condition at the time of initiation of that project would be required to consider the Coso project.

K2. LADWP

Comments

Comments were received from the LADWP regarding an Aquifer Storage and Recovery (ASR) project and the South Haiwee Reservoir Seepage Recovery (SHRSR) project proposed by the LADWP. Comments requested that these projects are evaluated in the cumulative analysis. Commenters suggested that the proposed project conflicts with the water recovery projects and water rights of the LADWP and would render the recovery projects infeasible.

Responses

The proposed SHRSR project is described on page 4-3 of the Draft EIR. Analyses of effects are addressed on page 4-7 of the Draft EIR. The City of Los Angeles is required to submit a detailed proposal to Inyo County as an application to pump groundwater in order to commence SHRSR groundwater pumping in Rose Valley. Los Angeles, in cooperation with Inyo County, would be required to complete a CEQA analysis of the project and would not be allowed to take any action that would cause a significant detrimental effect to the environment. The City has taken no affirmative steps to do so and the likelihood of such a project is speculative, although the City has indicated some inclination to establish such a project; therefore, it need not be mitigated as a cumulative impact. There is little likelihood that those impacts could be cumulatively considerable when added to the impacts from the Coso project because the City of Los Angeles would be required to mitigate its pumping impacts. Any loss of groundwater flowing to the Hay Ranch as a result of improving the retention capability of the Haiwee Reservoirs, would be accommodated by the fact that Coso must comply with the established trigger levels. Edits have been made to page 4-7 of the Draft EIR, as shown above.

The following revisions have been made to page 4-7 of the Draft EIR.

Page 4-7:

The South Haiwee Reservoir Leakage Recovery project, if implemented, would likely have aggregate impacts to Rose Valley groundwater resources. Analysis using the numerical model indicated that the Reservoir Leakage Recovery project would cause additional drawdown in Rose Valley, additively increasing to that predicted for the Hay Ranch project.~~ with the~~ The ~~greatest~~ largest increase in drawdown is estimated by the model to be ~~of~~ up to 10 feet in wells in the Dunmovin community at the north end of the valley and up to 0.5 feet at the south end of the valley near Little Lake, which would be a significant impact. However, to commence SHRSR groundwater pumping in Rose Valley, the City of Los Angeles is required to submit a detailed proposal to Inyo

County as an application to pump groundwater. Prior to taking any action with the potential to affect the environment, Los Angeles, in cooperation with Inyo County, would be required to complete a CEQA analysis of the project and would not be allowed to take any action that would cause a significant detrimental effect to the environment. Although it has indicated some inclination to establish such a project, the City has taken no affirmative steps to do so and the likelihood of such a project is speculative. As such, it need not be mitigated as a cumulative impact by Coso. Since LADWP would be required to mitigate its pumping impacts, there is little likelihood that those impacts could be cumulatively considerable when added to the impacts from the Coso project. Any loss of groundwater flowing to the Hay Ranch as a result of improving the retention capability of the Haiwee Reservoirs, will be accommodated by the fact that Coso must comply with the established trigger levels.

~~If the Reservoir Leakage Recovery project operates over the same time frame as the Hay Ranch project, then either a greater reduction in extraction rates would be necessary at Hay Ranch or a reduction in the amount of groundwater extracted for the Reservoir Leakage Recovery project would be needed to avoid incurring significant impacts at Little Lake. The reduction in allowable Hay Ranch extraction rates would amount to approximately the same 870 acre-ft per year contemplated for the Reservoir Leakage Recovery project. However, if the Reservoir Leakage Recovery project continues~~d ~~indefinitely as would be expected, a greater reduction in Hay Ranch extraction rates, or a reduction in the Reservoir Leakage Recovery project extraction rates, would be needed to mitigate potential impacts to Little Lake. The amount of this additional reduction was not modeled for the predictive simulations of the Hay Ranch project because the time frame for monitoring and mitigation in that case extends well beyond the proposed time frame for the Hay Ranch project. Since the Reservoir Leakage project is only conceptual at this time (i.e. an application has not yet been filed with Inyo County), and mitigation on the Hay Ranch project likely shortens the period of time that the project can operate, these projects may not temporally overlap~~.

The Hay Ranch project is predicted to have little to no significant impacts on groundwater quality. The project may cause a slight reduction in TDS concentrations at some locations near the south end of Rose Valley because it would intercept high TDS geothermal waters. The Crystal Geyser and South Haiwee Reservoir Leakage Recovery projects are unlikely to have cumulatively significant impacts on groundwater quality.

The proposed project does not render the SHRSR infeasible; however, the SHRSR project would likely have substantial adverse impacts on groundwater levels in Rose Valley and surface water features at Little Lake Ranch if it was not mitigated, and even if the Hay Ranch project was not implemented. It would be the LADWP's responsibility to install any additional monitoring wells in the north end of the valley and to conduct pumping tests to evaluate the environmental effects of the project. The Draft EIR includes a discussion of cumulative impacts associated with the proposed project and the SHRSR project. Modeling indicated that SHRSR would cause an additional drawdown in Rose Valley beyond that predicted for the Hay Ranch project. The modeling results indicate that the largest drawdown (of up to 10 ft) would occur in wells in the Dunmovin community at the north end of the valley, and up to 0.5 ft of drawdown would occur at the south end of the valley near Little Lake, which would be a potentially significant impact. It is not known if the SHRSR would be implemented or if the impact could be mitigated.

The LADWP completed the first phase of evaluation for an ASR project in Rose Valley in 1992. The study recommended follow-up steps required for implementing an ASR project. No application has been submitted to the County for the ASR project in the last 16 years. No quantitative analysis or modeling could be conducted for this project because it is conceptual and highly speculative at this time. It is unknown if the project would even occur at the same time as the Hay Ranch project. The commenters submitted supplemental information including a letter dated September 15, 2006, written in response to Inyo County's Draft Initial Study for the proposed Hay Ranch project. The letter states that the ASR project would be infeasible if the proposed project caused an increase in groundwater gradient at LADWP's property. The letter states that the groundwater gradient on their property is 10 ft per mi, and that the proposed project without mitigation would more than double the groundwater gradient on LADWP property. The Hay Ranch project is predicted to increase the groundwater gradient from about 10 ft per mi near Hay Ranch to about 13 ft per mi with implementation of the proposed mitigation. The additional 3 ft per mi increase in groundwater gradient is minimal and would not have a significant impact on any future proposed ASR project in terms of requiring deeper wells, more power for pumping, etc. The project was not considered in the cumulative analysis because there is no application or additional detail for an ASR project from the last 16 years. Details necessary for a cumulative analysis, such as groundwater pumping rates, locations, and the timeframe of the project, were not available at the time of publication of the Draft EIR. CEQA compliance requires a *reasonable* analysis of the cumulative impacts of relevant projects (CEQA Guidelines §15130(b)(5)) (emphasis added). CEQA compliance also requires that the discussion of cumulative impacts be guided by standards of practicality and reasonableness (CEQA Guidelines §15130(b). Data that would be necessary to perform a cumulative impact analysis were not available, and the SHRSR project is speculative because no application has been filed and the timing of implementation is unknown; thus, this analysis would not be reasonable or practical.

L. ALTERNATIVES

Multiple comments were received on the following topics:

1. CEQA Requirements and Project Objectives
2. Several Additional Alternatives Should be Addressed
3. Comparison of Alternatives
4. No Project Alternative
5. Economic Feasibility

L1. CEQA Requirements and Project Objectives

Comments

Comments were received questioning the project objectives as defined in the Draft EIR. Commenters claimed that the objectives are too narrow and preclude other viable alternative options that should be considered (as required by CEQA). Commenters stated that the alternatives analysis was inadequate under CEQA as a result of the County's narrow definition of the objectives.

Responses

The requirements for the statement of project objectives under CEQA are fairly broad. CEQA Guidelines §15124(b) states the following should be included in an EIR:

> A statement of objectives sought by the proposed project. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project.

The project objectives are included in the purpose and need discussion, and are restated on page 5-1 of the Draft EIR under Section 5.1.2: Project Objective. The Draft EIR states on page 5-1 that the objective of the proposed project is to provide supplemental injection water to the Coso geothermal field to minimize the annual decline in reservoir productivity due to evaporation of geothermal fluids from the power plant cooling towers. This injection would sustain the production capacity and useful economic lives of the existing power plants. The objective is valid under CEQA. The objectives were established through Coso's application to the County. Coso is seeking to maintain the productivity of their facilities through a means that is directly related to solving the issue of the decline in reservoir pressure. The objective is broad enough to allow for consideration of other alternatives, such as alternative water sources, but is specific enough to state what Coso proposes to accomplish with the proposed project (i.e., minimize the decline in plant productivity). The objectives did not inhibit consideration of a reasonable range of alternatives. Several other alternatives that would meet the objectives of the project were considered in Chapter 5, including:

1. Increases in power generation through power plant enhancements
2. Modifications providing additional output without utilizing more resource or system efficiency improvements
3. Modifications providing water savings through a reduction in the evaporative water losses associated with the cooling towers
4. Other sources of water for injection

Several of these alternatives were found to be infeasible after evaluation and were therefore rejected, as is allowable under CEQA Guidelines §15126.6(a). Feasibility of an alternative can be determined through examining site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site, or the site is already owned by the proponent. None of these factors alone establishes a fixed limit on the scope of reasonable alternatives (CEQA Guidelines §15126.6(f)(1)). Several of the "reasonable" alternatives were determined infeasible through this evaluation. Refer to pages 5-1 through 5-6 of the Draft EIR for the explanation of why several of the reasonable alternatives were found to be infeasible. Any reduction in power production would not meet the purpose and need and would reduce California's ability to meet renewable portfolio standard goals of producing 20% of the State's power portfolio through renewable power generation.

Commenters presented several other alternatives to consider; however, many of these alternatives are either infeasible, would generate a new significant impact, or would not avoid significant environmental impacts according to CEQA Guidelines §15126.6. Discussion of alternatives raised by commenters is presented in Master Response L2.

L2. Several Additional Alternatives Should be Addressed

Comments

Many comments presented several additional alternatives to be addressed. These alternatives include:

1. **Lower extraction rate:** Comments were received suggesting that an alternative should consider reducing the geothermal fluid extraction rate to extend production.
2. **Air cooled condensers:** Several comments were received suggesting the use of air cooled condensers as an alternative to the proposed project. One commenter questioned the impacts of subsidence with air cooled condensers compared to water cooled towers.
3. **Prior modifications to power plants:** Several commenters questioned what Coso has already done to increase power plant efficiency in order to bring production back to its original levels. Some commenters also suggested modifications to power plants as an alternative of the proposed project; some of the suggested modifications have already been made.
4. **Potential additional modifications to power plants:** Commenters inquired about future modifications that could be made to power plants as alternatives to the proposed project.
5. **Binary power plant:** Several comments were received suggesting that Coso replace the double-flash steam power plants currently in use with binary power plants that

would reinject all geothermal fluids, thereby preventing fluid loss and pressure declines in the geothermal reservoir.

6. **Wastewater:** Several commenters suggested analyzing the use of wastewater as an alternative to the proposed project. Another commenter asked about recycling the current water used.
7. **Importation of water from other groundwater basins:** Several commenters suggested using a groundwater basin other than Rose Valley as a source of injection water. Potential groundwater basins that were noted were the Owens Valley Basin, Coso Basin, and the Indian Wells Basin.
8. **LADWP water:** Several comments were made about purchasing water from the LADWP, either from the Los Angeles Aqueduct or Haiwee Reservoirs, as an alternative to the proposed project.
9. **Reduce Production:** Comments were received suggesting reducing the production rate at the Coso geothermal field as a feasible alternative to the proposed project.
10. **Deepen Production Wells:** Comments were received suggesting the alternative of deepening existing production wells.

Responses

Lower Extraction Rates

This alternative is essentially a restatement of the No Project Alternative. Coso would necessarily be require to reduce its extraction rates and reduce the amount of electricity produced without the project. This is the result the proposed project seeks to avoid.

Lower geothermal fluid extraction rates would result in reduced production of steam, reduced flow to the power plants, and corresponding reduced power generation. Power plants are designed to operate within a range of mass flow and pressure. Geothermal power plants can operate at lower pressures and steam flow rates, but at much lower efficiencies. A geothermal power plant cannot operate below approximately 50% of the mass flow and pressure. Portions of the plant such as the steam jets require high pressure steam to operate. Maintaining pressures for these portions of the plant when the mass flow drops below 50% becomes infeasible. Geothermal plants do not have an infinite level to which production can be reduced for this very reason. The amount of steam required to generate a MW of electricity (also called the “steam rate”) increases as the flow rate and pressure fall outside the range of design conditions. It is, therefore, not feasible to operate the project at lower extraction rates.

Air Cooled Condensers

The use of “dry cooling” to avoid the evaporative losses of the current wet cooling system used by Coso was analyzed as an alternative on page 5-4 of the Draft EIR. This alternative was rejected because it is economically infeasible, would have significant environmental impacts, and would not meet the project objective.

Evaporative cooling is the most efficient mode of cooling in the dry climate of the project area. The power plants’ initial design included cooling towers at the nine units. Coso has investigated replacement of the cooling towers with dry cooling systems in order to reduce fluid losses due to evaporation. Coso has also considered augmenting the wet cooling systems with dry cooling systems. The overall objective was to save condensed steam currently evaporated in the cooling towers and achieve 3,000 gpm additional injection to match that of the proposed project.

To transition to dry cooling would require machinery costing $27.3 million, and would have a parasitic load of 2.67 MWe. The parasitic load for wet cooling is approximately 50% of the parasitic load for dry cooling. The additional cooling towers would require about 0.9 ac of surface disturbance. Four of these units would be required to achieve the 3,000 gpm of the proposed project. The total cost of replacing all the wet cooling with dry cooling depends on the efficiency required of the dry cooling system, but could cost as much as $110 million if the design attempts to maintain current generation, though the typical dry cooling unit has a very large reduction in summer peak generation in dry climates. The loss in net generation due to the additional parasitic load required to operate these fans could not be recovered. Dry cooling is typically not used with flash-type generation facilities because of this reduced efficiency. This alternative was rejected because the reduced efficiency would not meet the proposed project objective, and it would be economically infeasible.

An alternate design was analyzed that would save 60% of current evaporation on a unit basis. This approach would use air cooling to augment wet cooling during the winter months and during cooler periods in the spring and fall. Based on current losses of 1,255 ac-ft/yr (778 gpm) due to evaporation, this design would reduce evaporative losses to 502 ac-ft/yr (311 gpm) for most of the year. This would result in a savings of 755 ac-ft/yr (468 gpm) of water per unit. This approach would involve similar equipment to the dry cooling scenario, but would not have to be designed to address the highest temperature conditions in the summer. The current evaporative cooling tower would be used for cooling during the summer. A cost estimate of about $14 million per unit yields a total cost of $80 million (6.4 fractional units were used in the calculation assuming size could be adjusted without appreciably affecting incremental cost). Each of the units would have a footprint of about 0.6 ac.

Installation of the seven augmented dry cooling units that would be required under the augmented dry cooling scenario would require the disturbance of 4.2 ac of additional land. These units would need to be sited in MGS and desert tortoise habitat near the existing plants because of the power plant orientation. Additional construction would also be required, with the associated air, noise, traffic, and other environmental impacts. The additional parasitic load of the alternative would reduce power generation by approximately 18 MWe. This option was rejected as infeasible because less energy would be produced, and it would cause more environmental impacts than the proposed project.

The difference in impacts of subsidence among the varying technologies does not pertain to environmental impacts of the proposed project, and are outside the scope of this EIR. Subsidence impacts of the current project are not significant; less fluid loss would not increase subsidence. The potential lifetime of the project as a result of using air cooled condensers does not pertain to environmental impacts of the proposed project, and is outside the scope of this EIR.

Prior Modification to Power Plants

Many modifications have already been made to the power plants in order to sustain output. Some of the previous power plant modifications are discussed on page 5-4 of the Draft EIR under *Previous Power Plant Modifications*. These modifications include:

> *Steam Turbines:* Coso has already completed redesign and replacement of blading and sealing configurations on four of the turbines. This steam path upgrade has allowed improved use of the steam at the facility.
>
> *Piping:* All technologically feasible piping modifications have been implemented.
>
> *Gas Removal Systems:* Coso has implemented several equipment additions and modifications to ensure that gases are effectively removed from the steam because non-condensable gases in the steam can create a back pressure on the turbine and decrease its efficiency and performance. Modifications include the installation of gas abatement units, the addition of vacuum pumps and compressors, the replacement of steam jet air ejectors, and the expansion of condenser cooling capabilities by installing gas pre-coolers.

Coso has also relocated injection to optimize heat mining.

Potential Additional Modifications to Power Plants

Several power plant modifications were considered as alternatives to the proposed project, as discussed beginning on page 5-2 of the Draft EIR under *Increase Power Generation Through Power Plant Enhancements*.

Coso will continue to evaluate the design of the units even if the CUP for the proposed project is approved, and will make additional modifications when the modifications become economically feasible. The following modifications have been considered:

> *Steam Turbines:* Coso considered a complete replacement of steam turbines with newer equipment; however, advances in technology typically yield only 1 to 3% improvement in the design efficiency of the turbine. The minimal increase in efficiency does not justify a capital expenditure of $10 to $15 million per turbine, or up to $130 million for replacement of all nine turbines at the Coso geothermal field. Turbine replacement requires downtime for replacing the equipment, and would require the disturbance of approximately 30 ac, in addition to the capital costs. Each turbine would require approximately six months to replace. The power plants would not be fully operational for approximately 4.5 years. Coso would lose revenue, and the power lost to downtime would have to be compensated for by generation through other power plants (probably fossil-fuel power generation).
>
> *Piping:* Coso performs ongoing evaluations to determine whether piping modifications could benefit the performance of the geothermal facility. There are no additional piping modifications that have been identified to serve as an alternative to the proposed project because all technologically feasible piping modification have already been implemented.
>
> *Gas Removal Systems:* Coso reviews performance of the gas removal systems on a daily basis, and will make additional modifications when they are determined to be economically feasible. Coso has also conducted a detailed study to determine the benefit of replacement of the main condensers. No benefit could be realized on three of the units; the replacement cost of $2.5 million per unit makes condenser replacement infeasible for the other units.

Most plant modifications, at best, yield benefits on the order of 5%, and most of these have already been undertaken by Coso. Plant modifications tend to become less and less economical because of diminishing returns associated with progressively smaller modifications. A combination of many smaller modifications cannot provide the magnitude of increase in productivity sought by implementing the proposed project. Plant modifications were therefore considered but rejected as part of the alternatives analysis.

Binary Power Plant

Replacing the double-flash steam power plants currently in use with binary power plants was rejected as an alternative because it is economically infeasible, would likely not significantly reduce environmental impacts, and would not meet most of the project objectives. These three criteria are provided by CEQA as a means to reject an alternative (CEQA Guidelines §15126.6(c)).

The initial capital expenditure associated with procurement of completely new equipment as compared to equipment that is already in place can never be recovered. Complete replacement of the existing turbine sets with binary equipment, which is less efficient than flash steam systems, would cost approximately $560 million and would not increase power generation. The alternative is economically infeasible.

Binary systems have additional impacts that are not present for the selected alternative. For example, the footprint of plants using binary systems is significantly larger. The relative land area required for binary systems is approximately 60 ac, which is three times larger than that of the existing standard flash plants. The acreage includes the equipment required to transfer heat from the geothermal fluid to the motive fluid, the turbine generator sets required to generate a similar amount of electricity as compared to the current flash plants, and the surface area required to install the cooling units for the spent motive fluid. Developing this additional land would entail additional environmental impacts, which could be significant.

Binary units create scaling concerns in piping systems. The use of binary units with the brines at the Coso geothermal field would lead to scaling and plugging issues. These scale deposits would not be hazardous, but would require significant plant down time. The Coso power plants are shut down approximately once per year presently and operate on-line in the 98.5 to 99.5% range. Using a binary system would require the power plants to be taken offline for a couple of days every month or two, or approximately 7% of the time. Taking the power plants offline for these periods would decrease overall electricity generation capacity by around 10%. A decrease in electricity generation capacity is not consistent with the project objectives.

Wastewater

The injection of wastewater as an alternative to the proposed project was rejected because it is infeasible, does not reduce environmental impacts, and does not meet most objectives of the project.

Alternative sources of injection water are analyzed beginning on page 5-5 of the Draft EIR under *Alternative Sources of Injection Water*. Coso has estimated that a water source would have to produce at least 500 gpm to be economically feasible as an injection water source. The rate is reasonable considering the fixed costs for a water extraction project are probably on the order of $7 million.

A potential source of wastewater is in Ridgecrest, California which is approximately 25 mi southwest of the Hay Ranch parcel. The Hay Ranch water source would require about 9 mi of piping, the other identified sources are at much greater distances and thus would require a significantly longer pipeline with proportionate surface disturbance and environmental effects. The pipeline would likely need to be much longer than the 25-mi linear distance to compensate for terrain and other obstacles, and would have to be cut through a mountainous area. These factors would make the cost of the project much higher. Using wastewater would require much more land disturbance and would cause considerably more construction-related impacts. Cutting through mountainous areas could require blasting and tunneling. The environmental impacts would likely be greater than those of the proposed project.

Longer pipelines require more pumping, which requires more electricity to operate. A longer pipeline would thus greatly diminish or eliminate the benefits of increased output. Coso has also learned that there is no water available for use at Coso geothermal field at this time. This alternative would not meet the stated objectives of the proposed project.

Recycling water currently used by the power plants would not meet the objective of the project. The objective of the project is to increase production. Additional injection water, in conjunction with the water that the commenter suggests should be recycled, is needed to increase production. This is because Coso already captures brine and evaporate from its processes and re-injects it into the ground. Despite this effort; however, the productivity of the geothermal resource has declined. Solely relying on the using the water that was utilized to produce electricity would not provide an additional source of water or eliminate the need for the proposed project.

Importation of Water from Alternative Groundwater Basins

Alternative sources of injection water are analyzed beginning on page 5-5 of the Draft EIR under *Alternative Sources of Injection Water*. Coso has estimated that a water source would have to produce at least 500 gpm to be economically feasible as an injection water source. The rate is reasonable considering the fixed costs for a water extraction project are probably on the order of $7 million; about $6 million is related to the pipeline and pumps for the Hay Ranch wells.

The use of water from Coso Basin is discussed beginning in the last paragraph on page 5-5 of the Draft EIR. The review of potential production wells does not identify any other water sources that that have the potential to supply an adequate source of injection water as the Hay Ranch project at 3,000 gpm or the threshold rate of 500 gpm for economic feasibility, except possibly the Coso Ranch wells. Average well flow rates in the Coso Basin are low (<50 gpm as shown in Table 5.2-2 on page 5-6 of the Draft EIR); it is unlikely that new wells drilled in that area would produce water at economically feasible rates.

The use of water from the Owens Valley Basin would be economically infeasible and could cause significant environmental impacts. Most of the cost of the proposed project is related to the pipeline, as noted above. The southern end of the Owens Valley Basin is approximately 20 mi from the injection system location. The additional pipeline length required to pump water from the Owens Valley Basin would make this alternative infeasible because most of the cost of the project would be dependent on the pipeline length. The pipeline would also have to cross through rugged terrain, which could require more intrusive construction. The additional ground disturbance would cause more environmental impacts than the proposed project. The ability to secure a source of water is speculative and therefore has not been included. The Owens Valley has been subject to considerable groundwater withdrawal by the LADWP.

The use of water from the Indian Wells Basin would be economically infeasible and could cause significant environmental impacts. Most of the cost of the project is related to the pipeline, as noted above. The northern end of the Indian Wells Basin is approximately 12 mi from the injection system location. The additional pipeline length required to pump water from the Indian Wells Basin would make this alternative infeasible because most of the project cost would be dependent on the pipeline length. The pipeline would also have to cross through rugged terrain, which could require more intrusive construction. Additional work could include blasting to pass through elevated land, and there would be more ground disturbance due to the greater length of the pipeline. The change in pipeline elevation could also require pump stations to lift the water over the pass, which would require construction of additional facilities. The added disturbance would cause more environmental impacts than the proposed project. The discussion of alternatives to a proposed project should focus on alternatives that are capable of feasibly attaining most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project (CEQA Guidelines §15126.6(a)). A reason to eliminate an alternative from detailed consideration in an EIR is that it does not avoid significant environmental impacts (CEQA Guidelines §15126.6(c)). The use of water from the Indian Wells Basin likely would not avoid significant impacts, and could potentially cause additional significant impacts.

LADWP Water

Purchasing water from the LADWP is an unrealistic option. The LADWP is authorized to export water from Inyo County for use in Los Angeles. Water supplies to Southern California are currently less than adequate, and there is little economic likelihood that the supply will increase. It is extremely unlikely that the LADWP would be allowed to divert water from use in its jurisdiction to a commercial sale for export.

Furthermore, the use of water from the LADWP from either the Los Angeles Aqueduct or the Haiwee Reservoirs would be economically infeasible. Costs would include purchase of water in addition to the construction of the infrastructure. A pipeline would have to be built through the LADWP and private property, and securing this right-of-way is speculative. The pipeline would also have to cross through rugged terrain, which could require more intrusive construction such as blasting. The additional ground disturbance could cause more environmental impacts than the proposed project. The increased demand could cause the utility to expand its infrastructure and could cause significant effects. The LADWP obtains its water from groundwater. It is therefore logical to assume that the water would be pumped from Owens Valley instead of Rose Valley.

The Los Angeles Aqueduct is approximately 8 linear mi from the injection system location and Haiwee Reservoir is 11 mi from the injection system. This alternative would require additional engineering, may need to cross US 395, and would involve legal issues related to the purchase of water from the LADWP. This alternative is economically infeasible, and may have additional significant environmental impacts when compared to the proposed project.

Reduce Production

Reducing the production rate of Coso geothermal plants would not meet the main objective of the proposed project. The purpose of the proposed project is to offset the substantial decline in the geothermal field’s productivity, and the consequential reduction in power output.

CEQA Guidelines §15126.6(c) permits the elimination of an alternative from detailed consideration do to the failure to meet most of the basic project objectives.

Deepen Production Wells

An EIR is not required to consider an alternative if the effects of that alternative cannot be reasonably analyzed and implementation would be remote and speculative (CEQA Guidelines §15126.6(f)(2)). Deepening production wells is remote and speculative because it is unknown whether there would be a resource that would increase production. Coso has already drilled several deep wells near the limit of economic feasibility. A substantial new source of geothermal fluid was not identified.

L3. Comparison of Alternatives

Comments

Several comments were received stating that the alternatives brought forth for analysis were not compared to the proposed project (pumping at 4,839 ac-ft/yr for 30 years), and that the alternatives were compared to the proposed project with mitigation incorporated.

Responses

Two alternatives were brought forth for detailed comparison to the proposed project. The alternatives brought forth for comparison to the proposed project include Alternative 1, pumping Hay Ranch wells at the maximum rate sustainable for the 30-year project life without reaching trigger levels established in the analysis of the proposed project, and Alternative 2, pumping Hay Ranch Wells at lower rates.

The impacts of Alternatives 1 and 2 are compared directly to the impacts of the project as proposed. It is stated on page 5-7 of the Draft EIR that, “The environmental effects of Alternative 1 would be largely the same in nature as the proposed action, but would take longer to occur. The alternative would reduce but not eliminate hydrological and biological effects from groundwater pumping.” Many impacts are related to the construction and placement of infrastructure. Those impacts would be the same for the alternatives as the proposed project.

The impacts of the alternatives would be less than the proposed project in terms of hydrologic and biological impacts. Alternative 1 effectively incorporates the mitigation determined for the proposed project using the same criteria for a significant impact at Little Lake. This alternative essentially minimizes pumping over a longer period of time, which may reduce some effects and the likelihood of impacts in terms of effects per year, but the end result would still be the same as for the proposed project. It is valid under CEQA to generate an alternative based on mitigation determined in the EIR. This alternative is compared with the project as proposed as well as the project with mitigation, which is not prohibited in CEQA.

Alternative 2 includes reduced pumping rates. This impact would also have fewer hydrological impacts than the proposed project without mitigation; however, the effects could still be significant. The same mitigation would apply to this alternative as the proposed project. The difference again would be a slower accumulation of impacts; however, the end result in impacts would be the same as for the proposed project with mitigation. The comparison of alternatives compares the alternatives to the proposed project and the analysis on page 5-12 of the Draft EIR indicates that the “proposed project, without mitigation, would result in several potentially significant impacts.” The alternatives, because they would also incorporate the mitigation of the proposed project, would have fewer impacts than the project as proposed but still may reach trigger points. In evaluating and choosing an alternative, it is important to understand the mitigation associated with each option. Alternative 2 without mitigation would have greater impacts than the proposed project with mitigation. The alternatives analysis presents a complete analysis of each alternative with mitigation. The total amount of impact would be the same; however, the amount of time over which effects accumulate would differ.

L4. No Project Alternative

Comments

Comments were received stating that the No Project Alternative is environmentally superior because the loss of power could be replaced by other renewable energy sources. Other commenters noted that the analysis of the No Project Alternative is misleading because it assumes that production capacity would continue to decrease.

Response

CEQA does not require adoption of the No Project Alternative, even if it has less environmental impacts than the proposed project. CEQA requires identification of the environmentally superior alternative among the rest of the alternatives (CEQA Guidelines §15126.6(e)(2)). The No Project Alternative is superior in terms of impacts to hydrological and biological resources; however, it may result in a loss of electricity supply, and could cause the use of energy sources that would cause more pollution than geothermal energy. Commenters suggested that the electricity supply could be compensated through other renewable means; however, the environmental impacts of constructing any additional generation are unknown and could be considerable.

The need for this project is described in Section 2.1.2, beginning on page 2-1 of the Draft EIR and supported in the first full paragraph on page 5-3 of the Draft EIR. Generation at the Coso geothermal field was initially approximately 270 MWe. Output is now under 200 MWe, representing a total power generation decline of more than 25%. The total mass fluid produced has declined from 33,000 pounds per hour to approximately 20,000 pounds per hour, representing a decline of approximately 40%. The power generation has declined at a lower rate than the reservoir production partly because the enthalpy of the fluid has increased, but primarily because Coso has already performed numerous modifications to the power generation facilities in order to increase power generation efficiency.

It is not inaccurate or misleading to say that the life of the Coso power plants would be shortened without the proposed project. The original environmental review for the plants contemplated a potential future need for reservoir augmentation. The life of the power plant could be considered in terms of the energy source. The heat source of the KGRA is not impacted by development and does not have a defined life. The life of the plant can also be determined in terms of the life of the equipment at the plant. The plants would shut down before the end of the life of the equipment without the proposed project.

L5. Economic Feasibility

Comments

Comments were received stating that the economic feasibility of alternatives should not be a consideration when determining alternatives. Many comments were made regarding the economic status of Coso, as well as their financial motivations in proposing the Hay Ranch project.

Response

CEQA Guidelines §15126(f)(1) states that, "Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries …and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site. No one of these factors establishes a fixed limit on the scope of reasonable alternatives." Economic constraints are one factor that may be considered when rejecting an alternative as infeasible.

The potential financial gain that Coso could acquire through completion of the proposed project; however, was not a factor that was considered during any part of the CEQA review.

M. MITIGATION

Multiple comments were received on the following topics:

1. Mitigation Monitoring
2. Determination of Conditional Use Permit Violation
3. Deferred Mitigation

M1. Mitigation Monitoring

Comments

Several comments were received requesting that the project should require mitigation monitoring. Commenters inquired about who would bear the costs of mitigation monitoring; how excessive pumping would be prevented; how monitoring would remain impartial; and, what methods would be used to conduct mitigation monitoring. Some comments were received questioning who would pay for a mitigation monitor for Little Lake Ranch.

Responses

The Rose Valley HMMP is included as Appendix C4 in the Draft EIR. Monitoring of water levels would occur monthly for at least 2 years, and results must be reported to the County within 2 weeks of data collection, as stated on page C4-6 of the Draft EIR. If water levels decrease more slowly than predicted by the Hydrology Model after 2 years, Coso would be allowed to petition the County to reduce the monitoring frequency to quarterly. The Hydrology Model would also be recalibrated within 1 year of the beginning of pumping, or in less than 1 year if trigger levels are reached sooner. The Draft EIR states in mitigation measure Hydrology-1 on page 3.2-39 that the project applicant shall implement the HMMP. The Draft EIR states on page C4-10 that the monitoring and mitigation described in the HMMP would be performed by Coso; therefore, Coso would be responsible for the costs associated with mitigation monitoring. Coso would also work with the Inyo County Water Department to implement the HMMP. The County would review reports and provide oversight to ensure that requirements are being met.

Methods to prevent excessive pumping are outlined in the HMMP on page C4-19 of the Draft EIR. If the project is approved, remedial actions that would be taken based on conditions observed during the first year of pumping include:

- If drawdown trigger levels predicted for any point in time are exceeded in any of the selected monitoring wells, Coso shall verbally report the exceedence to the Inyo County Water Department within 48 hours, followed by a written report submitted to the Inyo County Water Department within 7 days.
- If drawdown trigger levels predicted for any point in time are exceeded in two or more of the selected monitoring points by at least 0.25 ft, Coso shall verbally report to the Inyo County Water Department within 48 hours, followed by a written report submitted to Inyo County Water Department within 7 days, followed by a recalibration of the Hydrology Model and recommendation of cessation of pumping or predictions of the duration of pumping that can be sustained without causing a significant reduction in water available to Little Lake (defined as no greater than 10% reduction in groundwater inflow); if appropriate, Coso may petition the County for permission to continue pumping for a specified duration. The County will evaluate the report and data, and will make a determination as to whether continued operation is appropriate.
- If predicted maximum acceptable drawdown trigger levels are exceeded in any of the selected monitoring points located at least 9,000 ft from both Hay Ranch production wells, Coso shall: verbally report to the Inyo County Water Department within 48 hours, followed by a written report submitted to the Inyo County Water Department within 4 days, followed by suspension of pumping within 7 days pending recalibration of the model, and recommend either cessation of pumping or make predictions of the duration of pumping that can be sustained without causing a significant reduction in water available to Little Lake (defined as no greater than 10% reduction in groundwater inflow), to be conducted within 4 weeks of the observation of the exceedence.
- If measured drawdown values in all monitoring locations at all times within first year of project pumping match predicted drawdown plots to within 25% or less but are generally below the predicted values, then Coso must stop pumping at 1.2 years. However, they may recalibrate the model before cessation of pumping and use available data collected to date to petition for a presumably small extension to pumping. The County will evaluate the report and data, and will make a determination as to whether continued operation is appropriate.
- If monitoring data collected during the first year show that a majority of monitoring points record drawdowns consistently lower than predicted, then Coso can recalibrate the Hydrology Model and make new predictions of the acceptable duration of pumping. Evaluation and correction of background levels for each well shall be conducted to account for natural variation and to separate effects of pumping from natural effects.

The following edits have been added to page C4-19, to the last bullet, for additional clarification. These edits are not significant changes that would require recirculation of the EIR.

Page C4-19

- If monitoring data collected during the first year show that a majority of monitoring points record drawdowns consistently lower than predicted, then Coso can recalibrate the Hydrology Model and make new predictions of the acceptable duration of pumping which will be summarized in a report provided to the County. Evaluation and correction of background levels for each well shall be conducted to account for natural variation and to separate effects of pumping from natural effects. The County will evaluate the report and data, and will make a determination as to whether continued operation is appropriate.

Table C4-2, beginning on page C4-15, of the Draft EIR also outlines actions to be taken if certain thresholds are exceeded during the startup monitoring and reporting phase of the HMMP.

Monitoring required by the HMMP would remain impartial because Inyo County Water Department would be involved with the review of monitoring data, recalibration of the Hydrology Model, and the approval of continued operation of the proposed project.

See mitigation measure Hydrology-3 beginning on page 3.2-47 of the Draft EIR, which states that the applicant shall provide a qualified person, approved by Inyo County Water Department, to collect and analyze monitoring data. Coso would not be required to pay for an independent hydrologist for Little Lake unless the optional Task 1.1(h.) on page C4-13 of the Draft EIR is completed. This task involves the preparation of a groundwater diversion plan for Little Lake capable of providing water to augment water levels in Little Lake. If the stated conditions are met, Coso would provide funding for the diversion.

CEQA requires mitigation monitoring of all mitigation measures. CEQA requires that:

> "The public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects."

CEQA Guidelines state that:

> "Monitoring ensures that project compliance is checked on a regular basis during and, if necessary after, implementation. Reporting ensures that the approving agency is informed of compliance with mitigation requirements."

The Final EIR includes a mitigation monitoring and reporting program (MMRP) that meets all CEQA requirements. The purpose of the MMRP is to:

- Comply with the requirements of CEQA and the CEQA Guidelines
- Clearly define parties responsible for implementing and monitoring the mitigation measures
- Organize the measures into a format that can be more readily implemented by Coso and monitored by the County and other agencies
- Provide a clear methodology and framework for verifying and reporting that the mitigation measures were implemented on a timely basis

The MMRP would be approved when the project is approved. The MMRP addresses mitigation and monitoring for all measures identified in the EIR and incorporates the HMMP.

M2. Determination of Conditional Use Permit Violation

Comments

Several comments were received that requested definition of the process for determining if Coso is in violation of the CUP, if they are issued a CUP. Commenters also questioned what the penalties would be for excessive pumping.

Responses

Inyo County Code §18.77.045 outlines the process for revocation of a CUP; this regulation is discussed on page 3.2-31 of the Draft EIR. The Inyo County Planning Commission would conduct a noticed public hearing on the issue if evidence shows that the water transfer subject to the CUP has unreasonably affected, or has the potential to unreasonably affect, the overall economy or the environment of Inyo County, or that there has been a failure to comply with the provisions of the permit. the commission would modify the terms of the CUP in order to avoid impacts if the commission finds that an existing water transfer, if continued, would cause an unreasonable effect on the overall economy or the environment of the County. The commission would order the implementation of mitigation measures as it finds to be necessary to reduce impacts to less than significant if the commission finds that the water transfer has unreasonably affected the overall economy or the environment of the County. The commission can also modify the CUP to the extent that it finds necessary to avoid impacts in the future.

The Inyo County Planning Commission may revoke the CUP at the conclusion of the public hearing described above if it finds that the water transfer cannot be continued without causing an unreasonable effect on the overall economy or environment of Inyo County. The CUP may also be revoked if the commission finds that there has been a failure to comply with the terms of the CUP.

Inyo County Code §18.77.055 allows any interested party to challenge, during the term of the permit, the ongoing transfer of water subject to the CUP. This regulation is discussed on page 3.2-31 of the Draft EIR. A challenge can be made if one or more of the following circumstances exist:

- There has been or is an ongoing violation of one or more conditions of the CUP
- The transfer or transport of water under the CUP has unreasonably affected the overall economy or the environment of the County

The process for challenging the ongoing transfer or transport of water is to first file a signed written statement with the planning commission that sets forth the challenge. The Inyo County Planning Commission would complete a review and make a determination within 45 days of receipt of the challenge whether or not to have a hearing on the challenge. The commission would then follow the provisions set forth in Inyo County Code §18.77.045, as described above, to determine if Coso is in violation of the CUP.

Penalties for excessive pumping do not pertain to environmental effects of the proposed project. The Draft EIR analyzes potential impacts of the proposed project, and assumes that Coso would follow mitigation measures outlined in the Draft EIR, and terms included in the CUP. The County would adopt monitoring requirements as part of any approval to ensure that all mitigation is completed.

M3. Deferred Mitigation

Comments

A commenter noted various court cases pertaining to deferred mitigation in claiming that mitigation measure Hydrology-4 and the HMMP outlined in the Draft EIR are deferred mitigation.

Responses

CEQA does not allow mitigation to be deferred; however, it is allowable to implement mitigation in the future if the lead agency adheres to performance standards that would mitigate a significant impact of a proposed project and if the mitigation could be achieved in more than one specified way (CEQA Guidelines §15126.4(a)(1)(B)).

Mitigation measure Hydrology-4 outlines performance standards that would avoid significant impacts of the proposed project. Additional studies are outlined in mitigation measure Hydrology-1 and Appendix C4 of the Draft EIR. These studies are described under Section C4.3.3: Monitoring Phases. The studies required by the HMMP are not deferred mitigation. The studies are meant to:

- Provide baseline data for future refinement and calibration of the Hydrology Model;
- Provide data for use in the recalibration of the Hydrology Model;
- Establish baseline conditions of wells; and
- Establish background groundwater levels.

These studies would be performed after the project commences and are necessary in order to identify the potential for significant impacts. Recalibration of the Hydrology Model is best performed after pumping has started and the aquifer is stressed. The longer groundwater pumping occurs the more accurately the model can be calibrated to the conditions in the Rose Valley. The measures include actions to be taken based on conditions observed during the first year of project operation. These actions are outlined beginning on page C4-19 of the Draft EIR under *Remedial Actions*. Additional studies are defined in sufficient detail to demonstrate that they are feasible and that mitigation is feasible.

The studies are not deferred mitigation because the mitigation and HMMP identify how the results are to be used towards determining impacts and the need for application of mitigation. Significant impacts are defined, as are contingency actions. Table C4-2 on page C4-15 through page C4-19 of the Draft EIR, Appendix C4, provides a comprehensive summary of the mitigation program. The program includes monitoring points, parameters monitored, monitoring frequency, threshold requiring action, and the action/mitigation if thresholds are exceeded.

The HMMP uses an adaptive management approach. Adaptive management is a process that allows the refinement and implementation of a mitigation plan to address the uncertainty in baseline conditions. The HMMP is based on four basic tenets:

1. A commitment to a continual learning process;
2. A reiterative evaluation of goals and approaches;
3. Redirection based on an increased information; and,
4. Explicit hypotheses about natural system structure and function, and about anticipated resource response.

The adaptive management approach is designed to allow information gathering and change in the management approach to reflect changing conditions. Adaptive management gives information gathering a high priority in the stewardship of land. The HMMP outlines management principles for determining impacts to the hydrologic system in Rose Valley. Selected standards are used in adaptive management to determine whether those management principles are adequate.

The three key elements of adaptive management include:

1. Selection of indicators and criteria that reflect the desired conditions;
2. Monitoring of the indicators and criteria; and,
3. Implementation of management action when the desired conditions are violated or when conditions are deteriorating and preventive measures are available.

Table C2-4 in the Draft EIR identifies these three elements.

The County and other resource agencies would use the plan and studies generated from the plan to make decisions in determining desired conditions, assessing the relationship between information gathered and management actions, and choosing appropriate action. Adaptive management is an accepted form of impact monitoring and mitigation; for example, under the federal ESA, adaptive management plans can be utilized as long as mitigation is “reasonably specific, certain to occur, and capable of implementation; they must be subject to deadlines or otherwise-enforceable obligations; and most important, they must address the threats to the species in a way that satisfies the jeopardy and adverse modification standards" (Bloom and Boer 2008).

N. OUT-OF-SCOPE COMMENTS

Multiple comments were received on the following topics:

1. BLM Geothermal Leasing Programmatic EIS
2. Enhanced Geothermal Systems
3. Impacts of Power Plant Operation
4. Data Obtained from Coso
5. Past Actions of Inyo County
6. Past Actions of Coso
7. Economic Analysis and Coso's Financials
8. Power Plant Technology and Operation
9. Royalties

N1. BLM Geothermal Leasing Programmatic EIS

Comments

Several comments were received requesting that information and guidelines from the BLM's Geothermal Leasing Programmatic EIS for Western States be incorporated into the EIR. Comments also suggested that the Hay Ranch project should utilize BMPs outlined in the Programmatic EIS.

Responses

The BLM's Geothermal Leasing Programmatic EIS does not include the lands leased or contracted to Coso at the Coso geothermal field. The Programmatic EIS pertains to pending leases on BLM or USFS lands, and lands that may be leased throughout the western United States by these agencies in the future. Guidelines and mitigation outlined in the Programmatic EIS may be similar to those included in the Hay Ranch Draft EIR; however, the EIR is not tiered from the BLM Geothermal Leasing Programmatic EIS. The Coso KGRA was subject to a leasing EIS by the BLM (1980) and analysis of a geothermal development program by the Navy (1979; 1981; 1983; 1986; 1988).

N2. Enhanced Geothermal Systems

Comments

Several comments were made regarding enhanced geothermal systems (EGS). Comments were general, and related to the use of EGS at the Coso geothermal field. There were also questions regarding the use of the proposed project water for EGS activities, and whether those activities should be specifically prohibited in the CUP.

Responses

EGS can enhance geothermal reservoirs where fractures have been closed by mineral precipitation. When natural fractures and pores in rocks are reduced to limit flow rates, the permeability can be "enhanced" or stimulated by pumping cold water into the rock. These actions for improved geothermal flow rates are called EGS.

EGS stimulation has been performed on wells at the Coso geothermal field. These tests were part of the Coso Enhanced Geothermal Systems Project. Further studies are deferred until 2010. The proposed project is unrelated to the Coso Enhanced Geothermal Systems (EGS) Project. The proposed project water would be injected into the existing injection system at well 88-1 as part of normal operations, and cannot be transported to the potential sites where EGS programs are located. The proposed Rose Valley water is mixed with other injection water within the injection system. The EGS operations are separate operations and not a part of the proposed CUP. The appropriate environmental analysis and approvals would be obtained prior to work on EGS projects if additional EGS projects were to be conducted at Coso. The proposed project does not include any EGS activities. The water pumped as a part of the proposed project is meant to be used as supplemental injection water for normal operations, as stated in the Purpose and Need on page 2-1 of the Draft EIR.

N3. Impacts of the Power Plants

Comments

Several comments were received regarding the impacts of the power plants. Questions were asked regarding the production of unpleasant odors, waste, heat, noise, carbon dioxide (CO_2), and hydrogen sulfide (H_2S) from the power plants. Commenters requested that impacts from the power plants be included in the EIR.

Responses

Impacts of the power plants are not addressed in the EIR for the proposed project because the impacts are addressed in previous documents and are part of the baseline condition for this EIR. This EIR analyzes only the impacts from the proposed project. Previous documentation for the power plants addresses all impacts of the power plants, and how these impacts could be mitigated. The proposed project would not generate power in excess of what was previously permitted and which is currently produced (at the time of issuance of the NOP for this EIR). The mitigation from previous documents is applicable to the ongoing generation of power from the plants (i.e., plant operation). The increase in power from current generation to that permitted was previously addressed and would not cause significant, unmitigated effects. These impacts were addressed in previous environmental documents (NWC 1981; 1983, 1986; 1988a; BLM 1980; and BLM and NWC 1988).

See Master Response A6 for additional discussion of the baseline studies performed. Addressing the impacts of the plants is, therefore, beyond the scope of this EIR because the effects of the power plant have already been addressed in previous environmental documents. The proposed project would not result in an increase in production beyond the existing level. Production rates would likely decrease slightly and then stabilize (versus decline further without the project).

The proposed project would not extend the life of the plants beyond that which is currently permitted. Environmental review would be necessary to renew the permits, even with supplemental injection water.

N4. Data Obtained from Coso

Comments

Several commenters expressed concern that some of the data used in the Draft EIR was provided by Coso. Commenters were concerned that this data from Coso would introduce bias to the Draft EIR. Commenters requested copies of Coso’s data.

Responses

Baseline data and data pertaining to Coso's proposed action were used to prepare the EIR. Coso is proposing the project; therefore, the background data for the proposed operations was supplied by Coso. Other data received from Coso were reviewed and verified by the County and the County's consultants to avoid bias.

The Draft EIR does not contain evidence of bias due to data provided by Coso. The source of the data does not pertain to environmental impacts of the proposed project and is outside the scope of the Draft EIR because the data were developed by independent consultants and are scientifically sound. The County would be required to review the Final EIR and exercise its independent judgment and analysis prior to certification of the EIR or approving the project (State CEQA Guidelines Section 15090).

N5. Past Actions of Inyo County

Comments

Comments questioned if Inyo County had ever approved a project that would allow a 10% reduction in groundwater.

Responses

The past actions of Inyo County do not pertain to environmental effects of the proposed action under CEQA. Inyo County, as a decision-making entity, follows applicable rules and regulations in making decisions about groundwater transfer. The Inyo County Water Department and the Inyo County Water Commission evaluate the environmental impacts of the proposed project and, based on this evaluation, identifies and develops associated mitigation measures, proposed project conditions, the monitoring, groundwater management and/or reporting program, and proposed findings. The Inyo County Water Commission then submits its recommendations to the Inyo County Planning Commission (Inyo County Code §18.77.025).

The CUP will be approved only if the Inyo County Planning Commission, in consideration of the recommendations submitted by the Water Commission, finds that the proposed water transfer would not unreasonably affect the overall economy or environment of Inyo County (Inyo County Code §18.77.030).

A CUP could have been denied if previous projects would have had an unreasonable effect on the overall economy or environment, which could have been a function of factors other than groundwater drawdown. (Note that the LADWP water extraction activities are not subject to permit from Inyo County and were initiated by right. It is not useful for comparison to projects over which Inyo County holds permitting authority, even though this export has been made subject to limited County control.) The proposed project will be subject to the same process as other CUP applications. The EIR examines the proposed project and the environmental impacts of the proposed project. The level of significance of impacts for the proposed project will be reviewed by the decision makers in order to issue or deny a permit. The codes mentioned above would be relevant to the CUP review process. Previous decisions on other groundwater pumping projects are not relevant to the CEQA review of the proposed action. Contrary to what the commenter implies, the threshold described in the Draft EIR, page 3.2-45 is not a 10% reduction in groundwater. The Draft EIR explains that the threshold is a 10% reduction in groundwater discharge to Little Lake (page 3.2-45).

N6. Past Actions of Coso

Comments

Several comments were made about Coso and its past business and operational decisions. Comments were related to the reason that Coso installed water cooling towers, Coso's knowledge of the geothermal reservoir at the time the power plants were installed, and various other questions about the intentions of Coso.

Responses

The past actions and past intentions of Coso do not pertain to environmental effects of the proposed project, and are outside the scope of the EIR, except where it pertains to the analysis of cumulative impacts. Equipment already in place at the Coso geothermal field is considered part of the baseline physical condition of the environment. The purpose of this EIR is to analyze change that would be caused by the proposed project; it is not meant to analyze the baseline physical conditions.

To attempt to infer the past intentions and knowledge of Coso does not pertain to the environmental effects of the proposed project.

N7. Economic Analysis and Coso's Financials

Comments

Comments were received that suggested that economic analysis would be useful in determining the impacts of the proposed project. Some commenters also requested Coso financial data, and inquired about the profits that Coso had earned or would earn as a result of the proposed project.

Responses

Inyo County decision makers can request an economic analysis separate from the CEQA review in order to aid the decision-making process. Economic analysis is not a requirement of the CEQA process other than its relationship to population growth and to the alternatives analysis. The Draft EIR addresses growth inducing impacts on page 4-12. The project would not induce growth since the project would not expand the plants' facilities beyond what they are currently generating (and permitted to generate). The alternative analysis does include elimination of some options because those options are economically infeasible. In the case *San Franciscans Upholding the Downtown Plan et al. vs. City and County of San Francisco et al.* (2002), the judge determined that, "[A]lthough CEQA plainly provides that a reasonable range of alternatives must be included in the EIR, the statute does not require the EIR to provide any evidence of the feasibility of those alternatives, much less an economic or cost analysis of the various project alternatives and mitigating measures identified by the EIR." The ruling also stated that, "Instead it does require the public agency to make findings and determinations as to the feasibility of such alternatives or mitigation measures with respect to each significant environmental impact which the EIR identifies, based on substantial evidence set forth anywhere in the record."

The project is analyzed as proposed by Coso in their application to Inyo County for a CUP. Coso's economics can be reviewed by the general public through a Freedom of Information Act request, as is applicable. Some information is considered trade secret and is proprietary. The EIR is tasked with assessing the potential environmental impacts of a project as proposed, regardless of the applicant's financial situation. The project as proposed by Coso has the potential to have significant impacts to the environment; however, all impacts of the proposed project would be mitigated to less than significant levels. Additional analysis of Coso's financials is not pertinent to the EIR.

N8. Power Plant Technology and Operation

Comments

Several questions were asked about the technical features of the existing power plants operated by Coso. Questions ranged from the number of power generators, the operating capacity analyzed in previous environmental documentation, and whether the development of new technology warrants a new analysis of the power plants.

Commenters also questioned how Coso power plants have operated, and questioned the relation between power plant technology and the need for the proposed project.

Responses

The technological characteristics of the power plants do not pertain to environmental effects of the proposed project. Equipment already in place for the power plants is considered part of the baseline physical condition of the environment. The purpose of the EIR is to analyze environmental impacts of the proposed project; it is not meant to analyze the baseline physical conditions. The County did consider past approvals in its analysis of cumulative impacts. No significant cumulative impacts would result.

The addition of new technology to the power plants is limited to analysis as alternatives to the proposed project. Please refer Master Response L2 of this document for discussion of power plant modifications as an alternative to the proposed project.

Equipment choices that were previously made, the effects of which were addressed in previous environmental documents, as listed in Table 1.1-1 on page 1-4 of the Draft EIR, are irrelevant to this EIR.

N9. Royalties

Comments

Comments were received regarding the consideration that the County's approval of the CUP is based on economic benefits and incentives from taxes, royalties, and the Energy Policy Act of 2005.

Response

The concern of economic benefits to Inyo County from taxes, royalties of the proposed project are beyond the scope of this EIR. The consideration of tax benefits and royalty reductions that Coso could obtain under the Energy Policy Act of 2005 is out of scope of this EIR. CEQA does not assess issues of economic concern that do not lead to a physical environmental change. The project would not expand the generation capacity of the power plants beyond what is currently generated. The project would not generate additional revenue that could induce population growth nor have other indirect environmental effects associated with growth.

Other comments were raised regarding analysis of socioeconomic impacts related to potential decreases in royalties by Coso paid to the County under the Energy Policy Act of 2005 §224(c) and §224(d). The comments claim that Coso could obtain a 50% reduction in royalties for a 4-year period if Coso increases its production by 10% over existing production levels of the last 5 years. The increase in production would have to be implemented by August 8, 2011. The interpretation and applicability of this regulation to the Coso power plants is not known; however, it is not relevant to the CEQA analysis.

CEQA requires analysis of a proposed project's potential impacts on population growth and housing supply; however, social and economic changes are not considered environmental impacts in and of themselves under CEQA. These factors can be used, however, to determine whether a physical change is significant or not. CEQA allows discussion of social and economic changes that would result from a change in the physical environment and could in turn lead to additional changes in the physical environment (CEQA Guidelines §15064(f)).

A change in royalty payment does not constitute a change in the physical environment, and would not lead to changes in the physical environment.

N10 Comments on Interim Analysis

Comments

Several comments were received on files and interim correspondence obtained through the Freedom of Information Act. The questions pertain to interim information that does not appear in the Draft EIR.

Response

The Draft EIR is the environmental document prepared for consideration by County decision-makers in determining whether to approve the proposed project. The references cited in the Draft EIR are not incorporated into the Draft EIR. They are included because they were consulted by the County and its consultants in preparing the Draft EIR and as potential references for the public when evaluating the Draft EIR. The County is not required to, and will not, respond to comments regarding the content and text of references cited in the Draft EIR. Relevant comments are those that address the Draft EIR itself.

The Draft EIR is the environmental document prepared for consideration by County decision-makers in determining whether to approve the proposed project. Communications among County staff or among County staff and its contractors are not included in or part of the Draft EIR and are not relevant to the Draft EIR. The County is not required to, and will not, respond to comments regarding staff communications regarding to the Draft EIR. Relevant comments are those that address the Draft EIR itself.

2.4 Comments and Responses

This section presents responses to all of the comments received on the Draft EIR during the review period. Each comment letter received is recorded according to the numbering system identified previously (*i.e.,* F, S, M, NG, A, P, PM, T). Each comment in each letter received has a number (A1-1, P1-1, etc.) assigned to it. Responses are provided to each written or oral comment. Where a response is provided in a Master Response or other prior response, the reader is referred to that response.

The California Environmental Quality Act (CEQA) Guidelines indicate that the Final EIR should identify and provide responses to comments on the Draft EIR. This section presents the comments received and responses to comments on environmental issues raised regarding the environmental effects of the proposed project. Responses are generally not provided to comments that state opinions about the overall merit of the project or comments about the project description, unless a specific environmental issue is raised within the context of the specific comment. Commenters' opinions are noted.

Changes to the Draft EIR, where deemed appropriate and necessary to clarify and further enhance the adequacy and readability of the EIR, are summarized in the responses and refer to the section or mitigation measure in which the text or figure appears in the Final EIR. The actual text changes are noted in the Final EIR in a ~~strikethrough~~/underline format and included in Errata (Chapter 3 of this Final EIR). Revisions to figures are listed in Section 3.4 of this Final EIR.

DEPARTMENT OF THE NAVY

NAVAL FACILITIES ENGINEERING SERVICE CENTER
1100 23RD AVE
PORT HUENEME CA 93043-4370

IN REPLY REFER TO:

PW25038
31 July 2008

Inyo County Planning Department
P.O. Drawer "L"
Independence, CA 93526

RE: COSO OPERATING COMPANY HAY RANCH WATER EXTRACTION AND DELIVERY SYSTEM, CONDITIONAL USE PERMIT (CUP 2007-003) APPLICATION SCH# 2007101002

Dear Sir/Madam:

F1-1 The U.S. Navy Geothermal Program Office views the Coso geothermal development project as a National asset that provides a substantial amount of reliable renewable electrical energy at a time when it is most needed in our Country. In the interest of continuing this landmark effort, we are herein expressing our full support for the Hay Ranch water augmentation project proposed by Coso Operating Company. This project will add much-needed fluid to the geothermal reservoir, thus sustaining it for maximum ultimate recovery of the resource, and conversion to electricity, in the future. Without the Hay Ranch project, there is a significant potential that the benefits of a large amount of geothermal resource beneath Coso will never be realized.

This project will also provide support to the State's Renewable Portfolio Standard (RPS) and enable the utilization of additional renewable energy instead of fossil-fueled resources to meet the electrical energy requirements of the State of California as well as reducing greenhouse gas emissions. As a result the project will reduce our nation's dependence on foreign oil.

Thank you for the opportunity to comment on this important project. We sincerely hope that the County of Inyo Planning Commission sees fit to approve this action in a timely manner so that this promising resource management approach can be initiated.

Sincerely,

Andrew E. Sabin, Ph.D., P.G.
Director, Geothermal Program Office

cc:

R. Arruda, COC
K. Bonin, GPO
PW25 Files

F1 **Andrew E. Sabin**
United States Department of the Navy
Naval Facilities Engineering Service Center
1100 23rd Ave
Port Hueneme, California 93043-4370

F1-1 Support of the project is noted.

F2

HOWARD P. "BUCK" McKEON
25TH DISTRICT, CALIFORNIA

COMMITTEE ON EDUCATION
AND LABOR

SENIOR REPUBLICAN MEMBER

COMMITTEE ON ARMED SERVICES
SUBCOMMITTEE ON AIR AND LAND FORCES
SUBCOMMITTEE ON MILITARY READINESS

MEMBER OF REPUBLICAN WHIP TEAM

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House of Representatives
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SAN BERNARDINO, INYO,
AND MONO COUNTIES
(800) 565–4333

WEB SITE
www.house.gov/mckeon/

September 3, 2008

Inyo County Planning Department
P.O. Box "L"
Independence, CA 93526

RE: COSO OPERATING COMPY HAY RANCH WATER EXTRACTION AND DELIVERY SYSTEM, CONDTIONAL USE PERMIT (CUP 2007-003) APPLICATION SCH# 2007101002

To whom it may concern:

F2-1

As our reliance on foreign sources of energy continues to hurt working families and businesses it is high time we supported clean, domestically produced energy. The Coso Hay Ranch geothermal facility is such a project and will help to decrease our reliance on costly foreign energy. It is for that reason that I strongly urge the County of Inyo to approve the Coso Hay Ranch Conditional Use Permit.

This Conditional Use Permit would allow ground water pumping from the Hay Ranch property for injection into the Coso geothermal reservoir. This water source would help to provide more stable and reliable energy production at the facility. Fluctuations in the water supply at the facility have the potential to affect production and there is no reason to curb the safe and clean energy production occurring at the Coso Hay Ranch geothermal facility.

As you are aware, the State of California has recently instituted a Renewable Portfolio Standard (RPS) to encourage the use of renewable energy statewide. The aggressive RPS goal set the requirement that 20% of statewide electricity produced by 2010 be from renewable sources. This requirement has set in motion a number of initiatives by both private and public entities to meet the RPS goals. The Coso Hay Ranch facility would surely contribute to reach this aggressive RPS.

It is for the above reasons that I strongly encourage the County of Inyo to approve the Conditional Use Permit sought by the Coso Hay Ranch geothermal facility.

Sincerely,

Howard P. "Buck" McKeon

Howard P. "Buck" McKeon
Member of Congress

F2 **Howard P. “Buck” McKeon**
United States House of Representatives
2351 Rayburn House Office Building
Washington, District of Columbia 20515

F2-1 Support of the project is noted.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Ridgecrest Field Office
300 S. Richmond Road
Ridgecrest, CA 93555
www.blm.gov/ca/ridgecrest

1430(P)

CACA-46289

CA-650.50

SEP 08 2008

Tanda Gretz

Inyo County Planning Department

Post Office Box L

168 N. Edwards Street

Independence, CA 93526

RE: Comments on the Draft EIR for the Coso Operating Company Hay Ranch Water Extraction and Delivery System

Dear Tanda,

We have completed our review of the Draft EIR for this project and have the following comments.

F3-1 Table ES.1.1: Project Elements should have a final row of information that addresses the pipeline across public lands managed by the BLM.

F3-2 Page ES-8, 2nd paragraph, last three lines: It is stated that "specific actions must be taken to prevent Little Lake from experiencing a reduction in flows into the lake greater than 10%; the plan would therefore reduce potentially significant effects to less than significant levels." What would happen during drought conditions? For example, would a drought be reasonable cause to not allow the company to continue to pump/extract water?

F3-3 Page ES-9, Cultural Resources Section, 1st paragraph, next to last line: Replace the word "between" with the word "among". Also, in the 1st line of the next paragraph do the same thing. (The observation is that the document states that a Programmatic Agreement is being developed "between" the BLM, SHPO and ACHP. The word "between" would be appropriate to use for two parties. When more than two parties are involved the Agreement occurs "among" them.)

F3-4 Page ES-21, Table ES.2-1 (Continued): Potential Impacts and Mitigation: At the end of the first paragraph under the Mitigation column, it stated that a "responsible party" will be identified who will provide for the conservation of a population of threatened and endangered crowned muillas located at

F3-4 a mitigation site "in perpetuity". The BLM does not issue decisions in perpetuity. We limit our requirements to the duration of operations, and then require final reclamation and restoration to approximate original conditions. We may monitor the success of the reclamation efforts for two to five years before we release the operator from further liability, but we don't require the commitment for "perpetuity".

F3-5 Page 1-3, last paragraph, 4th line from the bottom, the word "determined" should be the word "determine".

F3-6 Page 2-3, Table 2.3-1 (Continued): Project Elements: A row of information needs to be added that addresses the pipeline component of this project. The 9-mile pipeline is being evaluated by the BLM via Environmental Assessment #CA650-2005-65.

F3-7 Page 2-11, paragraph 3, 1st sentence: This sentence leads one to believe that the Coso-Hay Ranch property runs to the Gill Station Coso Road. We recommend it be re-worded to read "A 20-inch pipeline would run from the storage tank on the Hay Ranch property along an existing access road located on BLM administered public lands to Gill Station Coso Road."

F3-8 Page 2-11, paragraph 5, 1st line, 2nd sentence: We recommend you insert the phrase "across public lands" after the word "pipeline", so the sentence would read "The 20-inch pipeline across public lands would be approximately 9.3 miles in length...".

F3-9 Page 2-12, Construction section: We believe it would be appropriate to identify that most of this construction will be taking place on public lands administered by the BLM.

F3-10 Page 2-13, Water Storage Tanks, Component Description section, 1st paragraph: We believe it would be good to reference that the second storage tank would be located on public lands administered by the Department of the Navy.

F3-11 Page 3.4-15, Mojave Ground Squirrel section, 3rd paragraph, line 4: This line does not accurately describe where public lands under BLM's jurisdiction occur. Public lands begin at the fence line around the Hay Ranch property. The access road that the 20-inch pipeline will follow from the fence line for 9.3 miles to the CLNAWS boundary is located on public lands administered by the BLM.

F3-12 Page 3.4-27, Operations and Maintenance section, last paragraph (Pipeline): The statement begins "The pipeline route would be buried...". We observe that the pipeline would be buried along the route. The route itself will not be buried.

F3-13 Page 3.4-29, Mojave Ground Squirrel section, last paragraph: In line 15 there is a reference to surface disturbances that had occurred by 1988. We do not believe it is prudent or appropriate to reference 20 year old data. Surely there has been more recent information gathered that can be used to state how many acres of surface disturbance have occurred as of 2008.

F3-14 Page 3.4-33: The 1st paragraph on this page is exactly the same information as the last half of the 2nd paragraph.

F3-15 Page 3.5-5: Native American Consultation section: The BLM has completed consultation with the tribes, SHPO, and the ACHP and is proceeding under an approved Programmatic Agreement (PA).

F3-16 Page 3.5-5, Cultural Resources Surveys, Overview section, last two lines: During consultation with the tribes, SHPO and the ACHP, the Area of Potential Effects (APE) was extended to include Coso Hot Springs.

F3-17 Page 3.5-10, section 3.5.4, Overview of Impacts, 1st paragraph, next to last line: We recommend you replace the word "between" with the word "among".

F3-18 Page 3.5-11, Substation and Associated Facilities section, 1st paragraph, 2nd line: We recommend you insert the word "been" before the word "previously".

F3-19 Page 3.7-2, Figure 3.7-1: Land Ownership in Inyo County: The color scheme of this map is contrary to the standardized land status and ownership maps sold to the user public. BLM standard colors for ownership are:

*Yellow, public lands administered by the BLM;
*Green, US Forest Service lands;
*Blue, State lands;
*Purple, National Park lands;
*Pink, Military lands;
*White, private lands.

F3-20 Page 4-1, section 4.1, Introduction, last paragraph: We believe that cumulative impacts must address all projects in the vicinity, not just "related projects" to the proposed pipeline, tanks and pumping station.

F3-21 Page 5-6, Table 5.2-2: Potential Alternative Sources of Water for Injection: We note there does not appear to be a water source outside the Rose Valley that was considered as a potential source. Was there ever such a consideration identified/studied? If not, perhaps a revision to this analysis could consider other water sources outside the Rose Valley.

Should you have any questions concerning these comments, please contact me at your earliest convenience.

Sincerely,

Linn Gum

Linn Gum
Assistant Field Manager

F3 Linn Gum
United States Bureau of Land Management
Ridgecrest Field Office
300 S. Richmond Road
Ridgecrest, California 93555

F3-1 The change was made as requested in order to remove the formatting error in the Draft EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. See the discussion of the pipeline beginning in the fourth full paragraph on page 2-11 of the Draft EIR. The following revisions were made to the EIR:

Page ES-5 (Table ES.1-1)

Pipelines	Hay Ranch Property & Hay Ranch to Coso Road, along BLM lands, to the CLNAWS Geothermal Field	• Piping from groundwater wells to a collection tank at the lift pump station • A main pumped transmission pipeline from the lift pump station to a high point tank • A main gravity transmission pipeline to transfer water from the high point tank to the injection well

F3-2 The mitigation is designed to prevent a 10% reduction in the flow of groundwater available to Little Lake reservoir *caused by pumping at the Hay Ranch*. A reduction in groundwater caused by drought would not be caused by the pumping at the Hay Ranch and would not necessarily trigger a dramatic reduction in or cessation of pumping. The applicant would not be required to reduce or cease pumping to account for the effect of a drought if the drought lowers groundwater levels to the established trigger levels. The Inyo County Water Department would recalculate the pumping rate to ensure a no greater than 10% reduction in groundwater flow based on the new reduced background level. This would likely result in reduced pumping because the maximum 10% reduction would be calculated based on the reduced availability of groundwater.

F3-3 The changes were made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revisions were made to the EIR:

Page ES-9

Several known cultural resource sites are located within the project region. Project construction has the potential to disturb or cause an adverse change to known and unknown resources, including the potential to disturb human remains. Mitigation measures are defined to minimize impacts to historic and archaeological resources to less than significant levels. Mitigation includes worker training, performing additional testing and data recovery if needed, moving pipeline alignments to avoid sites, flagging sites, performing additional surveys for the substation site and connection, and directing water away from sites during maintenance activities. All mitigation measures or resulting actions would be coordinated with the BLM and would be consistent with the Programmatic Agreement being developed ~~between~~among the BLM, State Historic Preservation Office, and the Advisory Council on Historic Preservation.

The proposed project is also subject to the existing 1979 Memorandum of Agreement ~~between~~among the CLNAWS, the State Historic Preservation Office, and the Advisory Council on Historic Preservation, which addresses effects to the

Coso Hot Springs (a site listed on the National Register of Historic Places) from geothermal development activities.

F3-4 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts that have not been analyzed previously. The change does not reduce the effectiveness of the mitigation because the measure still establishes success criteria. The need for mitigation in perpetuity is excessive and not common practice. The following revisions were made to the EIR:

Page ES-20 to ES-21; and 3.4-33

Biology-8: The population of crowned muillas shall be avoided during construction.

If the crowned muillas cannot be avoided during construction, a plan shall be prepared for restoration (as well as an attempt at relocation of the individual plant), and seeds of the plant shall be collected. The plan shall include at a minimum (a) the location of where the plant shall be seeded or replanted, with preference for on-site replacement such as over the pipeline route; (b) the plant species and seeding rate; (c) a schematic depicting the replanting or seeding area; (d) the planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on-site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria ~~and providing for conservation of the mitigation site in perpetuity~~.

F3-5 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revisions were made to the EIR:

Page 1-3

NEPA requires that federal agencies consider and document environmental impacts prior to making certain decisions. The proposed pipeline crosses BLM lands. A portion of this project is also located on CLNAWS on US Department of the Navy (Navy) withdrawn lands. BLM and Navy each must review and decide whether or not to grant approval of this project, and have cooperated in the preparation of an Environmental Assessment (EA) to provide sufficient evidence and analysis for each to independently determine whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact with respect to the project under NEPA. The Navy may also determine~~d~~ that the project is categorically exempt because the action is to grant COC a right-of-way. Injection of fluids was considered under several environmental documents (NWC 1979, BLM 1980, NWC 1983, NWC 1986, NWC 1988).

F3-6 The change was made as requested in order to remove the formatting error in the Draft EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. See the discussion of the pipeline beginning in the fourth full paragraph on page 2-11 of the Draft EIR. The following revisions were made to the EIR:

Page 2-3 (Table 2.3-1)

Pipeline	Hay Ranch Property & Hay Ranch to Coso Road, along BLM lands, to the CLNAWS	• Piping from groundwater wells to a collection tank at the lift pump station • A main pumped transmission pipeline from the lift pump station to a high point tank • A main gravity transmission pipeline to transfer water from the high

	Geothermal Field	point tank to the injection well

F3-7 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revisions were made to the EIR:

Page 2-11

A 20-inch pipeline would run from the storage tank on the Hay Ranch property along an existing access road ~~on the Hay Ranch property~~ located on BLM administered public lands to Gill Station Coso Road. The proposed pipeline would be installed under Gill Station Coso Road and proceed east, approximately 50 feet from the edge of the road.

F3-8 The total length of the pipeline is approximately 9.1 mi. This area includes public and private lands. The 9.3-mi value written in the text was a typographical error. It should have been 8.3 mi of 20-in pipeline on public lands, not 9.3 mi. There would also be 0.8 mi of 10-in pipeline on private land, for a total of 9.1 mi of pipeline. The text has been revised as follows:

Page 2-11

The 20-inch pipeline would be approximately ~~9.3~~ 8.3 miles in length, extending from the tank on the Hay Ranch property to the injection system at CLNAWS.

F3-9 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. The pipeline would also be constructed on Navy land. The following revision was made to the EIR:

Page 2-12

The pipeline construction right-of-way would be 50 feet wide and would follow the proposed alignment shown in Figure 2.3-1. Trenching equipment, cranes, welders, and earthmoving equipment would be utilized to install the pipeline. The majority of pipeline construction would take place on BLM administered lands and Navy lands.

F3-10 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revision was made to the EIR:

Page 2-13

One of the water storage tanks would be located on the Hay Ranch property, as part of the lift pump station shown in Figure 2.3-1 and Figure 2.3-3. The second water storage tank would be located on public lands administered by the Navy along Gill Station Coso Road, as shown in Figure 2.3-4.

F3-11 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. The comment does not have the correct distance stated in the comment. The pipeline follows US Bureau of Land Management (BLM) administered lands for 8.3 mi (not 9.3 mi). The following revision was made to the EIR:

Page 3.4-15

The Gill Station Coso Road Improvement Project survey identified Mohave ground squirrel habitat from where the unpaved road (off of the Hay Ranch property where the proposed pipeline would be installed) meets Gill Station Coso Road up to the CLNAWS boundary (where that survey ended). This area corresponds to the BLM managed portion of the Hay Ranch project area. The BLM administered lands begin at the Hay Ranch property boundary and continue east to the CLNAWS boundary for 8.3 miles. In this section, the highest quality habitat was found closest to the CLNAWS boundary (and likely onto the CLNAWS lands). The narrow alluvial valley in this area is characterized by soils suitable for burrow construction. It supports a diverse creosote bush community, with a number of other shrub and herbaceous species present as well (Leitner 2007).

F3-12 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revisions were made to the EIR:

Page 3.4-27

Pipeline. The pipeline ~~route~~ would be buried for all but a few small sections of the route; about 500 feet in length would not be buried.

F3-13 Please refer to Master Response E1 for discussion of mitigation for impacts to the Mohave ground squirrel. Approximately 474.69 ac of surface disturbance of the permitted 2,193 ac on CLNAWS property, and 0 of the 35 ac for lands outside of CLNAWS boundaries have been used to date. The source of this information is personal communication with a Navy representative.

F3-14 The change was made as requested in order to remove the formatting error in the Draft EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revisions were made to the EIR:

Page 3.4-33

Individual tortoises may be injured or killed during construction activities. Construction of the pipeline would result in temporary habitat loss of about 53.5 acres on private, BLM, and CLNAWS lands. ~~Several signs of desert tortoise were found during the survey for the Gill Station Coso Road Improvements project, with one burrow found within 200 feet of the dirt road along which the pipeline route is proposed (near the intersection with Gill Station Coso Road).~~

F3-15 The additional information provided by the BLM regarding the status of the consultation with the State Historic Preservation Office (SHPO), Advisory Council on Historic Preservation (ACHP), and tribes is noted. The Final EIR has been updated with the new background information. The following revisions were made to the EIR:

Page 3.5-5

The BLM ~~is currently consulting~~has completed consultation with the State Historic Preservation Office, the tribes, and the Advisory Council on Historic Preservation (ACHP) for impacts associated with the proposed project (see Regulatory Setting, below) and is proceeding under an approved Programmatic Agreement (PA). The County is also currently consulting directly with the tribes via letters and plans to conduct in-person government-to-government communication. Tribal members attended the scoping meeting in Lone Pine in October 2007.

F3-16 The BLM has provided additional information to reflect the modification of the APE during consultation with the SHPO, the ACHP, and the tribes. The change was made as requested for the purpose of updating the EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. There is still no surface disturbance proposed at Coso Hot Springs, and potential indirect impacts to Coso Hot Springs were addressed in Section 3.5: Cultural Resources of the Draft EIR. The following revisions were made to the EIR:

Page 3.5-5

An archaeological survey and evaluation for the project was conducted by ASM Affiliates in 2005 and is presented in a report entitled *Cultural Resources Inventory for the Hay Ranch Water Extraction and Delivery System, Coso Geothermal Project, Inyo County, California* (ASM 2005). This cultural resource inventory included a literature review for previously recorded historic and prehistoric materials present in the project area and a pedestrian survey of a 50-foot wide (15.35 meters) corridor along the entire project pipeline route as identified in the site drawings in Appendix B. The area of potential effect (APE) for the survey includes the area around the well, tanks, substation, ~~and~~ the pipeline route, and Coso Hot Springs.

F3-17 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. The following revision was made to the EIR:

Page 3.5-10

All mitigation measures or resulting actions will be coordinated with the BLM and be consistent the Programmatic Agreement being developed ~~between~~among the BLM, SHPO, and the ACHP, and to which the County has been invited to be a concurring party.

F3-18 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revision was made to the EIR:

Page 3.5-11

Substation and Associated Facilities. The substation site and the path to interconnect the substation to the proposed switchyard near the lift pump station has not been previously surveyed for the presence of cultural resources.

F3-19 Figure 3.7-1 on page 3.7-2 of the Draft EIR is a portable document file (PDF) figure taken from the Inyo County General Plan; the colors cannot be easily changed. The lands are still uniquely identified in the figure, although it does not use BLM standard colors and symbology.

F3-20 CEQA requires discussion of cumulative impacts, which includes an evaluation of impacts of the proposed project as well as other projects. Projects must be "past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency..." (CEQA Guidelines §15130). CEQA requires that the projects are related or produce cumulative impacts. The list of projects on page 4-1 of the Draft EIR is comprehensive of all projects in the Rose Valley area that have an application or decision pending with a regulatory agency. Refer to Master Response K1 for text additions clarifying the details of the Deep Rose project.

F3-21 Please refer to Master Response L2 for discussion of alternate sources of injection water.

S1

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION

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RECEIVED
AUG 2008
INYO COU
PLANNING DEP

August 1, 2008

Ms. Tanda Gretz
COUNTY OF INYO
P.O. Office Drawer L
Independence, CA 93526

Re: SCH#2007101002; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for the Conditional Use Permit No. 2007-03/Hay Ranch Water Extraction, Export and Delivery System Project; Inyo County, California

Dear Ms. Gretz:

The Native American Heritage Commission (NAHC) is the state agency designated to protect California's Native American Cultural Resources. The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c (CEQA guidelines). Section 15382 of the 2007 CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ... objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE)', and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following action:

√ Contact the appropriate California Historic Resources Information Center (CHRIS) for possible 'recorded sites' in locations where the development will or might occur.. Contact information for the Information Center nearest you is available from the State Office of Historic Preservation (916/653-7278)/ http://www.ohp.parks.ca.gov. The record search will determine:

- If a part or the entire APE has been previously surveyed for cultural resources.
- If any known cultural resources have already been recorded in or adjacent to the APE.
- If the probability is low, moderate, or high that cultural resources are located in the APE.
- If a survey is required to determine whether previously unrecorded cultural resources are present.

√ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure. S1-1
- The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.

√ Contact the Native American Heritage Commission (NAHC) for:

  * A Sacred Lands File (SLF) search of the project area and information on tribal contacts in the project vicinity that may have additional cultural resource information. Please provide this office with the following citation format to assist with the Sacred Lands File search request: USGS 7.5-minute quadrangle citation with name, township, range and section; .

- The NAHC advises the use of Native American Monitors, also, when profession archaeologists or the equivalent are employed by project proponents, in order to ensure proper identification and care given cultural resources that may be discovered. The NAHC recommends that contact be made with Native American Contacts on the attached list to get their input on potential project impact (APE). In some cases, the existence of a Native American cultural resources may be known only to a local tribe(s).

√ Lack of surface evidence of archeological resources does not preclude their subsurface existence.

- Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
- A culturally-affiliated Native American tribe may be the only source of information about a Sacred Site/Native American cultural resource.
- Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.

S1-1 √ Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigation plans.

* CEQA Guidelines, Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens.

√ Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the California Code of Regulations (CEQA Guidelines) mandate procedures to be followed, including that construction or excavation be stopped in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery until the county coroner or medical examiner can determine whether the remains are those of a Native American. Note that §7052 of the Health & Safety Code states that disturbance of Native American cemeteries is a felony.

<u>√ Lead agencies should consider avoidance, as defined in §15370 of the California Code of Regulations (CEQA Guidelines), when significant cultural resources are discovered during the course of project planning and implementation</u>

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,

Dave Singleton
Program Analyst

Attachment: List of Native American Contacts

Cc: State Clearinghouse

S1 **Dave Singleton**
California Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, California 95814

S1-1 Refer to Section 3.5: Cultural Resources. All recommendations provided in the comment letter have been performed and are documented in the Draft EIR. A detailed discussion of the survey work is provided on pages 3.5-5 through 3.5-7 of the Draft EIR, and is summarized below.

- A records search was performed at the Eastern Information Center, and 30 historic properties were identified
- The inventory survey was performed for the BLM and reports were prepared by Ultra Systems (2006).
- UltraSystems and the BLM contacted the Native American Heritage Commission, as detailed in their report (2006).
- The project includes avoidance of known archaeological resources and includes mitigation that requires a Native American monitor during excavation and procedures if a previously undiscovered resource or burial is encountered during construction.

A discussion of impacts and mitigation is provided on pages 3.5-10 through 3.5-18 of the Draft EIR.

S2

STATE CAPITOL
P.O. BOX 942849
SACRAMENTO, CA 94249-0032
(916) 319-2032
FAX (916) 319-2132

DISTRICT OFFICE
4900 CALIFORNIA AVE., SUITE 100-B
BAKERSFIELD, CA 93309
(661) 395-2995
FAX (661) 395-3883

Assembly
California Legislature

JEAN FULLER
ASSEMBLYMEMBER, THIRTY-SECOND DISTRICT

COMMITTEES
VICE CHAIR
NATURAL RESOURCES
MEMBER
AGRICULTURE
BUDGET

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August 8, 2008

Inyo County Planning Department
P.O. Drawer "L"
Independence, CA 93526

RE: COSO OPERATING COMPANY HAY RANCH WATER EXTRACTION AND DELIVERY SYSTEM, CONDITIONAL USE PERMIT (CUP 2007-003) APPLICATION SCH# 2007101002

Dear Sir/Madam:

Coso Hay Ranch has put forth an application for a Conditional Use Permit ("CUP") to allow ground water pumping from the Hay Ranch property for injection into the Coso geothermal reservoir to stabilize and enhance reliable renewable electrical energy production. This water augmentation project is very important for meeting the State of California Renewable Portfolio Standard ("RPS") which encourages the utilization of renewable energy to supply the electrical energy requirements of the State. The State of California has set an aggressive RPS goal of achieving production of 20% of the State's electricity demand from renewable sources by 2010. In addition, this project is also responsive to the Federal Energy Policy objectives of increasing the utilization of renewable resources and reducing greenhouse gas emissions.

S2-1

Supplying augmentation water to the Coso reservoir will enhance the generation of electricity from the Coso geothermal resource for utilization within the State. This will serve to help achieve an important goal of the RPS by improving air quality and reducing greenhouse gas emissions by displacing the demand for the fossil-fueled resources that would otherwise be utilized to supply the equivalent amount of electricity to meet demand in the State and thereby reducing our nation's dependence on foreign oil.

I therefore strongly encourage the County of Inyo to approve the Coso Hay Ranch Conditional Use Permit.

Sincerely,

Jean Fuller

JEAN FULLER
Assemblymember, 32nd District

S2 **Jean Fuller**
California State Assembly
P.O. Box 942849
Sacramento, California 94249-0032

S2-1 Support of the project is noted.

DEPARTMENT OF TRANSPORTATION
District 9
500 South Main Street
Bishop, CA 93514
PHONE (760) 872-0785
FAX (760) 872-0754
TTY 711 (760) 872-0785

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August 18, 2008

Tanda Gretz
Senior Planner
Inyo County Planning Department
Post Office Drawer L
Independence, California 93514

File: 09-INY
DEIR
SCH #: 2007101002

Dear Ms. Gretz:

Coso Hay Ranch Water Extraction, Export and Delivery System
Draft Environmental Impact Report (DEIR)/Conditional Use Permit 2007-03

Thank you for giving the California Department of Transportation (Caltrans) the opportunity to review the proposed water system project near US 395 and Gill Station-Coso Road. We appreciate the clarifications you had the consultant provide us. We have the following comments:

S3-1 • The proposed construction access to the Hay Ranch property is referenced as an "unmarked, unpaved road off of US 395" and was clarified to be "Rose Valley Ranch Road" at postmile 20.35. This unpaved road does have a paved access at the highway (approximately 56-ft deep from the limit line and just under 25-ft wide). There is a median crossover and a south bound left-turn lane. It is also marked with advance warning intersection signs but has no name designation.

S3-2 The project proponent must verify that it does meet current standards and is a safe access (i.e. turning radius, storage length, etc.) for the type and number of vehicles that may use it. Turning templates can to be used to show what geometry would suffice. If it is shown to be adequate, refreshing the pavement and pavement markings may be required. If it is not, improvements, which could include acceleration/deceleration lanes, turning radius, throat length etc, will be

S3-3 required. We find no record of an encroachment permit on file. One is needed for the access itself and any construction activities.

S3-4 • Any construction signage for US 395 would also fall under the encroachment permit process. We will review proposed locations to determine whether or not they are warranted during the permit application review phase.

S3-5 • In Table ES.2-1, item Traffic-4, in addition to restoring Gill Station-Coso Road, please include that the applicant shall restore any areas of US 395 and right-of-way that are disturbed by construction . . ."

S3-6
- For further details on access standard, signage and permitting you may contact Stephen Winzenread at (760) 872-0674 or email: stephen.winzenread@dot.ca.gov.

  Permit Application:
  http://www.dot.ca.gov/hq/traffops/developserv/permits/pdf/forms/Std._E.P._Application_(TR-0100).pdf

  Permit Instructions:
  http://www.dot.ca.gov/hq/traffops/developserv/permits/pdf/forms/encrchpermt_instruc.pdf

S3-7 When available, please email Caltrans related project conditions to gayle.rosander@dot.ca.gov. We value a cooperative working relationship with Inyo County concerning project impacts upon the state highway system. If you have any questions, I may be contacted at (760) 872-0785.

Sincerely,

Gayle J. Rosander

GAYLE J. ROSANDER
IGR/CEQA Coordinator

c: State Clearinghouse
Steve Wisniewski, Caltrans

S3 **Gayle J. Rosander**
California Department of Transportation
District 9
500 South Main Street
Bishop, California 93514

S3-1 The comment is noted regarding the condition and characteristics of Rose Valley Ranch Road.

S3-2 The Draft EIR indicates that the project may utilize this road to access the parcel. Coso has indicated that it is unlikely that they would use this route. The analysis is included in the Draft EIR to allow for use of this route. The following edits have been made to indicate that an encroachment permit and further work on the intersection may be necessary if this route is used. An encroachment permit would not be required if Coso does not use this route. Several edits are made throughout the Draft EIR, as shown below, to indicate this clarification. Impacts of using this route were addressed and therefore do not constitute a new significant impact.

Page ES-11

Construction trucks may access or leave the Hay Ranch property using an un marked, unpaved road off of US 395 instead of using the protected turn lanes at the Gill Station Coso Road intersection with US 395. This could lead to potentially significant impacts regarding transportation hazards. Coso would be required to apply for and receive an encroachment permit from Caltrans prior to use of this road for construction activities on the Hay Ranch property. Application for an encroachment permit would require verification from Coso that the road meets current standards and is a safe access (i.e., turning radius, storage length, etc.) for the type and number of vehicles that may use it. Mitigation would ensure implementation of improvements to the road as necessary, and the placement of warning and construction signage in accordance with standards developed by the California Department of Transportation (Caltrans)~~, and would~~ to reduce impacts to less than significant levels.

Page 2-17

Table 2.5-1: Required Permits or Approvals for the Proposed Project

Agency	Approval or Permit
Federal	
US Navy, China Lake Naval Air Weapons Station	Permits and rights-of-way for pipeline and high point water tank.
Bureau of Land Management, Ridgecrest	NEPA compliance and right-of-way for pipeline on public lands
US Fish and Wildlife Service	Consultation with the BLM under Section 7 of the Endangered Species Act
State	
California Department of Fish and Game	Responsible agency for CEQA review
State Historic Preservation Office	Consultation and compliance under Section 106 of the National Historic Preservation Act; consultation with BLM
California Department of Transportation (Caltrans), District 9	Encroachment Permit. Required only if the COC is to access the Hay Ranch parcel off of Highway 395 via Rose Valley Ranch Road.

Regional	
Lahontan Regional Water Quality Control Board	Issuance of National Pollutant Discharge Elimination Permits for construction
Great Basin Unified Air Pollution Control District	Authority to Construct permits
Local	
Inyo County Planning Commission	Approval of the Conditional Use Permit (CUP 2007-003)
Inyo County Water Department	Compliance with Inyo County Code Section 18.77, Regulation of Water Transfers
Inyo County Environmental Health Services Department	Construction of monitoring wells
Inyo County Public Works Department	Building and Grading Permits for pipeline along Coso Road

Page 3.14-7

The majority of construction vehicles would access the project site along existing US 395 and Gill Station Coso Road. The intersection of Gill Station Coso Road with US 395 is controlled with turn pockets, acceleration-deceleration lanes, and a stop sign. No additional transportation hazards would result from the use of this intersection by construction vehicles. Trucks delivering heavy equipment would likely access the project site via the transmission line right of way north of Gill Station Coso Road.

Delivery and other trucks ~~could also~~ may access the site via a driveway off of US 395 along Rose Valley Ranch Road. Use of this route is unlikely. Visibility in the project area is good; however, some vehicles would enter and exit the Hay Ranch property directly from or onto US 395. These locations are not controlled and trucks entering the highway at slow speeds could cause an increase in transportation hazards at that location. If this access point were to be used, the applicant would need to apply for an encroachment permit from Caltrans, District 9. The application for the encroachment permit would require evaluation of the road and intersection to verify that it meets current standards and provides safe access (i.e., turning radius, storage length, etc.) for the type and number of vehicles that may use it. If turning radii are not adequate, mitigation measure Traffic-2 requires that the route not be used in order to prevent further environmental impacts associated with other improvements such as creating acceleration/deceleration lanes on Highway 395. If it is adequate, the encroachment permit may require refreshing the pavement and pavement markings at the intersection. Implementation of the following mitigation measure if Rose Valley Ranch Road is to used for access during project construction would reduce impacts associated with access hazards to less than significant levels.

> **Traffic-2:** This mitigation measure would only be necessary if Coso decides to use Rose Valley Ranch Road to access the Hay Ranch parcel directly off of US 395. If Rose Valley Ranch Road is determined to have an inadequate turning radius for the proposed project usage during the encroachment permit application process, the route shall not be used. If the turning radius is adequate, all other recommendations in the encroachment permit shall be implemented.
>
> During project hours, construction signs shall be posted along northbound US 395 between Coso Junction and the northern extent of the Hay Ranch parcel. Signage shall indicate slower construction traffic ahead, and shall be ~~coordinated with Caltrans to meet any Caltrans requirements~~ installed in compliance with encroachment permits.

Construction vehicles would be located along Gill Station Coso Road during construction of the proposed pipeline and the 1.5-million-gallon water tank. Vehicles would park on the shoulder and would not create any increased transportation-related hazards.

S3-3 Coso would apply for an encroachment permit from Caltrans if Rose Valley Ranch Road would be used as an access route to the property directly off of US 395. Text edits have been made to reflect the encroachment permit process. Mitigation measure Traffic-2 would require that, if the access point is determined to have an inadequate turning radius during the encroachment permit process, it would not be used. The permit summary table on page 2-17 of the Draft EIR has also been updated.

S3-4 Mitigation measure Traffic-4 has been revised to include that signage would be implemented in accordance with an encroachment permit.

S3-5 The change was made as requested for the purposes of clarification. The following revisions were made to the EIR:

Page ES-29

Potential Impact 3.14-4: The potential to degrade US 395 or Gill Station Coso Road beyond pre-project conditions	PS	**Traffic-4:** The applicant shall regrade and restore any areas of Gill Station Coso Road <u>and US 395 and its ROW</u> that are disturbed by construction including installation of the pipeline and high point tank. The applicant shall take photo documentation of the roadway conditions before construction and after construction and shall provide these photographs to County Public Works upon request.	LS

Page 3.14-10

Traffic-4: The applicant shall regrade and restore any areas of Gill Station Coso Road <u>and US 395 and its ROW</u> that are disturbed by construction including installation of the pipeline and high point tank. The applicant shall take photo documentation of the roadway conditions before construction and after construction and shall provide these photographs to County Public Works upon request.

S3-6 The Caltrans point of contact is noted. An application for an encroachment permit would be submitted if the Coso decided to use access off of US 395 via Rose Valley Ranch Road.

S3-7 The comment is noted regarding providing updated information to Caltrans. The contact will be added to the mailing list.

STATE CAPITOL
ROOM 5094
SACRAMENTO, CA 95814
(916) 651-4031
(916) 327-2272 FAX

DISTRICT OFFICES
8577 HAVEN AVENUE
SUITE 210
RANCHO CUCAMONGA, CA 91730
(909) 466-4180
(909) 466-4185 FAX

3560 UNIVERSITY AVENUE
RIVERSIDE, CA 92501
(951) 715-2625
(951) 715-2627 FAX

California State Senate

SENATOR
BOB DUTTON
THIRTY-FIRST SENATE DISTRICT

COMMITTEES:
VICE-CHAIR:
BUDGET & FISCAL REVIEW
ENERGY, UTILITIES & COMMUNICATIONS

MEMBER:
RULES
APPROPRIATIONS
BUDGET & FISCAL REVIEW
ENERGY, UTILITIES & COMMUNICATIONS
JOINT LEGISLATIVE AUDIT COMMITTEE
SELECT COMMITTEE ON ALAMEDA CORRIDOR
SELECT COMMITTEE ON MOBILE & MANUFACTURED HOMES

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August 19, 2008

Inyo County Planning Department
P.O. Drawer "L"
Independence, CA 93526

RE: COSO OPERATING COMPANY HAY RANCH WATER EXTRACTION AND DELIVERY SYSTEM, CONDITIONAL USE PERMIT (CUP 2007-003) APPLICATION SCH# 2007101002

Dear Sir/Madam:

S4-1

I encourage your support of the Coso Hay Ranch application for a Conditional Use Permit to allow ground water pumping from the Hay Ranch property for injection into the Coso geothermal reservoir.

This pumping and injection will help to stabilize and enhance reliable renewable electrical energy production. This water augmentation project is very important for meeting the State of California Renewable Portfolio Standard ("RPS") which encourages the utilization of renewable energy to supply the electrical energy requirements of the State. In addition, this project is also responsive to the Federal Energy Policy objectives of increasing the utilization of renewable resources.

Supplying augmentation water to the Coso reservoir will enhance the generation of electricity from the Coso geothermal resource for utilization within the State. This will serve to help achieve an important goal of the RPS and reduce our nation's dependence on foreign oil.

S4-1 I therefore strongly encourage the County of Inyo to approve the Coso Hay Ranch Conditional Use Permit. Thank you for your consideration of this important issue.

Sincerely,

Bob Dutton

Bob Dutton

31st Senate District

S4 **Bob Dutton**
California State Senate
State Capitol, Room 5094
Sacramento, California 95814

S4-1 Support of the project is noted.

CAPITOL OFFICE
STATE CAPITOL
ROOM 3063
SACRAMENTO CA 95814
TEL (916) 651-4037
FAX (916) 327-2187

DISTRICT OFFICES

73-710 FRED WARING DRIVE
SUITE 112
PALM DESERT CA 92260
TEL (760) 568-0408
FAX (760) 568-1501

13800 HEACOCK STREET
SUITE C-112
MORENO VALLEY, CA 92553
TEL (951) 653-9502
FAX (951) 653-9524

Senate
California Legislature

JIM BATTIN
SENATOR
THIRTY-SEVENTH SENATE DISTRICT

COMMITTEES:
RULES
VICE-CHAIR
ELECTIONS, REAPPORTIONMENT AND CONSTITUTIONAL AMENDMENTS
VICE-CHAIR
ENERGY, UTILITIES AND COMMUNICATIONS
GOVERNMENTAL ORGANIZATION
HUMAN SERVICES
SELECT COMMITTEES:
CALIFORNIA-EUROPEAN TRADE
CALIFORNIA'S HORSE RACING INDUSTRY
JOINT COMMITTEES:
ARTS

August 20, 2008

Inyo County Planning Department
P.O. Drawer "L"
Independence, California 93526

RE: COSO OPERATING COMPANY HAY RANCH WATER EXTRACTION AND DELIVERY SYSTEM. CONDITIONAL USE PERMIT (CUP 2007-003) APPLICATION SCH# 2007101002

Dear Sir/Madam:

S5-1

Coso Hay Ranch has put forth an application for a Conditional Use Permit ("CUP") to allow ground water pumping from the Hay Ranch property for injection into the Coso geothermal reservoir to stabilize and enhance reliable renewable electrical energy production. This water augmentation project is very important for meeting the State of California Renewable Portfolio Standard ("RPS") which encourages the utilization of renewable energy to supply the electrical energy requirements of the State. The State of California has set an aggressive RPS goal of achieving production of 20% of the State's electricity demand from renewable sources by 2010. In addition, this project is also responsive to the Federal Energy Policy objectives of increasing the utilization of renewable resources and reducing greenhouse gas emissions.

Supplying augmentation water to the Coso reservoir will enhance the generation of electricity from the Coso geothermal resource for utilization within the State. This will serve to help achieve a goal of the RPS by improving air quality and reducing greenhouse gas emissions by displacing the demand for the fossil-fueled resources that would otherwise be utilized to supply the equivalent amount of electricity to meet demand in the State.

I therefore strongly encourage the County of Inyo to approve the Coso Hay Ranch Conditional Use Permit.

Sincerely,

James F Battin, Jr

JIM BATTIN
Senator
37th District

S5 **Jim Battin**
California State Senate
State Capitol, Room 3063
Sacramento, California 95814

S5-1 Support of the project is noted.

S6

California State Senate

ROY ASHBURN
SENATOR, 18TH DISTRICT

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PLANNING DEPT.

August 20, 2008

Pat Cecil, Planning Director
Inyo County Planning Department
P.O. Drawer "L"
Independence, CA 93526

Dear Mr. Cecil:

It is my understanding that Coso Hay Ranch has submitted an application for a conditional use permit ("CUP") to allow ground water pumping from the Hay Ranch property for injection into the Coso geothermal reservoir to stabilize and enhance reliable renewable electrical energy production. This water augmentation project is very important for meeting the State of California Renewable Portfolio Standard ("RPS") which encourages the utilization of renewable energy to supply the electrical energy requirements of the State. The State of California has set an aggressive RPS goal of achieving production of 20% of the State's electricity demand from renewable sources by 2010. In addition, this project is also responsive to the Federal Energy Policy objectives of increasing the utilization of renewable resources and reducing greenhouse gas emissions.

S6-1

Supplying augmentation water to the Coso reservoir will enhance the generation of electricity from the Coso geothermal resource for utilization within the State. This will help achieve an important goal of the RPS by improving air quality and reducing greenhouse gas emissions by displacing the demand for the fossil-fueled resources that would otherwise be utilized to supply the equivalent amount of electricity to meet demand in the State and thereby reducing our nation's dependence on foreign oil.

I strongly encourage the County of Inyo to approve the Coso Hay Ranch conditional use permit. If you have any questions, please feel free to contact my office.

Sincerely,

Roy Ashburn

ROY ASHBURN
Senator
18th District

S6 **Roy Ashburn**
California State Senate
State Capitol
Sacramento, California 95814

S6-1 Support of the project is noted.

S7

State of California – The Resources Agency ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF FISH AND GAME

http://www.dfg.ca.gov
Inland Deserts Region (IDR)
407 West Line Street
Bishop, CA 93514
(760) 872-1171
(760) 872-1284 FAX

September 5, 2008

Mr. Pat Cecil
Ms. Tanda Gretz
Inyo County Planning Department,
P. O. Drawer "L"
Independence, CA 93526

Subject: Coso Operating Company Hay Ranch Water Extraction and Delivery System Conditional Use Permit (CUP 2007-003) Application, Inyo County, State Clearinghouse Number 2007101002

Dear Mr. Cecil and Ms. Gretz:

The Department of Fish and Game (Department) has reviewed the Environmental Impact Report (EIR) for the above referenced project. The proposed project involves pumping water from two existing wells from the "Hay Ranch" property in Rose Valley (adjacent to and east of Highway 395, just north of Coso Junction, and half mile south of Dunmovin) for injection into the geothermal field operated by Coso Operating Co. LLC, within the China Lake Naval Air Weapons Center (CLNAWS). Water will be withdrawn from the wells at an average rate of 3,000 gallons per minute (gpm), or approximately 4,800 acre-feet per year. The water will be piped from the Hay Ranch property to the geothermal facility, a distance of 9 miles. The water pipeline will consist of a 20-inch diameter steel pipe, which will be buried for most of its length, and which will follow the general path of existing roads and associated rights of way. Other facilities would be constructed to support the pipeline and wells. The Conditional Use Permit (CUP) is proposed for a period of 30 years. The project would impact approximately 59.5 acres.

The Department is providing comments on the IS/ND as the State agency which has the statutory and common law responsibilities with regard to fish and wildlife resources and habitats. California's fish and wildlife resources, including their habitats, are held in trust for the people of the State by the Department (Fish and Game Code §711.7). The Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitats necessary for biologically sustainable populations of those species (Fish and Game Code §1802). The Department's Fish and wildlife management functions are implemented through its administration and enforcement of Fish and Game Code (Fish and Game Code §702). The Department is a trustee agency for fish and wildlife under the California Environmental Quality Act (see CEQA Guidelines, 14 Cal. Code Regs. §15386(a)). The Department is providing these comments in furtherance of these statutory responsibilities, as well as its common law role as trustee for the public's fish and wildlife.

The Department offers the following comments and recommendations:

S7-1

1. The EIR frequently refers to the "Coso Known Geothermal Area" (KGRA). Because this area is often mentioned in relation to biological impacts and mitigation, the Final EIR (FEIR) should include a map depicting where the KGRA is located, along with a brief written description of the location and boundaries.

S7-2

2. As described in the EIR, the project site supports the state-threatened Mohave ground squirrel "MGS" (*Spermophilus mohavensis*) and the state- and federally listed threatened desert tortoise (*Gopherus agassizii*). In several places the EIR fails to identify the Department's roles under the California Endangered Species Act (CESA). For example, the Department is not listed as the CESA permitting agency on page 2-17 (Table 2.5-1). The FEIR should correct this and any similar omissions.

S7-3

3. The EIR describes aspects of the West Mojave Plan. Please note that the West Mojave Plan has been completed for Federal land only, and only sets habitat mitigation ratios on Federal land. There is no streamlined compliance program in place for CESA within the currently approved West Mojave Plan.

S7-4

4. The EIR states "Compensation for Mohave ground squirrel is included in the existing mitigation plan for the geothermal development. The plan was evaluated under CEQA in 1988 and is applicable for all geothermal projects associated with geothermal development at Coso and within the Coso KGRA". The Department does not believe this statement to be completely accurate in reference to the private land component of the proposed project. Please refer to the 1988 "Stipulation for the Mitigation of Impacts to the Mohave Ground Squirrel at the Coso Known Geothermal Resource Area". We believe that the Plan's scope only includes lands located within the China Lake Naval Weapons Center, and *public lands* located outside the China Lake Naval Weapons Center. The Hay Ranch property is private land. It is therefore probable that a CESA permit will be required for listed species impacts on private land.

S7-5

5. We recommend that the Final EIR is revised to include specific mitigation measures to compensate for private land impacts to Mohave ground squirrel. The mitigation measures should be consistent with CESA's "minimized and fully mitigated" requirements. This could easily be accomplished by incorporating Mohave ground squirrel mitigation into Mitigation Measure Biology 7 (for desert tortoise), using the same 3:1 ratio proposed by Inyo County for desert tortoise. Many areas are occupied by both desert tortoise and Mohave ground squirrel, and the same amount of replacement land (occupied by both species) could

S7-5 provide compensation for both species with no additional acreage commitment required.

S7-6 6. With regard to the 1988 Mohave ground squirrel mitigation program, the EIR states the following: "Six acres of land would be debited from the total mitigation credit acreage. Temporarily disturbed habitat would be restored to natural conditions after construction to minimize impacts to Mohave ground squirrel habitat." The second sentence should be clarified to state that temporary disturbance areas would be debited from the total mitigation credit acreage, and would also be revegetated, so as to not imply that the temporary impact areas would not be debited against the mitigation credit. The 1988 Stipulation clearly states that any surface disturbance, long-term or short-term, is required to be mitigated through the program. The Department requests this clarification be made in the FEIR.

S7-7 7. Also regarding the 1988 Mohave ground squirrel mitigation program, the EIR states: "As of 1988, about 885 acres of surface disturbance of the permitted 2,193 acres had been used." The FEIR should clarify the acreage amount of surface disturbance permitted through the mitigation program as of 2008, even if it is the same amount as 1988.

S7-8 8. The groundwater monitoring program includes triggers tied to changes in groundwater levels that appear to provide for ongoing reassessment of pumping. Most of the triggers are changes in groundwater levels around Little Lake and other existing wells. The reporting requirement on C4-20 and C4-24 requires reporting of evidence for impacts to spring discharge and/or surface water flow to Little Lake. To more closely link monitoring with surface water sources providing valuable spring and wetland habitat, the Department recommends identification of specific springs to be monitored, monitoring frequency, and methods. The Department also recommends monitoring of both spring discharge and surface water flows to Little Lake.

S7-9 9. The EIR states that background groundwater levels would be established by monitoring for 6 months. Given the extensive nature of the groundwater modeling effort, it seems logical that "background" data would or should have been collected over several years. How was the model calibrated without long-term water level data, or were other data used? All of the groundwater measurements that have been taken to date should be made part of the "background" data set.

The Department appreciates the opportunity to comment. I can be reached at (760) 873-4412 to address questions regarding this letter and additional coordination.

Sincerely,

Brad Henderson
Senior Environmental Scientist

cc:

Chron

S7 Brad Henderson
California Department of Fish and Game
Inland Deserts Region
407 West Line Street
Bishop, California 93514

S7-1 The Coso KGRA is discussed in relation to biological impacts. Figure 1.1-2 was created to provide supplemental information that depicts the Coso KGRA. The following revisions were made to the EIR in order to incorporate the figure:

Page 1-3

NEPA requires that federal agencies consider and document environmental impacts prior to making certain decisions. The proposed pipeline crosses BLM lands. A portion of this project is also located on CLNAWS on Navy withdrawn lands. BLM and Navy each must review and decide whether or not to grant approval of this project, and have cooperated in the preparation of an Environmental Assessment (EA) to provide sufficient evidence and analysis for each to independently determine whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact with respect to the project under NEPA. The Navy may also determine~~d~~ that the project is categorically exempt because the action is to grant COC a right-of-way. Injection of fluids was considered under several environmental documents (NWC 1979, BLM 1980, NWC 1983, NWC 1986, NWC 1988).

<u>Figure 1.1-2 shows the boundaries of the Coso Known Geothermal Resource Area (KGRA) in relation to the proposed project. The Coso KGRA encompasses an area of approximately 107 square miles and extends from east of Haiwee Reservoir southward to just east of Little Lake Ranch.</u>

S7-2 The comment noted that the CDFG has roles related to the CESA and CESA permitting. The CDFG's role and a description of CESA is presented on page 3.4-24 of the Draft EIR, under the heading *California Endangered Species Act*. Desert tortoise and MGS are acknowledged as State-listed species on pages 3.4-7 to 3.4-9, 3.4-19 to 3.4-20, 3.4-29, etc. of the Draft EIR. The impact assessment for MGS and desert tortoise (pages 3.4-29 through 3.4-33 of the Draft EIR) also discuss the CDFG's role in mitigation for these species.

The table on page 2-18 includes the CDFG as a CEQA review agency; however, edits have been made as requested to clarify the CDFG's role under the CESA.

Page 2-18 (Table 2.5-1)

California Department of Fish and Game	Responsible agency for CEQA review <u>California Endangered Species Act (CESA) permitting agency</u>

S7-3 The comment noted that the West Mohave Plan has no streamlined compliance program in place for the CESA and currently only has mitigation ratios established for federal lands. The Draft EIR includes a discussion of potential impacts and mitigations for Mohave ground squirrel and desert tortoise. The majority of impacts would occur on federal lands, as described in Table 3.4-4. The mitigation described in the Draft EIR was determined so as to minimize impacts to these species to less than significant levels. Mitigation for loss of habitat on private land does not fall under the West Mohave Plan; however, mitigation ratios are still proposed in order to minimize effects to these species per the requirements of CEQA. These mitigation measures would be implemented in compliance with the CESA and consultation with the CDFG (as indicated in mitigation measure Biology-7).

S7-4 Please refer to Master Response E1. The commenter is correct that the 1988 Mitigation Plan for MGS does not cover impacts to ground squirrel habitat on private land; however, the mitigation for the Desert Tortoise that is described in the Draft EIR in Table 3.4-4 and in mitigation measure Biology-7 would also mitigate the impacts to MGS. These species have similar habitat requirements and it is feasible (and common practice) to find compensation land suitable to both species.

Coso has submitted an application for a 2081 Incidental Take Permit (which would allow the take of MGS under certain terms and conditions) for activities to be conducted on private land. The CDFG has confirmed that the 3:1 ratio for the habitat mitigation requirement would apply, and that the requirement can be satisfied through a payment to the Desert Tortoise Preserve Committee. Master Response E1 indicates the text revisions made to incorporate this additional information.

S7-5 Several revisions have been made to the EIR to reflect that the 1988 Mitigation Plan does not include mitigation for effects to MGS habitat on the private Hay Ranch property. Please refer to Master Response E1 for text edits. Mitigation measures Biology-6 and Biology-7 have been edited to include MGS, per the commenter's request.

S7-6 The comment is noted. The project would temporarily disturb about 33 ac of public land off of CLNAWS (i.e., BLM managed lands) and 15.8 ac of CLNAWS land. The text has been revised as shown in Master Response E1 to show that acreage of temporary impacts would also be deducted from the plan.

S7-7 Please refer to Master Response E1 for discussion of mitigation for impacts to the MGS. Approximately 474.69 ac of surface disturbance of the permitted 2,193 ac on CLNAWS property and 0 of the 35 ac for lands off of CLNAWS has been used to date. The source of this information is personal communication with a Navy representative and the 2008 Annual Compliance reports submitted to the California Energy Commission. The text has been edited to reflect that this acreage deduction is as of 2008.

S7-8 No perennial surface water flows to Little Lake were identified. Consequently, no surface water inflow monitoring to Little Lake are discussed in the HMMP. One spring, Coso Spring, was identified on the property. Monitoring the discharge rate from Coso Spring would require intrusive construction to install a weir and flow monitoring system. The HMMP (Table C4-2 of the Draft EIR) instead proposes monitoring the water level in Little Lake, the discharge rate from Little Lake, and the combined discharge rate from Coso Spring and Little Lake at an existing manmade feature called the North Culvert. The monitoring frequency is identified as hourly (using pressure transducers), with data downloaded and plotted weekly for the first 2 months, then monthly thereafter.

S7-9 Other data were used to calibrate the Hydrology Model. Please refer to Master Responses C2.5 and C2.6 on model calibration and documentation. Text of the HMMP would be revised to state that for monitoring points with more extensive long-term monitoring data (e.g., the Hay Ranch wells). All groundwater measurements collected to date would be used to evaluate background conditions.

Page C4-14

i. **Establish background groundwater levels**. Establishing a pre-pumping statistical background water level for each designated monitoring point is essential, in order to distinguish between natural seasonal variability versus drawdown caused by pumping associated with the project. Establishing a background for each monitoring point will require pre-pumping measurements to be conducted for a sufficient period of time to encompass normal seasonal variations in water level.

A minimum of 6 months of water level data will be required to establish the background water level at each monitoring point, and it is recommended but not required that 12 months of data be collected. For monitoring points with more extensive long-term monitoring data, e.g., the Hay Ranch wells, all groundwater measurements collected to date will be used to evaluate background conditions. The reference levels will be identified for each monitoring well during the 6 month baseline study period. An addendum to this HMMP will be required after the first six months of baseline data collection that lists the reference elevations for calculating drawdown for each trigger point monitoring well.

The applicant shall conduct statistical evaluation of the background water level data by a qualified person approved by Inyo County Water Department and provided by the applicant. An appropriate statistical method to calculate the background water levels shall be proposed by the applicant, subject to approval by Inyo County. Upon approval, the background water level for each monitoring point shall be calculated by the applicant and presented to Inyo County Water Department for review and approval. It is anticipated that statistical methods similar to those used to calculate background concentrations of naturally occurring chemical constituents at RCRA and CERCLA sites may be applicable.

California Regional Water Quality Control Board
Lahontan Region

Linda S. Adams
Secretary for Environmental Protection

Victorville Office
14440 Civic Drive, Suite 200, Victorville, California 92392
(760) 241-6583 • Fax (760) 241-7308
http://www.waterboards.ca.gov/lahontan

Arnold Schwarzenegger
Governor

File: Environmental Doc Review
Inyo County

To: Planning Department
168 North Edwards Street
Post Office Drawer L
Independence, CA 93526

Date: September 5, 2008

COMMENTS ON CONDITIONAL USE PERMIT No.2007-03/COSO OPERATING COMPANY LLC (COSO HAY RANCH WATER EXTRACTION, EXPORT AND DELIVERY SYSTEM), INYO COUNTY

Please refer to the items checked for staff comments on the above-referenced project:

[ ] The site plan for this project does not specifically identify features for the post-construction period that will control stormwater on-site or prevent pollutants from non-point sources from entering and degrading surface or ground waters. The foremost method of reducing impacts to watersheds from urban development is "Low Impact Development" (LID), the goals of which are maintaining a landscape functionally equivalent to predevelopment hydrologic conditions and minimal generation of nonpoint source pollutants. LID results in less surface runoff and less pollution routed receiving waters. Principles of LID include:

- Maintaining natural drainage paths and landscape features to slow and filter runoff and maximize groundwater recharge,
- Reducing the impervious cover created by development and the associated transportation network, and
- Managing runoff as close to the source as possible.

We understand that LID development practices that would maintain aquatic values could also reduce local infrastructure requirements and could benefit energy conservation, air quality, open space, and habitat. Many planning tools exist to implement the above principles, and a number of recent reports and manuals provide specific guidance regarding LID.

We request you require these principles to be incorporated into the proposed project design. We request natural drainage patterns be maintained to the extent feasible.

[ ] The proposal does not provide enough information to determine the type of wastewater disposal system that will be used (i.e. septic system, sewer, etc.).

[ ] Discharge of any material other than domestic wastewater to an onsite septic tank wastewater disposal system is prohibited.

[ ] The proposed project deals with a non-sewage discharge to land and may need to be regulated by the Lahontan Regional Water Quality Control Board. Therefore, the County must require the proponents to contact the Regional Board for filing of a complete report of waste discharge.

[ ] The proposed project appears to exceed the Regional Board's 500 gallon per acre per day limitation on the discharge to septic tank disposal systems. Please address how this requirement will be met in the document and proposed project design.

[ ] The proposal does not provide enough information to determine if the Regional Board's 500 gallon per acre per day limitation of the discharge to septic tank disposal systems is exceeded. Please address in the document how this requirement will be met.

[ ] The proposed project is located in an area where septic tank disposal systems are prohibited unless an exemption is requested and granted by the Regional Board. If the project proponent intends to request an exemption, the environmental document must contain the information necessary to make the findings for an exemption (Please review the exemption criteria contained in the Water Quality Control Plan for the Lahontan Region (Basin Plan) accessible on the Regional Board's homepage at http://www.waterboards.ca.gov/lahontan/BPlan/BPlanIndex.htm

[X] S8-1 The project will require development of a Stormwater Pollution Prevention Plan and may require an NPDES General Construction Stormwater Permit. This permit is accessible on the State Board's Homepage (www.waterboards.ca.gov). Best Management Practices must be used to mitigate project impacts. The environmental document must describe the mitigation measures or Best Management Practices.

[ ] The project will require development of a Stormwater Pollution Prevention Plan and may require an NPDES General Industrial Stormwater Permit. This permit is accessible on the State Board's Homepage (www.waterboards.ca.gov). Best Management Practices must be used to mitigate project impacts. The environmental document must describe the mitigation measures or Best Management Practices.

[ ] The project appears to propose a discharge of waste to surface water. Therefore an NPDES permit for the project may be necessary. Describe potential impacts to surface water quality and beneficial uses of water. Also describe measures to be taken to reduce pollutant loading to surface waters to meet numerical and narrative water quality objectives contained in the Water Quality Control Plan for the Lahontan Region homepage (http://www.waterboards.ca.gov/lahontan).

[ ] The proposed project may result in discharges of waste that may need to be regulated by the Regional Board. Please review the general permits and the Water Quality Control Plan for the Lahontan Region (Basin Plan) accessible on the Regional Board's homepage (http://www.waterboards.ca.gov/lahontan).
(provide more specific information here on the type of waste or form of regulation)

[ ] Please require written confirmation from the project proponent that they obtain Regional Board concurrence before approving this project.

[ ] The project may require a Federal Clean Water Act Section 401 Water Quality Certification from the Regional Board. Application forms can be found at our web site homepage (http://www.waterboards.ca.gov/lahontan).

[ ] The proposal does not provide specific information on impacts to wetlands. The Environmental Document needs to quantify these impacts. Discuss purpose of project, need for wetland disturbance, and alternatives (avoidance, minimize disturbances and mitigation). Mitigation must be identified in environmental document including timing of construction. Mitigation must replace functions and values of wetlands lost (at a minimum, 1.5 times the area disturbed should be restored)

[ ] Regional Board staff has determined that this project will not have a significant effect on water quality as proposed.

[ ] Regional Board staff will make additional comments after a more detailed review is complete.

[ ] Project may result in spills that will adversely impact ground and surface waters. Include spill contingency measures in the environmental document.

[X] Other – Please provide data supporting the DEIR statement that a substantial groundwater withdrawal is defined to be greater than 10% reduction in water available to surface features at Little Lake. Your DEIR has not sufficiently identified the effect on surface waters (e.g. lakes, springs, wetlands etc.) from the extraction of 4,839 ac-ft/yr
S8-2 for 30 years. Additionally, please reference the data you are using in support of water quality not being impacted by this project. The DEIR also states that impacts to springs would not occur. Please substantiate this statement with supporting data. Please include mitigation measures that would monitor for adverse effects on surface waters. Provide corrective measures in case that monitoring does show significant adverse effects on surface waters.

Please note that obtaining a permit and conducting monitoring does not constitute adequate mitigation. Development and implementation of acceptable mitigation is required.

Sincerely

Print Name John Morales
Title Water Resource Control Engineer
Phone No. (760) 241-7366
E-Mail jmorales@waterboards.ca.gov

JM/rc/Coso Hay Ranch water extraction proj.doc

S8 **John Morales**
California Regional Water Quality Control Board
Lahontan Region
Victorville Office
14440 Civic Drive, Suite 200
Victorville, California 92392

S8-1 The comment regarding the requirement for a National Pollutant Discharge Elimination system (NPDES) permit is noted. Table ES.1-3 on page ES-6 of the Draft EIR and Table 2.5-1 on page 2-17 of the Draft EIR identify the potential need for the NPDES permit from the Lahontan Regional Water Quality Control Board. See the first full paragraph on page 3.2-31 of the Draft EIR for a discussion of the Stormwater Pollution Prevention Plan and use of BMPs.

S8-2 Please refer to Master Response E4. The 10% criterion is discussed on pages 3.2-45 through 3.2-47 of the Draft EIR. The criterion is based on observed water levels and differences in groundwater levels as observed by Bauer 1998. The criterion is also based on natural variability already experienced by the system at Little Lake.

See Master Responses C2.7 and C3. The analysis sufficiently identifies the impacts to surface waters, streams, and wetlands from the extraction of 4,839 ac-ft/yr for 30 years. The analysis begins on page 3.2-40 of the Draft EIR and continues through page 3.2-51.The project as proposed would have a potentially significant impact on groundwater and surface waters in the Rose Valley, particularly surface waters and springs at Little Lake. Several mitigation measures have been proposed in the Draft EIR that require monitoring for adverse effects on surface waters and include corrective measures in case that monitoring does show significant adverse effects on surface waters. Please refer to pages 3.2-39, 3.2-47, 3.2-48, 3.2-49, and Appendix C4: Rose Valley HMMP. All elements requested by the commenter are already addressed in the Draft EIR and the extensive HMMP prepared for and included in the Draft EIR. With implementation of the mitigation measures in the EIR, no potentially significant impact would result from the project.

Department of Water and Power the City of Los Angeles

ANTONIO R. VILLARAIGOSA
Mayor

Commission
NICK PATSAOURAS, President
EDITH RAMIREZ, Vice President
LEE KANON ALPERT
WALLY KNOX
FORESCEE HOGAN-ROWLES
BARBARA E. MOSCHOS, Secretary

H. DAVID NAHAI,
Chief Executive Officer and General Manager

September 5, 2008

Mr. Pat Cecil, Director
Inyo County Planning Department
168 North Edwards Street
P.O. Box Drawer L
Independence, California 93526

Dear Mr. Cecil:

Subject: Draft Environmental Impact Report for Conditional Use Permit No. 2007-03/Coso Operating Company LLC – Coso Hay Ranch Water Extraction, Export, and Delivery System (Project), State Clearing House No. 2007101002

Thank you for providing the Los Angeles Department of Water and Power (LADWP) the opportunity to review and comment on the Draft Environmental Impact Report (DEIR) for the above-mentioned Project. As discussed below, the DEIR fails to analyze and identify mitigation measures for several potentially significant impacts to the City of Los Angeles' (City) water rights.

M1-1

The proposed Project entails extracting approximately 4,840 acre-feet of groundwater per year for 30 years from Coso Hay Ranch and exporting it approximately nine linear miles to the Coso geothermal reservoir for use in the Coso Geothermal Power Plant. Groundwater would be extracted from two existing wells on Coso Hay Ranch.

M1-2

The Coso Hay Ranch is located in Rose Valley in Inyo County. The Rose Valley groundwater aquifer is primarily recharged by mountain front recharge that is derived from precipitation that falls at higher elevations of the Eastern Sierra Nevada Mountains. The second groundwater recharge component to Rose Valley is the inflow from the north, which mainly includes seepage from the City's Haiwee Reservoir Complex.

The City owns approximately 400-acres of property in Rose Valley immediately north of the Coso Hay Ranch. In addition to this property, the City also owns and operates the Haiwee Reservoir Complex. The Haiwee Reservoir Complex, including north and south

M1-2 Haiwee Reservoirs, is located north of Rose Valley. The City also has water rights to the reservoirs' outflow. Water from the reservoirs runs through the Los Angeles Aqueducts along alluvial fans to the west of Rose Valley and proceeds to flow southerly to Los Angeles for municipal use by the City's four million residents. LADWP believes that seepage from Haiwee Reservoir Complex should neither be assumed as natural inflow to Rose Valley, nor should it be depended upon to be available for extraction by the Project.

M1-3 LADWP foresees the implementation of two City projects in Rose Valley: an Aquifer Storage and Recovery (ASR) project and a South Haiwee Reservoir Seepage Recovery (SHRSR) project. (*See* Exhibits A, B, C, and D). Both of the City's projects will be located in the northern portion of Rose Valley. As explained below, the Project will conflict with the both of the City projects. The impacts of the Project to the ASR and SHRSR projects must be analyzed and if the Project results in impacts to the City's water rights, appropriate mitigation measures must be identified and implemented.

M1-4 The City entered into an agreement with Inyo County in 1991 regarding the long-term management of water resources in the Owens Valley and Inyo County. This agreement foresaw implementation of an ASR project in Rose Valley. A feasibility study was completed in the early 1990s and LADWP proposes to perform the second phase of evaluating an ASR project in Rose Valley in the near future. It is estimated in the DEIR that over its 30 years life, the Project's groundwater extraction will cause approximately 30 feet of additional drawdown in groundwater levels immediately under the City's property (*See* DEIR, Appendix C, Figure C2-15). The maximum predicted drawdown at LADWP's wells, approximately 1.5 miles north of Hay Ranch is 55 feet. (*See* DEIR, Appendix C, Page C4-4). The drawdown caused by this extraction will increase the hydraulic gradient of groundwater levels north of Coso Hay Ranch and will make the recovery of stored water in the aquifer nearly impossible; and therefore, will make LADWP's planned ASR project unfeasible.

M1-5 LADWP is also considering the SHRSR project to recover water seepage from the South Haiwee Reservoir to Rose Valley. The groundwater model presented in the DEIR estimated the amount of seepage from South Haiwee Reservoir to Rose Valley to be approximately 900 acre-feet per year. However, after reviewing the water levels measured in the Haiwee Canyon monitoring wells, we believe that the 900 acre-feet per year of seepage is an underestimation of the actual seepage. The drawdown caused by the Project will increase the hydraulic gradient of groundwater levels between the Haiwee Reservoir and Rose Valley aquifer, thereby increasing the seepage from the South Haiwee Reservoir. The impacts of this potential seepage increase to the City's water rights should be evaluated and mitigation measures identified.

M1-6 The bulk of hydrologic analysis performed by the DEIR utilized a model of the Rose Valley groundwater aquifer. Pursuant to the California Public Records Act, LADWP requests that an electronic copy of this model be made available to LADWP to allow for proper evaluation of its adequacy for modeling the Project area.

M1-7 The pump testing results and hydrologic data are presented in Appendix C of the DEIR. Figure C2-13 shows a comparison between measured and simulated water levels. Based on this figure, the model underestimates water levels in LADWP's wells by approximately 105 feet, indicating the inability of the model to accurately represent the northern Rose Valley groundwater aquifer. Further review of the modeling report and figures C2-8 through C2-11 shows that hydraulic conductivity assigned to the aquifer in the northern Rose Valley is much smaller than the hydraulic conductivities assigned in the center of the valley. The City's property is located in northern Rose Valley and the Coso Hay Ranch property is located in the center of Rose Valley. For model layer No. 1, the hydraulic conductivity of the northern zone is one order of magnitude smaller than the central zone and for model layer No. 2 the hydraulic conductivity is three orders of magnitude smaller. No geological cross-sections are included in the modeling report and no justification is presented for the difference between the two formations and the way hydraulic conductivities were distributed within model domain. A reduction in the hydraulic conductivity in the northern portion of Rose Valley effectively separates Haiwee Reservoir from Rose Valley, resulting in a smaller Haiwee Reservoir seepage estimate. This might explain the underestimation of the water levels in LADWP wells by the model. At a minimum, a sensitivity analysis should be performed to evaluate the significance of hydraulic conductivity assignment in the accuracy of the model results. Increasing the hydraulic conductivity in the northern portion of the aquifer will increase the connectivity between Haiwee Reservoir and Rose Valley aquifer, which will result in a higher seepage estimate from Haiwee Reservoir to Rose Valley.

M1-8 To better evaluate the hydraulic conductivity in northern Rose valley, the Project analysis should include the installation of additional monitoring wells in that area of Rose Valley, carrying out additional pumping tests, possibly at LADWP wells, and recalibration of the model with the new data.

M1-9 Moreover, given the uncertainty in the model results, and to mitigate possible impacts from addition seepage from the City's Haiwee Reservoir, which will be induced by drawdown from Coso Hay Ranch extraction, the Project should assign trigger levels for LADWP wells in northern Rose Valley.

M1-10 As indicated on page C2-8 in Appendix C2, this DEIR assumes that 10 percent of precipitation on the Eastern Sierra Nevada Mountains contributes to groundwater recharge in Rose Valley, which amounts to approximately 4,200 acre-feet of water per

M1-10 year. In comparison, Danskin[1] assumed 6 percent recharge in Owens Valley, to the north, and Williams[2] assumed 8 percent recharge in Indian Wells Valley, to the south, from mountain front precipitation. The DEIR's overestimation of recharge results in the conclusion that more water is available for pumping than actually exists. Given the uncertainty in the amount of precipitation recharge, the DEIR should perform a sensitivity analysis of the model results to the amount of recharge actually coming from mountain front recharge.

M1-11 The DEIR fails to clarify why the groundwater discharge rates from Rose, Tunawee Canyon, Little Lake Fault, or Little Lake Canyon Springs are not represented in the model. Excluding these spring flows from the model will result in the conclusion that more water is available for extraction from Coso Hay Ranch than really exists.

M1-12 The model divides the Rose Valley aquifer into four distinct layers and describes the amount of extraction from Coso Hay Ranch wells. However, the modeling report does not specify from which model layer the pumped water is coming. The DEIR should clearly identify which model layer(s) are being utilized for analysis of the Project.

M1-13 Figures C2-5 through C2-7 show the model domain and boundary conditions. These Figures show the entire northern boundary of the model, for all four layers, as being constant head cells. With the exception of the cells in the model layer No. 1 that depict Haiwee Reservoir, the remaining cells in the northern boundary should not be represented as constant head cells since this forces more inflow from the north. The General Head Boundary is a more appropriate representation of the boundary conditions in the north.

M1-14 Section C2-4.2 describes the cumulative impact analysis. This section states: "The Cumulative Effects Analysis consisted of developing and running a transient model simulation scenario in which the Hay Ranch wells were pumped at the full project development rate of 4,839 acre-ft/yr plus pumping was simulated at the LADWP wells at a rate totaling 900 acre-ft/yr using MODFLOW well package." However, results of this analysis and discussion of the results are not presented in the DEIR. Therefore, the DEIR is inadequate by failing to analyze and describe the commutative impacts of the Project.

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[1] Danskin, W.R., 1998, "Evaluation of the Hydrologic System and Selected Water Management Alternatives in the Owens Valley", U.S. Geological Survey, Water –Supply Paper 2370, Chapter H

[2] Williams, D. V., 2004, "Hydrogeologic and Hydrochemical Framework of Indian Wells Valley, California: Evidence for Interbasin Flow in the Southern Sierra Nevada", Mater's Thesis, Colorado School of Mines, Golden, Colorado

M1-15 In summary, LADWP believes this DEIR fails to analyze significant impacts of the Project, which is a threat to the City's water rights.
M1-16 The DEIR also fails to identify any mitigation measures designed to protect the City's water rights.

If you have any questions regarding our comments, please contact Dr. Saeed M. Jorat of my staff at (213) 367-1119.

Sincerely,

Thomas M. Erb
Director of Water Resources

SMJ:ly

Enclosures

c: Mr. Chris Ellis, Coso Operating Co.
Mr. Gary Arnold, Little Lake Ranch, Inc.
Dr. Saeed M. Jorat

Exhibit A

September 15, 2006

Ms. Jan Larsen, Senior Planner
Inyo County Planning Department
P. O. Drawer L
Independence, CA 93526

Dear Ms. Larsen:

Subject: Conditional Use Permit No. 2005-03/Coso Operating Company LLC

Thank you for providing the Los Angeles Department of Water and Power (LADWP) the opportunity to review and comment on the Draft Mitigated Negative Declaration of Environmental Impact and Initial Study for the subject project. Because of the extent of the potential significant impacts from the proposed project, LADWP is requesting that an Environmental Impact Report (EIR) be prepared to analyze potentially significant impacts, some of which are outlined below.

The proposed project entails pumping approximately 4,800 acre-feet of groundwater per year for 20 years from Coso Hay Ranch and conveying it approximately nine linear miles to the Coso geothermal reservoir for use in the Coso geothermal power plant. Groundwater will be pumped from two existing wells on the Coso Hay Ranch property.

All answers on the Environmental Checklist form must take into account the whole action involved, including off-site as well as on-site, cumulative as well as project level, indirect as well as direct, and construction as well as operational impacts. LADWP believes that an inadequate level of environmental analysis has been conducted during the Environmental Checklist/Initial Study and that reasonably foreseeable impacts have not been addressed. The Initial Study, specifically Section VIII. Hydrology and Water Quality (b), did not consider the cumulative impacts of the proposed Coso Hay Ranch project on the groundwater supplies in relation to the adjacent Aquifer Storage and Recovery (ASR) project in Rose Valley. In Section VIII. Hydrology and Water Quality (i), concerning dam safety, the Initial Study does not address the potential significant impacts of the proposed Coso Hay Ranch project on the integrity of the nearby South Haiwee Dam, only potential storm events causing flooding. In light of these concerns, LADWP believes that further analysis in the form of an (EIR) is needed to determine potentially significant adverse impacts by the proposed Coso Hay Ranch Water Extraction and Delivery System project on nearby LADWP facilities.

The City of Los Angeles (City) owns approximately 400 acres in Rose Valley just north of the Coso Hay Ranch. The City also owns the Haiwee Reservoirs, located north of Rose Valley. Water from the reservoirs runs through two Aqueducts from the north along alluvial fans to the west of Rose Valley and flows south to Los Angeles. The City entered into a long-term agreement with Inyo County in 1991 regarding long-term management of water resources in the Owens Valley. The Long Term Water Agreement specifically recognized LADWP's potential development of new ground water banking and recharge facilities in Rose Valley.

In 1992, LADWP completed the first phase of an evaluation to develop the ASR project in Rose Valley. This study determined the suitability of the Rose Valley aquifer for an ASR project and recommended follow-up steps required for implementing this project. The proposed Coso Hay Ranch groundwater withdrawal project is located immediately to the south of LADWP's site for its ASR project. The groundwater modeling performed by Brown and Caldwell determined that as a result of the Coso Hay Ranch project, groundwater levels at the center of production will decline approximately 70 feet. At the northern boundary of the Coso Hay Ranch, the drawdown will be approximately 54 feet. Currently, the average ambient groundwater gradient in Rose Valley is only 10 feet per mile, making it a suitable site for LADWP's ASR project. Implementation of the proposed Coso Hay Ranch groundwater pumping project would double the groundwater gradient in the vicinity of LADWP's property in Rose Valley, effectively making the area unsuitable for the planned ASR project.

Your initial study has not evaluated possible impacts of the Coso Hay Ranch project to the groundwater gradient and to LADWP's planned ASR project in Rose Valley. An EIR should be prepared that fully evaluates these potential significant impacts, and identifies mitigation measures and/or alternatives that would minimize impacts to LADWP's planned ASR project in Rose Valley.

The groundwater modeling of Rose Valley performed as part of your initial study indicated that approximately 900 acre-feet of water leaked from South Haiwee Reservoir to Rose Valley every year. The water contained in South Haiwee Reservoir is intended for municipal use in the City of Los Angeles and, under well-settled water law precedent, no other entity has rights to its use. Implementation of the proposed project will limit LADWP's capability to recover the water leaked from South Haiwee Reservoir. An EIR should evaluate these impacts and identify mitigation measures and/or alternatives to the project that would not significantly impact LADWP's ability to recover leaked water from South Haiwee Reservoir.

The South Haiwee Dam was put into service in 1913 as part of the Los Angeles Aqueduct system. Since 1957, the maximum allowed water level behind the dam has been lowered several times for a total of 18 feet due to dam safety concerns. Your initial study has not evaluated potential significant impacts of the Coso Hay Ranch project on the South Haiwee Dam. Concerns that must be evaluated in an EIR include, but not limited to, hydro-consolidation and changing of groundwater hydraulic gradient under the South Haiwee Dam due to drawdown resulted from the proposed pumping at Coso Hay Ranch.

Please feel free to contact me at (760) 873-0225 if you have any questions or need clarifications.

Sincerely,

Original signed by Gene L. Coufal

Gene L. Coufal
Manager
Aqueduct Section

MT:lge
bc: James B. McDaniel
Thomas M. Erb
Richard F. Harasick
Gene L. Coufal
Clarence E. Martin
Brian Tillemans
Charlotte L. Rodrigues
Chuck C. Holloway
Mark J. Sedlacek
Milad Taghavi
Saeed M. Jorat

Exhibit B

October 15, 2007

Ms. Jan Larsen, Senior Planner
Inyo County Planning Department
P.O. Drawer L
Independence, CA 93526

Dear Ms. Larsen:

Subject: Notice of Preparation of a Draft Environmental Impact Report for Conditional Use Permit No. 2007-03, Coso Hay Ranch Water Extraction, Export, and Delivery System

Thank you for the opportunity to review and provide comments on the Notice of Preparation and the Environmental checklist form for the evaluation of environmental impacts for the above-mentioned project.

The Los Angeles Department of Water and Power is pleased that the potential impacts, as well as cumulative impacts, of the City of Los Angeles' South Haiwee Reservoir Leakage Recovery Project and the Coso Hay Ranch Water Extraction, Export, and Delivery System Project will be evaluated for the Little Lake and surrounding resources, as outlined in Section VIII (b) of the Inyo County Planning Department's Environmental Checklist.

The City of Los Angeles' Project consists of recovering approximately 900 acre-feet of leakage from the South Haiwee Reservoir, as identified in the Brown and Coldwell Groundwater Modeling Report for Conditional Use Permit No. 2005-03. The water will be pumped from an existing well and conveyed through an approximately 1,700-foot-long pipeline to the Los Angeles Aqueduct as shown on the enclosed map. The existing well is located on the City of Los Angeles' 400-acre property in Rose Valley, just north of Hay Ranch. The proposed 8-inch-diameter pipeline will be installed within the City of Los Angeles' property. The existing well is approximately 470 feet deep, with an 18-inch-diameter casing. The planned pumping rate from this well will be approximately 1.2 cubic feet per second.

Please feel free to contact me at (760) 873-0225 if you have any questions or need clarification.

Sincerely,

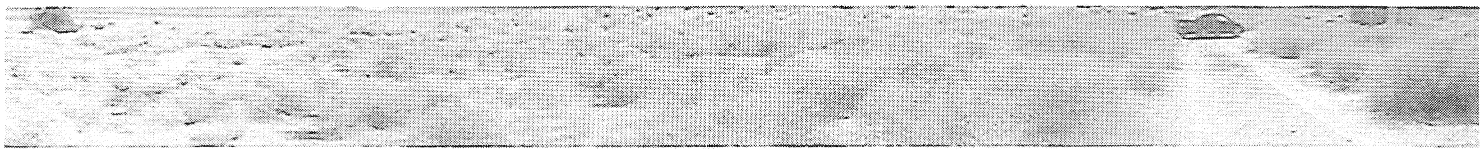
ORIGINAL SIGNED BY
GENE L. COUFAL

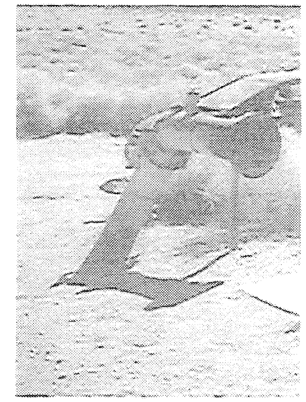
Gene L. Coufal
Manager
Aqueduct Section

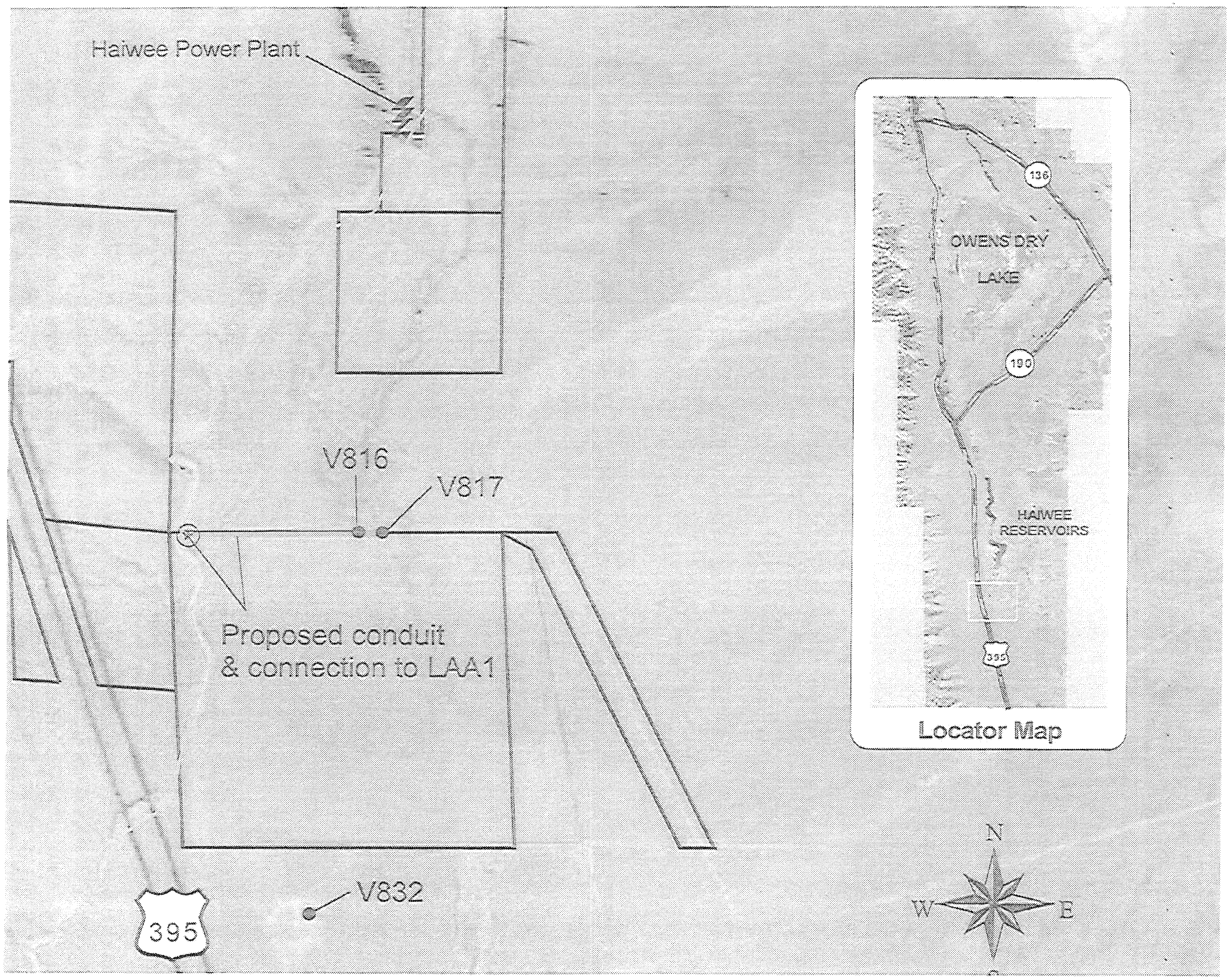
SMJ:rjm
Enclosure
c: Mr. Thomas A. Brooks
Inyo County Water Department
Mr. Joseph Greco
Caithness Operating Company

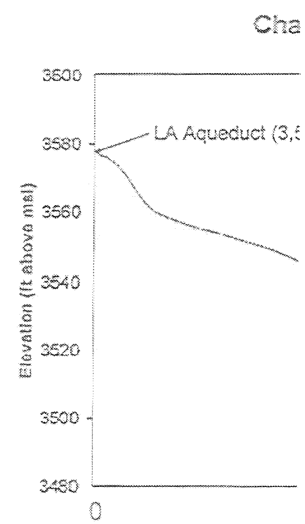
bc: James B. McDaniel
Thomas M. Erb
Milad Taghavi
Saeed M. Jorat
Gene L. Coufal
Clarence E. Martin
Charlotte L. Rodrigues
Brian B. Tillemans
Admin. File

FileNET









South H
Leakage

- Well
- Prop
- LA A

Exhibit C

July 25, 2007

Mr. Thomas A. Brooks, Director
Inyo County Water Department
163 May Street
Bishop, CA 93514

Dear Mr. Brooks:

Subject: South Haiwee Reservoir Leakage Recovery Project

The Los Angeles Department of Water and Power (LADWP) would like to discuss with you our desire to move forward with recovering approximately 900 acre-feet of water leakage from the South Haiwee Reservoir.

The South Haiwee Reservoir is located just to the north of Rose Valley and has been owned and operated by LADWP since 1913. Part of the water stored in the reservoir is lost due to leakage through the dam and from the bottom of the reservoir and moves southward to the Rose Valley groundwater aquifer. Estimates of the leakage amount can be made utilizing either analytical methods or numerical groundwater models.

According to the results of a modeling effort by Brown and Caldwell Consulting Company as part of the Initial Study and Mitigated Negative Declaration (MND) for Conditional Use Permit No. 2005-03/Coso Operating Company LLC (Coso Hay Ranch Water Extraction and Delivery System) which was approved by the Inyo County Planning Commission on December 14, 2006, approximately 900 acre-feet of recharge to the groundwater aquifer in Rose Valley is from leakage from the Haiwee Reservoir.

The recovery project includes equipping and pumping LADWP's existing well(s) in the vicinity of the South Haiwee Reservoir dam at the rate of approximately 1.2 cfs and piping the recovered water back to the Los Angeles Aqueduct. The required piping will be constructed within LADWP's property. This recovery project is consistent with Section 106 of the California Water Code which declares that the use of water for domestic purposes is the highest use of water.

Additionally, according to the Coso Hay Ranch Water Extraction and Delivery Project as approved by the Inyo County Planning Commission, pumping of 4,800 acre-feet of groundwater per year for 20 years from wells in Hay Ranch located just to the south of LADWP's property in Rose Valley would not have a significant effect on the environment. Therefore, it would appear that the Inyo County Planning Commission's earlier determination would govern LADWP's proposed recovery project which is less than 20 percent of the Coso Hay Ranch Water Extraction and Delivery Project.

I will contact you within the next few days to set up a meeting to discuss our proposed recovery project. Meanwhile, should you have any questions, please contact me at (760) 873-0225.

Sincerely,

ORIGINAL SIGNED BY
GENE L. COUFAL

Gene L. Coufal
Manager
Aqueduct Section

MT/SMJ:lge

c: Ms. Jan Larsen, Inyo County Planning Department
Mr. Chris Ellis, Coso Operation Company, LLC

bc: Joseph Brajevich
S. David Hotchkiss
Julie Riley
Jack Brown
James B. McDaniel
Thomas M. Erb
Gene L. Coufal
Clarence L. Martin
Charlotte L. Rodrigues
Milad Taghavi
Saeed M. Jorat

Exhibit D

bc: James B. McDaniel
Thomas M. Erb
Milad Taghavi
Saeed M. Jorat
Gene L. Coufal
Clarence E. Martin
Charlotte L. Rodrigues
Brian B. Tillemans
Admin. File

November 1, 2007

Mr. Thomas A. Brooks, Director
Inyo County Water Department
163 May Street
Bishop, CA 93514

Dear Mr. Brooks:

Subject: South Haiwee Reservoir Leakage Recovery Project

This is in response to your August 23, 2007 letter requesting additional information on the Los Angeles Department of Water and Power's (LADWP) South Haiwee Reservoir Leakage Recovery Project.

Rose Valley is located to the south of the City of Los Angeles' Haiwee Reservoir Complex which consists of North and South Haiwee Reservoirs and the Haiwee Hydroelectric Power Plant. The construction of these reservoirs was completed in 1913 to provide storage and flow control for the First Los Angeles Aqueduct (LAA1) operations. These reservoirs also provide the needed storage and flow control for the Second Los Angeles Aqueduct operations.

The South Haiwee Reservoir is approximately 105 acres in area, with inflow from North Haiwee Reservoir. As is typical of reservoirs with earthfilled dams, South Haiwee Reservoir has been leaking water through the bottom and through its dam.

Leakage Estimate

According to the Brown and Coldwell Groundwater Modeling Report (Report) which was prepared for the Inyo County Planning Commission prior to issuance of Conditional Use Permit No. 2005-03, approximately 900 acre-feet of water is leaking from the South Haiwee Reservoir into Rose Valley groundwater aquifer.

LADWP does not have any reasons to doubt the accuracy of the Report's leakage estimate; however, in order to comply with your request, LADWP is working on independently verifying the leakage estimate from the South Haiwee Reservoir into the Rose Valley groundwater aquifer. We expect that a leakage estimate from this evaluation will be available by January 7, 2008. Unless information from this evaluation significantly contradicts the results from the Report, LADWP's Project will be based on recovery of approximately 900 acre-feet of water leakage from South Haiwee Reservoir.

Leakage Recovery Project

The City of Los Angeles owns a 160-acre former alfalfa field at the northern end of Rose Valley along with other properties in the area. This 160-acre property was acquired on or about 1988 to partly accommodate LADWP's Rose Valley Aquifer Storage Project. The Phase 1 feasibility study for Rose Valley Aquifer Storage Project was completed in January 1992.

There are two existing wells (Wells V816 and V817) on this 160-acre property which were used to irrigate and grow alfalfa. Both of these wells were recently video logged. Specifications of each well, as observed in the video log, are shown on the table below.

Well number	Total depth (ft)	Casing Diameter (in)	Screen interval (ft)	Casing material	Comment
V816	380	18	297-380	Fiber Glass	Damaged casing
V817	470	18	290-465	Steel	Good condition

Ground elevation near both wells is roughly the same, and depth to water was approximately 70 feet from the top of the casing.

Well V817 will be utilized for recovery of leakage water from the South Haiwee Reservoir since the Well V816 casing is damaged.

As shown on the enclosed map, Well V817 is located approximately 1,700 feet east of the LAA1. The elevation difference between the top of Well V817 and the LAA1 is 64 feet. Utilizing an 8-inch-diameter pipeline, the friction loss will be approximately 10 feet. Therefore, to pump and transport leakage recovery water from Well V817 to the LAA1, approximately 74 feet of head is required at the well head. This head could be produced by either the pump in the well or a booster pump at the surface.

The pipeline and associated appurtenance will be installed in the vicinity of the existing unimproved access road located within the City of Los Angeles' property as shown on the enclosed map. The pipeline will be installed with a minimum of 18 inches of cover or as otherwise required.

There are two potential sources of electrical power for the Project. The power may be provided to the Project from the Haiwee Hydroelectric Power Plant or through a low-sulfur stationary generator. If power is provided from the Haiwee Hydroelectric Power Plant, approximately 5,400 linear feet of electrical overhead facilities must be installed along the existing LAA1 right-of-way from the Haiwee Hydroelectric Power Plant to Well V817.

Power may also be provided through a more direct alignment to Well V817 from the Haiwee Hydroelectric Power Plant requiring the installation of approximately 3,100 linear feet of electrical overhead facilities. Under this alternative, approximately 1,600 linear feet of right-of-way grant must be obtained from the U.S. Department of Interior, Bureau of Land Management, for installation, maintenance, and operation of electrical overhead facilities.

If power is provided from a low-sulfur stationary generator, the generator will be installed within 30 feet radii of the well head or as otherwise required by existing regulations. The immediate area within the well head, pump, and low-sulfur stationary generator, if utilized, will be fenced off using standard 6-foot-high chain link fence.

The planned pumping rate from Well V817 will be approximately 1.2 cubic-feet-per-second, and the water will be used for municipal purposes.

If you have any questions, please feel free to contact me at (760) 873-0225.

Sincerely,

ORIGINAL SIGNED BY
GENE L. COUFAL

Gene L. Coufal
Manager
Aqueduct Section

MT/SMJ:lge
Enclosures

c: Ms. Jan Larsen, Inyo County Planning Department
Mr. Joseph Greco, Caithness Operating Company

M1 **Thomas M. Erb**
City of Los Angeles Department of Water and Power
Box 51111
Los Angeles, California 90051-5700

M1-1 The comment is noted regarding identification of mitigation and potentially significant impacts. Please refer to Master Response C7 for a discussion of water rights. Water rights issues are beyond the requirements for analysis under CEQA. The Draft EIR explains, however, that all potentially significant environmental impacts to hydrology would be mitigated to levels below significance.

M1-2 Analysis conducted for the Draft EIR was not completed under the assumption that groundwater inflow into the north end of Rose Valley was solely comprised of seepage from Haiwee Reservoir; rather, the groundwater inflow is believed to be a mixture of groundwater underflow from Owens Valley and seepage from the Reservoir. The modeling analysis does assume that a constant groundwater elevation will be maintained at the north end of Rose Valley for the entire simulation period, because of the distance from the Hay Ranch pumping (over 4 mi) and because of the low permeability of soils that are apparently present at the northern end of Rose Valley.

CEQA requires the evaluation of baseline conditions at the time of the NOP. The baseline conditions in the Rose Valley include the effects on the Rose Valley Aquifer from the Haiwee Reservoir Complex. The reservoirs are unlined and any water recovery project implemented by the LADWP in the future would require environmental review for the effects to the Rose Valley. Draining the reservoir, lining the reservoir, or capturing seepage from the reservoir would likely lower the groundwater elevation in the vicinity of the reservoir and reduce associated groundwater inflow into Rose Valley. The amount of recharge to the Rose Valley would be reduced by approximately 18% if the LADWP captures the entire 900 ac-ft/yr of estimated groundwater seepage from the north.

It is questionable whether groundwater that seeps into the Rose Valley aquifer from the Haiwee Reservoirs has any different legal status than water that enters the aquifer from elsewhere. Any asserted ownership of this water is not relevant to the analysis in this EIR. The background level calculated for the aquifer would be reduced accordingly and the rat of pumping adjusted, to the extent that less water enters Rose Valley from the Haiwee Reservoir area in the future. Changes in aquifer levels would be detected through the HMMP.

Please refer to Master Response K2 for a discussion of cumulative impacts from LADWP activities and the proposed Hay Ranch groundwater extraction project.

M1-3 Please refer to Master Response K2. The cumulative impacts of the Hay Ranch project and implementation of the SHRSR project were evaluated with respect to potential impacts on groundwater levels throughout Rose Valley, and the results are discussed in Section 4.3.2: Hydrology and Water Quality. Cumulative impacts of the ASR project were not evaluated because this project is only conceptual and no application with a description of the project has been submitted to the County (or appropriate permitting agencies) in the 16 years since the initial feasibility study was completed. No modeling can be performed without additional information.

M1-4 Please refer to Master Response K2. With implementation of mitigation for the Hay Ranch project, the project would not cause a significant decline in the groundwater gradient. A 3-ft decline at the LADWP wells is predicted with implementation of mitigation (as opposed to 55 ft without mitigation). This small amount of drawdown would not render an ASR project infeasible in terms of requiring deeper wells, more power for pumping, etc.

There is no requirement and it is not possible to extensively evaluate the ASR proposal, as it is speculative in nature. There has been no application with the Inyo County Water Department for such a project and no detailed explanation about how such a proposal would operate. The LADWP would be required to describe the project to and negotiate the extent of the project with Inyo County should the LADWP decide to pursue such a project. The LADWP would also be required to conduct CEQA analysis on the project and mitigate any significant environmental impacts from the project. It is unlikely that such a project could legally proceed if it created a significant additional effect to the environment. It is unlikely that the project would create significant cumulative impacts combined with the Hay Ranch withdrawals because the ASR project would, in concept, add water to the aquifer to be withdrawn later.

M1-5 Please refer to Master Response C2.4. It is acknowledged on page 3.2-17 of the Draft EIR that the 900 ac-ft/yr estimate of groundwater inflow from the north is likely an underestimate, and there are proposed studies in Appendix C4 to further characterize that influx. It is unlikely that the entire inflow from the north is attributable to seepage from the Haiwee Reservoirs. The origin of the groundwater entering the Rose Valley aquifer from the north has little impact on the environmental analysis here. The hypothetical reduction in groundwater entering Rose Valley would be accounted for in the background water availability for the project, should the LADWP introduce more efficiency in its reservoir system. Coso is only allowed to reduce the amount of water available to Little Lake Reservoir (the primary area that can be affected) by 10%. Coso would have to reduce it pumping to remain within the 10% criteria if the total amount of water available is reduced.

Table 3.2-6 indicates that development of the Hay Ranch project would increase the groundwater inflow from the north by an estimated 26 ac-ft/yr for pumping at the full project rate for the full 30 years. Implementation of mitigation further limits the pumping duration based on groundwater drawdown trigger levels. The proposed project would not significantly increase seepage from Haiwee Reservoir as explained in Master Response C2.4.

M1-6 A copy of the model input files can be provided to the LADWP through the Inyo County Planning Department.

M1-7 See Master Response C2.2 Aquifer Hydraulic Properties, Hydraulic Conductivity. From a hydrologic standpoint, the only possible explanation for the large difference in hydraulic head between the LADWP wells and the Cal-Pumice Mine well are perched water at the LADWP wells and a much lower transmissivity around the LADWP wells.

M1-8 Additional monitoring wells in the north end of the valley would be useful in the event LADWP were to gain approval for one of its proposed projects. However, even in the absence of pumping at Hay Ranch, the LADWP's SHRSR project would likely have substantial adverse impacts on groundwater levels in Rose Valley and surface water features at Little Lake Ranch, as discussed in Section 4.3.2, Hydrology and Water Quality of the Draft EIR. The LADWP would be responsible for installation of any additional monitoring wells in the north end of the valley and to conduct these pumping tests to evaluate the environmental effects of the ASR and SHRSR projects. The LADWP has not submitted an application for the ASR projects and the details of the project are not yet presented in enough detail to perform modeling. CEQA does not require that an applicant perform tests to evaluate impacts to a future speculative project.

M1-9 It is unnecessary to set trigger levels for LADWP wells in northern Rose Valley because there are no pumps in the wells, and no groundwater extraction from those wells. CEQA does not require that an applicant perform tests to evaluate impacts to a future speculative project. There is no indication that pumping at the Hay Ranch wells would increase seepage from Haiwee Reservoir. Impacts are assessed on the baseline condition established at the time of distribution of the NOP. Cumulative analysis of the LADWP projects is discussed in Master Response K2.

M1-10 Danskin (1998) included separate recharge components for recharge resulting from precipitation on fan heads, mountain front recharge along the areas between streams, and recharge from stream channels. In the Rose Valley model, all of these components are lumped together as mountain front recharge. The comparison of Danskin's 6% and the Rose Valley model's 10% is a comparison of different parameters. Williams (2004) used a value of 7% for total mountain front precipitation for the El Paso Valley which drains to the Indian Wells Valley, but noted that this would be a conservatively low estimate for Rose Valley because the Sierra Nevada adjacent to Rose Valley is in a higher and wetter zone than that adjacent to Indian Wells Valley. Williams estimated the total water flux from Rose Valley to Indian Wells valley, including surface water flow discharging from the spring, lake, and siphon well and subsurface groundwater flow, to be approximately 6,040 acre-ft per year (compared to 5,092 ac-ft/year used in the Hydrology Model). Consequently, the recharge values used in the hydrologic model appear to reasonable and conservative.

M1-11 Rose Spring is dry, with a flow rate equal to zero. Therefore it should not be represented. Little Lake Fault spring is outside the model grid to the south, and Tunawee Canyon Spring is outside the model to the west. No flow measurement data were identified for Little Lake Canyon spring; however, outflow flow from this spring, if present, likely re-infiltrates minus some evaporation, and re-enters the groundwater system. This is not estimated to be a significant loss of water availability.

M1-12 The two Hay Ranch wells extract groundwater from model layers 1 and 2, only.

M1-13 Please refer to Master Response C2.4 for a discussion of boundary conditions. The Rose Valley model distributes recharge in proportion to aquifer thickness across layers 2, 3, and 4. As a basin-scale water balance model, the main factor in the simulations is the amount of recharge, not the vertical location of recharge input.

M1-14 The results and analysis are presented on Page 4-7 of the Draft EIR. Please refer to Master Response K2, for additional discussion of the evaluation of the cumulative effects of the proposed project with LADWP projects.

M1-15 The project would not have significant impacts on the existing LADWP systems. Future projects (that are speculative at this time) to be performed by the LADWP would require additional environmental analysis prior to their approval. The cumulative projects considered include those projects for which an application has been submitted and could overlap to cause cumulative effects in the project area.

The purpose of CEQA analysis is to identify impacts to the environment from a proposed project. Water rights issues are beyond the scope of the EIR, and are beyond the jurisdiction of Inyo County. Should the LADWP establish that the applicant does not own sufficient water rights to conduct its operations, those operations would necessarily be curtailed without reference to the permit approval or the associated EIR.

M1-16 The project includes mitigation and a mitigation plan to minimize impacts to groundwater hydrology in the Rose Valley and ensure all impacts remain less than significant. Refer to Chapter 3.2 Hydrology and Water Quality and Appendix C of the Draft EIR. An extensive MMRP is proposed and mitigation requires considerable reduction in the amount of pumping.

NG1

August 18, 2008

Inyo County Planning Department
168 N. Edwards Street
P. O. Drawer L
Independence, CA 93526

Re: Coso Project
Conditional Use Permit No. 2007-03

Dear Planning Department:

The purpose of this letter is to express the intent of the California Waterfowl Association (CWA) to provide comments on the Draft Environmental Impact Report (DEIR) for the proposed Water Pumping and Transfer Project by Coso Operating Company (Coso). I regret that we are unable to attend the public hearing for the initial review on August 20; this is due to time constraints and logistics, not because this issue is unimportant. CWA views all avoidable loss of wetland habitat seriously, and we plan to submit more detailed comments prior to the September 6 deadline. CWA is a charitable 501(c)(3) organization dedicated to conserving California's waterfowl, wetlands, and outdoor heritage, representing the interests of over 21,000 members statewide.

California has lost more than 95% of its historic wetlands, largely due to urbanization, flood control and agriculture. As a result, many species have declined from historic levels, and are increasingly dependent on fewer wetlands. Despite these tremendous habitat losses, California arguably remains the most important wintering area for waterfowl and other waterbirds in the Pacific Flyway. Avian species from the north, some as far as Alaska and the Canadian Arctic, rely on our wetlands for nutritional and other needs while visiting during the winter. In addition, many resident bird species nest within or near local wetland habitats.

The importance of wetland habitat in California is now recognized and policies have changed to insure conservation of existing wetlands and restoration of additional wetland acres. In 1993, Governor Wilson signed Executive Order W-59-93, to "ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property".

NG1-1 The proposed Coso project is not consistent with this Executive Order or national "no net loss" wetlands policies, because it could have long-term and unmitigated detrimental effects to the wetlands and uplands of Rose Valley. The DEIR presumes that a 10% loss of the water resources at Little Lake is not significant. However, any loss of water in the

NG1-1 Rose Valley Basin, even 10%, can impact the water table and wetland levels and functions.

NG1-2 We have too few wetlands remaining in California to jeopardize losing the ecological and wildlife values of Little Lake and other critical wildlife habitat of the Rose Valley Basin, and respectfully request the Conditional Use Permit not be granted.

Sincerely,

Gregory S. Yarris
Director of Conservation Policy

NG1 Gregory S. Yarris
California Waterfowl Association
4630 Northgate Blvd., Suite 150
Sacramento, California 95834

NG1-1 Please refer to Master Response E2 for discussion of impacts to wetlands and the significance of impacts to wetlands. Mitigation is proposed to minimize effects to wetlands. The 10% significance threshold is for reduction in groundwater inflow to Little Lake only, and this 10% is within the natural variation that occurs at Little Lake. While it is noted that any loss of water can impact the water table and wetland levels, there appears to be some flexibility in the management of the wetland at Little Lake. Little Lake currently exports some of their water (approximately 6 ac-ft/yr) to a nearby pumice mine for non-wetland and consumptive uses. This exportation constitutes a loss of water, while they are still able to maintain the wetlands. Further explanation is provided in Master Response E2.

NG1-2 Objection to the project is noted.

GEOTHERMAL ENERGY ASSOCIATION

209 Pennsylvania Avenue SE, Washington, D.C. 20003 U.S.A.
Phone: (202) 454-5261 Fax: (202) 454-5265 Web Site: www.geo-energy.org

August 25, 2008

Inyo County Planning Department
P.O. Drawer "L"
Independence, CA 93526

RE: COSO OPERATING COMPANY HAY RANCH WATER EXTRACTION AND DELIVERY SYSTEM, CONDITIONAL USE PERMIT (CUP 2007-003) APPLICATION SCH# 2007101002

Dear Sir/Madam:

NG2-1

On behalf of the Geothermal Energy Association, I would like to convey our support for the Coso Hay Ranch geothermal water augmentation project whose Conditional Use Permit is now under review by the Inyo County Planning Department.

This proposed project will supplement other ongoing projects and represent a positive step in California's efforts to increase its use of renewable energy. It will contribute to meeting the state's goal of achieving 20% renewable energy utilization by 2010, as well as support national energy and environmental policy objectives of expanding the use of renewable resources, reducing greenhouse gas emissions, and enhancing our country's energy independence.

For these reasons, we urge the Planning Department to complete its review and approve the Conditional Use Permit for the Coso Hay Ranch project as soon as possible.

Sincerely,

Karl Gawell
Executive Director

NG2 **Karl Gawell**
Geothermal Energy Association
209 Pennsylvania Avenue SE
Washington, District of Columbia 20003

NG2-1 Support of the project is noted.

NG-3

DUCKS UNLIMITED

WESTERN REGIONAL OFFICE
3074 Gold Canal Drive
Rancho Cordova, CA 95670-6166
916-852-2000 916-852-2200 (fax)
www.Ducks.org

August 29, 2008

Tanda Gretz
Inyo County Planning Department
P.O. Box L
168 N. Edwards Street
Independence, CA 93526

RE: Hay Ranch Water Extraction and Delivery System Project (EA Number CA-650-2005-100) on Little Lake Ranch

Dear Ms. Gretz:

The Hay Ranch Water Extraction and Delivery System Project proposed by Coso Operating Company, LLC (COSO) is currently undergoing environmental review
NG3-1 by the Inyo County Planning Department (EA Number CA-650-2005-100). Ducks Unlimited's (DU) wetlands experts believe that water extraction from Rose Valley aquifer proposed by this project will have adverse impacts on the unique and sensitive wetlands of Little Lake Ranch (LLR) that now provide species habitat.
NG3-2 In addition, because federal, state and private funds were used to enhance species habitat on LLR, the proposal by Coso could involve possible legal ramifications on habitat conservation projects and requirements to maintain those projects.
NG3-3 As a result, we request that the Inyo County Planning Department reject the Hay Ranch Water Extraction and Delivery System Project as currently proposed due to the impacts we believe the proposed water extraction from the Rose Valley aquifer would have on LLR's wetlands habitat. Our detailed comments are listed below.

NG3-4 Little Lake Ranch consists of more than 1,200 acres and is managed to provide species habitat and wildlife-oriented recreation. The property provides vital wintering habitat for many wetland-dependent species and serves as an important stopover site for many migrants. More than 150 species of birds have been observed there. Much of the wetland habitat that historically occurred in the region has been lost to water diversions and agricultural conversion. Little Lake at LLR is one of the few sizable wetland sites remaining along the eastern Sierras. It receives more use by diving ducks than any other wetland in the eastern Sierra region. In addition to Little Lake, the five other wetland areas on LLR are spring-fed. The wetlands and adjacent areas of LLR provide vital habitat for species, making the area an oasis in the desert for a diversity of waterfowl, shorebirds, neotropical migratory songbirds, and other wildlife.

State and Federal agencies, along with non-governmental conservation organizations and private individuals have entered into partnership to protect and improve LLR's habitat for species. Through this partnership over 300 acres of habitat have been restored or protected on LLR, including work to protect the water supply to wetlands. This was done through constructing water structures, recontouring land, installing a water conveyance and control system, establishing a riparian corridor, removing non-native vegetation, installing rock and straw waddles for erosion control, planting native riparian and upland vegetation, and seeding seasonal wetlands to facilitate faster establishment of wetland species. This
NG3-4 effort protected and improved habitat quality for numerous wetland, riparian, and upland-associated species, including providing habitat for three avian species that are state and/or federally listed as threatened or endangered.

The Inyo County Board of Supervisors supported this work to provide species habitat by writing a letter to help acquire funding for improvements. In total, 11 partners, including 6 state and federal agencies, paid for this species protection work on LLR. In addition, LLR has continued funding management of the habitat and maintenance of the water conveyance system that supports the species habitat.

As a condition of government funding of this species habitat work, there is a legal obligation to maintain and protect the habitat improvements. Ducks Unlimited
NG3-5 wetlands experts believe the proposed Hay Ranch Water Extraction and Delivery System Project would impact the water resources upon which the LLR wetlands and species habitat depend.

Therefore, we request that the Inyo County Planning Department reject the Hay Ranch Water Extraction and Delivery System Project as currently proposed due
NG3-6 to the impacts we believe COSO's proposed water extraction from the Rose Valley aquifer would have on LLR's wetlands habitat.

Ducks Unlimited works with a broad array of local, state and federal agencies to conserve, restore, and manage wetlands and associated habitats for waterfowl in California and throughout North America. Our over one million members, supporters, and volunteers have invested over $2.32 billion to conserve almost 12 million acres in North America, including about 700,000 acres in California, since
NG3-7 DU was formed in 1937. With the historic loss of over 95% of California's wetlands, we can ill afford to lose any more. We have been engaged in habitat conservation and improvement work at LLR since February 2000, because of the importance of the area to waterfowl and other wetland-dependent wildlife.

If you have any questions regarding DU's concerns, please contact Mark Biddlecomb, Director of Conservation, or Virginia Getz, Manager of Conservation Pro-

NG3-7 grams, at (916) 852-2000. Alternately, you can reach Mr. Biddlecomb and Ms. Getz by e-mail at mbiddlecomb@ducks.org and vgetz@ducks.org, respectively. Thank-you for considering our concerns.

Sincerely,

Rudolph A. Rosen

Rudolph A. Rosen, Ph.D.
Director, Western Regional Office

cc: Curt Taucher – DFG
Michael Haynie - DFG
John Donnelly – WCB
Dave Smith – IWJV
Debra Schlafmann – USFWS
Ken Kriese – NAWCA
Bill Dunkelberger - BLM
Gary Arnold – LLR
Daniel Tolbert – LLR

NG3 **Rudolph A. Rosen**
Ducks Unlimited
Western Regional Office
3074 Gold Canal Drive
Rancho Cordova, California 95670-6166

NG3-1 Please refer to Master Response E2 for discussion of potential impacts to wetlands. The project would not have a significant impact on wetlands with implementation of the proposed mitigation.

NG3-2 Please refer to Master Response E2 for a discussion of potential impacts to Little Lake/habitat restoration efforts and habitat plans. The project would not have a significant impact on wetlands with implementation of the proposed mitigation. The wetlands at Little Lake would not dry and would not experience a change in wetland species or type as a result of the proposed project with mitigation. The system at Little Lake includes flexibility in management of Little Lake, and the significance criteria set for impacts to Little Lake are based in the natural variation already experienced at Little Lake Ranch. Wetlands would not be significantly impacted and the ability for Little Lake Ranch to meet habitat restoration requirements would not be significantly impacted with implementation of the proposed project with mitigation.

NG3-3 Objection to the project is noted.

NG3-4 The comment is noted regarding background, historic, and observational information provided on Little Lake.

NG3-5 Please refer to Master Response E2 for a discussion of potential impacts to wetlands. The project would not have a significant impact on Little Lake wetland habitats with implementation of the proposed mitigation.

NG3-6 Objection to the project is noted.

NG3-7 The comment regarding background information on Ducks Unlimited is noted.

NG4

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PLANNING DEP...

August 29, 2008

Ms. Tanda Gretz
Inyo County Planning Department
P. O. Box L
168 N. Edwards Street
Independence, CA 93526

RE: (EA Number CA-650-2005-100) Hay Ranch Water Extraction and Delivery System Project on Little Lake Ranch

Dear Ms. Gretz:

NG4-1 The California Outdoor Heritage Alliance (COHA), a nonprofit organization dedicated to promoting wildlife conservation and protecting our hunting heritage, is strongly opposed to extracting water from the Rose Valley aquifer as proposed by the Hay Ranch Water Extraction and Delivery System Project. We firmly believe that this water extraction will negatively impact the extremely valuable and sensitive wetlands, and wetland dependent species currently found on Little Lake Ranch.

NG4-2 Little Lake Ranch consists of more than 1,200 acres of intensely managed wetlands and uplands that provide key wildlife habitat and wildlife dependent recreational opportunities. The property provides wintering habitat for many wetland dependent species and serves as an important stopover for the Pacific Flyway. With over 95% of California's wetlands destroyed, Little Lake Ranch is one of only a handful of wetlands that remain due in large part to water diversions and agricultural conversion.

For nearly a decade, State and Federal agencies, along with non profit conservation organizations and private individuals have entered into public-private partnerships to protect and improve the wildlife habitat on Little Lake Ranch. Through these important partnerships hundreds of acres of habitat have been restored and protected. These wetlands now provide additional habitat for numerous wetland and upland dependent species, including providing habitat for species that are state and/or federally listed as threatened or endangered. Much of this work would not have been accomplished without generous private, as well as public funding.

NG4-3 In conclusion, the proposed Hay Ranch Water Extraction and Delivery System Project will ultimately reduce the water supply to Little Lake Ranch wetlands and significantly harm wetland dependant species. For these reasons, we strongly urge the Inyo County Planning Department to reject the Hay Ranch Water Extraction and Delivery System Project as currently proposed due to the negative impacts that would occur under the proposed water extraction from the Rose Valley aquifer.

Sincerely,

Bill Gaines
President

cc: Gary D. Arnold, Esq.
Mike Eberhard

NG4 **Bill Gaines**
California Outdoor Heritage Alliance
1600 Sacramento Inn Way, Suite 232
Sacramento, California 95815

NG4-1 Objection to the project is noted. The project would not have significant impacts on wetlands with implementation of mitigation. Please refer to Master Response E2 for additional discussion of impacts to wetlands.

NG4-2 The background information provided on collaborative efforts towards wetland restoration is noted.

NG4-3 Objection to the project is noted. Please refer to Master Response E2 for discussion of impacts to wetlands and wetland dependent species.

NG5

INDEPENDENT ENERGY PRODUCERS

September 4, 2008

Inyo County Planning Department

P.O. Drawer "L"

Independence, CA 93526

Re: Coso Operating Company Hay Ranch Water Extraction and Delivery, Conditional Use Permit (CUP 2007-003); application #2007101002

Dear Sir/Madam:

Independent Energy Producers Association (IEP) is California's oldest and leading nonprofit trade association, representing the interest of developers and operators of independent energy facilities and independent power marketers. IEP members collectively own and operate approximately one-third of California installed generating capacity, which includes renewable products derived from biomass, geothermal, small hydro, solar, and wind, producers of highly efficient cogeneration and owners/operators of gas-fired merchant facilities.

NG5-1

Coso Hay Ranch has put forth an application for a Conditional Use Permit ("CUP") to allow ground water pumping from the Hay Ranch property for injection into the Coso geothermal reservoir to stabilize and enhance reliable renewable electrical production. This water augmentation project is very important for meeting the State of California Renewable Portfolio Standard ("RPS") which encourages the utilization of renewable energy to supply the electrical requirements of the State. The State of California has set an aggressive RPS goal of achieving production of 20% of the State's electricity demand from renewable sources by 2015.

The above reference project will enhance the generation of electricity from the Coso geothermal resource for utilization within the State. This will serve to help achieve an important goal of the RPS by improving air quality and reducing greenhouse gas emissions by displacing the demand for the fossil-fueled resources that would otherwise be utilized to supply the equivalent amount of electricity to meet demand in the State and thereby reducing our nation's dependence on foreign oil.

We therefore strongly encourage the County of Inyo to approve the Coso Hay Ranch Conditional Use Permit.

Sincerely,

Jan Smutny-Jones

Executive Director

NG5 **Jan Smutny-Jones**
Independent Energy Producers
1215 K Street, Suite 900
Sacramento, California 95814

NG5-1 Support of the project is noted.

CALIFORNIA WATERFOWL

September 4, 2008

Inyo County Planning Department
168 N. Edwards Street
P. O. Drawer L
Independence, CA 93526

Re: Coso Project
Conditional Use Permit No. 2007-03

Dear Planning Department:

The purpose of this letter is to express the concerns of the California Waterfowl Association (CWA) on the Draft Environmental Impact Report (DEIR) for the proposed Water Pumping and Transfer Project by Coso Operating Company (Coso). CWA is a charitable 501(c)(3) organization dedicated to conserving California's waterfowl, wetlands, and outdoor heritage, representing the interests of over 21,000 members statewide.

California has lost more than 95% of its historic wetlands, largely due to urbanization, flood control and agriculture. As a result, many species have declined from historic levels, and are increasingly dependent on fewer wetlands. Despite these tremendous habitat losses, California arguably remains the most important wintering area for waterfowl and other waterbirds in the Pacific Flyway. Avian species from the north, some as far as Alaska and the Canadian Arctic, rely on our wetlands for nutritional and other needs while visiting during the winter. In addition, many resident bird species nest within or near local wetland habitats.

The importance of wetland habitat in California is now recognized and policies are
NG6-1 changing to insure conservation of existing wetlands and restoration of additional wetland acres:

1) Through the passage of Senate Concurrent Resolution 28 (January 1, 1983), the Legislature, in recognition of the importance of wetlands, indicated its "intent to preserve, protect, restore and enhance California's wetlands and the multiple resources which depend upon them for the benefit of the people of the State".

2) In 1993, Governor Wilson signed Executive Order W-59-93, to "ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property".

4630 Northgate Blvd., Suite 150, Sacramento, CA 95834
916.648.1406 • www.calwaterfowl.org

3) The State Fish and Game Commission policy states (Amended 8/18/05):
"...it is the policy of the Fish and Game Commission to seek to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California".

4) On April 15, 2008, the State Water Resources Control Board adopted Resolution No. 2008-0026, "Development of a Policy to Protect Wetlands and Riparian Areas in Order to Restore and Maintain the Water Quality and Beneficial Uses of the Water of the State".

NG6-1 On November 14, 2000, the Inyo County Board of Supervisors also recognized the importance of restoring and maintaining wetlands in the state of California, and locally. They submitted a letter to the U.S. Fish and Wildlife in support of the "Upper Little Lake Habitat Restoration Improvement Plan". (Appendix F, Coso DEIR). They were not the only group who thought this was a great opportunity; 11 other private and government entities also pledged their support for the project. Ultimately, about $500,000 of public and private funds was spent on this habitat restoration project as it overwhelmingly proceeded forward. The project still functions as intended, providing wetland and upland habitat for a myriad of wildlife species.

NG6-2 I have reviewed the proposed Coso project, and concluded that it jeopardizes the cooperative effort to restore Little Lake that began almost 10 years ago. The proposed project is not consistent with state wetland policies, or the intention of the Inyo County Supervisors when they voiced there support for the Little Lake Project in 2000. The assertion that something less than a 10% loss in water resources is not significant is the primary basis for my contention.

As stated in the DEIR, "The relationship between groundwater withdrawal at Hay Ranch and impacts to Little Lake are Complex", and that "The existing groundwater model predicts that the project as proposed (pumping at a rate of 4,839 ac-ft/yr for 30 years) would have a significant impact on water availability at Little Lake Ranch." There is considerable uncertainty as to the eventual effects of pumping on water levels, and caution in favor of wetlands and wildlife in the face of uncertainty is prudent.

NG6-3

In addition, I have the following more specific comments pertinent to the wetland impacts from the proposed project as presented in the DEIR:

NG6-4 The conclusion that a 10% or less reduction in water available to Little Lake is not considered "substantial" is not justified. Little Lake has been defined as a 90 acre lake which is predominantly very shallow and has an average depth of only 5'. A 10% reduction in flows of water to Little Lake would result in a 6" average decline in the underground water table of Little Lake. Thus, the DEIR suggests that an average 6" loss of the average volume of water available to Little Lake would not be significant. Such a loss could have lasting residual impacts on the ponds and wetlands of Little Lake Ranch.

NG6-5 In the DEIR, it is mentioned that "wetland restoration efforts have been designed to considerable variation in water availability on the Little Lake Ranch property. Changes

NG6-5 related to the proposed project would fall within the range that has been previously experienced. Impacts to wetland vegetation would be less than significant". The habitat project was designed to manage water levels. The wetlands are actively managed with the goal to provide the best habitat available for local and migrating wetland wildlife. Implying that variation in wetland depth at Little Lake is seemingly random, and that a 10% reduction falls within that variation shows a lack of understanding about wetland management. A 10% loss in water resources will hinder prescribed management at Little Lake.

NG6-6 More than once, the DEIR depicts managed wetlands and hunting in a bad light. For example, "wetlands occur here naturally; however, the system is now manipulated for maintenance of the lake for recreational purposes and habitat enhancement efforts".

And further, "Little Lake Ranch is a private property that includes wetlands and open water habitat currently undergoing habitat restoration efforts, and is used for recreational hunting".

NG6-7 The wetlands are there because a group of concerned individuals had the foresight to restore them. Many partners supported the project (including Inyo County), and public funds were committed because of the potential habitat values. Hunting occurs there, but probably less than 25 days per year. However, the habitat values benefit many wildlife species on a year-round basis. The depiction that the property's main purpose and benefit is for hunting is inaccurate. The fact that the property is hunted is not relevant to the environmental impacts of the proposed project. Further, very few wetlands with completely natural hydrology exist in California. "Manipulation" is actually management, a practice used by professional habitat managers throughout the U.S to maximize the limited acres of wetland that remain. I suggest you read the Little Lake Habitat Restoration Plan in Appendix F for a summary of the true benefits of the project.

NG6-8 Highway 395 is considered to be a scenic highway, or at least a candidate for scenic highway status. It is traveled by millions of people seeking recreational and visual benefits of the Owens Valley and the Eastern Sierra corridor. A loss of water, coupled with the degradation of vegetation and wildlife, may dramatically impact the visual benefits of the highway. If the County allows a decrease of up to 10% of the water resources at Little Lake and a reduction in the underground water table, it may be difficult to maintain wetlands and wildlife that are a common and welcome sight along 395. When the Inyo County Board of Supervisors endorsed this project in 2000, in their letter they stated that "the scenic enhancement provided by this plan will significantly improve the Eastern Sierra Scenic Bypass." Clearly, the county wants to maintain the resources it helped secure almost 10 years ago.

NG6-9 Little Lake Ranch is also subject to several agreements regarding the maintenance, management and preservation of the habitat enhanced as part of the Habitat Project. The project partners (and there were many, as stated above) expect the stewards of Little Lake to continue to fulfill the obligations of the partnership. Little Lake entered into an

NG6-9 agreement to maintain the habitat based on historical water flows, and Inyo County should honor that agreement.

NG6-10 We have too few wetlands remaining in California to jeopardize losing the ecological and wildlife values of Little Lake and other critical wildlife habitat of the Rose Valley Basin, and respectfully request the Conditional Use Permit not be granted under the conditions in the DEIR.

Sincerely,

Gregory S. Yarris
Director of Conservation Policy

NG6 Gregory S. Yarris
California Waterfowl Association
4630 Northgate Blvd., Suite 150
Sacramento, California 95834

NG6-1 The comment regarding the history and importance of wetland habitat in California is noted.

NG6-2 Please refer to Master Response C4.4 for a discussion of the significance criteria for determining significant impacts to Little Lake. Please also refer to Master Response E2 for a discussion of effects to wetlands and consistency with wetland preservation policy.

NG6-3 The comment regarding exercising caution in favor of wetlands and wildlife is noted.

NG6-4 Please refer to Master Response C4.4 for discussion regarding the significance criteria and justification for setting the threshold at 10% for reduction in water flow. This percentage actually equals a 0.3-ft (4-in) reduction in groundwater level, not 6 in as the commenter states. The groundwater reduction of 4 in is also at the north end of Little Lake, and that amount decreases towards the south end of the lake. Please refer to Master Response E2 for a discussion of impacts on wetlands. Wetlands are not expected to be significantly impacted, even with a 10% decrease in flows to Little Lake.

NG6-5 Please refer to Master Response E2 for a discussion of wetland impacts and the rationale for why 10% reduction in flow is not expected to have a significant impact on wetlands at Little Lake. It is noted that any loss of water can impact the water table and wetland levels; however, there appears to be some flexibility in the management of the wetland at Little Lake. Little Lake Ranch currently exports some of their water (approximately 6 ac-ft/yr) to a nearby pumice mine for non-wetland and consumptive uses. This exportation constitutes a loss of water, while they are still able to maintain the wetlands. The level of the lake is also manipulated through a weir on the south end of the lake, which can create considerable variability in the lake level.

NG6-6 The Draft EIR correctly summarizes the history and ongoing condition of Little Lake. The Draft EIR does not portray hunting or wetland restoration efforts in a negative manner. The sentence quoted by the commenter is a statement of fact. No revisions were made to the Draft EIR to change this language.

NG6-7 The Draft EIR correctly summarizes the uses of Little Lake, including habitat restoration and for recreational use. CEQA requires evaluation of effects to a wide range of subjects including biological resources and recreational uses. The land uses of the Little Lake Ranch area is adequately presented in the Draft EIR. No changes to the language of the Draft EIR are merited from this comment.

NG6-8 Please refer to Master Response H1. The aesthetic qualities of Little Lake Ranch as viewed from US 395 are addressed in the Draft EIR (page 3.9-1). Changes to the aesthetic quality of the Little Lake Area would be imperceptible with implementation of mitigation.

NG6-9 The comment regarding partnership agreements for the restoration of Little Lake is noted. Mitigation proposed for the project would not have a significant effect on the wetlands at Little Lake. Please refer to Master Response E2.

NG6-10 Objection to the project is noted.

Kerncrest Chapter
National Audubon Society
P.O. Box 984
Ridgecrest, CA 93556

September 5, 2008

Inyo County Planning Department
168 N. Edwards Street
P. O. Drawer L
Independence, CA 93526

Re: Coso Project
Conditional Use Permit No. 2007-03

NG7-1 Kerncrest Audubon Society is opposed to the granting of Conditional Use Permit No. 2007-03. The project poses an unacceptable risk of adverse impact to the Rose Valley water table, to Little Lake and to the wildlife that use those desert resources.

NG7-2 We note the data provided does not support the conclusions of the DEIR. The Hydrology Model itself states that the Basin is in equilibrium and that the 4,839 acre-feet to be pumped each year would only allow 1.2 years of pumping before there would be a 10% loss of water to Little Lake. The 20-30 year life of this project will permanently and significantly reduce water resources in the Rose Valley Basin.

NG7-3 There is no data supporting the conclusion that 10% less water at Little Lake is of no harm to the habitat there. It seems to us that even 10% loss would come from the lake surface and cause a loss of all the surrounding wetlands, important breeding habitat for nesting Yellow Warblers and Common Yellowthroats and foraging for migrating passerines.

NG7-4 We note also that any lowering of the water table will definitely impact the surrounding riparian habitat of Fremont Cottonwoods, important foraging and resting areas for raptors and passerines, including the California endangered Yellow-billed Cuckoo.

NG7-5 The ponds and surrounding wetlands and riparian area at Little Lake are also of esthetic value to tourists traveling along the eastern Sierra, as well as recreational value to Kerncrest Audubon and other groups who watch birds and wildlife there.

NG7-6 Study conclusions were based on an "average year." There is no such thing as an average year. An average is a mathematical averaging of actual years, many of which are extreme. Weather models accounting for the impact of global warming predict an increasing number of drought years in the local area. Any analysis of potential impact should be based on a worst-case scenario, not an average.

NG7-7 There is discussion of Coso entering into mitigation measures with Little Lake when the 10% drawdown is reached; however, the hydrology model referenced states that drawdown will continue after pumping is stopped. If this ill conceived project is approved, then we recommend that immediate monitoring by an independent agency be conducted and pumping stopped periodically to determine if data proves any long term drawdown is occurring.

NG7-8 No alternative water sources were studied. It is our opinion that the desert is being run roughshod over to produce energy for urban areas. In this case, much of the power generated will be fed to the power grid and ultimately used in Los Angeles. The water to cool the geothermal plant should, therefore, be supplied by the Los Angeles Department of Water and Power (DWP). Indeed, Hay Ranch, the proposed source of the water, is less than two miles from DWP's Haiwee reservoir, and to tap into that water source would be a simple matter.

NG7-9 Kerncrest Audubon Society supports the development of alternative energy sources. However water resources are of critical importance as well, and protection of those resources should take a front seat in consideration of alternatives, especially here on the desert.

NG7-10 The people (and the wildlife) of the Rose Valley should not have to suffer for the decision of Coso Geothermal Company to use a water-intensive method of power generation rather than a more efficient one.

The Inyo County Board of Supervisors will not be supporting the residents of Inyo County if they support this project as proposed.

Sincerely,

Terri Middlemiss

Terri Middlemiss
Conservation Chair
Kerncrest Audubon Society

NG7 **Terri Middlemiss**
Kerncrest Chapter National Audubon Society
PO Box 984
Ridgecrest, California 93556

NG7-1 Objection to the project is noted.

NG7-2 Mitigation would be required to be implemented if the EIR is certified and the project is approved. The mitigation would be incorporated into the conditions of the CUP or imposed via the MMRP (Appendix A to this Final EIR). The project as proposed has been determined to cause a potentially significant impact on the environment. The mitigation measures reduce those effects to less than significant levels, and would be a condition of any permit granted if the EIR is approved.

NG7-3 Please refer to Master Response C4.4 for a discussion of the determination of the 10% threshold of significance. Please refer to Master Response E2 for a discussion of effects to wetlands, yellow warbler, common yellowthroats, and passerines. Implementation of mitigation would minimize effects to the wetlands at Little Lake.

There is no likelihood that a 10% reduction in the flow of water to the Little Lake reservoir would significantly affect the surface level of the lake, which is maintained by a dam. There is generally sufficient flow to maintain the lake level with overflow feeding ponds and wetland areas south of the lake. The reduction would not significantly prolong the dry period of the year when water does not flow out of Little Lake, during which springs continue to provide water to wetlands south of the lake.

Wetlands would not change in composition or type with implementation of mitigation. The project would have no direct impacts on yellow warbler, common yellowthroats, or passerines. Indirect effects would not occur with implementation of mitigation identified in the Draft EIR.

NG7-4 Please refer to Master Response C4.4 for a discussion of the determination of the 10% threshold of significance. Please refer to Master Response E2 for a discussion of effects to wetlands, bird species, and cottonwoods.

NG7-5 Please refer to Master Response H1. The aesthetic qualities of Little Lake Ranch as viewed from US 395 are addressed in the Draft EIR (page 3.9-1). Changes to the aesthetic quality of the Little Lake area would be imperceptible with the implementation of mitigation.

NG7-6 The effects of pumping would be averaged over many years because of the physical configuration of the Rose Valley groundwater basin and the way drawdown effects propagate out from a pumping center. The effects of drought years and years of above average rainfall are likewise averaged out by the length of time required for infiltration or natural discharge from the basin. The use of averages in the Draft EIR is the appropriate way to address long-term response in the reservoir. The assumptions made in the Draft EIR are conservative; therefore, potential impacts are likely over-estimated in the EIR.

NG7-7 Please refer to Master Response C4.2 and Master Response M1 for a discussion of the proposed monitoring program oversight. The hydrology of the Rose Valley is very complex. The monitoring and trigger levels have been established in order to determine an impact down-valley prior to occurrence, through monitoring up-valley. The monitoring would be reviewed and overseen by the County. Refer to Appendix C4 for a discussion of the monitoring program, baseline data collection, pumping data collection, monitoring trigger levels, roles and responsibilities, contingency and mitigation actions, etc. Inyo County is the permit authority for this action and has the jurisdiction and capability to enforce the mitigation. It is the appropriate enforcement entity to ensure environmental protection in Rose Valley.

NG7-8 Please refer to Master Response L2. Several other water sources were addressed in Chapter 5: Alternatives of the Draft EIR. Master Response L2 includes all the alternatives considered in accordance with CEQA. Obtaining water from the LADWP was determined to be economically, legally, and practically infeasible and would also have considerable environmental effects, including potentially to groundwater levels in the Rose and/or Owens Valley. Climate change affects all areas, rural and populated, and clean energy projects benefit Inyo County as well as populated areas.

NG7-9 The comment regarding the importance of water and energy resources is noted.

NG7-10 Objection to the project is noted.

Coso Operating Company LLC
P.O. Box 1690
Inyokern, CA 93527

September 5, 2008

VIA PERSONAL DELIVERY

Inyo County Planning Dept.
Attn: Tanda Gretz
P.O. Drawer L
Independence, CA 93526

Re: Comments on Coso Operating Company's Hay Ranch Water Extraction and Delivery System Project Environmental Impact Report

Dear Ms. Gretz,

Thank you for providing us with the opportunity to review and comment on the Draft Environmental Impact Report ("EIR") for the Hay Ranch Water Extraction and Delivery System Conditional Use Permit (the "Project"). Please note that the following are comments that are intended to merely augment and clarify the data and analysis already contained in the EIR.

COSO OPERATING COMPANY, LLC

Terra-Gen Power is a renewable energy company focused on geothermal, wind, and solar generation projects. Terra-Gen Power and its wholly owned subsidiary Coso Operating Company, LLC ("Coso" or "the Company"), the applicant for the Project, own and operate renewable energy power plants, provide maintenance services, and sell the output of their renewable energy projects to electric utilities. These companies employ a team of capable scientists, hydrogeologists, and engineers that specialize in this area and have long been industry leaders in geothermal power plant production and the development, evaluation, and implementation of engineered design modifications to continually improve facility operations. With skyrocketing oil costs and California's recent push for renewable energy, the renewable sources of energy these companies produce provide a better option for the health of the planet and its inhabitants. However, these projects must be able to be economically competitive with traditional fossil fuel sources to continue to be feasible.

A1-1 California has committed itself to reducing its greenhouse gas emissions, and one of the ways in which it will do this is by converting 20 percent of the State's energy portfolio to renewable energy sources. For this reason, reliable and clean sources of energy are particularly important to this State at the present time and for the future. The Coso Geothermal project, especially as modified by the Hay Ranch Delivery System Project at issue here, helps the State meet these goals and is part of the solution to global warming and the ongoing energy crisis. It will reduce greenhouse gas emissions and dependence on foreign oil by displacing the demand for fossil-fueled resources that would otherwise have to be built in order to produce an equivalent amount of electricity to meet electrical demand in the State.

Coso Geothermal Field and the Project

One of Terra Gen's renewable energy projects, the Coso Geothermal Field at U.S. Naval Weapons Center in Inyo County, began power production in May of 1987. It consists of three separate but interlinked geothermal plants and is one of the top three producers of geothermal electric power in the country. These facilities are efficient, up to date, and well maintained, and have 20-year track record of providing safe, clean, and cost-effective renewable energy to Inyo County residents and others. The Coso Geothermal Field currently produces 200 megawatts ("MW"), approximately 8 percent of the U.S.'s geothermal power. This is enough electricity to meet the needs of approximately 200,000 homes, the equivalent of saving almost 3 million barrels of oil a year. The energy generated by the Coso Geothermal Field is sold to utilities pursuant to long-term, fixed-price energy agreements.

A1-2 The Project involves a Conditional Use Permit application for Coso to pump and inject water into the geothermal reservoir to help stabilize and enhance reliable renewable electrical energy production. The Project is key to allowing Coso to achieve its full generation potential and is very important for meeting the State of California Renewables Portfolio Standard ("RPS"), which encourages the utilization of renewable energy to supply the electrical energy requirements of the State. California has set a very aggressive 20% RPS goal to meet the State's electricity demand from renewable resources by 2010. In addition, the Project is also responsive to the Federal Energy Policy objectives of increasing the utilization of renewable energy resources, which reduces our nation's dependence on foreign oil and reduces greenhouse gas emissions.

How the Coso Geothermal Power Plants Work

Instead of using fossil fuel such as coal or oil to create heat, geothermal power production takes advantage of naturally occurring hotspots and converts that heat to electricity. Under pressure from the natural geothermal resource, or reservoir, thousands of feet below the surface, hot geothermal fluid (brine), travels up wells, some as deep as 11,000 feet, and flashes into steam that drives turbines, which in turn drive electrical power generators. Brine that does not flash into steam, as well as condensed steam from the turbines, is collected and injected back into the geothermal reservoir through injection wells. This energy production is predictable and reliable and requires no dams, produces no radioactive byproducts, and can operate 24 hours a day, 365 days a year, unlike other sources of renewable energy. In addition, a geothermal power plant releases 90% less carbon dioxide (a greenhouse gas) emissions than a comparable fossil fuel plant. (See Bloomfield & Moore, *Production of Greenhouse Gases from Geothermal Power Plants* (1999) at p. 4.) Like all geothermal resources, the Coso projects are a clean, renewable source of energy with a nearly perfect reliability factor. However, in some cases, as here, due to the loss of brine through cooling tower evaporation losses as time goes by, it becomes necessary to augment brine reinjection back into the geothermal resource to maintain reservoir pressure for optimizing the extraction of the hot geothermal fluid.

Benefits to the Local Community

In addition to providing clean and green power to the region, Coso and its affiliates have a long track record of being responsible stewards of the environment and the natural resources under their control. The Coso facilities have been a major economic benefit to Inyo County residents, generating more than $4.5 million in annual property taxes as well as providing additional sources of revenue from the Bureau of Land Management ("BLM") royalty process, which are shared by the BLM with the County. Recent fixed-price power contract extensions will supply an enhanced tax base for the next 20 years. Besides being the largest private taxpayer in Inyo County, the Company employs 90 workers and is one of the largest private employers in the area and a major contributor to local schools, charities, and community organizations. The Company currently works with over 50 area businesses that supply goods and services that support the operation. Furthermore, during the state's energy crisis in 2001, Coso and its affiliates demonstrated the importance of geothermal power and its commitment to being a responsible corporate citizen by helping meet local area and California's energy needs by providing power for six months with no assurances that the Company would be repaid.

Since the inception of this Project, Coso has been dedicated – and continues to be committed – to continually making improvements to the geothermal facilities in order to improve efficiency. To this end, it makes evaluations on an ongoing basis to determine what modifications could benefit the performance of the facility and has invested more than $100 million in capital equipment improvements to the Coso facilities to ensure they have the most up-to-date and efficient technology available. An example of this is Coso's continued review and evaluations of its piping system. In order to move fluids within the nearly 15,000-acre Coso facility, substantial piping systems are required. Within those systems, losses in energy occur due to many phenomena, including changes in elevation and friction in the lines. In order to minimize these losses, Coso designs its pipelines utilizing very conservative criteria. Standard Coso design calls for a maximum pressure drop of 5 pounds per square in ("p.s.i.") in any steam pipe line. This limitation on allowable pressure drop dictates line sizing, separator location, and pipe line routing for new and existing systems. Coso utilizes a piping pressure model to determine the performance of its steam gathering system. Existing systems are evaluated on an ongoing basis to determine if piping modifications could benefit the performance of the facility. Coso has invested over $8 million during the past seven years in the modification and replacement of approximately 6 miles of piping systems at the site. Over the next several years, and depending on the outcome of the current EIR and Project permitting process, Coso plans to continue to invest a significant amount of capital to enhance the viability and efficiency of the geothermal facilities.

THE EIR AND CEQA

A1-3

Because of the all-inclusive scope of analysis it affords, we agree that the EIR for the Project fully complies with the requirements of the California Environmental Quality Act ("CEQA") (Public Resources Code section 21000 et seq. and California Code of Regulations, title 14 ["State CEQA Guidelines"], section 15000 et seq.). Coso believes that the analysis therein is thorough and reflects comprehensive investigation. The comments and additional substantial evidence herein are designed merely to provide further explanation and amplification of the EIR's conclusions. Because the document's conclusions and analysis are already correct, these additional minor comments merely help further CEQA's purpose to "[i]nform governmental decision makers and the public about the potential, significant environmental effects of proposed activities." (State CEQA Guidelines, § 15002, subd. (a)(1).)

PROJECT DESCRIPTION

A1-4

The Project description fully describes the Project and thus is legally sufficient. However, there are a couple of additional items that could be noted. For example, regarding the discussion on page 2-10 on electricity transmission poles, the Project Description states that "[t]he specific number and configuration of poles and lines is not known at this time." To clarify, the service line necessary to connect the Project to the new Southern California Edison power substation will be very minimal in length. In fact, minimal if any utility poles will be required, because the existing Southern California Edison line actually clips the corner of the Hay Ranch property on which the new substation and pumping facilities will be located. For this

A1-4 reason, and as already correctly noted in the EIR, any impacts from the poles and lines will be extremely minimal and less than significant.[1]

A1-5 In addition, regarding pages 2-9 to 2-11 of the Project description discussing the Substation, we would like to provide a minor clarification. While the Substation is being built as part of the Project and will, as discussed in the previous paragraph, connect to Southern California Edison for the Project's power needs, the use of two temporary California Air Resources Board ("CARB")-certified generators may be required for a short period until the necessary Substation and components are completed and ready for use. Because these generators are certified by CARB and are designed to operate efficiently and with minimal emissions, no significant air quality impacts will be associated with their use. Therefore, the EIR's conclusion of no significant impacts to air quality is correct and unchanged by this circumstance.

BIOLOGICAL RESOURCES

The EIR discusses the Project's potential adverse effects in terms of impacts to wetlands and hydrologic interruption. (See EIR at pp. 3.4-25 et seq.) Coso would like to provide the following additional information to the County that confirms and provides additional substantial evidence in support of the County's less than significant impact conclusion.

A1-6 Coso recently received a letter from the Department of the Army dated August 11, 2008 which confirms that no United States jurisdictional waters will be impacted by the Project. A copy of this letter is being provided to the County concurrently with these comments. The Army's letter states that:

> [W]e have determined that the proposed project would not discharge dredged or fill materials into a water of the United States or an adjacent wetland. Furthermore, we have determined that the project entails an activity (pumping groundwater and conveyance by pipeline) that is not subject to Corps regulation. Therefore, the project is not subject to our jurisdiction under Section 404 of the Clean Water Act and a Section 404 permit would not be required from our office. This letter contains an approved jurisdictional determination for the Coso Hay Ranch water extraction and reinjection project.

This additional substantial evidence confirms the County's conclusion that impacts to biological resources are not potentially significant.

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[1] Furthermore, Coso agrees with the County's assessment that there are no significant unavoidable impacts, but we would also like to point out that the Project will not result in any significant, irreversible environmental changes. Although minor amounts of natural resources will be consumed by installing the pipeline, digging, running the well pumps, etc., these are typical of this type of project, the project is very small, and the resultant environmental impacts are very minor and not irreversible. (State CEQA Guidelines, §§ 15126(c), 15126.2(c).)

CULTURAL RESOURCES

A1-7 The EIR correctly concludes that, with mitigation, no significant impacts to Cultural Resources will result from the Project. (EIR at pp. 3.5-10 to 3.5-18.) Specifically, Mitigation Measure Cultural Resources-4 (EIR pp. 3.5-11 to 3.5-12) states that "[a] Native American crew member/monitor shall be present during all survey work" and ground-disturbing activities. As noted in Mitigation Measures Cultural Resources-5 on page 3.5-13, it would be more correct for the former mitigation measure to read "[a] Native American monitor shall be present during all survey work," because Coso has committed to retaining a fully trained and certified Native American resources monitor for monitoring purposes during all Project ground-disturbing activities. As discussed above, a minor technical correction such as this does not affect the EIR's conclusion of no significant impacts to Cultural Resources.

CUMULATIVE IMPACTS

A1-8 As noted in the EIR, the U.S. public and government have recently become concerned about greenhouse gas ("GHG") emissions and their effects on global climate change, and the EIR appropriately has five pages devoted to analysis of this topic. (EIR at pp. 4-8 to 4-12.) This includes a thorough discussion of Assembly Bill 32 ("AB 32") and other recent legislative guidance on analyzing GHGs. However, in further support of the County's conclusions on this topic, we have provided more information regarding the scientific evidence for global warming and further description of the types of global warming gases, where such gases are found or how they are created.

The Earth's environment, including the climate, is in a state of continuous change. Despite this, the general scientific consensus has accepted that the global surface temperatures have risen almost a degree in the last hundred years, and that human activities, especially those involving the combustion of fossil fuels, are the primary cause of this change. (See, e.g., Bloomfield et al. , *Geothermal Energy Reduces Greenhouse Gases*, Climate Change Research (2003) at p. 77; U.S. Climate Change Initiative ["CCRI"], *Our Changing Planet* (2003) at p. 2.) GHGs are those gases that allow light and ultra-violet radiation from the sun to reach the Earth's surface unimpeded. As the sun's energy heats the surface of the earth, energy in the form of heat is re-radiated back to the atmosphere. However, GHGs absorb this reflected energy, allowing less of the heat to escape back to space, and instead trapping the heat in the lower atmosphere. Scientific data show that emissions from human activities causes radiative forcing[2] and that this has elevated the levels of these GHGs in the atmosphere, which, in turn, has led to an increase in

[2] "Radiative forcing" is a term used to describe any externally imposed change in the radiative energy budget of the earth's climate. An imbalance in the radiation budget has the potential to lead to changes in climate parameters and result in a new equilibrium state for the climate system. (Intergovernmental Panel on Climate Change ["IPCC"], Climate Change 2001 – The Scientific Basis (2001) at p. 353.)

global temperatures. The single largest source of GHGs, accounting for approximately half of all global GHG emissions, is fossil fuel consumption in the transportation sector. As noted in the EIR, this is true for California as well. (EIR at p. 4-10.)

Global warming is expected to intensify the threats to the State's biological wealth by increasing the risk of wildfire and altering the distribution and character of natural vegetation. Continued global warming will increase extreme conditions, which will exacerbate air pollution, intensify heat waves, and expand the range of infectious diseases. (California Energy Commission ("CEC"), *Climate Change Impacts and Adaptation in California* (2005) at pp. 16-22; CEC, *Our Changing Climate Report* (2006) at p. 7.) Californians already experience the worst air quality in the nation, and higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution creation.

The EIR contains a good discussion of the primary GHGs and how some of these are generated. (EIR at pp. 4-8 to 4-12.) Coso Operating Company, LLC would like to clarify that the global warming potential ("GWP") of each GHG and their respective impacts varies. GWP

A1-8 is a simplified index used to estimate the potential effect of the different GHGs which is based on the heat-absorbing ability of each gas relative to that of carbon dioxide. For example, carbon dioxide has a GWP of 1, methane of 21, nitrous oxide of 310, hydrofluorocarbons have a range of 140 to 11,700 depending on the specific type, chlorofluorocarbons have a range of 6,500 to 9,200, and sulfur hexafluoride has a GWP of 23,900.[3] The implications of these numbers is that methane, for example, has 21 times the global warming potential of an equivalent amount of carbon dioxide, while nitrous oxide has a GWP 310 times that of the equivalent amount of carbon dioxide. (U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, *available at*: http://www.epa.gov/climatechange/.)

Of the GHGs, carbon dioxide is by far the most prevalent GHG in the atmosphere. While it can be naturally occurring, it also enters the atmosphere via human-made sources. Indeed, in recent years, more than 96% of gross carbon dioxide emissions have come from fossil fuel combustion alone, demonstrating that presently the vast majority of emissions comes from human-made sources. Even under these increased outdoor concentrations, carbon dioxide levels are generally not known to be associated with negative health effects, though much higher concentrations in enclosed spaces can be debilitating or even deadly. However, the main impacts from increased carbon dioxide in the atmosphere are related to its global warming potential. Ice-core analysis has shown that atmospheric carbon dioxide concentrations increased more than

[3] The GWP for ozone remains widely debated. Because ozone is often found in very low concentrations at ground levels and is actually beneficial when found in high concentrations at stratospheric elevations, where it blocks ultra-violet radiation from reaching the Earth's surface, the contribution of ozone to global climate change is unclear. (See Intergovernmental Panel on Climate Change, Climate Change 2001 – The Scientific Basis (2001); U.S. EPA Climate change website *available at*: http://www.epa.gov/climatechange/).

31% over the last 200 years and are continuing to grow, likely tripling from the current level by the year 2100. (U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, *available at*: http://www.epa.gov/climatechange/; IPCC Climate Change, *supra*, at p. 187; National Institute for Occupational Safety and Health ("NIOSH"), Pocket Guide to Chemical Hazards website.)

Methane is an odorless, colorless gas that is the principal component of natural gas. About sixty percent of global methane emissions come from human-related activities, including fossil fuel production, raising livestock, rice cultivation, biomass burning, and waste management. Methane is similarly not toxic to humans at atmospheric concentrations, but it has increased in atmospheric abundance by a factor of approximately 2.5 in the last 200 years. (U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, *available at*: http://www.epa.gov/climatechange/; IPCC Climate Change, *supra*, at p. 248.)

Nitrous oxide, also referred to as "laughing gas," is commonly used in medical practice. It is produced by both human and natural sources, with human sources accounting for between 35 and 50 percent of total emissions levels. Agricultural activities produce the majority of human-generated nitrous oxide, with additional contributions from production of nylon and nitric acid and the burning of fossil fuel in internal combustion engines. While it is non-toxic, it is one
A1-8 of the five primary GHGs, and it also has a secondary role in increasing global warming by aiding in the destruction of ozone in the stratosphere. Nitrous oxide's global atmospheric concentrations have increased about 16% since 1750 and continue to increase. (U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, *available at*: http://www.epa.gov/climatechange/; NIOSH website.)

Ozone, another odorless, colorless gas, has different functions and implications depending on its source and location in the earth's atmosphere. "Natural" ozone occurs at ground level and is a combination resulting from the down-mixing of the stratosphere and photochemical reactions of natural precursors from natural sources. Most of this type of ozone comes from reactions of ultraviolet radiation with the ozone precursors: volatile organic compounds and nitrogen oxides. Stratospheric or high-altitude ozone is formed when oxygen atoms are ionized by solar ultraviolet light and combine with other oxygen molecules. About 90% of the earth's ozone is contained in the high-altitude area referred to as the ozone layer, which absorbs radiation from the sun and is beneficial for the earth's ecosystem. Tropospheric or low-altitude ozone is created by chemical reactions from automobile and power plant emissions, as well as other industrial and commercial source emissions, in the presence of sunlight. This is the type of ozone that is considered a greenhouse gas, and it has increased by about 36% since the pre-industrial era. In addition to its direct radiative forcing, it creates an additional environmental impact by modifying the lifetimes of other greenhouse gases. Besides being a greenhouse gas, it can be a harmful air pollutant at ground level, and prolonged exposure can lead to respiratory distress or even irreparable lung damage. (CEC, *Public Health Related Impacts of Climate Change* (2005) at p. 22; IPCC Climate Change, *supra*, at p. 260; U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, *available at*: http://www.epa.gov/climatechange/.)

A1-8

Fluorinated gases, which have particularly high GWPs, include hydro-chlorofluorocarbon compounds ("H-CFCs"), hydrofluorocarbon compounds ("HFCs"), perfluorocarbon compounds ("PFCs"), and sulfur hexafluoride. H-CFCs were prohibited by international protocol in 1989. PFC emissions are byproducts of aluminum production. Sulfur hexafluoride is widely used by the magnesium industry. Other sources of these types of gases include semiconductor manufacturing and electric power transmission. While most of these have no ambient air health effects, prolonged exposure to concentrated amounts can result in deleterious health effects. In addition, these gases are particularly potent GHGs and may persist in the environment for thousands of years. (U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, *available at*: http://www.epa.gov/climatechange/.)

A1-9

As noted in the EIR, carbon dioxide is a byproduct of fossil fuel combustion, and the largest emitters of this GHG in California are the transportation sector, <u>followed by electricity generation</u>. (EIR at p. 4-10.) The Coso Geothermal field helps meet the State's energy needs in a clean, green way because geothermal energy facilities emit significantly lower amounts of carbon dioxide than coal, petroleum, or natural gas power plants, resulting in near-zero air emissions. (Bloomfield et al., *supra*, at p. 78, Figure 1; Kagel et al., *Clearing the Air: Air Emissions from Geothermal Electric Power Facilities Compared to Fossil-Fuel Power Plants in the United States*, GRC Bulletin (May/June 2005) at p. 113.) For this reason, increased geothermal utilization will help the State and the country reduce its GHG emissions while helping to meeting increasing power demands. (Bloomfield et al., *supra*, at p. 79; Bloomfield & Moore, *Production of Greenhouse Gases from Geothermal Power Plants* (1999) at p. 4.)

A1-10

Because the Project involves maximizing the productivity of a renewable energy source, it will off-set the need for fossil fuel production of electricity and consequently have an indirect, and net-positive impact on reducing carbon dioxide and other GHG emissions. Moreover, the amount of GHGs that it will emit will be very minor and cause a less than significant impact to climate change, particularly in comparison to the impacts of other sources of electricity that would be required without this Project or the geothermal plant. The construction of the Project will be short in duration and employ few people; according to the EIR, it would last only 110 days and employ fewer than 40 workers. (EIR at pp. 3.13-6 and 3.13-7.) In addition, very little emissions would be associated with Project operation, which would entail a single vehicle visiting the Project site for maintenance and site surveillance visits two to three times a week. (EIR at p. 3.13-7.)

A1-10 It is especially important to note, as the EIR does (EIR at p. 5-7), that energy needs throughout the state of California are continuous and increasing. For this reason, continued loss of electricity generation ability in the Coso geothermal power plants would necessarily need to be recompensed by electrical generation elsewhere. (See also discussion of renewable energy resources *infra*.) This would likely be required to come from the construction and operation of one or more additional fossil-fuel powered cogeneration plants, the construction and operation of which would emit significantly more GHGs, and other environmental impacts, than the use of or improvements to the existing Coso geothermal plants.

Regulatory Background

A1-11 In addition to the EIR's discussion of Executive Order S-3-05, AB 32, and Senate Bill 1368, further information regarding the regulatory setting for climate change impacts is presented herein supporting the County's climate change impacts conclusion. California first passed a bill addressing global climate change in 1988 with Assembly Bill 4420, which directed the Energy Commission, in consultation with CARB and other agencies, to study and report on global warming trends, how these could affect California, and ways to avoid, reduce, and address these impacts. Senate Bill 1771 in 2000 established the California Climate Action Registry and designated the Energy Commission and CARB's advisory functions, including a periodic update of the State's GHG inventory. Also in 2002, Assembly Bill 1493 required CARB to develop and adopt regulations to achieve the maximum feasible and cost-effective reduction of GHGs from mobile sources. In 2002, three Senate Bills were adopted that impact this topic. Senate Bill 812 instructed the California Climate Action Registry to adopt procedures and protocols for the reporting and certification of GHG emission reductions resulting from a project. Senate Bill 1078 established the California Renewable Portfolio Standard Program, which encourages the development of renewable energy resources to help ameliorate air quality problems and improve health by reducing the burning of fossil fuels and associated environmental impacts. Senate Bill 1389 required the Energy Commission to adopt an integrated energy policy report every two years and develop public interest energy strategies to reduce statewide GHG emission and address the impacts of climate change in California. More recently, Senate Bill 97, enacted in 2007, amended the CEQA statute to establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis, and OPR is currently developing CEQA Guidelines for mitigation of GHG emissions, a draft version of which is due in mid-2009.

In 2005, the total U.S. GHG emissions equated to 7,260.4 million gross metric tons of carbon dioxide equivalent. The country's total emissions rose by 16.3 percent from 1990 to

A1-11 2005. The state of California alone generates significant GHGs, ranking second, only behind Texas, in contributing the most GHGs of any state. In 2004, California produced an estimated 492 million gross metric tons of carbon dioxide equivalent. If California were an independent country, its emissions would rank the 16th largest in the world. Proportionally, 81% of California's GHG sources were from fossil fuel combustion, 2.8% from other sources of carbon dioxide, 5.7% from methane, 6.8% from nitrous oxide, and the remaining 2.9% from high GHG fluorinated gases.

A1-12 While, as discussed above, much legislation has been passed regarding GHGs and climate change, regulatory guidance establishing thresholds for determining the significance of GHG emissions is not yet available on a nationwide, statewide, or any applicable local basis. In addition, at the time of writing, there are currently no known inventories of GHG emissions data for the County of Inyo or any of its localities. Consequently, the significance of the contributions of a specific project cannot be easily determined. Recent lower court activity and other public information indicate that such requirements are not far away. Indeed, the most recent guidance from the Office of Planning and Research ("OPR"), CARB, and the State executive branch's Climate Action Team ("CAT") suggests that it is preferable if GHGs are quantified during environmental review and a significance conclusion is reached, if possible. (See, e.g., OPR Technical Advisory on CEQA and Climate Change (June 19, 2008), at p. 4.)

CEQA and Climate Change

A1-13 If possible and non-speculative (see State CEQA Guidelines § 15145), CEQA requires a lead agency to determine whether a potential environmental impact may be significant, and thresholds of significance assist the lead agency in making this determination, However, no state or relevant local agency has adopted any threshold relating to potential global warming impacts. Despite this, existing CEQA principles can provide some guidance on addressing a project's potential impacts on global warming, providing that the lead agency's determination of significance must result from "careful judgment . . . based to the extent possible on scientific and factual data." (State CEQA Guidelines, § 15064.) In addition, the lack of thresholds is not insurmountable because CEQA also cautions that "an ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting." (State CEQA Guidelines, § 15064(b).)

Climate change is a global phenomenon, and no single project could likely impact global temperature change on its own. Therefore, global warming is appropriately analyzed as a cumulative impact. Consequently, a project would have a significant impact if its incremental contribution to global climate change is cumulatively considerable. The significance of a project's incremental contribution depends on a number of factors, including the quantity of

A1-13 project emissions compared to state and nationwide emissions, project emissions compared to what is permitted in any applicable general plan or zoning designations, and the project's potential to interfere with the State's efforts to comply with AB 32. As noted in the EIR, the project entails a Conditional Use Permit for the construction and operation of a pipeline and well pumps. (EIR at p. 2-1.) The construction and interim electricity generator emissions, while minor, will emit the majority of the Project's emissions, and these would entail carbon dioxide, methane, and nitrous oxide emissions as a byproduct of equipment used in the construction and initial phase of the Project. Because of its type, the Project will emit no fluorinated gases during construction or operation. The temporary generators will likewise have negligible GHG emissions. While the Project has the potential to allow the Geothermal Field to generate up to its historical maximum levels of 273 MWs of essentially GHG-emission free power, the generator operations would draw only 1.6 to 1.8 MWs, so there is a net benefit rather than any impact. In addition, during the operational phase of the Project, the only GHG contributions would entail very minor vehicle emissions for occasional maintenance vehicles traveling to the project site and generator emissions from pumping. The Project's GHG emissions are trivial to begin with and will be mitigated to a level of less than significant by the mitigation measures discussed in the EIR on page 4-12.

A1-14 Ultimately, the EIR's analysis concluded that it could be speculative to come to a conclusion regarding global warming impacts. Because there is no clear guidance available regarding how to effectuate global climate change analysis under CEQA, it should be noted that the analysis provided by the County of Inyo is the County's best efforts to assess the potential impacts of the project on global warming and GHG contribution. However, for the above reasons and because this Project fosters the continued and efficient operation of a renewable energy facility, it can also be safely concluded that the Project will not have a significant impact on GHG emissions and climate change.

Hazards and Hazardous Materials

A1-15 In the section on Hazards and Hazardous Materials, a few minor clarifications could be helpful. While, as stated in the EIR, the Project's nine-mile pipeline will not convey hazardous materials (EIR at pp. 2-2, 3.10-6), it should additionally be noted that there are also no hazards related to a risk of the pipeline bursting. The pipeline is an open system; there are open tanks at the end of the line, not a closed system in which pressure can build up. In addition, both tanks have pressure release valves that are maintained in the open position to allow constant release of pressure. Furthermore, no blasting is anticipated during the construction phase of the Project, and, of course, none would be necessary during Project operations. In the unlikely event some blasting is required during construction, it would be only on a short segment of pipeline located in a rocky area, but this section is not near any roadways or residential areas. Any such blasting

A1-15 would be undertaken in compliance with all County policies and parameters and consultation with County. Therefore, even to the extent blasting were necessary, it would cause no impacts due to hazards, as previously noted in the EIR.

HYDROLOGY AND WATER QUALITY

A1-16 As noted in the EIR, the proposed Project would pump groundwater from wells in the Rose Valley and transport it via an approximately 9-mile-long pipeline to the Coso Geothermal Field's injection sites. (EIR at pp. 1-1, 3.2-1.) To ensure that all impacts to hydrology and water quality remain less than significant, the County has imposed a number of mitigation measures, including a comprehensive Hydrologic Monitoring and Mitigation Plan ("HMMP"), which establishes trigger points at which various types of mitigation would be implemented. (EIR at App. C-4.) Coso agrees with the County's conclusions that, as mitigated, impacts to hydrology and water quality will be less than significant. (EIR at pp. ES-8, ES-14 through ES-17.) Additionally, Coso would like to provide the County with the following additional information to clarify and expand upon the information already provided in the EIR.

A1-17 The EIR explains that the Los Angeles Department of Water and Power ("LADWP") maintains some existing wells in the Rose Valley to recapture leakage that escapes from the Department's Haiwee Reservoir. (EIR at pp. 3.2-5 et seq.) The EIR also explains that the Department's wells are located in the northern end of the Rose Valley and are nearly 170 feet higher in groundwater elevation levels than other nearby wells. (EIR at p. 3.2-14.) Because of this discrepancy in groundwater elevation levels, the EIR explains that LADWP's wells are likely fed by a surface water flow or groundwater basin that is much higher in elevation than those sources that feed the remainder of the Rose Valley. (*Ibid.*) The EIR thus cites to substantial evidence supporting the County's conclusion that impacts are less than significant. Coso would like to further clarify that the Department's wells and potential pumping operations and the proposed Project now before the County are two unrelated, independent activities. The mitigation measures and trigger points will be utilized and enforced for the Project by the County and Coso irrespective of LADWP's project; the HMMP is specific to the Project only. LADWP's project has its own design mechanisms that are completely separate and unrelated to the Project. Accordingly, and because LADWP's wells have been in existence for some time, the Project does not propose placing any additional responsibilities on LADWP in connection with the Project's EIR.

A1-18 Additionally, and related to Table C4-1, water level drawdown measured in observation wells north of the Hay Ranch (Dunmovin and Pumice Mine wells) might not be as useful a measurement for triggering mitigation as would be measurements in wells to the south of Hay Ranch. Water level drawdown in the northern wells will either reflect upgradient boundary

A1-18 effects resulting from Hay Ranch pumping or will be reflecting other hydrologic changes unrelated to drawdown impacts south of the Hay Ranch. These would include a reduction in mountain front recharge from the northern portion of the Rose Valley or groundwater entering the Rose Valley from the Owens Valley. If these impacts will ultimately affect Little Lake, their effect will likely first be measured in observation wells located close to but south of Hay Ranch, and this response would then be used to trigger mitigation. As the EIR notes, because trigger levels at both the northern and southern wells will be used, the HMMP ensures that adequate mitigation for Project impacts is provided. This also ensures that non-Project wells in these areas (including LADWP's) will not be impacted.

A1-20 The EIR discusses the hydrologic system underlying the Coso Geothermal Field and states that the operation of the Field results in brine production. (EIR at p. 3.2-24.) Additionally, the EIR states that there appears to be no natural recharge of the hydrologic system underlying the Field. (*Ibid.*) Coso would like to clarify that any brine produced as a byproduct of Field operations is injected into the geothermal reservoir. Brine is not discharged onto the ground and does not affect surface water quality in the area of the Geothermal Field. Additionally, Coso would like to clarify that there is, in fact, natural recharge that occurs to the hydrologic system beneath the Field. This natural recharge results from the combined effect of precipitation and surface saturation, and lateral movement of deep bedrock groundwater adjacent to and beneath the Geothermal Field. These clarifications serve to confirm the County's significance conclusions and provide additional substantial evidence that the Project's impacts are less than significant.

A1-21 In the EIR, it is stated that groundwater levels have risen approximately 2 feet across the northern portion of Rose Valley and that, although not measured, higher lake levels and higher discharge rates are likely. (EIR at p. 3.2-8.) The current assumption is that the lake and aquifer system are under a quasi-steady-state condition such that increases in groundwater flow into the lake are matched by an increased outflow. Presently, because there is no information available on variable lake storage capabilities, it is reasonable to assume that an increase in groundwater discharge into the upstream portion of the lake will likely result in increased groundwater discharge from the downstream portion and that the lake will generally remain the same size.

A1-22 The EIR also states that the model recalibration will be conducted sooner if actual drawdown in two or more monitored wells is at least 0.25 feet higher than predicted by the model for those locations. (EIR at p. 3.2-40.) Later, in Appendix C of the EIR this is concept is expanded upon where it is stated:

> Exceedance of predicted groundwater drawdowns (trigger levels) at two or more locations in Rose Valley, or exceedance of a

> maximum acceptable drawdown level at any location, would be a cause for action as determined by the county, including recalibration of the model and potential reductions or cessation of pumping. See Table C4-1 for trigger levels and maximum acceptable drawdown levels.

A1-22

(EIR Appendix C at p. C4-7.)

The use of trigger points and maximum acceptable drawdown is a logical and appropriate methodology for the timely identification of potentially unacceptable impacts to Little Lake inflows. However, it would be helpful to include the additional requirement of technically logical hydrogeologic continuity between the data.

The EIR and the HMMP impose mitigation and monitoring requirements to ensure that the water flows entering Little Lake are decreased by no more than 10% during Project operations. (EIR pp. 3.2-24, C4-6.) The EIR further states: "A benchmark of no more than a 10% decrease in discharge to Little Lake has been determined to be the "tolerance" level at the lake in order to prevent significant impacts to water availability at the lake." (EIR at page 3.2-45.) This "maximum limit of 10% groundwater inflow reduction to Little Lake has been selected, to avoid a significant effect on Little Lake." (EIR at p. C4-6.) The HMMP makes clear that, in practical terms, this 10% maximum limit is a 0.3-foot reduction in the water level at the monitoring point, which is a more sensitive indicator to changes in groundwater flow into Little Lake than the surface elevation of Little Lake itself. (See EIR p. C4-5.) This trigger point is very conservative and is supported by substantial evidence because it is the minimal change in the inflow water levels that can be reliably measured. Moreover, the EIR explains that the estimates of predicted drawdowns to groundwater levels in the Rose Valley are a worst-case scenario analysis because the assumptions that were used to compute the impacts are each extremely conservative. (See EIR p. 3.2-34 [listing six separate conservative assumptions].) Moreover, and in support of the use of the 10% threshold, this 10% reduction was solely used as a threshold in the model by which to set water level declines at wells miles upgradient from

A1-23

Little Lake. It is important to note that, <u>based on this, the 10% reduction in discharge to the lake will never occur</u> because the mitigation steps outlined when an upgradient threshold is exceeded will prevent this threshold from ever being reached.

A1-24

To put the 10% into perspective, it should be noted that the use of 10% is equivalent to a 0.3-foot decline in the apparently relatively consistent 3-foot difference in hydraulic head readings between the lake and the aquifer adjacent to the lake. Quantifying 10% as being equivalent to a drawdown of 0.3 feet at the Little Lake North Dock well is based on the linear relationship in Darcy's Law, which is the equation used to describe the flux of groundwater

A1-24 moving through a porous media, and the 3-foot vertical hydraulic gradient between the well water level and the lake level. The flow model assumes 1,200 acre-feet per year of groundwater enter the Little Lake surface water and riparian area. This is based on the 700 acre-feet/year lost to transpiration occurring over an estimated 300 acres of vegetation, plus 500 acre-feet per year lost to evaporation directly off the 90-acre lake surface. This indicates that, of the groundwater moving into the Little Lake region at the southern end of the Rose Valley basin, approximately 1,200 acre-feet per year of groundwater exits the basin at Little Lake <u>before</u> it can exit the basin farther to the south at Little Lake Gap. If what goes into the lake and associated riparian vegetation equals what goes out via evapotranspiration, then a 10% decrease in inflow equals approximately 120 acre-feet/year of water (1,200 acre-feet x 0.10). It should be noted that 120 acre-feet per year is equal to only 2.4 percent of the total annual flux of groundwater (4,979 acre-feet) estimated to move through the basin as described in the flow model groundwater budget (Appendix C, Table C2-4). This further supports the EIR's conclusion that this impact will be less than significant with the required mitigation.

A1-25 At numerous places in the EIR it is stated that data collection (monitoring), data analysis, and model recalibration will be conducted by a qualified person approved by Inyo County Water Department and funded by the applicant. In an effort to reduce the time between data collection and data reporting, it would be useful if a project website could be developed that provides monitoring data within days after collection. This approach would allow for potentially impacted parties to view and evaluate the data as close to real-time as possible and in conjunction with their own knowledge of what is occurring at their site/property, to be able to alert the County to potential impacts.

A1-26 In Appendix C2 of the EIR (EIR Appendix C2 at page C2-16) aquifer storage terms were calculated using the pumping test results. The values were a specific yield of 3% for model layer 1 and specific storage of 7 x 10^{-7}/feet for model layers 2 through 4. It is then explained on page C2-18 why a specific yield of 3% is never utilized in the groundwater flow model, but there is no discussion as to why a basin-scale flow model should generally not be calibrated to an aquifer test of 14 days. Both the specific yield and specific storage values are much lower and much more conservative than would traditionally be assumed for similar aquifer materials, and lower and more conservative than are typically assigned in groundwater flow models in the western US. The 3% specific yield and specific storage values are so overly conservative as to be unrealistic. This is why the 10% specific value was used instead of the 3%; 10% is within the range of what is traditionally and typically assumed for specific yield in the deposits defined by layer 1 of the model.

In addition, the rationale for the use of a groundwater flow model approximately 3,000 feet in thickness is helpful for understanding the modeling section in Appendix C2 of the EIR. A brief statement from the Brown and Caldwell (2006) report might eliminate possible confusion on why the model bottom was extended significantly below any extraction well depths. The rationale behind this approach was two-fold: 1) it was recognized that pumping from the coarse-grained alluvium zone, as defined by model layer 1, would induce some upward flow from the underlying finer-grained alluvium, and 2) the model was developed with the potential to simulate the effect of deeper pumping in the future.

A1-26 As is well understood by Inyo County and its consultants, the flow model, although the best available tool for predicting future aquifer behavior, like any model contains some uncertainty. Only with the collection of water level changes over time in response to both Hay Ranch pumping and seasonal recharge events will our understanding of basin behavior improve. For this reason, Coso remains amenable to an alternative recalibration scheme that would fulfill all of the purposes and goals of the HMMP's current recalibration plan, while providing the most accurate data possible. For example, the model could be most useful if it is not recalibrated sooner than the eight to 12 month time period after Project start-up presently proposed in the HMMP.

Section C4.3.3 of the EIR states that two new monitoring well clusters, one 600 to 800 feet south of the Hay Ranch North well and one 600 to 800 feet south of the Hay Ranch South well, will be installed, each with three wells varying in depth from 290 to 550 feet below ground surface. (EIR Appendix C4 at p. C4-12.)

There are three technical issues associated with this monitoring requirement that should be noted:

1. The key question associated with this project is the basin-scale response to the pumping of the Hay Ranch wells at an annual rate of 4,839 acre-feet per year. As such, the near-well water level response around the Hay Ranch wells is much less important than the water level response across the basin and in particular, between the Hay Ranch and Little Lake.

A1-27

2. The installation of an observation well and the collection of water level data between the Hay Ranch North and South wells may provide data of scientific interest regarding well interference, but it will not be helpful in increasing our knowledge of potential basin-scale impacts.

3. Although fine-grained layers within the sand and gravel aquifer intersected by the Hay Ranch wells undoubtedly exist, and will affect the drawdown response in the immediate region of the pumping wells, standard aquifer test theory and data analysis shows that these effects diminish with increased lateral distance from the pumping well. Because

A1-27 the primary concern is how the cone of depression will grow towards Little Lake, within the approximately 9 miles between the Hay Ranch and Little Lake, the collection of detailed water level change data close to the Hay Ranch is less important than data approximately 1 mile, 3 miles, and 6 miles south of the Hay Ranch. At these distances, vertical differences in water level response to pumping will not be of importance.

A1-28 Again, and similar to the recalibration comments submitted above, Coso would support an alternative observation well scheme that would meet all of the purposes and goals behind the HMMP while providing equally accurate data for monitoring purposes. For example, and based on the three observations above, it might be appropriate if the new observation wells installed include:

- One well located on the south-central boundary of the Hay Ranch property, installed with screen or perforated pipe from 10 feet above the water table to 100 feet below the water table, and

- A second well located approximately 3 miles south of Coso Junction near or along the Highway 395 right-of-way, installed with screen or perforated pipe from 10 feet above the water table to 50 feet below the water table.

Both wells should be equipped with a pressure transducer and data logger with water levels collected every 6 hours (6 am, 12 noon, 6 pm and 12 midnight). This data collection plan will ensure that both diurnal/tidal and barometric effects are captured at a suitable level of detail such that they can be filtered out of the water level response.

A1-29 In Section C.4.3.3 of the EIR, tasks a, b and c all involve the collection of groundwater levels beneath the lake, bathymetric and water quality data, respectively, from Little Lake. (EIR Appendix C4 at p. C4-14.) Collection of this data is unnecessary as the manipulation of water flow by the Little Lake personnel makes the collection of this type of data inconsistent with the objectives of this HMMP. Because trends in this data are subject to effects from sources other than Hay Ranch pumping, however, some data of interest may be collected, but pre-project start-up data collection is simply unnecessary.

A1-30 In Section C.4.3.3 of the EIR, it is stated under the column titled "Monitoring Frequency" that water levels be measured hourly. (EIR Appendix C4, Table C4-2 at p. C4-15.) It is unnecessary to collect water level measurements from any well more than 4 times every 24 hours (every six hours). This level of monitoring provides fully adequate temporal frequency for evaluating water level changes due to diurnal/tidal forces and barometric changes. While the more frequent monitoring will collect more data, 4 times every 24 hours will be as statistically

A1-30 reliable and will be less likely to over-load the data logger memory or create overly cumbersome data files.

Finally, Coso would like to provide an update to the County of Inyo regarding its efforts to commence monitoring activities around Little Lake. As part of the HMMP, Coso must take certain measurements of groundwater levels in the Project area to establish a base-line condition before Project-related pumping commences. Although Coso understands that the County retains the discretion to deny approval of the Project, Coso – upon its own choice and at its own expense – is willing to begin these monitoring activities now in order to better fulfill the purposes behind the HMMP and assemble a complete set of monitoring data as efficiently as possible. To that end, Coso has sent two letters and one piece of e-mail correspondence, the first of which was
A1-31 dated August 19, 2008, to Gary D. Arnold, attorney for the Little Lake Ranch, seeking permission for a qualified environmental services contractor to enter Little Lake Ranch property and begin conducting monitoring activities. Mr. Arnold's response, dated August 20, 2008, was that Little Lake Ranch preferred not to grant Coso any access to conduct this early monitoring. In response, Coso sent a second letter dated August 21, 2008, renewing its request for access and requesting that Little Lake Ranch allow monitoring to proceed. At this time, Coso has received return correspondence from Mr. Arnold stating that Little Lake Ranch will not be able to respond to Coso's inquiry until the week of September 8th. (See Various Correspondence [dated August 19, August 20, August 21, and September 2, 2008] Between Coso Operating Company, LLC and Gary Arnold, Attorney for Little Lake Ranch.)

All of the information described in this section provided additional substantial evidence supporting the County's conclusion that impacts to Little Lake will be less than significant with the implementation of mitigation.

RENEWABLE ENERGY

The Coso Geothermal Field hosts a world-class power-generating project that has been in continuous operation for the past 20 years. Before it began generating power in 1987, the Coso Geothermal Field went through a rigorous and complete environmental process under both the National Environmental Policy Act and CEQA. At its peak, the Coso Geothermal Field produced more than 273 megawatts ("MW") of electricity that was provided to the regional
A1-32 utility grid pursuant to a long-term power sales agreement.

As the EIR points out, the Coso Geothermal Field currently has permits allowing for ongoing power-generation until 2031, at which point the permits may be revisited. (EIR at p. 2-1.) Unfortunately, and despite the installation of numerous modifications to increase the plant's efficiency, the productivity of the Geothermal Field in recent years has declined by approximately 25% from approximately 270 MWs to approximately 200 MWs. (EIR at pp. 5-3

A1-32 and 5-4.) Because the Coso Geothermal Field has already undergone extensive environmental review and is operational, the current Project seeks only to return the Coso Geothermal Field's productivity levels to normal through the provision of supplemental water from the Coso Hay Ranch wells.

The Coso would like to take this opportunity to provide the County of Inyo with additional information on the importance of continued energy production from the Coso Geothermal Field that the proposed Project would allow.

A1-33

Both California's Energy Regulation Agencies and State Law Urge Reliance on Geothermal Generation

Under California law, geothermal generation plants are categorized as renewable energy resources. (Pub. Res. Code, §§ 25741, 26003(i).) The California Legislature has recognized that the "[r]eduction of dependence on fossil fuels and stimulation of the state's economy through development of geothermal resources" is of vital importance. (Pub. Res. Code, § 3800.) Accordingly, the California Legislature has developed a funding program for the development of geothermal resources under certain conditions. (See Pub. Res. Code, § 3800 et seq.) Moreover, the regulatory agencies that set state policy for renewable energy resources have focused on geothermal generation plants as one means to achieve California's growing energy demands while reducing air pollution, global warming, and the other adverse effects associated with traditional fossil fuel generation plants.

In 2002, California's Governor signed the Renewable Portfolio Standard, SB 1078. This standard required an annual increase in renewable generation equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. Subsequently, in 2003, the California Energy Commission and the California Public Utilities Commission adopted California's Energy Action Plan, which accelerated the State's renewable energy goals. Specifically, the 2003 Energy Action Plan stated that energy conservation measures and the continued use of renewable energy facilities "would minimize the need for new generation, reduce emissions of toxic and criteria pollutants and greenhouse gases, avoid environmental concerns, improve energy reliability and contribute to price stability." Additionally, the 2003 Energy Action Plan moved up the proposed schedule for reaching a 20% renewable energy portfolio standard from 2017 to 2010.

In 2005, a new Energy Action Plan for the State of California provided still further incentives for increased reliance on renewable energy projects. First, the 2005 Plan confirmed the 2010 target date for reaching a 20% renewable energy portfolio standard. Second, the 2005 Plan called for the development of strategies to reach a 33% renewables standard by 2020 for all load serving entities. The 2005 Energy Action Plan specifically called out the need to encourage the use development of renewable energy resources including "facilities for wind, solar, geothermal and biomass."

In 2007, the California Energy Commission released its Integrated Energy Policy Report, which advanced policies to enable California to meet its energy needs in a carbon constrained world. The report also provides a comprehensive set of recommended actions to achieve these policies. Among them was the continued reliance on California's renewable generation portfolio including "renewable energy sources such as solar, wind, geothermal, and biomass."

At the beginning of 2008, an Energy Action Plan Update was released that continued to urge reliance on renewable energy resources, explaining that "[r]enewable energy policy is a cornerstone of our approach to reducing greenhouse gas emissions in the electricity sector."

A1-33

Accordingly, both California law and the State-wide energy policies that guide future energy development in California encourage the continued reliance on renewable energy resources such as the Coso Geothermal Field. The Project proposed by Coso and under consideration by the County of Inyo would allow for that continued and efficient operation, thus contributing to the State's future energy supply.[4] Moreover, multiple letters of support have been submitted to the County of Inyo by State Legislators and others supporting the Project and confirming that the continued and efficient operation of the Coso Geothermal Field is in the best interest of the State. For example, letters from California Senator Bob Dutton of the Thirty-first District, California Senator Roy Ashburn of the Eighteenth District, and California Assembly-member Jean Fuller of the Thirty-second District have all expressed support for the Project and pointed out that the Project is important for meeting the State of California's Renewable Energy Portfolio Standard.

Both Federal Law and Energy Policy Urge Reliance on Geothermal Generation

A1-34

Federal law similarly defines geothermal generation facilities as renewable energy resources. (42 U.S.C. § 15851(a).) Like California, the Federal Legislature has also developed a limited funding incentives program for the development of qualified geothermal resources. (42 U.S.C. § 13317.) Moreover, federal law specifically encourages the development of technologies to better understand and extend the life-cycle of geothermal reservoirs. (See 42

[4] Although the sustained operation of the Coso Geothermal Field would continue to make energy available to the State, the Coso agrees with the County's conclusion that the proposed Project would not result in any significant growth inducing impacts. (See EIR at pp. 4-12 and 4-13.) As is noted in the EIR, the proposed Project will not extend the life of the Coso Geothermal Field beyond that previously analyzed and approved. (EIR at p. 2-1.) Nor does it prevent Coso from pursuing future applications or permits to extend the life of the Geothermal Field. Additionally, the energy generated by the Coso Geothermal Field is minimal in comparison to the State-wide demand for energy resources and the anticipated growth in that demand in future years. Accordingly, the proposed Project will neither induce direct growth nor remove an obstacle to growth in a way that would result in potentially significant growth inducing impacts. (See State CEQA Guidelines, § 15126.2(d).)

U.S.C. § 16231(a)(2)(C).) Most recently, federal energy policy was changed through the enactment of the Energy Policy Act of 2005. The act, which was signed into law by President Bush, attempts to combat growing energy problems by providing a variety of incentives for renewable energy production. Additionally, this Project furthers the use of U.S. Navy lands for the generation of renewable energy.

A1-34 Accordingly, federal law too recognizes that geothermal resources including the Coso Geothermal Field are desirable renewable energy resources that should be encouraged. Moreover, many letters in support of the Project have been submitted to the County of Inyo. These letters – again coming from the offices of California Senator Bob Dutton of the Thirty-first District, California Senator Roy Ashburn of the Eighteenth District, California Assembly-member Jean Fuller of the Thirty-second District, and others – have made it clear that the proposed Project and the continued operation of the Coso Geothermal Field are responsive to the Federal Energy Policy objectives of increased reliance on renewable energy resources and reducing dependence on foreign oil.

ALTERNATIVES

A1-35 The Alternatives section discusses a reasonable range of alternatives to the Project. Analyzed were alternatives for: (1) pumping Hay Ranch wells at the maximum sustainable level for 30 years without reaching trigger levels; (2) pumping Hay Ranch wells at lower rates; (3) modifications to the power plant providing additional output without utilizing more resource or system efficiency improvements, including four potential improvements that could be made; (4) modifications providing water savings through a reduction in the evaporative water losses associated with the cooling towers; (5) using other sources of water for injection, including exploring nine different water sources; and (6) reducing the time frame of the Conditional Use Permit. (EIR at pp. 5-1 to 5-12.) In addition, (7) the No Project alternative was considered, as well as (8) the Project itself. (*Ibid.*)

CEQA requires an agency to make a good-faith effort to evaluate a reasonable range of alternatives in an EIR. (EIR, at p. 5-1.) While there is no bright-line rule regarding how many alternatives qualifies as a "reasonable range" (*Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal.3d 553), here the EIR evaluated 8 different possibilities, plus 12 additional sub-alternatives regarding 8 different possible alternate sources of water and 4 potential efficiency improvements. Case law shows without question that this is a reasonable range of alternatives. (See, e.g., *Sierra Club v. County of Napa* (2004) 121 Cal.App.4th 1490, 1496 [six sufficient]; *San Franciscans Upholding the Downtown Plan v. City & County of San Francisco* (2002) 102 Cal.App.4th 656, 692 [five adequate].)

A1-35 The EIR's Alternatives analysis properly sets forth the requirements under CEQA, describes the Project objectives, evaluated the feasibility[5] of the alternatives, and rejected some alternatives as infeasible due to their inability to meet important Project objectives or failing to reduce environmental impacts compared to the proposed Project. (See State CEQA Guidelines, § 15126.6(f) ["the EIR need examine in detail only the ones the Lead Agency determines could feasibly attain most of the basic objectives of the project"].) For this reason, only four were chosen for evaluation in greater depth. (EIR at pp. 5-7 to 5-12.)

It is important to note that there are several additional reasons for the infeasibility of the non-selected alternatives, both economic and non-economic. For example, for Alternative (3), above, Coso analyzed a number of possibilities for modifications to the power plant that could be made to provide additional output.

Piping

A1-36 As discussed previously, Coso is dedicated to perform ongoing evaluations to determine whether piping modifications could benefit the performance of the geothermal facility. Because all technologically feasible piping modifications have already been implemented, there are no additional modifications that have been identified to serve as an alternative to the Project at this time. Accordingly, increased piping efficiency would not eliminate the need for the Project.

Steam Turbines

A1-37 Coso has already completed redesign and replacement on four of the units' steam turbine blading and sealing configurations at the facility. Steam path upgrades of this type allow for improved use of the steam that exists at the facility. It should be noted that work of this type has a cost of approximately $2,000,000 per unit. Coso indicates that it continues to evaluate the design of the units, and will make additional modifications when they become economically feasible. Because these elements are already being incorporated, they cannot serve as viable alternatives to the Project.

As an alternative to the Project, Coso also considered complete replacement of its steam turbines with newer equipment. However, advances in technology typically can only yield a 1 to 3% improvement in the design efficiency of the turbine at best. This minimal improvement in performance cannot support the capital expenditure of $10 to $15 million per turbine or $90 to $130 million for complete replacement, with almost no increase in capacity. In addition, such large scale turbine generator replacements are infeasible due to the down time associated with

[5] "Feasible" is defined under CEQA as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." (Pub. Res. Code, § 21061.1.)

the retrofit of new equipment. Furthermore, this alternative would require the disturbance of new areas, approximately equal in size to the existing power plants, to place the new equipment. Once the new equipment was installed, it would have to be tied back into the existing auxiliary systems. This would require the permanent disturbance of an additional 30 acres and would cause concomitant air quality, noise, traffic, biological (including impacts to the habitats of listed wildlife species), and other environmental impacts. In addition to the land disturbance, significant construction equipment and extensive construction traffic would be required for a period of approximately 6 months per unit, and substantial grading and fill issues would be encountered during hillside construction activities, with resulting environmental impacts. Furthermore, because each of the nine units would, on a rotating basis, have to be completely shut down for approximately 6 months for construction and installation, the plant would not be
A1-37 fully operational for four and a half years. This loss of power would not only result in an additional economic burden to Coso, but because California's energy demands are increasing, the power would have to be generated elsewhere, most likely in a fossil-fuel burning power plant, which would entail the production of significantly greater environmental impacts (including air quality emissions, greenhouse gas emissions), with no net benefit.

Thus, as with the piping improvements alternative, even if all of the turbines were replaced, recharge would still be required in order to reverse the annual decline in reservoir productivity. Accordingly, the recharge Project is necessary to allow the plant to continue optimum energy generation.

For all of the above reasons, this alternative is infeasible at this time.

Binary Systems

In conjunction with the evaluation of replacement steam turbines, Coso considered the use of binary systems. In addition, Coso is continuing to evaluate binary and other heat recovery systems as a means for generation improvement.

As it relates to replacement of the steam turbines, the initial capital expenditure associated with procurement of completely new equipment as compared to equipment that is
A1-38 already in place can never be recovered. Complete replacement of the existing turbine sets with binary equipment, which is by its nature less efficient, would cost approximately $560,000,000.00, with no increase in generation.

As it relates to enhancement of generation, at this time there is insufficient brine in any one area to justify the capital costs for the equipment installation as compared to the potential generation improvement. The capital costs of additional auxiliary systems and equipment, coupled with the parasitic energy demands to run those auxiliaries, which can be as much as

30%, preclude the option of installing equipment of this type in an area where the brine available could be consolidated and effectively utilized. In addition, binary systems have additional impacts that are not present for the selected alternative. For example, the footprint of plants using binary systems is significantly bigger. The relative land area required for binary systems is approximately 60-acres, which is 3 times larger than that of the existing standard flash plant, when one considers the relative equipment required to transfer heat from the geothermal fluid to the motive fluid, the number of turbine generator sets required to generate a similar amount of electricity as compared to the current flash plants, and the surface area required to install the cooling units for the spent motive fluid. Developing this additional land would entail additional environmental impacts, including air quality, noise, and traffic impacts during construction and possible biological impacts due to the sensitive nature of some of the surrounding habitat.

A1-38 Further, binary units create scaling concerns in the piping systems, a concern which is not presently at issue with present operations at the Coso Geothermal Field. The use of binary units with the brines at the Coso Geothermal Field will lead to scaling and plugging issues. At Coso, these scale deposits would not be hazardous, but would require significant plant down time, and additional maintenance staffing in order to keep the systems fully functional. To put this in perspective, currently the Coso plants are shut down approximately once per year, and operate in the 98.5 to 99.5 percent range. Using a binary system instead would require the machines to be taken offline a couple of days every month or two, or approximately 7 percent of the time, decreasing overall electric generation capacity by around 10 percent. As discussed elsewhere, this loss in renewable energy would likely be replaced by energy generated by traditional fossil-fuel burning plants, along with their attendant environmental impacts. Additionally, the scale deposit material would require disposal. Because of all of these significant drawbacks, this option was accordingly also eliminated as infeasible.

Gas Removal Systems

As another alternative for modifications to the power plant that could be made to provide additional output, gas removal systems were studied. Byproducts of the geothermal steam gathering process include non-condensable gases. These gases travel in the steam phase, and through the steam turbine. During the condensation process, these non-condensable gases are

A1-39 separated from the condensed steam. These gases occupy void space within the condenser and interfere with its operation. At that point, the gases can create a back pressure on the turbine, decreasing its efficiency and performance.

Coso has already implemented several equipment additions and modifications to ensure that gases are effectively removed from the process. These include; installation of gas abatement units, addition of vacuum pumps and compressors, replacement of steam jet air ejectors, and expansion of the cooling capabilities of our condensers by addition of gas pre-coolers.

The installation of gas abatement units eliminated the need to reinject gases that are intrinsic to the geothermal steam. Gas concentrations in the steam had begun to increase as a result of gas reinjection, which was part of Coso's original design. Increases in gas concentration have a detrimental effect on condenser and turbine performance as described above. Coso has invested over $20 million dollars in the installation and operation of these gas abatement units, which represent the best available technology for control of hydrogen sulfide gas emissions.

The addition of vacuum pumps and compressors was undertaken in order to improve the efficiency of the gas removal systems. Vacuum pumps take the place of relatively inefficient steam driven jet ejectors, and allow the motive steam for that equipment to be routed through the steam turbines. The compressors boost the gas pressure from the vacuum pump discharge to move the gas flow through the abatement system. Coso has invested approximately $12 million

A1-39 dollars in the addition of this equipment.

Redesign and replacement of the primary steam ejectors has been implemented on five of the nine Coso units. This equipment replacement was undertaken to improve the performance of this equipment by better matching its design to the current operating conditions.

Gas pre-coolers have also been added to three of the Coso units. They were added to remove excess water vapor that was being carried out of the main condenser in the gas stream and that was negatively affecting the performance of downstream equipment. This decline in performance led to increased system back pressure, which affected turbine performance. Installation of this equipment was achieved at a cost of $1,000,000 per unit. As with the other possibilities under this alternative, Coso reviews performance of the gas removal systems on a daily basis, and will make additional modifications when they are determined to be economically feasible. Similar to the piping alternative, this option cannot really serve as an alternative to the Project because all feasible modifications in this regard have already been incorporated, and future modifications will be undertaken as soon as they become feasible as well.

Coso has also conducted a detailed study to determine the benefit of replacement of the existing main condensers. No benefit could be realized on three of the units. On the remaining units, the replacement cost of $2.5 million per unit could not be economically justified.

For the above reasons, all of the alternatives regarding possibilities for modifications to the power plant that could be made to provide additional output above were either already being

A1-39 performed or were infeasible due to vast differentials between the cost of the improvement and resultant performance benefit.

Cooling Tower Redesign/Replacement

Alternative (4) analyzed the possibility of modifications providing water savings through a reduction in the evaporative water losses associated with the cooling towers. This alternative has been mentioned frequently in public comments as something that should be studied for this Project, and it was. (See EIR at pp. 5-4 to 5-5.)

Evaporative cooling is the most efficient mode of cooling in dry climates like the area surrounding the Project site because the ultimate heat sink is the wet bulb rather than the dry bulb temperature. The power plant's initial design included cooling towers at the nine units. Coso has investigated replacement of the cooling towers with dry cooling systems in order to reduce fluid losses due to evaporation. In addition, Coso has also considered augmenting the wet cooling systems with dry cooling. The overall objective was to save condensed steam currently evaporated in the cooling towers, and achieve 3,000 gallon-per-minute (gpm) additional injection as a result. In both cases, the capital cost of the added equipment negated further investigation.

100% dry cooling.

A1-40 On an individual unit basis - 560 kph of steam flow, with 13% moisture, at 1.75 psia (3.5 inches of Hg) would require a GEA 18 cell unit for air cooled only. The capital cost quoted by the supplier would be $27.3 million, with a parasitic load of 2,670 kW. This number was confirmed as a very similar cost was calculated by scaling up from a smaller 1999 installation. The footprint for each unit would be 35,000 sq ft or 104 x 385 ft.

Four of these units would be required to achieve 3000 gpm of the current water augmentation project. (Total cost $110 million). This design attempts to maintain current generation, though the typical dry cooling unit has a very large negative impact to summer peak generation in dry climates. In addition, the loss in net generation due to the additional parasitic load required to operate these fans could not be recovered. Accordingly, and as relates to what is industry practice, dry cooling is typically not used with flash-type generation facilities like Coso's because of this reduced efficiency. Due to the high capital cost, detailed reductions during summer peak were not modeled.

Augmented dry cooling.

An alternate design was also reviewed, estimated to save 60% of current evaporation on a unit basis. This approach would use air-cooling to augment the wet cooling during the winter months, and the cooler periods in the spring and fall. Based on current losses of 389 kph (778 gpm) due to evaporation, this design would reduce that to 156 kph (311 gpm) most of the year. This results in a savings of 468 gpm of water per unit. This approach would involve similar equipment to the above dry cooling scenario, but would not have to be designed to address the highest temperature conditions in the summer. Summer cooling would use the current evaporative cooling tower. A cost estimate of $14.06 million per unit yields a total cost of 80 million (6.4 fractional units were used in the calculation assuming size could be adjusted without appreciably affecting incremental cost.) Each of the 6+ units would have a footprint of 110 ft x 250 ft (0.6 acres excluding any maintenance clearance). This design would maintain generation in summer as the current wet cooling towers would continue to be used.

A1-40 Installation of the seven augmented dry cooling units that would be required under this scenario would require the disturbance of 4.2 acres of additional land, and by their nature would be required to be located in a sensitive biological habitat area near the existing plants. Additional construction would also be required, with the concomitant air, noise, traffic, and other environmental impacts. Moreover, the additional parasitic load that this option would create would result in the transfer of approximately 18 MW <u>less</u> renewable power to the general public. This would lead to additional GHGs and the other environmental impacts that would occur due to the fact that this energy would have to be produced elsewhere, presumably in a fossil-fuel powered plant. In addition, this option would still require additional water, and thus the Project, or something very similar, would still be required. This option was rejected as infeasible because it would result in <u>less</u> energy being produced while causing <u>more</u> environmental impacts and would not eliminate the need for the Project.

<u>Injection Systems</u>

A1-41 Coso's primary focus is on fluid injection. Coso continues to do extensive research and testing to ensure that all available injectate is captured and returned to the reservoir in the most optimal areas. Coso conducts tracer studies, which provide information as to the amount of time, relative locations, and rate at which fluids return to production areas. Further, Coso routinely conducts injecting surveys, which indicates the depth at which the injectate re-enters the resource. Injection guidelines for each of the injection sites are set based upon this information. Injection rates are carefully monitored and controlled in accordance with this optimization strategy. Augmentation fluids will be injected into the resource in conjunction with this philosophy. Evaluation of the effectiveness of the injection program will remain under constant scrutiny. Adjustments will be made as additional information is gathered. Because all feasible changes to the injection systems are already being incorporated into the geothermal facility, there are no additional options to be studied as an alternative to the Project.

A1-41 For all of the above reasons, the EIR's alternatives analysis is sufficient in the number and range of alternatives it analyzes, and the analysis is supported by the substantial evidence above and in the EIR. While other alternatives in addition to the 8 above and more than a dozen subalternatives, have been suggested by outside parties, it is important to note that, under CEQA, "[a]n EIR need not consider an alternatives whose effect cannot be reasonably ascertained and whose implementation is remote and speculative." (Pub. Res. Code, § 15126.6(f)(3); *Residents Ad Hoc Stadium Committee v. Bd. of Trustees* (1979) 89 Cal.App.3d 274

<u>Alternative Sources of Injection Water</u>

A1-42 The EIR studied eight alternative locations for water sources for the Project, and certain public comments on the Project have suggested a number of other sources. However, all of these sources had significant drawbacks and additional environmental impacts not present, or present to a much lesser extent, in the selected alternative.

One of the primary problems with almost all of the other identified potential sources was their distance from the Project site, including one that were as far away as Barstow. While use of water from Hay Ranch will require only nine miles of piping, the other sources are at much greater distances and thus would require significantly longer piping. Using water at these other sources would require much more land and would cause considerably more construction-related environmental impacts, including air emissions, impacts to biological resources, traffic, and other issues. In addition, longer pipelines require more pumping, which requires more electricity. A longer pipeline would thus significantly diminish, or entirely eliminate, the very purpose of the Project. The greater distances would also significantly increase the costs of the Project.

As an example of one of the suggested alternative sources, one of the comments advocated using Ridgecrest wastewater. However, Ridgecrest is approximately 25 linear miles away, much farther than the Project's selected source, and thus all of the drawbacks discussed in the previous paragraph apply. In addition, practically speaking, any pipeline would likely have to be much longer than the shortest route, and would have to be cut through a mountainous area, causing considerable difficulty and resultant significant environmental impacts, including the need for substantially more blasting and potentially tunneling. Furthermore, Coso's prior inquiries have evidenced that there is no water available for the Coso Geothermal Field at this time. The same or very similar problems exist for <u>all</u> of the alternative sources identified in the EIR or by public comments. Because the alternative sources would cause greater environmental impacts, significantly increase the cost, reduce the Project benefits, and supply insufficient water, thus failing the primary objective of the Project, they were properly rejected as infeasible. As

A1-42 noted in the EIR, for these reasons, the Hay Ranch source is thus clearly the preferred alternative.

CONCLUSION

A1-43 Again, I would like to thank you for providing us with this opportunity to comment on the Hay Ranch Water Extraction and Delivery System Project and its EIR. As noted above, this information merely clarifies and amplifies the discussion already included in the County's EIR, and we provide these comments only to further document and support the County's determinations that the Project will not result in any potentially significant impacts.

Thank you for your attention to these comments. If you have any questions or concerns, we would be happy to meet with you at your convenience.

Sincerely,

Chris Ellis, Site Manager
COSO OPERATING COMPANY, LLC

AND

Steve Brooks, Senior Hydrogeologist
SCHLUMBERGER WATER SERVICES

Exhibits (Submitted Under Separate Cover):

1. Assembly Bill 1493 (2002)
2. Assembly Bill 32 (2006)
3. Bauer Report (2002)
4. Bloomfield & Moore, *Production of Greenhouse Gases from Geothermal Power Plants* (1999)
5. Bloomfield et al., *Geothermal Energy Reduces Greenhouse Gases*, Climate Change Research (2003)
6. Brown & Caldwell Report (2006)

7. California Energy Commission & California Public Utilities Commission, California Energy Action Plan (2003)

8. California Energy Commission & California Public Utilities Commission, California Energy Action Plan (2005)

9. California Energy Commission & California Public Utilities Commission, California Energy Action Plan Update (2008)

10. California Energy Commission, Climate Change Impacts and Adaptation in California (2005)

11. California Energy Commission, Integrated Energy Policy Report (2007)

12. California Energy Commission, Our Changing Climate Report (2006)

13. California Energy Commission, Public Health Related Impacts of Climate Change (2005)

14. Department of the Army Letter to Coso, dated August 11, 2008

15. Intergovernmental Panel on Climate Change, Climate Change 2001 – The Scientific Basis (2001).

16. Kagel et al., *Clearing the Air: Air Emissions from Geothermal Electric Power Facilities Compared to Fossil-Fuel Power Plants in the United States*, GRC Bulletin (May/June 2005)

17. National Institute for Occupational Safety and Health, Pocket Guide to Chemical Hazards, website, *available at*: http://www.cdc.gov/niosh/npg/

18. Office of Planning & Research, *Technical Advisory on CEQA and Climate Change* (June 19, 2008)

19. Senate Bill 1078 (2002) (Renewable Portfolio Standard)

20. Senate Bill 1389 (2002)

21. Senate Bill 1771 (2000)

22. Senate Bill 812 (2002)

23. Senate Bill 97 (2007)

24. U.S. Climate Change Initiative, Our Changing Planet (2003)

25. U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 Climate Change website, *available at*: http://www.epa.gov/climatechange/

26. Various Correspondence (dated August 19, August 20, August 21, and September 2, 2008) Between Coso Operating Company, LLC and Gary Arnold, Attorney for Little Lake Ranch Regarding Commencing Early Monitoring Activities Around Little Lake

A1 **Chris Ellis and Steve Brooks**
Coso Operating Company, LLC
PO Box 1690
Inyokern, California 93527

A1-1 Support of the project is noted.

A1-2 Support of the project is noted.

A1-3 Concurrence with conclusions of the Draft EIR is noted.

A1-4 Coso has provided additional detail regarding the number of poles necessary for the transmission line. The electricity service line length would be minimal, and fewer poles would be needed than anticipated in the Draft EIR. This new information would not result in any new significant impacts.

A1-5 The temporary use of licensed generators during project implementation would not result in any negative environmental impacts.

A1-6 The comment regarding the letter received from the US Army Corps of Engineers that no jurisdictional waters would be impacted is noted.

A1-7 The change was made as requested for the purpose of clarification. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revisions were made to the EIR:

Page ES-23 (Table ES.2-1) and Page 3.5-12

> **Cultural Resources-4:** The entire proposed ~~0.5~~ 1.5-acre substation site, and the path to interconnect the substation to the proposed switchyard near the lift pump station, shall be subject to an intensive pedestrian survey for cultural resources, consistent with the previous survey work performed for this project. If resources are found that are potentially eligible for the National Register of Historic Places, the substation site shall be moved to a surveyed area without resources. If resiting the substation to avoid potentially significant resources (resources eligible for the NRHP, also known as historic properties) is not possible, data recovery shall be accomplished in the context of a detailed research design and in accordance with current professional standards. The plan shall result in the extraction of sufficient volumes of non-redundant archaeological data so as to address important regional research consideration; detailed technical reports shall be prepared to document the findings. The survey and substation siting shall be performed prior to sale of land to Southern California Edison. A Native American ~~crew member/~~monitor shall be present during all survey work.

A1-8 The comment is noted regarding greenhouse gas emissions and regulations.

A1-9 The comment is noted regarding geothermal energy's role in reduction of greenhouse gas emissions.

A1-10 The comment is noted regarding offset of fossil fuel use.

A1-11 The comment is noted regarding greenhouse gas emissions and regulations.

A1-12 There are currently no known inventories of greenhouse gas emissions data for Inyo County, as stated in this comment. The Draft EIR presents a qualitative analysis of construction and operational impacts of greenhouse gas emissions from the proposed project. Implementation of several qualitative measures as described on page 4-12 of the Draft EIR would ensure impacts associated with emission of greenhouse gases would be less than significant.

A1-13 The comment regarding greenhouse gas emissions is noted.

A1-14 The comment is noted regarding the EIR's conclusion that the project would have less than significant impacts on greenhouse gas emissions.

A1-15 The comments regarding hazardous materials and construction methods of the pipeline are noted. These comments do not merit any revisions to the EIR.

A1-16 The comment regarding the proposed pumping and implementation of the HMMP is noted.

A1-17 The comment is noted regarding baseline information for LADWP wells. The Draft EIR does not state that LADWP wells have been used to capture seepage from Haiwee Reservoir, contrary to what this comment suggests. The LADWP has referred to such a project; however, no concrete steps have been taken to bring it about.

A1-18 The comment is noted regarding the monitoring program and effects to LADWP wells and operation. To some extent, the comment implies that mitigation would be required if the aquifer level is reduced in Rose Valley due to natural occurrences. This is not accurate. The applicant would be required to mitigate impacts to the aquifer resulting from its activities, not from natural variations in aquifer levels.

A1-19 The comment notes that brine that produced in the geothermal operation is injected into the subsurface. This fact was noted in the Draft EIR. The injection avoids any impact to surface waters.

A1-20 The comment regarding natural recharge in the geothermal field is noted.

A1-21 The comment is noted regarding groundwater levels and Little Lake's storage capacity.

A1-22 The comment regarding the use of monitoring and trigger levels to determine the timing of model recalibration is noted. Reaching an established trigger level most immediately triggers an evaluation of the data by the Inyo County Water Department, pursuant to the HMMP. This step allows the evaluation of the data to confirm that the event is not an anomaly and that it is consistent with data from adjacent monitoring points. Recalibration of the Hydrology Model or reduction or cessation of pumping would be required at that point.

A1-23 The comment regarding trigger level thresholds is noted. The Draft EIR clearly states that this threshold would not be exceeded.

A1-24 The comment regarding the inflow trigger level is noted. The estimated reduction in groundwater inflow to Little Lake would reach a maximum of approximately 80 ac-ft/yr based on auditing the Hydrology Model, but would be less than that for the majority of the time.

A1-25 The comment is noted regarding creation of a website for sharing the monitoring data with the public, real-time. Creation of a website is at the discretion of Inyo County or the project applicant during implementation.

A1-26 Please refer to Master Response C2.1 for a discussion of the aquifer thickness represented in the model. The comment supporting the conclusions of the Draft EIR hydrologic analysis is noted.

A1-27 The comment regarding monitoring requirements is noted. The HMMP proposes multi-level well completions close to the Hay Ranch production wells specifically to evaluate vertical groundwater flow gradients that develop as a result of pumping and, as stated in the comment, are most significant close to the production wells. These close-in multi-level wells would provide the best, earliest data regarding vertical hydraulic conductivity and specific yield that would be needed for model recalibration soon after pumping begins.

A1-28 The comment regarding additional monitoring offered by Coso is noted. Completing and monitoring these wells as suggested by the applicant and in addition to new observation wells proposed in the HMMP would provide more complete data set for monitoring impacts from pumping. Changes to the Draft EIR are not required based on this comment; however, the applicant can implement these suggestions during implementation of the HMMP at the County's discretion.

A1-29 An understanding of the interaction of groundwater and Little Lake and springs is important to minimizing and mitigating potential impacts to the surface water bodies. The commenter would be correct if the issue at Little Lake was potential impacts to a deep water supply well. There is not a deep water supply at Little Lake. The shallow lake and spring system are poised right at the elevation of the local groundwater table. Changes to groundwater elevation may directly impact lake level and nearby spring flows in low-lying areas. An understanding of how that system works is needed before pumping commences in order to recognize changes in the system, and how the changes would manifest. The HMMP imposes certain baseline studies and monitoring requirements that must be met for this reason.

A1-30 The project team hydrogeologists do not disagree with applicant's comment regarding monitoring frequency; however, given the sensitive nature of the monitoring program and numerous public comments requesting increased monitoring frequency, we recommend collecting data in the early part of the monitoring program to make a case for reducing monitoring frequency.

HMMP text has been revised to note that, consistent with standard practice for pumping effects, monitoring data would be collected at high frequency initially, with the potential for reducing the monitoring data collection frequency as demonstrated by analysis of the data. Text changes are shown below.

Page C4-10

C4.3.1 HMMP IMPLEMENTATION RESPONSIBILITIES AND SCHEDULE

The monitoring and mitigation described in this HMMP will be performed by COC. COC will report results to the Inyo County Water Department on a monthly basis, and within 20 days of data collection. In addition, COC will submit quarterly and annual reports to the Inyo County Water Department summarizing the changes observed during the year and cumulative changes of the entire monitoring period, including conclusions and recommendations evaluating those changes relative to natural conditions such as rainfall and snowfall, assessing the significance of any changes compared to threshold levels if any, documenting any additional hydrologic modeling or adjustments to model-predicted impacts, and documenting any mitigation measures taken with respect to private wells or changes in Hay Ranch extraction rates. <u>The applicant may request that Inyo County Water Department allow changes in monitoring frequency by presenting hydrologic data to support a reduction in monitoring frequency that would not compromise the ability to monitor the response of the aquifer to pumping.</u> Data will also be provided to a designated contact at Little Lake Ranch, LLC.

Page C4-15 to C4-19

Table C4-2: Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Groundwater Level, Extraction				
Hay Ranch North and Hay Ranch South wells	Total Groundwater Extracted	Daily	Pumpage not to exceed 4,839 acre-ft per year (13.25 acre-ft per day)	Reduce or discontinue pumping.
Six New Hay Ranch Observation wells (2 nests of 3 wells)	Groundwater Elevation	Measured hourly at a minimum using dedicated pressure transducer with data downloaded and plotted weekly for the first 3 months, then monthly. Supplement with manual measurements weekly for the first three months, then monthly. Hourly collection of data may be reduced to once every 4 hours, if appropriate and approved by Inyo County, as demonstrated by the analysis.	Deviation of observed drawdown in two or more wells is at least 0.25 feet more than predicted trigger level value at any time beyond 4 months.	Alert County. County evaluates whether reduced pumping is appropriate prior to model recalibration. If appropriate, recalibrate model within one month and reassess impact to Little Lake.
			Groundwater level decline in two or more wells exceeding updated model predicted drawdown trigger levels by more than 0.25 feet in any quarterly data collection and monitoring period	Alert County. County to determine if decreased pumping is necessary immediately. Increase monitoring frequency to weekly for one month to confirm observation. Include results as part of quarterly data submittal. Recalibrate model within one month.
			Maximum acceptable drawdown level from Table C4-1 exceeded	Pumping ceases until the model is recalibrated and will re-start only if it can be shown that pumping can continue at a rate that will maintain wetlands and water levels at Little Lake Ranch.

Table C4-2 (*Continued*): Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Pumice Mine well	Groundwater Elevation	Monthly for first two years, then quarterly	Deviation of observed drawdown at least 0.25 feet from predicted trigger level value at any time beyond the first quarter in two or more wells	Alert County. Recalibrate model within one month. Reassess potential impact to Little Lake. County to evaluate whether reduction in pumping is warranted.
LADWP V816			Groundwater level decline exceeding updated model predicted drawdown trigger levels by more than 0.25 feet in any well in any quarterly data collection and monitoring period	Alert County. Increase monitoring frequency to weekly for one month to confirm observations. Include results as part of quarterly data submittal. Recalibrate model within one month. County to evaluate whether and when a reduction in pumping is warranted.
Dunmovin well				
Coso Junction #1, Coso Ranch North Well				
Lego well				
Well G-36				
Well 18-28				
Fossil Falls Campground well. New well to be located between Coso Jnc and Cinder Road Red Hill well				
Cinder Road, Red Hill well			Maximum acceptable drawdown level from Table C4-1 exceeded	Pumping ceases until the model is recalibrated and will re-start only if it can be shown that pumping can continue at a rate that will maintain wetlands and water levels at Little Lake Ranch.
Little Lake Ranch North well	Groundwater Elevation	Monthly for first two years, then quarterly	Deviation of observed drawdown at least 0.25 feet more than predicted value at any time beyond the first quarter	Revise trigger level based on Little Lake hydrology study Reduce or cease pumping at Hay Ranch at the direction of the County. Augment flow to Little Lake in accordance with EIR Section 3.2.3 (Hydrology-3) and implement the Augmentation Plan to maintain

Table C4-2 (*Continued*): Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
				groundwater level above trigger level
			Groundwater level decline exceeding updated model predicted drawdown by more than 50% in the well in any quarterly data collection and monitoring period	Alert County. Increase monitoring frequency to weekly for one month to confirm observations. Include results as part of quarterly data submittal. Recalibrate model within one month. County to evaluate whether and when a reduction in pumping is warranted. .
			Maximum acceptable drawdown level from Table C4-1 exceeded	Pumping ceases until the model is recalibrated and will re-start only if it can be shown that pumping can continue at a rate that will maintain wetlands and water levels at Little Lake Ranch.
At least two of McNalley, Toone, Dews, or Buckland wells located west of Haiwee Reservoir	Groundwater Elevation	Monthly for first two years, then quarterly	N/A. Information used to update model	N/A
Haiwee Reservoir	Stage level	Request average weekly values from LADWP	N/A. Information used to update model	N/A
LADWP Aqueduct	Flow rate			
Little Lake Hydrology				
Little Lake Hotel Well and Little Lake North Dock well	Groundwater Elevation (or closed well pressure)	Measured hourly using dedicated pressure transducer with data downloaded and plotted weekly for the first 2 months, then monthly. Hourly collection of	No threshold applied, Information used to update model and trigger levels.	N/A
Little Lake	Lake Water Level Elevation			
Little Lake Weir	Little Lake Weir Discharge and Weir Height(1)			

Table C4-2 (*Continued)*: Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Little Lake North Culvert Weir	Little Lake System Discharge Rate	data may be reduced to once every 4 hours, if appropriate and approved by Inyo County, as demonstrated by the analysis.		
Groundwater beneath Little Lake (minimum of four locations)	Groundwater elevation relative to lake	Monthly for 6 months after startup; then Quarterly		
Little Lake Ranch Pond P1	Occurrence of Siphon Well Discharge	Weekly by visual inspection; discontinue at end of baseline monitoring period		
Little Lake	Major operational changes	Request quarterly reporting of any major operational changes to lake level or groundwater pumping on property.	1 ft or more change in lake level or groundwater pumping on property in excess of 100 gpm daily average	None applicable. Data to be used for model updates, if needed, and for evaluating basin wide groundwater level responses in quarterly data submittal
Groundwater Quality				
Hay Ranch North and Hay Ranch South wells	Specific Conductivity/TDS	Quarterly	TDS increase to 2,000 mg/L or greater	Increase monitoring frequency to monthly for 3 months and monitor 18-28, G-36; evaluate basin wide response and determine whether reduction in pumping or supply of alternative water source is warranted
Coso Junction #2, Little Lake Ranch North well	Specific Conductivity/TDS	Quarterly	TDS increase to 1,500 mg/L or greater	Increase monitoring frequency to monthly for 3 months and monitor 18-28, G-36; evaluate basin wide response and determine whether reduction in pumping or supply of alternative water source is warranted
Well Yield				
Dunmovin wells,	Well Yield	Quarterly	Decrease in yield of	Mitigate well impacts

Table C4-2 (*Continued*): Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Coso Junction wells, Red Hill well, Fossil Falls Campground well			25% or more from pre-startup levels	per EIR Section 3.2.3 (Hydrology-2) and the Private Well Mitigation Plan
Precipitation Recharge				
Little Lake Canyon Precipitation Gauge	Precipitation totals	Daily using continuous recorder	No threshold applicable. Use data to identify basin groundwater level response (west side vs. east side) and mountain vs. valley precipitation for future numerical model updates	Recalibrate model and reassess impact to Little Lake
Haiwee Reservoir Precipitation Gauge				
(1) With the exception of Hay Ranch, every monitoring point is subject to access approval from the appropriate owner. If approval is not forthcoming, alternative appropriate monitoring points will be established by Inyo County, if necessary.				

A1-31 The comment regarding contact between Coso and Little Lake Ranch regarding potentially beginning early monitoring is noted. This comment is not relevant to environmental analysis pursuant to CEQA.

A1-32 The comment regarding the applicant's intent and the history of the Coso power plants is noted.

A1-33 The background information regarding renewable portfolio standards is noted.

A1-34 Supplemental background information regarding federal and energy policy is noted.

A1-35 The commenter is correct that the Draft EIR includes a discussion of several reasonable alternatives. The comment is noted.

A1-36 The additional support information regarding the infeasibility of additional piping as an alterative is noted.

A1-37 The additional support information regarding the consideration, cost, and infeasibility of replacing the turbine blades is noted. Much of this information is also described in the Draft EIR, Chapter 5: Alternatives.

A1-38 The additional support information regarding binary systems costs and infeasibility is noted.

A1-39 The additional support information regarding gas removal systems costs and infeasibility is noted.

A1-40 The additional support information regarding modification to the existing cooling towers, and the associated costs, benefits and ultimate infeasibility is noted.

A1-41 The additional support and background information on the Coso injection system is noted. Support of the Draft EIR's alternatives analysis is noted.

A1-42 The additional support information regarding Coso's evaluation of alternative water sources is noted and is included in the Draft EIR, Chapter 5: Alternatives.

A1-43 Support for the project and the conclusions of the Draft EIR is noted.

SOUTHERN CALIFORNIA
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Stuart R. Hemphill
Vice President
Renewable and Alternative Power

August 12, 2008

Inyo County Planning Department
P.O. Drawer "L"
Independence, CA 93526

RE: COSO OPERATING COMPANY HAY RANCH WATER EXTRACTION AND DELIVERY SYSTEM, CONDITIONAL USE PERMIT (CUP 2007-003) APPLICATION SCH# 2007101002

Dear Sir/Madam:

P1-1

Coso Hay Ranch has put forth an application for a Conditional Use Permit ("CUP") to allow ground water pumping from the Hay Ranch property for injection into the Coso geothermal reservoir to stabilize and enhance reliable renewable electrical energy production. This water augmentation project is very important for meeting the State of California Renewable Portfolio Standard ("RPS") which encourages the utilization of renewable energy to supply the electrical energy requirements of the State. The State of California has set an aggressive RPS goal of achieving production of 20% of the State's electricity demand from renewable sources by 2010. Geothermal is the largest contributor towards meeting this aggressive goal and the Coso geothermal resource is one of the largest contributors to California's renewable resource portfolio.

In addition, this project is also responsive to the Federal Energy Policy objectives of increasing the utilization of renewable resources and reducing greenhouse gas emissions.

Supplying augmentation water to the Coso reservoir will enhance the generation of electricity from the Coso geothermal resource for utilization within the State. This will serve to help achieve the important goals of increasing the production of renewable energy and reducing greenhouse gas emissions by displacing the demand for the fossil-fueled resources that would otherwise produce an equivalent amount of electricity to meet demand in the State.

We therefore strongly encourage the County of Inyo to approve the Coso Hay Ranch Conditional Use Permit.

Sincerely,

Stuart R. Hemphill
Vice President
Renewable and Alternative Power

P.O. Box 800
2244 Walnut Grove Avenue
Rosemead, CA 91770

P1 **Stuart R. Hemphill**
Southern California Edison
P.O. Box 800
2244 Walnut Grove Avenue
Rosemead, California 91770

P1-1 Support of the project is noted.

ARNOLD BLEUEL
LAROCHELLE MATHEWS &
ZIRBEL LLP
ATTORNEYS AT LAW

ATTORNEYS

GARY D. ARNOLD
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RECEIVED
AUG 2008
INYO COUNTY
PLANNING DEPT.

August 13, 2008

Tanda Gretz
Inyo County Planning Department
Post Office Box L
168 N. Edwards Street
Independence, California 93526

Re: Coso Hydrology Model

Dear Tanda:

Over the last 10 to 14 days, I have made various requests for access to public records and documents concerning the Coso Pumping Project. One of the specific documents I have requested is the Hydrology Model on which all of the pumping and drawdown predictions contained in the Draft Environmental Impact Report ("DEIR") is based. I understand that the MODFLOW groundwater flow model is publicly available. The original Hydrology Model was prepared by Coso's consultant, Brown and Caldwell. However, it is my understanding that the County's consultant, Geologica, prepared a new MODFLOW model, the results of which are described in the DEIR. We would like to get access to this new MODFLOW model, including the presentation of all of the variables, assumptions and inputs by which the various predictions, conclusions and results set forth in the DEIR are based. For your convenience, when we refer to the "Hydrology Model", I am referring to the entirety of the data, software, program, and all other written or electronic aspects of the model described in the DEIR.

P2-1

It is crucial for me to have access to the entire Hydrology Model. Indeed, without having the Hydrology Model, it is virtually impossible to verify whether the predictions and results generated by the Hydrology Model are accurate and reliable. Moreover, the public needs to verify for itself whether the information contained in the DEIR is an accurate representation of the data and conclusions drawn from the Hydrology Model.

It seems that the Hydrology Model should clearly be considered a public record. The County ultimately is responsible for the preparation of the DEIR which has now been released for public comment. Thus, all of the reports and studies mentioned in the DEIR should also be made available for public review and evaluation. If any of these studies, reports or models are being relied upon by the County in preparing the DEIR, the public has no way of verifying the accuracy of the DEIR except upon review of the underlying materials themselves. If the County

P2-1 and the DEIR is not able to provide copies, such as the revised Hydrological Conceptual Model prepared by GeoTrends in 2004, which I had earlier requested, then any reference in the DEIR to such reference materials should be deleted.

I look forward to your prompt reply in light of the public hearing scheduled for Wednesday, August 20, 2008. This request is made pursuant to California Government Code §6253. Please contact the undersigned should you have any questions or require any additional information

Very truly yours,

ARNOLD, BLEUEL, LAROCHELLE,
MATHEWS & ZIRBEL, LLP

Gary D Arnold

Gary D. Arnold

GDA:tg
cc: Little Lake Ranch, Inc.

P2 **Gary D. Arnold**
Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP
300 Esplanade Drive, Suite 2100
Oxnard, California 93036

P2-1 The requested information, including data, software, programs and all other written or electronic aspects of the MODFLOW was provided by Geologica and sent to Gary D. Arnold of Arnold, Bleuel, LaRochelle, Matthews & Zerbel, LLP on August 22, 2008.

ARNOLD BLEUEL
LAROCHELLE MATHEWS &
ZIRBEL LLP
ATTORNEYS AT LAW

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August 15, 2008

Inyo County Planning Department
168 N. Edwards Street
P. O. Drawer L
Independence, CA 93526

Re: Coso Project
Conditional Use Permit No. 2007-03

Dear Planning Department:

I will be attending the public hearing for the initial review of the Draft Environmental Impact Report ("DEIR") for the proposed Water Pumping and Transfer Project by Coso Operating Company ("Coso") for August 20, 2008. This letter will only briefly summarize some of the broader views of Little Lake Ranch concerning the DEIR. We will provide later a much more comprehensive letter to the County which will contain in detail all of our comments, questions and issues.

SUMMARY OF DEIR CONCLUSIONS

P3-1 Coso seeks to pump 4,839 acre-feet per year (AFY) of water from the underground aquifer known as the Rose Valley Basin for 30 years. The DEIR includes the alleged results and impacts from a new groundwater flow model for the Rose Valley Basin ("Hydrology Model"). We do not believe the DEIR accurately reflects the actual results and impacts from the calibrated Hydrology Model. P3-2 We also believe the Hydrology Model is flawed and overstates the amount of available water. P3-3 Finally, we believe that the draft mitigation measures and triggers contained therein are not adequate to prevent the stated, but questionable, impacts from the Project, particularly since (a) the Hydrology Model uses annual average conditions without considering the cumulative effects from pumping over a course of several drier than normal years, and (b) the triggers are not set at levels which address both the problems of pumping during droughts and the continuing decline in water levels and flows even after pumping stops. We are attaching a copy of a Memorandum prepared by our hydrologists, Team Engineering and Mr. Andy Zdon, concerning the specific problems with the P3-4 Hydrology Model. Although we feel the entire DEIR is fundamentally flawed and cannot be supported by the Hydrology Model, and indeed that the Hydrology Model must be substantially changed in accordance with the views from Mr. Zdon, we will continue our comments on the DEIR and the Hydrology Model as if it were accurate, which conclusion we reject.

P3-5 The Hydrology Model states that the Rose Valley Basin is in a state of equilibrium. Succinctly, this means that <u>any</u> new pumping or transfer of water will deplete the water in the aquifer and be harmful to all of the Rose Valley residents, businesses and landowners, by way of reduced water availability. The Hydrology Model then predicts that (a) if Coso pumps at a rate of 4,839 acre-feet per year (AFY), Coso would have to completely stop pumping after 1.2 years (less than 15 months) to avoid causing Little Lake to lose more than 10% of its water, or (b) under the most optimistic assumptions, Coso can only pump 480 AFY of water for 30 years to avoid reducing Little Lake's water supplies by more than 10%. The Hydrology Model then says that Rose Valley and Little Lake will not recover even this 10% water loss for more than 100 years, after all pumping stops. These simple predictions are not even mentioned in the Executive Summary portion of the Draft EIR. Why doesn't the DEIR clearly describe the results of the Hydrology Model?

P3-6 The DEIR presumes that a 10% loss of the water resources at Little Lake is not significant. How was this determination made? Hasn't the County consistently rejected or refused to approve any project which would cause any depletion of water sources? Any loss of water in the high desert is significant. We disagree with the threshold assumption that a 10% loss of water is not significant. P3-7 Any loss of water throughout the Rose Valley, even 10% or less, will impact the habitat and wildlife. The Draft EIR does not address the impacts or the length of the impacts after pumping ceases. Does the DEIR suggest a change in the County's policies regarding water exportation projects? Please support the view contained in the DEIR.

P3-8 No resident, business or landowner in Rose Valley should be forced to suffer <u>any</u> water loss by virtue of the Project. A 10% decline, particularly during a normal drought, could destroy most, if not all, of the springs, lakes, ponds and wetlands at Little Lake and Rose Valley. There is no evidence in the Draft EIR to demonstrate otherwise.

P3-9 If the Hydrology Model predicts that Coso could only pump 4,839 AFY for 1.2 years, what justification is there for granting Coso a 30-year CUP to pump at 4,839 AFY? Once Coso has the CUP in hand for a 30-year pumping project, isn't it clear that Coso will pursue every legitimate or illegitimate means to prevent a reduction or curtailment of pumping, regardless of the conditions of the CUP to the contrary? Pumping should begin at only the safest allowable rate (120 AFY), or the CUP must only be granted for 1.2 years, both of which assume that the Hydrology Model is correct. We are convinced that once the true results and impacts from the Hydrology Model, calibrated at only a 3% specific yield, are revealed to the public, such results will lead to the inevitable conclusion that any pumping must be prohibited.

P3-10 None of the stated alternatives were studied. The only reason given is that Coso believes they are too costly or not economical. What is the evidence to support this conclusion by Coso itself? May the DEIR simply discount alternatives, without analysis, simply because the applicant, Coso, doesn't want to study them because they are more expensive than pumping and may hurt P3-11 Coso's profits? CEQA does not allow the rejection of a feasible alternative just because the applicant says it will not work or be too expensive.

P3-12 The reason given for exporting water to Coso is that the water will help to replenish its geothermal reservoir and minimize power declines due to losses caused by evaporation. Coso is now in need of imported water for two fundamental reasons. First, Coso installed more production wells than could be sustained by its geothermal reservoir. Second, Coso designed its geothermal power plant, including the use of evaporative water-cooling towers (WCTs), through which a substantial portion of the geofluids it produces is lost through evaporation. It could have used an air-cooled system to inject 100% of the geofluids and not lose any water through evaporation. Coso has sacrificed the geothermal reservoir to generate the maximum amount of power over the shortest possible term for its own profit. In so doing, Coso has depleted the geothermal reservoir and wants to take water from the Rose Valley Basin to offset its poor management decisions.

ENVIRONMENTAL IMPACTS FROM THE PROJECT

Project Description.

P3-13 The definition of the Project and the description of the objectives have been drafted to present the water pumping Project as the only viable means to let Coso generate more electricity. The Project, if approved, will perpetuate Coso's profit, despite the harm to the environment.

P3-14 What is the justification for the Project and the overdraft of the Rose Valley Basin? What has caused the annual decline in reservoir productivity? Has Coso over-exploited the capabilities of the geothermal reservoir? Could Coso increase injection by using an air-cooled system? Would the injection of additional water saved by an air-cooled system also boost energy production? If so, by how much and at what cost? Has Coso provided to the County complete details of the production, revenues, profits, expenses, injection and geothermal reservoir model to confirm the feasibility of alternatives?

P3-15 Figure ES 1-1: The schematic only shows Navy 1 and Navy 2 power plants. Where is the BLM power plant and why is it not included?

P3-16 The DEIR states that the pending Project would not extend the operating period of Coso beyond "planned operating periods". Please identify the original expected operating life. Was the

P3-17 importation of water contemplated or allowed? What would the planned life expectancy of Coso be if Coso extracted geothermal fluids from the reservoir at a lower flow rate? What would be the original estimated life span if Coso had used air-cooled condensers (ACCs) rather than WCTs? What would be the current estimated life span if Coso used air-cooled condensers (ACCs) compared to Coso’s estimated life span without the Project?

P3-18 The DEIR states that there is no natural recharge of the geothermal reservoir. What is the evidence that there are no natural recharges to the geothermal reservoir? Did Coso know there was no natural recharge when it designed its plant? If the geothermal reservoir is not naturally recharged, why did Coso install WTCs instead of using ACCs to allow for the reinjection of all geofluids?

Project Objectives (Section 5.1): The stated objectives can be stated as the following:

1. To provide supplemental injection water;
2. To minimize annual decline in reservoir productivity;
3. To replace geothermal fluids lost through the cooling towers;
4. To sustain production capacity; and
5. To sustain the useful economic life of the existing power plant units.

P3-19 The first stated objective "to provide supplemental injection water" is nothing more than a description of the Project itself. It is not the type of objective on which an environmental analysis can be made, nor does it allow for the consideration of any alternatives which may be superior from an environmental standpoint. As such, this objective cannot form the basis for a valid evaluation of alternatives.

P3-20 Were the Project's objectives defined by the County or Coso? P3-21 Are the objectives only stated on the short-term or long-term? P3-22 Would reduction of production also minimize the annual decline of the reservoir? If the decline in the geothermal reservoir is due to evaporation from the water-cooling towers, why hasn't consideration been given to air-cooled condensers which eliminate the water loss? If, as expected, Coso's answer is that air-cooling towers are both expensive and may cause some power reduction, shouldn't this be considered as an alternative if the conversion would extend in perpetuity the life of the Plant?

P3-23 If a reduction of production or the use of air-cooled condensers prolongs the life in perpetuity of Coso's Plant, shouldn't the cumulative long-term production of power compared to the short-term be analyzed?

P3-24 Why is the "economic life of the existing power plant units" meaningful? Is this a valid objective under CEQA? Would an enormously polluting manufacturing plant be allowed to continue, merely to avoid stranded investment costs? Is the economic life of Coso designed to only allow the profit of Coso? What if the economic life of Coso could be extended indefinitely? What are the relative present values of a short-term facility, compared to a long-term facility? What if a long-term facility also had the added benefit of eliminating all significant impacts to the environment by not requiring the importation of water?

P3-25 Coso will always have the "<u>capacity</u>" to produce energy. The generating equipment and physical improvements on site defines the capacity. Coso's poor choices to excessively exploit the resource and allow water loses through evaporation have diminished the ability of the resource to produce power.

P3-26 Both the definition of the Project and the objectives of the Project have been stated solely and exclusively to provide short-term profits to Coso and, on a much lesser scale, to maintain the payment of taxes and royalties by Coso to the Navy, BLM and the County. The definition of the Project and the description of the objectives have been designed to preclude any rational exploration of alternatives which could preserve the geothermal reservoir as a productive and beneficial community resource, and avoid all of the stated environmental impacts in the DEIR.

P3-27 The DEIR asserts that the changing of geothermal technologies for the intentional reduction of electrical generation do not have to be considered, as they may "conflict with the applicant's obligations under existing Power Purchase Agreements." When were these agreements negotiated? Were they signed by Coso at a time that Coso knew its annual production was declining? Why should Coso's obligations under a contract it freely negotiates and signs have any bearing on the
P3-28 environmental assessment from the Project? Did Coso contract to supply more energy than its current facility could produce? Is this a proper subject for analysis under CEQA?

P3-29 The DEIR discounts a variety of alternatives because they are allegedly "uneconomical" or result in "stranded investment costs." Whose fault is it that there now may be "stranded investment costs"? Who decided to construct the excessive capacity? Who over-built the Coso facility to an extent that it could not be utilized based on the available geothermal resource? Who designed a plant with WCTs causing excessive evaporation when there was no feasible source of makeup water? Would a switch to ACCs allow for longer production, to avoid stranded capital costs? Why is the amount spent by Coso on its capital costs even part of the DEIR discussion?

P3-30 The entire problem is that Coso chose to exploit the geothermal reservoir beyond reasonable limits of sustainability, merely for its profit. Coso decided to install water-cooling towers, at the cost of enormous losses of waters through evaporation, rather than ACCs. Why should Coso be permitted to now cause severe environmental damage based upon its own faulty economic decisions?

<u>Hydrology</u>.

P3-31 Assuming that the Hydrology Model and the results thereof as reported in the DEIR are accurate, which they are not, the Hydrology Model confirms that the Rose Valley Basin is in a steady-state. Any pumping by Coso is not replaced by natural recharge and creates an overdraft. The Hydrology Model confirms that any pumping by Coso will adversely impact the Rose Valley Basin, at least to some extent. Doesn't the Hydrology Model show that even a limited amount of pumping at the rates of between 120 to 480 acre-feet per year (AFY) will reduce Little Lake's water supplies by 10%? Doesn't the Hydrology Model show that pumping by Coso at a rate of 4,839 AFY for even as short as 1.2 years (less than 15 months) will reduce Little Lake's water supplies by 10%? Doesn't the Hydrology Model reflect that even after the cessation of all pumping by Coso, Little Lake will continue to feel the effects of the pumping for at least 100 years?

P3-32 How was the 10% decrease in groundwater and surface inflows to Little Lake determined to be not "significant"? Is this an arbitrary number, or a number based upon actual consideration of the impacts to the lake, ponds, wetlands, riparian habitat and wildlife? Why should Coso be allowed to overdraft the Rose Valley Basin at all? What has the County's policy been in the past when considering water transfer projects? Has the County routinely accepted a 10% loss of water or impacts to vegetation and wildlife as not significant? If so, identify any similar project approved by the County in which similar water losses have been allowed.

P3-33 The DEIR and Hydrology Model question the assumed values for aquifer specific yields. Wasn't the Hydrology Model calibrated on an estimate of a 3% specific yield? Was the Hydrology Model recalibrated assuming higher specific yields? On what basis can the Hydrology Model arbitrarily assume different specific yields than were set forth in the calibrated Hydrology Model itself? What is the evidence to vary specific yields? If the Hydrology Model wants to assume higher specific yield assumptions, doesn't the entire Hydrology Model have to be rerun and recalibrated to determine whether these assumptions can be sustained in actual practice?

P3-34 Potential Impact 3-2.6 states there are no impacts to water quality or the reduction of existing water quantity. The Project would overdraft the Rose Valley Basin. While the percentage of the water removed from the Rose Valley Basin may be relatively low compared to the total water in storage, the depletion of water in storage may affect water quality. Will not the reduction in underground water cause a greater interaction between the remaining waters and the surrounding rocks, sand and other below-ground materials and substances? Will not the increased interaction increase the amount of total dissolved solids (TDS) of the underground water? Will the reduced water flow into Little Lake prevent the natural replenishment of the water, leading to decreased water quality? Will the concentration of water and the reduction of overall water capacity, also affect water quality? If there are no impacts to water quality, why does the Hydrologic Monitoring and Mitigation Program include the monitoring of water quality and even triggers to curtain or reduce pumping due directly to a reduction in water quality? (See page C4-18.)

P3-35 The potable water from the Rose Valley Basin will be injected into the geothermal resource and subjected to numerous toxic and hazardous contaminants. Thus, the otherwise fresh water from the Rose Valley will itself become contaminated. What is the mitigation for these impacts? What is the mitigation for the loss of potable water, due to its intentional contamination? Does this proposal violate federal and state water quality standards?

P3-36 What is the evidence on which the County concludes that Portuguese Bench and Rose Spring "most likely" would not be impacted? Would the removal of subsurface waters not impact
P3-37 surface springs? Is it possible that the former agricultural pumping on the Hay Ranch caused Rose Spring to go dry? (See Zdon memorandum) Please explain your answers.

Geology and Soils.

P3-38 Isn't the geothermal resource of Coso a part of the environment? Does the geothermal resource demand protection and appropriate management? Hasn't Coso exceeded the reasonable and sustainable output from the geothermal resource thereby threatening the resource? Why should Coso be allowed to deplete one valuable natural resource, namely, water in the Rose Valley Basin, to support its unwarranted exploitation of its geothermal resource?

Biological Resources.

P3-39 What is the basis for assuming that a 10% reduction or less of water resources would not impact Rose Valley's and Little Lake's habitat? Where is the biological report confirming that a permanent 10% loss of water flow would not adversely affect vegetation or wildlife? Why are

P3-39 mitigation measures to reduce or curtail pumping only after the predicted 10% limit is reached adequate to prevent harm? Will the impacts of pumping continue to be suffered for decades after the cessation of pumping? How does mitigation protect the habitat from a 10% water loss? Will Rose Valley and Little Lake continue to have reduced water supplies for more than 100 years after pumping stops? The suggestion that vegetation in the Rose Valley does not rely on groundwater as a water source is wrong. The withdrawal of water from the underground will deplete the natural moisture available to all surface vegetation.

P3-40 Obviously, the ability of Little Lake to manage its water supplies depends upon the existence of water supplies. This is not the same as "manipulation," which implies wrongful conduct. Little Lake Ranch cannot turn on a spigot to produce water and then turn it off. It only takes and manages what water it receives. The suggestion that water resources at Little Lake are "highly manipulated" is argumentative at the least. P3-41 If water is reduced by any amount, let alone 10%, how is Little Lake supposed to manage something that doesn't exist? Why must Little Lake Ranch suffer a loss of water supplies for 100 years as a direct result of the pumping?

P3-42 By completely ignoring all impacts to the biology of the Rose Valley and Little Lake, the DEIR utterly fails to address critical impacts to the habitat and wildlife. Even a 10% loss of water to Little Lake and the Rose Valley would constitute a taking under the Federal and California Endangered Species Act, the Migratory Bird Treaty Act, and the Bald Eagle Protection Act. P3-43 Why has there been no attempt to address these impacts? Isn't Little Lake considered a critical stopping point for the migratory fowl along the Eastern Sierra Flyway? What will happen to the migratory fowl if Little Lake no longer exists?

P3-44 Similarly, Little Lake is a navigable body of water and there are wetlands dependent upon water flow. Why has no effort been made to comply with the Clean Water Act of 1977 or the Porter-Cologne Water Quality Control Act? Won't the loss of water flow to Little Lake impact both the Lake and the wetlands at Little Lake? Isn't the County required to take all steps necessary to prevent the loss of wetlands and riparian habitat?

<u>Cultural Resources</u>.

P3-45 The DEIR states that the injection of water under the Project "theoretically could counter the pressure differential that the system is currently experiencing and result in a decrease or stabilization of the steam-dominated portion of the reservoir and a decrease or stabilization in water level and temperature in the hot springs." Is there now recognition that there is a direct connection between the Coso Geothermal Plant and the Coso Hot Springs? Describe how the injection of cold water into a hot geothermal resource could cause the reversal of effects. What reports is the DEIR relying on?

P3-46 What was the condition of Coso Hot Springs before production began? What has occurred to the Coso Hot Springs since production commenced? What is the interconnection between Coso Hot Springs and the geothermal operations? What is the predicted result on Coso Hot Springs from P3-47 the injection of cooler waters from the Rose Valley Basin? Why didn't the Navy suspend all

P3-47 geothermal operations as soon as Coso Hot Springs experienced impacts in accordance with the 1979 Memorandum of Agreement?

Agricultural Resources.

P3-48 Previously, the Hay Ranch was used for agricultural purposes, and Coso's ownership of the property solely for the purposes of the water transfer negates the preferable use of the property for any sort of agriculture. Indeed, because the Hay Ranch is now fallow, it is contributing to air pollution by increasing the amount of fugitive dust arising from the property. Has the Hay Ranch ever been used or designated as prime agricultural land? How much alfalfa did Hay Ranch produce per acre? How long did the Hay Ranch operate for agricultural purposes? What were the dates of agricultural use? Based on its former use, would the Hay Ranch be considered as prime agricultural land? Steps should be taken to restore either agricultural use on the property or prevent dust emissions. Merely because the Project will only use 5 to 7 acres from the Hay Ranch containing 300 acres does not provide justification for the loss of the Hay Ranch for agricultural purposes.

Aesthetics.

P3-49 With respect to the impacts of the Project on the aesthetics of Rose Valley and Little Lake, the impacts are obvious. Even a 10% reduction in surface flows would lower the average water level available to Little Lake, decrease the amount of water available to replenish all of the ponds, wetlands and riparian habitat south of Little Lake, and retard or harm natural vegetation. Won't the loss or reduction of Little Lake impact the view of motorists on Highway 395?

Hazards and Hazardous Materials.

P3-50 The Hazards and Hazardous Materials section of the DEIR fails to address the potential contamination of the Rose Valley water, loss of the geothermal reservoir, effects on Coso Hot
P3-51 Springs, and other related systems. The replenishment of the geothermal reservoir in the manner proposed by Coso will perpetuate and increase the generation of hazardous substances (H2S) and
P3-52 the necessity for continued storage thereof, to the potential detriment of the populace. No mention is made of how Coso currently handles the discharge of the waste created during its operations. What is the magnitude of the waste? What are the components? How is it being handled? How much more waste will be created as a result of the Project?

Public Services and Utilities.

P3-53 The adequacy of existing "water supplies" is probably a misnomer under the current circumstances for the Project. Nonetheless, Coso has no legal entitlement to pump or transfer off of the Rose Valley Basin the fresh water derived from its Hay Ranch water wells. As such, Coso's electrical plant indeed has inadequate water supplies. According the Hydrology Model, the Project will reduce potable water supplies available to the landowners of Rose Valley having a prior legal right. The relative water usage rights of Coso, compared to the other overlying landowners, should be examined.

<u>Air Quality</u>.

P3-54 The air quality section of the DEIR only deals with construction activities. This section fails to address the conversion of the Hay Ranch from prime agriculture land to a fallow condition, the failure to conduct habitat enhancement activities on the Hay Ranch allowing additional dust and contamination, the impacts from the loss of natural habitat and vegetation necessary to reduce fugitive dust during the duration of the Project, and the removal of valuable water resources, both from the surface and the underground, which provide necessary moisture for the healthy propagation and maintenance of habitat, all of which serve to reduce PM10 emissions. These impacts should be evaluated.

<u>Cumulative, Growth-Inducing and Significant Unavoidable Impacts</u>.

P3-55 It is odd that under the specific heading of Significant Unavoidable Effects, the DEIR states that there are <u>none</u> that cannot be avoided with mitigation. Is the Rose Valley Basin in a steady-state according to the Hydrology Model? Will any pumping by Coso overdraft the underground aquifer? Does overdraft pumping and transfer of water by Coso deplete, at least to some extent, the aquifer? How long will it take before the loss of water is replaced? If Coso is overdrafting the Rose Valley Basin, isn't that an unavoidable effect, regardless of mitigation?

P3-56 The DEIR only references that portion of the Deep Rose Project within Section 16 consisting of approximately 640 acres managed by the California State Lands Commission. In addition to the 640-acre geothermal project noted by the DEIR, Deep Rose and others have applied to explore for geothermal resources on a total of 4,500 acres of land managed by BLM in the immediate area. Why haven't these projects been considered and addressed?

P3-57 The Los Angeles Department of Water and Power ("LADWP") proposes an additional 900 AFY of water extractions per year. Allegedly, the Hydrology Model purports to include the LADWP Project in its projections from Coso's pumping. What happens to the predicted impacts when LADWP begins to pump? Will both companies be allowed to pump at full maximum rates? Should the mitigation measures and CUP conditions include an automatic reduction in Coso's pumping if and when LADWP is given permission to pump?

P3-58 If Deep Rose operates a geothermal facility, will Deep Rose also seek water extractions and in what amount? If Deep Rose and other applicants pursue geothermal plants in the immediate vicinity, would not the same or closely identical creation of hazardous materials occur at Deep Rose? Given the much larger size and footprint of Deep Rose, and the other applicants for geothermal exploration permits, what would be the overall impacts from heat emissions, air pollution, fugitive dust emissions, and air quality?

<u>Alternatives to the Project</u>.

1. Legal Analysis of Required Alternatives.

Public Resources Code § 21002 states the general legislative policy that "public agencies should not approve projects as proposed if there are <u>feasible alternatives</u> or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects. . . ." (Pub. Res. Code § 21002.) CEQA Guidelines § 15126.6 states as follows: "<u>An EIR shall describe a range of reasonable alternatives</u> to the Project, or to the location of the Project, which would feasibly attain most of the basic objectives of the Project but would avoid or substantially lessen any of the significant effects of the Project, and evaluate the comparative merits of the alternatives… The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives."

CEQA Guidelines § 15364 defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

"The underlying policy and express provisions of CEQA limit the approving agency's power to authorize an environmentally harmful proposal when an economically feasible alternative is available." (*County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 203.) The California Supreme Court has stated that "[o]ne of [an EIR's] major functions . . . is <u>to ensure that all</u>
P3-59 <u>reasonable alternatives</u> to proposed projects are thoroughly assessed by the [lead agency]." (*Laurel Heights Improvement Assoc. of San Francisco, Inc. v. Regents of the University of California* (1988) 47 Cal.3d 376, 400.)

"Even as to alternatives that are rejected . . . 'the EIR must explain why each suggested alternative either does not satisfy the goals of the proposed project, does not offer substantial environmental advantages[,] or cannot be accomplished.' …The explanation must be sufficient to enable meaningful public participation and criticism." (*Save Round Valley Alliance v. County of Inyo* (2007) 157 Cal.App.4th 1437, 1458.) "<u>The fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible</u>. What is required is evidence that the additional costs or lost profitability are sufficiently severe as to render it impractical to proceed with the project." (*Citizens of Goleta Valley v. Board of Supervisors* (1988) 197 Cal.App.3d 1167, 1181 (*Goleta Valley I*).)

"<u>Nor can an agency avoid an objective consideration of an alternative simply because, prior to commencing CEQA review, an applicant made substantial investments</u> in the hope of gaining approval for a particular alternative. . . . The lead agency must independently participate, review, analyze and discuss the alternatives in good faith." (*Kings County Farm Bureau*, 221 Cal.App.3d at 736.) <u>[T]he agency preparing the EIR may not simply accept the project proponent's assertions about an alternative</u>. . . . [T]he willingness or unwillingness of a project proponent to accept an otherwise feasible alternative is not a relevant consideration." (*Save Round Valley Alliance*, 157 Cal.App.4th at 1460 & fn. 10.)

2. Analysis of Alternatives.

P3-60 The only Project alternatives considered are reducing initial pumping levels at varying rates, or possibly the duration of pumping.

P3-61 Why aren't all the charts depicting the results of the Hydrology Model presented in the same location of the DEIR? (See the last graph at Figure 3.2-15, Figure 5.4-1, Figure 5.4-2 and Figure C4-2). Why have the graphs been scattered through at least 3 sections of the DEIR and not compared together? Shouldn't all predictions be studied together?

P3-62 The suggestion that the alternative pumping rates are "largely the same as the proposed project" is patently inaccurate and misleading. Is the DEIR really suggesting that pumping only 120 AFY for 30 years will have the same environmental impacts as pumping 4,830 AFY for 30 years? Or, is the conclusion really saying that pumping 120 AFY for 30 years is equivalent to only pumping 4,830 AFY for 1.2 years? Why isn't this comparison expressly stated? If this is the comparison, shouldn't the CUP only be issued for 1.2 years, so the comparison to a lower pumping rate is meaningful?

P3-63 During the public comments associated with the scoping of the DEIR, Little Lake Ranch identified a number of possible alternatives. None of these alternatives are discussed in the DEIR, nor was any valid reason under CEQA given for the rejection of the alternatives. Based upon further review and reflection of the DEIR, and our analysis of which alternatives may be feasible, Little Lake Ranch continues to believe that the DEIR should address additional alternatives, including (a) the use of treated wastewater from sources throughout the immediate vicinity of Coso, (b) the retrofit of Coso's Plant to use air-cooled condensers to completely eliminate the loss of water at Coso through evaporation, (c) the better management of the geothermal resource by reducing production and output, (d) the purchase of water from the Los Angeles Department of Water and Power (LADWP), (e) the ability of Coso to deepen its own production wells to tap new sources of geothermal fluids, (f) the availability of water from nearby aquifers, such as Owens Valley or Indian Wells water basins, or (g) a combination of the alternatives.

P3-64 Little Lake Ranch has been able to identify no less than 15 wastewater treatment facilities within 60 miles of the Coso facility. Similar to Coso, The Geysers in Napa Valley does not have adequate fluids in its geothermal resource. In the case of The Geysers, however, The Geysers has always been a vapor-dominated resource. The Geysers determined that it was economically justifiable to import waste water from over 40 miles away in order to inject the wastewater and maintain production. Why isn't similar a solution available to Coso? At the very least, this alternative needs to be studied, along with the other specified alternatives.

P3-65 When addressing the alternatives, it is difficult if not impossible to analyze the feasibility of the alternatives, when Coso, without supplying any evidence whatsoever, has merely "indicated that their minimum economic pumping rate may be 3,000 acre-feet per year." How does this statement compare to Coso's later statement that alternative water sources must produce at least 500 gpm? Does Coso's alleged minimum requirement justify the environmental harm that would be caused from the pumping at 3,000 AFY? Why is this assertion even contained in the DEIR? The DEIR dismisses out-of-hand modifications to Coso's facility or operations. Changes to Coso's Plant are

P3-65 discounted by the conclusionary and unsupported statements that the alternatives are "uneconomical" or result in "stranded investment costs."

P3-66 Coso's use of the WCTs is drying out the geothermal reservoir. Coso's continued production in excess of recharge (both man-made and natural) is also causing trouble by changing the character of the reservoir from liquid-dominated toward vapor-dominated. Coso, by using WCTs, is depleting its ability to inject fluids back into the geothermal reservoir to prolong its life. The use of an air-cooled condenser system would (a) allow virtually all of the produced geofluids to be injected, (b) extend the long-term vitality of Coso, and (c) reduce or eliminate any need for importation of external water sources.

P3-67 Apparently, Coso itself is the only entity that identified alternative sources of water, and then Coso itself rejected them. It was only Coso that estimated what an alternate water source would have to produce in order to be "economically feasible." Since when does an applicant get to choose the alternatives it wants considered and then evaluate its own limited alternatives for feasibility? Does this meet CEQA standards?

P3-68 Both Alternate 1 (pumping not more than 480 AFY, but continuing for 30 years) and Alternate 2 (pumping greater amounts of water, but for a far shorter time, i.e. 750 AFY for 6 years) are never contrasted to the proposed pumping by Coso of 4,800 AFY for 30 years. Isn't it obvious that Coso cannot conceivably pump 4,800 AFY for 30 years without doing enormous environmental harm? How can the DEIR possibly assert that the proposed Project (pumping 4,839 AFY for 30 years) is no worse than either Alternative 1 or 2? Doesn't the continuing damage to water supplies for over 100 years after all pumping is stopped, even at the lowest pumping rates and the shortest term, constitute yet another compelling reason to both (a) reject the entire Project without any further discussion, or (b) consider the more appropriate alternatives of either (i) reducing the initial allowed pumping to only 120 AFY, or (ii) limiting the duration of the CUP to 1.2 years?

P3-69 The environmental analysis of the "No Project" alternative is flawed. The statement that the No Project alternative would shorten the lifespan of Coso is not supported by any evidence. The reduction in energy production coupled with the conversion of Coso's water-cooling towers (WCTs) to an air-cooled condenser (ACC) system could actually prolong the operation of Coso indefinitely, admittedly at the cost of new equipment costs and reduced energy production. What other changes to Coso's electrical plant and method of operations could be found if pumping were not allowed? It is fairly obvious that Coso would simply not go away without the water pumping project. It would simply mean that Coso would be forced to spend some of it profits to find other solutions. Why haven't all of these solutions been identified and discussed?

P3-70 Coso is a privately owned, for-profit company which operates its electricity generation plant using geothermal resources ("Electrical Plant"). In calendar year 2004, Coso earned approximately $50,000,000 in net income, according to publicly-available financial reports. Coso states that the Electrical Plant is at risk of failure, unless it is allowed to pump and transport over 4,800 AFY of water from the Rose Valley Basin. What is the justification for the claim? Clearly, Coso can afford a broad range of alternatives and still be profitable.

P3-71 Coso's dilemma is a self-inflicted wound. Coso itself decided the level of energy to produce, despite the risks to the geothermal reservoir. Coso decided to use WCTs, knowing that huge amounts of water would be lost through evaporation when there was no viable alternate supply. Coso entered into power supply contracts before it knew how much electricity it could continue to produce. None of these voluntary decisions by Coso provide justification to inflict harm on the environment. A prudent redesign of its facility and a more reasonable management of the geothermal reservoir can sustain production and preserve the geothermal reservoir itself.

3. Alternatives Conclusion.

P3-72 Little Lake Ranch has retained the services of a geothermal engineering expert. When we submit our formal comments to the DEIR, a comprehensive report from the geothermal expert will support all of the primary observations noted above. He will also conclude that each of the suggested alternatives related to (a) the reduction of geofluids production to prolong the life of the geothermal resource, (b) changing the water-cooling towers to an air-cooled system, (c) drilling deeper to reach and exploit a new geothermal reservoir below the current reservoir, and (d) the importation of wastewater are all technically feasible and merit further investigation and research.
P3-73 We will also substantiate the position of Little Lake Ranch that Coso has systematically installed greater capacity than the geothermal resource could support on a sustainable basis. As such, the
P3-74 DEIR's discussion of Project alternatives is inadequate.

P3-75 The exclusion of a discussion of feasible alternatives deprives both the County and the public of the opportunity to consider alternatives that would provide significant environmental advantages with little or no impact upon the attainment of overall Project objectives. The DEIR does not contain any discussion of numerous alternatives. The public cannot determine whether and upon what basis the County may have initially considered and rejected the alternatives as infeasible. The DEIR further fails to address at least two alternate sources of water, namely, (a) from LADWP either through Haiwee Reservoir or its aqueduct serving the City of Los Angeles, (b) other water sources in the Owens Valley, just to the north of the Rose Valley, and (c) water sources in or around the Indian Wells Basin. These alternate sources of water were not mentioned, let alone discussed or rejected, based upon credible evidence.

P3-76 The Project alternatives of only considering the reduction of pumping rates or the duration of pumping discussed in the DEIR do not constitute a reasonable range of alternatives sufficient to permit the County to make an informed decision whether other Project alternatives should be pursued. For these reasons, the DEIR's discussion of Project alternatives should be revised to include a discussion of all the Project alternatives mentioned herein.

Mitigation.

P3-77 All of the mitigation measures rely upon Coso to conduct the monitoring and notify both the County and other landowners in Rose Valley. What happens if Coso fails, forgets or refuses? Is Coso anymore likely to voluntarily suspend pumping than LADWP? What are the chances that Coso will voluntarily and in good faith adhere to the mitigation measures? Shouldn't all of the monitoring at least be performed by the County itself, but funded by Coso? Should an independent

P3-77 monitor or water master be appointed and funded by Coso? If the County believes Coso's dire predictions of the imminent demise of the Electrical Plant, how can it risk relying upon Coso to reduce or eliminate its pumping once it is given permission to pump through the CUP? Any excessive drawdown, regardless of cause, should force the immediate imposition of the mitigation measures. Coso must not be given any opportunity to debate the "cause" of the drawdown.

P3-78 Proper mitigation measures may not include future study or the formulation of future mitigation measures. (See *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 306.) Deferring evaluation of environmental impacts until after a project's approval improperly avoids the required public review and agency scrutiny which are the foundation of the CEQA process. The DEIR cannot properly consider the issuance of a CUP to allow pumping for 30 years at a rate of 4,800 AFY, when the Hydrology Model tells us that pumping will have to stop in just 1.2 years, at best, to avoid a greater than 10% water loss at Little Lake. It is impermissible to rely on further studies to allow the continuation of pumping.

P3-79 Any and all water table reductions or water supply availability to Little Lake must be conclusively presumed to be caused by the pumping. As soon as "natural factors" are introduced as a possible cause of drawdown, the County will never be able to curtail Coso's pumping once the CUP is granted. Coso's pumping will add to and make worse periods of drought. Even if the water table or water supplies are naturally reduced, then there is even more reason to stop all pumping. Coso is exporting water off the Rose Valley Basin. Coso's pumping should be expressly and without question subordinate to the legal rights and needs of all of the overlying owners.

P3-80 The adequacy of the mitigation measures are further flawed, because the Hydrology Model is based upon average annual conditions. The Hydrology Model should be run to reflect impacts from pumping during a cycle of wetter years as well as a cycle of drier years. In drier years, the pumping from the Project will accelerate or worsen the impacts from the drought cycle. To avoid even a 10% loss at Little Lake, the mitigation measures must assume a worst case scenario of a prolonged drought while pumping occurs.

P3-81 The triggers are also misplaced and inadequate. The cessation of pumping at triggers which are set at the maximum allowable water level drop is not adequate. The Hydrology Model predicts that water levels will continue to drop even after pumping stops. Thus, the triggers have to be set to take into account the continuation and worsening of water losses following the cessation of pumping.

CONCLUSION

P3-82 Coso's problems are of its own making. It chose to install excessive capacity and use water-cooling towers knowing that it would cause the geothermal reservoir to dry out. The use of the Rose Valley as an alternate source of water was rejected by the environmental studies when Coso was first permitted to operate. Coso made these decisions solely to increase its profits. Why should Coso be permitted to now cause severe environmental damage based upon faulty economic decisions?

P3-83 The Hydrology Model on which the entire DEIR is fundamentally flawed as described in the memorandum from Mr. Zdon. The actual results and predictions from the Hydrology Model as run were not even presented. The stated impacts from the Hydrology Model are not reliable because of the errors mentioned by Ms. Zdon. The DEIR then crafts its mitigation measures to avoid what it considers as the substantial impacts based upon the flawed impacts from the flawed Hydrology Model. There is utterly no way to fix the DEIR by a simple response to the comments herein.

P3-84 The entire Hydrology Model must be recalibrated and rerun. The DEIR must contain the accurate results from the rerun Hydrology Model. Once the two results are known, the mitigation measures would have to be redrafted and new trigger points set. However, in our view this is all a wasted exercise.

P3-85 Based on the rationale provided by Mr. Zdon, it is obvious that the results and impacts reported in the DEIR from the flawed Hydrology Model substantially overstate the amount of water available for pumping and further underestimate the impacts from such pumping. Rerunning the model will produce worse results for Coso. Nonetheless, even the impacts reflected by the Hydrology Model itself show unavoidable significant environmental impacts which cannot be
P3-86 mitigated. As presented, there is no basis for approving the Project.

Very truly yours,

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P3-1 The comment is noted. Please refer to Master Response C2 for discussion of various aspects of the Hydrology Model and its reliability.

P3-2 The comment is noted. Please refer to Master Response C2 for discussion of various aspects of the Hydrology Model and its reliability. Master Response C2.1 includes a discussion of the aquifer thickness. The model did not overestimate the amount of available water.

P3-3 Please refer to Master Response C2.7 for a discussion of the impact analysis findings. The effects of pumping would be averaged over many years because of the physical configuration of the Rose Valley groundwater basin and the way drawdown effects propagate out from a pumping center. The effects of drought years and years of above average rainfall are likewise averaged out by the length of time required for infiltration or natural discharge from the basin. The use of averages in the Draft EIR is the appropriate way to address long-term response in the reservoir. The model is accurate for the analysis proposed. Mitigation requires continued calibration of the model as more data is obtained once the aquifer is stressed. Mitigation identifies trigger points to detect significant impacts, which accounts for delayed response down-valley.

P3-4 Comment noted, and is included in the project record. Please refer to Master Response C2 for discussion of various aspects of the Hydrology Model, its use in the project analysis, and its reliability.

P3-5 The information cited by the commenter is located in Section 3.2: Hydrology and Water Quality. The Executive Summary is a summary of the issues and mitigation and does not require the level of detail as is presented in the complete project analysis. The results of the hydrological modeling are presented clearly in the hydrologic analysis. Graphs are shown on pages 3.2-37, 3.2-38, and 3.2-44 of the Draft EIR. Results are discussed throughout the text of the Draft EIR in Section 3.2: Hydrology and Water Quality. Water levels would take considerable time to rebound; however, at no point would water inflow to Little Lake decrease by more than 10% as a result of the proposed project, during or after pumping has ceased.

P3-6 Please refer to Master Response C4.4 for a discussion of the determination of significance criteria. The 10% decline is not the decline in the overall aquifer, but the allowable reduction in flow into Little Lake. This amount is within the natural variation which the habitat has historically tolerated. A full discussion of the justification for the significance criteria is presented in Master Response C4.4. Previous decisions by Inyo County on other projects are irrelevant to the objective environmental analysis of the proposed project.

P3-7 Please refer to Master Response E2 for a discussion of effects to habitat and wetlands at Little Lake. Impacts would be less than significant with implementation of mitigation. A 10% reduction in flow would not have a significant impact on habitat and vegetation, as described in the Master Response E2. Previous and future decisions by Inyo County on other projects are irrelevant to the objective environmental analysis of the proposed project.

P3-8 The comment is noted. Please refer to Master Response C3 for an explanation of impacts to springs. Please refer to Master Response C4.4 for a discussion of the 10% trigger level and impacts to habitat and waters. Little Lake is over 5 ft deep. With mitigation, the project would not result in more than 0.3 ft of drawdown of the aquifer at the north end of Little Lake and less at the south end. The hydrologic model was used to predict groundwater drawdown, as is standard industry practice. The project includes many safeguards to ensure that Little Lake would not be significantly impacted from project pumping. See Appendix C4 of the Draft EIR for the HMMP.

P3-9 Inyo County would issue the CUP if the project is approved. The CUP would contain conditions based on the analysis in the Final EIR. Please refer to Master Response M2 for a discussion of how a violation of the CUP is determined. The CUP conditions are legally binding and violations can be challenged and have consequences. CEQA analysis assumes that mitigation is implemented and Inyo County has the legal responsibility to ensure such mitigation is implemented.

P3-10 Several alternatives were studied and evaluated. Please refer to Master Response L2 for the list of other alternatives that were considered.

P3-11 CEQA statutes regarding alternatives analysis is provided in Master Response L1. Feasibility of an alternative can be determined through examining site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site, or the site is already owned by the proponent. None of these factors alone establishes a fixed limit on the scope of reasonable alternatives (CEQA Guidelines §15126.6(f)(1)). Several of the “reasonable” alternatives were actually determined infeasible through this evaluation.

P3-12 Please refer to Master Response N6 for discussion of out-of-scope comments/past intentions and past actions of Coso. The past operation of the Coso plants is irrelevant to the analysis of the proposed project. The geothermal power plants have had separate environmental review, and all impacts were found to be mitigable. Please refer to Master Response L2 for a discussion of other alternatives evaluated in the Draft EIR. Air cooling towers were considered and are not a feasible alternative.

P3-13 Please refer to Master Response B1 for a discussion of the project objectives. The Draft EIR states on page 5-1 that the objective of the proposed project is to provide supplemental injection water to the Coso geothermal field to minimize the annual decline in reservoir productivity due to evaporation of geothermal fluids from the power plant cooling towers. This allowed for a range of alternatives to be investigated, as described in Chapter 5: Alternatives in the Draft EIR.

P3-14 a. The project is analyzed in the Draft EIR for its potential impacts to the environment. Part of the process for an application for a CUP is to evaluate the effects of groundwater withdrawal. The project would have significant impacts on the environment; however, mitigation minimizes those effects to less than significant levels. Refer to Section 3.2: Hydrology and Water Quality for the analysis of effects from the proposed project.

b. The annual decline in reservoir productivity is caused by loss of water through the cooling towers, as stated on page 2-1 of the Draft EIR.

c. Coso has utilized the resource as permitted by the resource and regulatory agencies. Past actions and plant operation are not relevant to the analysis of the proposed project. Please refer to Master Response N6.

d. Evaluation of an air cooled system was performed as part of the alternatives analysis and was found to be infeasible. Please refer to Master Response L2.

e. Coso has provided justification as stated in Chapter 5: Alternatives in the Draft EIR. Coso has also submitted supplemental information in support of the Draft EIR regarding the feasibility analysis of alternatives. See comment letter A1 in this chapter for additional justification as provided by Coso.

P3-15 The change was made as requested for the purpose of clarification. The figures have been modified to show the BLM East and BLM West power plants. (Figures ES 1-1, ES 1-2, 1.1-1, 2.3-1, 4.2-1, and C4-1). Figure revisions are shown in Section 3.4 of this Final EIR. These power plants were accidentally omitted from the maps, even though they were described in the text. The addition of the location of these power plants does not constitute significant new information that would require recirculation of the EIR.

P3-16 The life of the power plant can be considered in terms of the energy source. The heat source in the KGRA is not impacted by development and does not have a defined lifetime. The life of the plant can also be determined in terms of the life of the equipment at the plant. The plants would have to be shut down before the end of the life of the equipment without supplemental injection water.

P3-17 The original environmental review for the plants contemplated a potential future need for reservoir augmentation, and identified the Rose Valley as a potential source of water. Please refer to Master Response L2 for a discussion of alternatives considered, including use of air-cooled towers and lower production rates. Neither are feasible alternatives. The past design of the Coso plants and questions regarding different equipment use from project commencement are irrelevant to the CEQA analysis of the proposed project.

P3-18 There is some natural recharge to the system, as clarified in comment letter A1. Please refer to Master Response N6 for a discussion of out-of-scope comments, including past plant design decisions.

P3-19 The first stated objective, “to provide supplemental injection water,” allows for consideration of many alternatives, as described in Chapter 5: Alternatives in the Draft EIR. Please refer to Master Response L1 for a discussion of the CEQA requirements for objectives and the validity of the objectives as proposed in the Draft EIR.

P3-20 The objectives were established through Coso’s application to the County. Coso is seeking to increase the productivity of their facilities through a means that is directly related to solving the issue of the decline in reservoir pressure. The objective is broad enough to allow for consideration of other alternatives, such as alternative water sources, but is specific enough to state what the Coso proposes to accomplish with the proposed project (i.e., stop the decline in existing productivity). Please refer to Master Response L1 for further explanation.

P3-21 The objectives are stated for the proposed project. The term of the objectives is relative to the term of the proposed project.

P3-22 Air-cooled towers were considered and determined to be infeasible. Please refer to Master Response L2 for a discussion of alternatives considered. Feasibility of an alternative can be determined through examining site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site, or the site is already owned by the proponent. None of these factors alone establishes a fixed limit on the scope of reasonable alternatives (CEQA Guidelines §15126.6(f)(1)). Please refer to Master Response L1 for a discussion of CEQA requirements for evaluation of alternatives.

P3-23 Cumulative analysis must only include cumulative impacts associated with the proposed project and past, present, or future reasonably foreseeable projects. Other theoretical options that are not proposed are not required to be analyzed.

P3-24 The rhetorical questions made by the commenter are noted. These comments are not relevant to the CEQA analysis. The Coso plants were previously permitted. The proposed project does not address the operation of the existing plants because those plants have already undergone environmental review, and all impacts were/are mitigated. The proposed project would not expand production of the power plants beyond existing levels. Please refer to Master Response B1 for a discussion of project objectives.

P3-25 The comment is noted. Please refer to Master Response N6 for a discussion of out-of-scope comments regarding Coso's past actions and the operation of the existing plants.

P3-26 Please refer to Master Response L1 for a discussion of the project objectives and Master Response L2 for a discussion of the number of alternatives that were considered in Chapter 5: Alternatives in the Draft EIR. The objectives are valid under CEQA and several alternatives were considered. Refer to Chapter 5: Alternatives in the Draft EIR.

P3-27 Please refer to Master Response L2 for a discussion of alternatives. Binding agreements render the alternative legally infeasible, in accordance with CEQA.

P3-28 Coso's previous contracts on the existing plants are not relevant to the proposed project. These contracts are part of the existing, permitted projects and are baseline for the proposed project.

P3-29 Comments are noted, and are included in the project record. Please refer to Master Response L2 for a discussion of alternatives considered as suggested by the commenter. Please refer to Master Response L1 for a discussion of reasons why projects can be found infeasible, including economic infeasibility. Previous approved decisions regarding the operation of the Coso power plants do not pertain to the environmental analysis of the proposed project.

P3-30 The comment regarding Coso's past decisions and intentions is noted. The comment is irrelevant to the analysis presented in the Draft EIR because it does not relate to environmental issues. Please refer to Master Response N6. The project with mitigation would not cause severe environmental damage.

P3-31 The Hydrology Model reflects that even after the cessation of pumping, drawdown at Little Lake would increase before it decreases. The mitigation takes into account the delayed drawdown. The mitigation has been devised to identify impacts prior to any drawdown at Little Lake. The threshold of 10% reduction in flow to Little Lake is the maximum that Little Lake would ever experience from the proposed project. Please refer to Master Response C2.7 for additional discussion of delayed impacts.

P3-32 Please refer to Master Response C4.4 for a discussion of the significance criteria. This amount is within the natural variation that the habitat has historically tolerated. A full discussion of the justification for the significance criteria is presented in Master Response C4.4. Previous decisions by Inyo County on other projects are irrelevant to the objective environmental analysis of the proposed project.

P3-33 Please refer to Master Response C2.2 for an explanation of the aquifer properties, specific yield, and calibration of the Hydrology Model.

P3-34 The Hydrology Model indicates that most of the recharge to the groundwater aquifer from which the Hay Ranch wells produce is Sierra mountain front recharge. The water that would replenish the Rose Valley aquifer after pumping stops is also mainly mountain front recharge. Consequently, no significant change in water quality is expected. A small component of geothermal fluid may enter the valley in the deep subsurface (Gruler 2002; Williams 2004). Geothermal fluids are a different water type (predominantly sodium-chloride, versus calcium-sodium bicarbonate in Rose Valley groundwater) with higher total dissolved solids than Rose Valley water. Unproven nature, depth and low rate of this proposed influx suggest it would not be significantly influenced by the project and therefore would not significantly affect water quality.

Reduction in water levels in and around the pumped wells may increase the hydrological drive of potential recharge toward the low-point in water levels. The increased hydrological drive may actually increase the flow rate of recharge towards this low-point thereby decreasing water/rock interaction.

Little Lake is in a constant state of throughput; groundwater enters the lake by way of springs and seepage and exits by way of evaporation and discharge over the weir. The water quality of Little Lake is dominated by evaporation. The relatively high total dissolved solids in water samples from the Lake are a result of evaporation-related concentration. A slight reduction in groundwater input would not significantly change the evaporation rate and therefore the water quality.

Monitoring water quality is a standard practice. The Draft EIR includes prudent measures intended to confirm the findings of the Draft EIR.

P3-35 The project would not contaminate drinking water and would not violate the CWA. Additional explanation is provided in Master Response C6.1. Mitigation is not required (please refer to the Master Response for explanation).

P3-36 Please refer to Master Response C3.1 for a discussion of why springs would not be impacted. This information is also included in the Draft EIR in Section 3.2: Hydrology and Water Quality.

P3-37 Please refer to Master Response C3.2. Previous pumping likely did not cause Rose Spring to go dry. It is unlikely that the water table in the Rose Valley would have been lowered sufficiently (more than 150 ft) by historic pumping to cause Rose Spring to go dry.

P3-38. Please refer to Master Response C5.1 for a discussion of the use of the geothermal resource. Such declines are a standard part of geothermal development, and mitigation of these impacts is included in development plans. Decline in the reservoir based on existing utilization by the permitted power plants is beyond the scope of this EIR. The proposed project would not allow for generation of power beyond what is currently permitted and is currently being produced (at the time of the issuance of the NOP). The proposed project would not deplete the water available in the Rose Valley Basin. The amount of groundwater removal would equal about 2.4 to 3% of the total water available in the basin.

P3-39 Please refer to Master Response E4 for a discussion of the 10% significance threshold and impacts to wetlands and habitat at Little Lake. Please refer to Master Response C4.4 for a discussion of the 10% trigger level. The analysis regarding the loss of 10% of water flow is presented in Chapter 3.4: Biological Resources in the Draft EIR. The maximum water flow loss allowable with implementation of mitigation would be 10%. Most vegetation in Rose Valley does not depend on groundwater as the groundwater table is from 140 to 240 ft bgs. Vegetation in the Rose Valley does not have roots over 100 ft deep. Refer to page 3.4-41 of the Draft EIR.

P3-40 Little Lake staff has the ability to transport water around the property, and thus has been able to manipulate the size of the lake and the ponds. The language is a statement of fact. No changes to the Draft EIR are merited. Impacts to Little Lake would be less than significant with the incorporation of mitigation identified in the Draft EIR.

P3-41 The project would not result in drying of Little Lake with implementation of mitigation. Please refer to Master Response E4 for a discussion of the 10% significance criteria with respect to biological resources. Habitat at Little Lake should remain largely the same, even with a 10% decrease in flows. There appears to be some flexibility in the management of the wetland at Little Lake, though it is noted that any loss of water can impact the water table and wetland levels. Little Lake currently exports some of their water (approximately 6 ac-ft/yr) to a nearby pumice mine for non-wetland and consumptive uses. This exportation constitutes a loss of water, while they are still able to maintain the wetlands. Further explanation is provided in Master Response E2 and E3. Appropriate consultation with the CDFG and the USFWS has been undertaken.

P3-42 Please refer to Master Responses E2 and E5 for a discussion of impacts to wetlands and impacts to migratory bird species, respectively. The project would not have a significant impact on wetlands with the implementation of mitigation. The habitat at Little Lake would remain largely the same, and wildlife and migratory bird species would not be impacted.

P3-43 Migratory fowl depend upon the habitat. The project would not result in significant impacts to habitat at Little Lake with implementation of mitigation. Migratory fowl would not be impacted. Please refer to Master Response E5.

P3-44 Please refer to Master Response E2 for a discussion of impacts to wetlands. The Porter-Cologne Water Quality Control Act is discussed in Section 3.4.2 beginning on page 3.4-24 of the Draft EIR. The CWA is discussed in Section 3.4.2 beginning on page 3.4-23 of the Draft EIR. Potential impacts to water quality are discussed under Potential Impact 3.2-6 beginning on page 3.2-57 of the Draft EIR.

The project would not result in violation of water quality under the CWA or the Porter Cologne Water Quality Control Act at Little Lake. No physical disturbance is proposed at Little Lake. The project would not result in loss of wetland habitat through placement of dredge or fill. Please refer to Master Response E2 for additional explanation of the impacts to wetlands.

P3-45 Please refer to Master Response C5.2 for a discussion of the connectivity between the Coso Hot Springs and the geothermal reservoir. There is some relationship between the hot springs and the geothermal reservoir; however, it is not a one-to-one, or direct relationship. It is a complex relationship and the hot springs are also affected by other factors. The description of how the injection from the proposed project could reverse effects is included on pages 3.5-15 through 3.5-17 of the Draft EIR. The reports used for the analysis of the impacts to Coso Hot Springs are listed on page 3.2-2 of the Draft EIR.

P3-46 Background information on the Coso Hot Springs is presented on pages 3.2-26 through 3.2-30 of the Draft EIR. Please refer to Master Response C5.2 for further explanation of the connectivity between the hot springs and the geothermal reservoir. Please refer to Master Response C5.5 for a discussion of impacts of cool water. The baseline for this analysis is the condition of the Coso Hot Springs at the time of issuance of the NOP.

P3-47 Please refer to Master Response F2 for a discussion of the 1979 MOA. The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR. The measures in the MOA as established were agreed upon by the signatory parties and remain valid.

P3-48 Hay Ranch may still be used for agriculture. The project would only use about 5 ac of the over 300 available on the property. Please refer to Master Response G2 for additional explanation. The existing state of the property is the baseline condition for the analysis of the proposed project. It is beyond the scope of the EIR to address the effects of the baseline conditions.

Hay Ranch has never been designated as prime agricultural land, as is stated on page 3.8-2 of the Draft EIR. “Inyo County does not contain any mapped Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (California Division of Land Resources Protection 2004); therefore, none of these land designations exists in the project area.”

Specific details of previous use of the property, such as the dates of previous alfalfa, production are not relevant to the EIR. The existing setting is the baseline condition at the time of the NOP, according to CEQA. The Hay Ranch parcel was not in agricultural production at that time. See page 3.8-1 of the Draft EIR for the amount of alfalfa that was produced per acre. The length of time that the Hay Ranch property produced alfalfa is unknown and irrelevant to the EIR. The Hay Ranch parcel would not and is not considered Prime Farmland. Please refer to Master Response G1. Steps to restore agricultural production on the Hay Ranch parcel are irrelevant to this EIR. Hay Ranch could be used for agricultural purposes in the future at the parcel owner’s discretion.

P3-49 Please refer to Master Response H1 for a discussion of aesthetics impacts. The project would not cause a discernible visual effect to Little Lake as viewed from US 395 with implementation of mitigation. Please refer to Master Response H1 for further explanation.

P3-50 The project would not contaminate drinking water. Additional explanation is provided in Master Response C6.1. The project would not result in the loss of the geothermal reservoir. Effects on Coso Hot Springs are not a hazards issue. Refer to pages 3.2-51 to 3.2-54 of the Draft EIR for a discussion of project impacts on the Coso Hot Springs.

P3-51 Please refer to Master Response J1 for a discussion of why the project would not increase the generation of hazardous substances from the power plants. The impacts of producing geothermal power from Coso geothermal fluids at the originally permitted power production rate has been addressed in the power plant environmental documents and the effects were found to be less than significant; it is not necessary to address further. The project would not generate more power output than was previously evaluated and produced at the power plants. Please refer to Master Response I for a discussion of H_2S emissions and why the proposed project would not result in greater emissions than the baseline level.

P3-52 Analysis of the existing waste and discharge from the Coso power plants is outside the scope of this EIR. Please refer to Master Response N3 for a discussion of out-of-scope comments related to the impacts of the power plants. Impacts of the power plants are not relevant to the proposed project because these impacts were addressed in previous documents. Previous documentation for the power plants addresses all impacts, and all impacts could be mitigated. The proposed project would not generate power or waste in excess of what was previously permitted and is currently being produced. The mitigation from previous documents is applicable to the ongoing generation of power from the plants (i.e., plant operation).

P3-53 Water usage rights are outside the scope of this EIR. Please refer to Master Response C7 for a discussion of water rights. Mitigation has been proposed to protect groundwater users in the Rose Valley, including deepening or re-equipping of private wells if necessary.

P3-54 The Draft EIR addresses air quality impacts of operations and maintenance as well as construction. See Section 3.13 of the Draft EIR. The existing state of the property is the baseline condition for the analysis of the proposed project. It is beyond the scope of the EIR to address the effects of the baseline conditions.

The Hay Ranch property is not Prime Farmland. There are no habitat enhancement activities occurring at Hay Ranch, nor are any required on this piece of private property. The Hay Ranch parcel is fallow, and the vegetation at the Hay Ranch parcel is not currently managed or farmed. The vegetation on the Hay Ranch parcel and in most of Rose Valley does not rely on groundwater for moisture, as the water table is more than 100 ft bgs in most areas. The calculation of emissions of dust and definition of mitigation for the baseline condition is not required under CEQA.

P3-55 A steady-state scenario is used for the Hydrology Model. Pumping would cause a reduction in the aquifer. The length of time for the reservoir to rebound depends upon the specific yield of the aquifer and other parameters. See Section 3.2: Hydrology and Water Quality in the Draft EIR for a discussion of the existing aquifer characteristics, and the analysis of groundwater pumping including system rebound.

Some loss of water from the aquifer is not necessarily a significant impact. Groundwater users would experience less than significant effects with implementation of mitigation. Impacts to habitat from a small loss of water from the aquifer would be less than significant with implementation of mitigation. Most plants are drought tolerant and do not rely on the groundwater table. Vegetation at Little Lake would experience less than significant impacts because of the mitigation that would prevent a decrease in inflows to Little Lake of greater than 10%.

P3-56 Please refer to Master Response K1 for a discussion of the Deep Rose project.

The only Deep Rose project applied for and under consideration by Inyo County is a project to explore on a limited amount of acreage, as specified in the Draft EIR.

CEQA analysis has been conducted on that exploration and the proposed exploration project has been considered in the cumulative impacts analysis for this project.

There are no applications with Inyo County for further geothermal exploration and supporting water transfer and no application to construct or operate a geothermal plant. Whether Deep Rose will eventually construct a geothermal plant is entirely speculative. Deep Rose would first have to locate an exploitable geothermal resource and then would have to obtain permits to construct and operate a plant and conduct environmental analysis of the effects of such construction. The baseline condition at the time of initiation of that project would need to consider the Coso project. This scenario is too speculative for evaluation in the cumulative impacts analysis.

P3-57 Refer to page 4-7 of the Draft EIR for a discussion of the cumulative impacts associated with the pumping of 900 ac-ft/yr by the LADWP. Please refer to Master Response K2 for further discussion. It is currently unknown if the LADWP project will occur or if it will occur at the same time as the proposed project. The LADWP project would require environmental review including evaluation of impacts to groundwater in the Rose Valley prior to issuance of a permit. It is likely that mitigation measures would be required. Mitigation in the Hay Ranch project EIR related to the LADWP project is not required at this time because the LADWP project and its potential overlap with the Hay Ranch project are speculative.

P3-58 Deep Rose would likely require water as well if it were to construct a geothermal plant. The only project proposed to date is a small exploration project for limited acreage, as described in the Draft EIR. The project as proposed would not have significant hazard impacts (please refer to Master Response I). The proposed project would not have a significant contribution to an overall significant impact. The proposal would be subject to extensive analysis, including CEQA analysis, if Deep Rose were to proposed construction of a geothermal plant. Such a project is too speculative to analyze or require analysis in this EIR.

P3-59 The comment citing CEQA regulations and related cases is noted.

P3-60 Refer to Chapter 5: Alternatives in the Draft EIR for a discussion of alternatives considered. Reducing pumping levels is not the only alternative considered. Several other alternatives were considered, but rejected.

P3-61 Charts and figures are presented as they are referenced throughout the Draft EIR. It would be impractical and confusing to group figures in one location that are referenced in several different sections. All predictions pertaining to the proposed project and the project with mitigation are presented in Section 3.2. CEQA requires analysis of cumulative impacts, which is presented in Chapter 4: Cumulative Analysis. CEQA also requires analysis of alternatives, which is presented in Chapter 5: Alternatives. Headings are used for clarification. The hydrology analysis and predictions in Chapter 4 and Chapter 5 are found under the heading *Hydrology and Water Quality*.

P3-62 The comment has misquoted the Draft EIR language. The Draft EIR does not read “largely the same as the proposed project,” as was quoted by the commenter. The correct quote from page 5-7 of the Draft EIR is, “largely the same in nature as the proposed project, but would take longer to occur.” The comparison is clearly stated. The CUP would be issued for 30 years. Mitigation from the Draft EIR would be incorporated into the CUP. Pumping would be evaluated and may be reduced or ceased once trigger levels in the groundwater monitoring wells are reached.

P3-63 Please refer to Master Response L2 for a discussion of evaluation of alternatives to the proposed project. All of the alternatives suggested by the commenter were evaluated but determined to be infeasible. Refer to comment letter A1 for additional information as supplied by the applicant.

P3-64 Please refer to Master Response L2 for a discussion of the feasibility of using wastewater as supplemental injection water. This scenario is economically infeasible and has additional environmental impacts.

P3-65 Please refer to Master Response L5 for a discussion of economic feasibility. Please refer to Master Response L2 for a discussion of other alternatives addressed and the feasibility of implementing these alternatives. The reference to 500 gpm would be feasible if the source were found at the power plants. The amount of water necessary to cover capital costs increases the farther from the plants the source is obtained. The economics of the project change depending upon how much pipeline and electricity is needed to transport the water. The project would not incur environmental harm with implementation of mitigation. CEQA allows for the finding of alternatives to be economically infeasible. Please refer to Master Response L5 for additional explanation.

P3-65 Previous decisions regarding equipment used at the Coso plants are irrelevant to this EIR because it predates this project application. Please refer to Master Response N6 for further discussion of out-of-scope comments regarding previous decisions made by Coso. Please refer to Master Responses L2 and L5 for a discussion of alternatives considered but rejected and requirements for analysis of feasibility. CEQA allows for the finding of alternatives as economically infeasible. Economics were provided in comment letter A1.

P3-66 Previous decisions regarding equipment used at the Coso plants are irrelevant to this EIR because it predates this project application. Please refer to Master Response N6 for further discussion of out-of-scope comments. Air-cooled towers are addressed in Master Response L2. Air-cooled towers would have additional environmental effects and would be uneconomical.

P3-67 Please refer to Master Response L1 for a discussion of CEQA standards requirements for addressing alternatives. The County reviewed the information provided by Coso in presenting the facts in the Draft EIR and concluded in the EIR that a reasonable range of alternatives had been identified. The alternatives analysis in the Draft EIR meets CEQA standards.

P3-68 Please refer to Master Response L3. The alternatives are compared to the proposed project. The alternatives, since they incorporate the mitigation of the proposed project, have fewer impacts than the project as proposed but still may require mitigation. The CUP would include mitigation as described in the Draft EIR. The applicant would not be allowed to pump 4,800 ac-ft/yr for 30 years with no mitigation. The CUP may contain additional limitations at the discretion of the County. All mitigation identified must be implemented if the EIR is approved.

P3-69 The life of the power plant can be considered in terms of the energy source. The heat source in the KGRA is not impacted by development and does not have a defined life. The life of the plant can also be determined in terms of the life of the equipment at the plant. The plants would shut down before the end of the life of the equipment without supplemental injection water; therefore, the No Project alternative would shorten the life of the plants. Please refer to Master Response L2 for a discussion of why air cooling towers are infeasible and for a discussion of other plant modifications that were determined to be infeasible. Speculation regarding Coso's intentions and future actions is not an environmental impact and hence not within the purview of CEQA. CEQA requires evaluation of a reasonable range of alternatives. Please refer to Master Response L2 for a discussion of the range of alternatives considered.

P3-70 The Draft EIR does not state that the Coso plant is at risk of failure. The comparison of the alternatives' economic costs are presented in the Draft EIR and in the comment letter submitted by Coso (comment letter A1).

P3-71 Previous decisions regarding equipment used at the Coso plants are irrelevant to this EIR. Please refer to Master Response N6 for further discussion of out-of-scope comments. Other plant modifications are addressed in Master Response L2. The Draft EIR includes mitigation to minimize effects to the environment. Mitigation must be implemented if the project is approved.

P3-72 Please refer to Master Response L2 for a discussion of the alternatives identified by the commenter. These alternatives were determined to be infeasible as set forth in the Draft EIR, the Master Responses, and other information in the administrative record.

P3-73 Previous decisions by Coso are outside the scope of environmental impacts associated with this project, as included in this EIR. Please refer to Master Response N6 for further discussion of out-of-scope comments.

P3-74 The comment is noted. Please refer to Master Responses L1 through L5 for further discussion of alternatives and the alternative analysis.

P3-75 Please refer to Master Response L2 for a discussion of alternatives considered, including alternative water sources. Several alternatives were evaluated but were determined infeasible. A discussion of alternative water from the LADWP is discussed in Master Response L2. This alternative would be economically infeasible because the water would have to be purchased. There may still be groundwater impacts, depending upon from where the LADWP obtains the water, as well as impacts associated with a longer pipeline. Water taken from Owens Valley would also have groundwater impacts, and no sites where water could be pumped are known or are reasonable to assume to exist. Indian Wells Valley is too far from the Coso plants and the cost of pipeline and electricity for pumping would render a project infeasible. Water from Indian Wells Valley would likely have similar groundwater effects.

P3-76 A reasonable range of alternatives is considered. Please refer to Master Responses L1 and L2 for a discussion of requirements under CEQA and the range of alternatives considered. Alternatives considered can be rejected if found to be infeasible.

P3-77 Please refer to Master Responses C4.3 and M1 through M4 for a discussion of mitigation and monitoring. Coso must implement mitigation measures identified in the EIR if the EIR and the project are approved. There are ramifications outside of CEQA for addressing violations if Coso fails to implement those requirements. The chance that Coso would not adhere to mitigation measures is irrelevant to the EIR analysis. Inyo County would be responsible for overseeing the monitoring program, approving technical staff proposed to conduct the monitoring, and evaluating the quality and objectivity of the monitoring program. Inyo County has jurisdiction to enforce all conditions imposed in its permit. Questions on whether or not Coso would implement required mitigation is irrelevant to the EIR.

P3-78 Please refer to Master Response M3. CEQA does not allow mitigation to be deferred; however, it is allowable to implement mitigation in the future if the lead agency adheres to performance standards that would mitigate a significant impact of a proposed project and if the mitigation could be achieved in more than one specified way (CEQA Guidelines §15126.4(a)(1)(B)). The HMMP includes mitigation standards and uses allowable adaptive management techniques.

P3-79 Water rights issues are legal conclusions beyond the scope of the EIR. The EIR analyzes the impacts on other users in the Rose Valley and such users would experience less than significant impacts with implementation of mitigation.

The mitigation is designed to prevent a 10% reduction in the flow of groundwater available to Little Lake reservoir *caused by pumping at the Hay Ranch*. A reduction in groundwater caused by drought would not be caused by the pumping at the Hay Ranch and would not necessarily trigger a dramatic reduction in or cessation of pumping. The applicant would not be required to reduce or cease pumping to account for the effect of a drought if the drought lowers groundwater levels to the established trigger levels. The Inyo County Water Department would recalculate the pumping rate to ensure a no greater than 10% reduction in groundwater flow based on the new reduced background level. This would likely result in reduced pumping because the maximum 10% reduction would be calculated based on the reduced availability of groundwater

P3-80 The effects of pumping would be averaged over many years because of the physical configuration of the Rose Valley groundwater basin and the way drawdown effects propagate out from a pumping center. The effects of drought years and years of above average rainfall are averaged out by the length of time required for infiltration or natural discharge from the basin. The use of averages in the Draft EIR is the appropriate way to address long-term response in the reservoir. The EIR explains that the assumptions of the EIR are conservative. Impacts would still be less than significant, even given these conservative assumptions.

P3-81 The trigger levels take into account that the water table would continue to drawdown after cessation of pumping. Refer to page 3.4-26 of the Draft EIR and the HMMP in Appendix C4 of the Draft EIR. The maximum drawdown that Little Lake would experience as a result of the proposed project even with drawdown is 0.3 ft at the north end of the lake.

P3-82 Previous decisions regarding equipment used at the Coso plants are outside the scope of environmental analysis for this EIR. Please refer to Master Response N6 for further discussion of out-of-scope comments. Evaluations of Coso's intentions are beyond the scope of this EIR because they do not relate to environmental impacts. Mitigation has been defined in the Draft EIR to reduce impacts to the environmental to less than significant levels, such that severe environmental damage would not occur.

P3-83 Please refer to Master Response C2 for an explanation of the validity of the Hydrology Model.

P3-84 Please refer to Master Response C2 for an explanation of the validity of the Hydrology Model.

P3-85 Please refer to Master Response C2 for an explanation of the validity of the Hydrology Model.

P3-86 The comment regarding the commenter's objection to the project is noted.

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PLANNING DEP.

August 22, 2008

Tanda Gretz
Inyo County Planning Department
Post Office Box L
168 N. Edwards Street
Independence, California 93526

Re: Public Meeting

Dear Tanda:

Enclosed please find a copy of my basic outline of the comments I made on behalf of Little Lake Ranch at the public meeting on August 20, 2008 regarding the Coso Project. Although my statements did not exactly follow the outline, I believe I raised most of the items set forth. Any item that I missed by way of my oral statements, but is contained in the outline, should be included as comments to the Draft Environmental Impact Report (DEIR).

During my presentation, there were several items at least briefly discussed. I thought I would take this opportunity to clarify and expound upon a few of my comments.

P4-1

According to CEQA, and the case law interpreting CEQA, the DEIR cannot rely upon future environmental studies or analysis to mitigate impacts from the Project. Rather, the DEIR itself must contain all environmental studies and reports and the mitigation of the all impacts. In this case, that means the DEIR must contain an analysis of all of the environmental impacts from pumping water from the Rose Valley at the rate of 4,839 AFY for 30 years, without mitigation. It is not permissible for the DEIR to simply include a mitigation measure of restricting pumping after 1.2 years, and then only consider what the environmental impacts would be from this shorter pumping duration. The County cannot rely on modeling and hydrology studies over the first one (1) year of pumping to then

P4-2

determine whether the Project should be modified or changed. Likewise, it is not permissible to compare (a) either of the stated alternatives of pumping at a lower rate (120 AFY for 30 years) or pumping at a lower rate for a shorter duration (3,000 AFY for 1.75 years) to (b) the Project with mitigation. Each of the alternatives must be compared to the full projected pumping of 4,839 AFY for 30 years, without mitigation. The statement in the DEIR that either alternative project has the same impacts as the proposed Project is patently wrong, when the comparison is properly made. To be

P4-2 accurate, the alternatives would have to be compared to a water project of pumping 4,839 AFY for only 1.2 years, but that is not the project being discussed by the DEIR.

P4-3 The comments I provided, along with the memorandum from our hydrologist, Andy Zdon, call into serious question the reliability of the Hydrology Model contained in the DEIR. Only two particular items have been noted thus far, although I have been advised by our hydrologist that there are numerous problems with the Hydrology Model. These problems are so central to the evaluation of the Hydrology Model that, in our view, the Hydrology Model must be completely reworked and rerun if it is to provide any reliable indicator of impacts from the proposed Project.

P4-4 The two major problems are (a) the Hydrology Model uses an estimated thickness of the Rose Valley Basin aquifer of 3,000', rather than the 700' estimate presented by Geologica at the public meeting and (b) the Hydrology Model was calibrated at a specific yield estimate of 3%, while the impacts from the Project arbitrarily used an estimated specific yield of 10% or greater. The arbitrary estimates used in the DEIR are inconsistent with the similar data for the Owens Valley as fully documented by Wesley Danskin in his report entitled "Evaluation of the Hydrologic System and Selected Water-Management Alternatives in the Owens Valley, California 1998" on which the

P4-5 Hydrology Model heavily relies. As I suggested in my verbal comments, if the County is unwilling to accept the conclusions from our hydrologist, then perhaps an appropriate compromise would be to subject the Hydrology Model to a peer review by an independent hydrologist, such as Wesley Danskin. Because of the extensive work Mr. Danskin has performed in the Owens Valley, he could provide valuable guidance concerning the accuracy and reliability of the Hydrology Model.

P4-6 The graphs and tables incorporated into the DEIR, including the narrative describing the same, are difficult to reconcile and to compare with one another. The problem is that they are not clear as to the proposed duration of pumping, the rates of pumping and which specific yield assumptions are being used to generate the results.

P4-7 The table displayed at the public meeting regarding the amount of allowable drawdowns throughout Rose Valley, reflected a drawdown trigger for remedial action at the Little Lake <u>North Dock</u> well. However, Table 3.2-7 and Table C4-1 in the DEIR both show monitoring and triggers at the Little Lake <u>Ranch North</u> well. When I raised this discrepancy, I was advised verbally by Geologica that triggers had been established for not only the Little Lake <u>North Dock</u> well, but apparently other wells at Little Lake. There are at least four (4) water wells at Little Lake Ranch from which monitoring could be performed. The DEIR does not clearly identify which wells will actually be monitored and what the drawdowns and triggers will be at each well. Indeed, the information in the

P4-8 DEIR is contradictory. How can we possibly provide comments by September 6, 2008 when the DEIR contains obvious discrepancies? Shouldn't these corrections be made and then give the public at least 30 or 45 days to respond?

P4-9 Another problem I noted about the triggers is that they are stated as a permissible amount of drawdowns (i.e. 0.3 feet at Little Lake). What is missing from the drawdown triggers is the level of the

P4-9 underground water table from which these drawdowns are to be measured against. When I raised this issue at the public meeting, the statement was made that the initial underground water levels would be determined by the well monitoring performed during a period of only six (6) months before pumping ensues. This verbal suggestion is not described in the DEIR. How is the public to provide meaningful comments on the DEIR when an absolutely essential piece of the information is entirely missing? The DEIR appears to be fatally deficient in describing the means to establish the initial underground water levels.

P4-10 Using a well monitoring program of only six (6) months before pumping begins to set the original baseline for the underground water table elevations is obviously flawed and unsupportable. First, six (6) months of pre-pumping monitoring will not fully measure seasonal fluctuations during summer, fall, winter and spring. I suggested at least a one (1) year pre-pumping monitoring program. Even a one (1) year pre-pumping monitoring program is not adequate to determine the full range of natural variations during a successive periods of wetter years compared to drier or drought years, but it is much better than six (6) months. Second, assuming that the initial groundwater levels are then based upon the "average" underground water levels, the permissible drawdown triggers will unfairly and improperly eliminate from consideration the actual impact of pumping during drought years.

Let me further explain the significance of setting the underground water levels at the wrong initial elevations. There is no question that the water level elevations naturally fluctuate from season to season. The environment of Rose Valley and Little Lake is accustomed to dealing with these natural fluctuations. However, the pumping will introduce a new artificial demand on water and will deplete the Rose Valley Basin. If the initial underground water elevations are set too far below the surface of the ground, the triggers may never be reached or only reached after an extended period of excessive pumping and drought conditions. During this time, however, the underground water levels will be much lower normal and may not allow a natural recovery during wetter years. Setting the initial groundwater levels too low will understate the actual impacts from the pumping.

P4-11 I also questioned the assertion that a 10% loss of water at Little Lake is not significant. It is the last portion of available water sources which allows Little Lake Ranch to preserve the habitat and the wildlife on which it depends. It is the upper most layer of water in the aquifer that allows the natural springs to run. Removing this layer of the aquifer may destroy the springs and the habitat.

P4-12 The DEIR is deficient in its dismissal of impacts to biological resources by simply saying that a 10% loss of the water sources is not significant. There is absolutely no discussion in the DEIR about the indirect impacts from the Project on these biological resources. The residents of Inyo County and Little Lake all exist within a high desert region devoid of substantial water resources. It makes no common sense whatsoever to assert that a 10% loss of water has no significant impacts on vegetation, wetlands, riparian habitat and wildlife.

P4-13 Even the flawed Hydrology Model confirms that Coso will be overdrafting the Rose Valley Basin by pumping and using more water than is naturally recharged. The County of Inyo has never

P4-13 approved a water project allowing an overdraft anywhere within its jurisdiction, and it should not. Indeed, Inyo County has fought for decades to prevent just this situation from ever happening.

P4-14 The questions posed by the representative from the Los Angeles Department of Water and Power ("LADWP") supported our view of the inadequacy of the Hydrology Model. The crucial variables and assumptions used in the Hydrology Model are not supported by available data. Moreover, these variables have not been subjected to adequate sensitivity testing to confirm their accuracy. Severe questions have been raised about the Hydrology Model. It should be subjected to at least a peer review, rerun and republished in a new DEIR for new public comment.

P4-15 I have made several requests for access to all of the data and inputs which were used by Geologica to generate the predictions and impacts based on the Hydrology Model. According to our hydrologist, all of such data and inputs could be copied and transmitted in minutes, either by e-mail or on a compact disc. The Hydrology Model is a central component of the DEIR. Not having this crucial information readily available to the public almost entirely eliminates the ability of the public to

P4-16 understand and comment upon the dynamics of the water situation in Rose Valley. Only a couple of weeks are left before the public comment period ends. How are we to provide final comments when perhaps the most important piece of the information has not been given to the public? Does not this delay justify an extension of the public comment period for at least 30 days from the delivery of the Hydrology Model data?

P4-17 I also made a brief comment about the suspect statements in the DEIR that the water injection at Coso could have a beneficial effect at Coso Hot Springs. I, together with representatives of the Paiute Indian Tribes in Owens Valley, objected to this questionable statement in light of the long-standing position of the County, US Navy and Geologica that there is no proven connection between Coso's operations and the changes in temperature, water levels and water chemistry at Coso Hot Springs.

P4-18 Ms. Haizlip did an admirable job of adding to the confusion at Coso Hot Springs by repeating the often-stated view that the connections between Coso Hot Springs and the geothermal plant were exceedingly complex, complicated and virtually impossible to measure, such that it is nearly impossible to verify any direct correlation between the Coso geothermal plant and Coso Hot Springs. Unfortunately, the monitoring data which has been presented dramatically shows the harm to Coso Hot Springs immediately following the inception of operations of the geothermal plant, well beyond any natural or seasonable fluctuations of Coso Hot Springs. If Ms. Haizlip's statements about the lack of direct connection are to be given any credence, how can she and Geologica then assert, with no monitoring data or models to support it, that the water injection project would actually benefit Coso Hot Springs? Mr. Nahabe presented directly opposite conclusions made by Dr. Carl Austin who has grave concerns over the injection project and the possible, if not likely, adverse consequences the injection project may have on Coso Hot Springs.

P4-19 The U.S. Navy, County and Geologica should simply acknowledge that the geothermal operations at Coso have had a direct and damaging impact upon the Coso Hot Spring area. The water injection project could have even worse implications for Coso Hot Springs. These impacts should be addressed in the DEIR and the self-serving statements about a possible benefit should be deleted in their entirety from the DEIR.

P4-20 Two brief notes are required with respect to the cumulative impacts. First, the DEIR only recognizes, but does not really discuss, cumulative impacts from the Deep Rose geothermal project on only 640 acres of state managed land in Section 16. The DEIR fails to address cumulative impacts from additional geothermal projects on approximately 4,500 acres of land within the Deep Rose area managed by BLM, as well as any solar, wind or other energy projects within the immediate area as mentioned by Mr. Nahabe. P4-21 Second, although the Hydrology Model allegedly takes into consideration the LADWP proposed project to reclaim approximately 900 AFY to water lost due to seepage at Haiwee Reservoir, the monitoring, mitigation and triggers do not account for further reductions when LADWP actually starts pumping. What changes will be made to the Coso's pumping rate, pumping duration and mitigation measures when LADWP begins pumping?

P4-22 Beyond the alternatives presented in the DEIR, Little Lake Ranch has suggested, and I presented at the public meeting, several alternatives which were not mentioned, studied, analyzed or rejected in the DEIR. If the Project is really about the need for water for injection, we do not understand why other water sources were not considered. These include the import of wastewater from wastewater treatment plants of which we have identified approximately 15 within 50 miles of Coso, utilization of new wells in the Coso Water Basin, which has annual estimated recharge of anywhere from 300 to 1,000 AFY, purchase and transport of water from the LADWP aqueduct or Haiwee Reservoir, or pumping and transport of water from either the Owens Valley Basin or the Indian Hills Water Basin. None of these water sources were mentioned, nor was the feasibility of any of these alternatives considered. The DEIR did not provide any rationale for the rejection of these alternatives. Why not?

P4-23 We then suggested a variety of additional alternatives related to the design and operation of the Coso facility. While a few were at least mentioned in the DEIR, they were all rejected. The only rationale given for rejection all centered around one simple response --- Coso does not want to do any of them because they are too costly. These alternatives included (a) the conversion of the water cooling towers to an air-cooled system which would permanently solve the loss of water at Coso through evaporation, (b) reducing the production of the geothermal fluids until the production is balanced with natural recharge, (c) drilling deeper production wells to seek new geothermal resources, and (d) possible conversion to a binary operation which results in a completely closed water system by which there are no losses to the geothermal reservoir. The law under CEQA is clear. Feasible alternatives may not be excluded from consideration merely because the applicant doesn't want to pursue them or they may be more costly than the proposed Project.

P4-24 Finally, we need to address the analysis of the "No Project" alternative. Coso is attempting to persuade the County to approve this Project by falsely suggesting that without the Project Coso will soon exhaust the geothermal fluids, leading to the shut down of Coso. If anyone wanted to believe this prediction, which we do not, then Coso would stop paying taxes to the County at the end of operations.

Should we give any credence to this argument? Simply, the answer is no. Coso must have known that the chances of it being able to pump the water out of Rose Valley for 30 years at a rate of 4,839 AFY were not assured. Nonetheless, Coso with full knowledge of the risks associated with the pending Project, entered into new agreements to supply its energy for approximately 30 years. Admittedly, Coso has invested hundreds of millions of dollars in its equipment and capital improvements. It generates tens of millions of dollars each and every year. Should anyone really believe that Coso would simply abandon its investment, breach its energy supply contracts and walk away from this enormous money making machine? Again, the answer must be no.

P4-25

P4-26 If Coso does not get the water it wants, it will actively explore one or more of the alternatives suggested by Little Lake Ranch. Yes, pursuing the alternatives may be more expensive, but Coso can afford it. Moreover, the consummation of one or more of the alternatives will be so superior from an environmental impact standpoint that the rejection of the Project is the only obvious choice. This will merely force Coso to do what it should have be doing all along, namely finding ways to continue its operations without the enormous harm it proposes to unleash on the community through the Project.

P4-27 The Project makes no logical sense. Coso says that it is running out of water. Pumping from the Rose Valley does not stop the problem. So far as we can tell, the amount of proposed water to be injected will not even offset the annual amount of water lost through evaporation. Thus, Coso's geothermal reservoir will continue to decline even while the Rose Valley Basin is also being drained. What happens after 30 years? Where will Coso then go for water? Why should Coso be permitted to deplete the Rose Valley Basin while it is still draining the geothermal reservoir? Is there any question but that a perpetual importation of water within the high desert regions of Inyo County, only to keep the Coso geothermal plant operating, will cause unavoidable environmental damage?

P4-28 Taking water from the Rose Valley Basin is not the solution. The solution is for Coso to find and implement a permanent change it is operations to protect and preserve its geothermal reservoir. The alternatives have been laid out and Coso should pursue them. The County should not delay this process for 30 years, sacrificing Rose Valley in the process.

P4-29 The County should see the Coso Project for what it is. From Coso's perspective, the Project merely provides the cheapest and fastest way to boost its production and the profits. It will also cause enormous environmental harm. As mentioned by Mr. Nabahe, perhaps the County should take a second look at the Energy Policy Act of 2005 which gives Coso enormous tax incentives and royalty savings if it can find a way to boost its production by 10% no later than the year 2011. Might the County be approving a Project which will only result in Coso getting wealthier while the County, its citizens and the environment suffers the damage?

P4-30 The County will not lose revenues on a cumulative basis. If the County rejects the Project, Coso will find other ways to operate, produce energy, and make profits. The alternatives suggested by Little Lake Ranch would allow Coso to keep operating for decades if not centuries thereby allowing a continuing stream of tax revenues into the distant future. What is the present value of that revenue stream? The goal is find a way to design and operate the power plant that will be sustainable for generations. The reliance on the water in Rose Valley will not achieve this goal.

P4-31 In conclusion, there are just too many errors, omissions, discrepancies, conflicts and just plain P4-32 misleading statements in the DEIR and the Hydrology Model. The current DEIR is not adequate under P4-33 CEQA. Our formal comment letter, together with the comprehensive comment letters from our hydrologist and geothermal engineer, will expose the full shortcomings of the DEIR. Merely answering the questions will not suffice. The public has not had the opportunity to look at a full, complete and adequate DEIR on which it can reasonably provide comments. Accordingly, the County should prepare an entirely new DEIR, containing an entirely new and supportable Hydrology Model. This revised DEIR should then be republished for further public comment.

P4-34 While the foregoing is the proper approach to take under CEQA, it is abundantly clear that the Project as proposed is ill-conceived and cannot truly mitigate significant environmental impacts. Coso simply withdraw its application and pursue the alternatives. It would behoove the County to tell Coso that this Project has no chance of approval. The County should abide by its historic policies of water conservation and the management of water resources for its community and reject the Project.

Very truly yours,

ARNOLD, BLEUEL, LAROCHELLE,
MATHEWS & ZIRBEL, LLP

Gary D Arnold

Gary D. Arnold

GDA:tg
cc: Little Lake Ranch, Inc.

P4

Public Meeting Outline (August 20, 2008)

P4-35
1. The groundwater flow model for the Rose Valley Basin ("Hydrology Model") is fundamentally flawed and overstates the amount of available water. We have given the County a memo from our hydrologist which disputes the accuracy and reliability of the Hydrology Model.

P4-36
1.1. It assumes an aquifer thickness of 3000', but the Danskin report on which it is based only assumes a thickness of 700. This change, without support, causes a vast overstatement of the available water in storage.

P4-37
1.2. The Hydrology Model was calibrated on a 3% specific yield.

1.2.1. Our hydrologist believes this is a fair estimate.

P4-38
1.2.2. Yet, the impacts from the pumping were based on specific yield estimates of 10%, 20% or 30%. The Hydrology Model was never recalibrated at these levels, so the predicted impacts cannot be supported by the Model.

P4-39
1.2.3. The higher specific yield estimates overstate the available water for pumping, and understates the impacts.

P4-40
1.3. The Hydrology Model must be re-run.

P4-41
1.4. If the County is unwilling to accept the conclusions from Mr. Zdon, then at a minimum the County should provide for an independent peer review. We might suggest Mr. Wesley Danskin who have extensively studied the Owens Valley for USGS, and whose work is included in the DEIR

2. Significant Impacts:

P4-42 2.1. The DEIR says 10% loss of water at Little Lake and in the Rose Valley is not significant.

2.2. Presumably a corresponding 10% loss of habitat and wildlife in Rose Valley is not significant —but those impacts are not even discussed or mitigated

P4-43 2.3. No resident, business or landowner in Rose Valley should be forced to suffer <u>any</u> water loss by virtue of the Project.

P4-44 2.4. Has the County ever allowed a water export project which will cause a 10% loss or water or habitat?

P4-45 2.5. Have any of the impacts Portuguese Bench, Rose Spring and Coso Springs been proved by the Hydrology Model?

P4-46 2.6. Were the springs even included in the Hydrology Model? Why not?

P4-47 2.7. By ignoring all impacts to the biology, the DEIR fails to address critical impacts to the habitat and wildlife.

3. Model Predictions:

P4-48 3.1. Although the Model is wrong, even its conclusions compel the rejection of the Project. The Model reflects the following:

P4-49 3.1.1. Rose Valley Basin is in a steady-state. Any pumping by Coso is not replaced by natural recharge and creates an overdraft.

P4-50 3.1.2. If Coso pumps 4,839 AFY, it would have to completely stop pumping after 1.2 years (less than 15 months). Why is a 30 year CUP being contemplated?

P4-51 3.1.3. Under a conservative assumption, Coso can only pump 120 AFY of water for 30 years. Why would the County consider allowing more pumping?

P4-52 3.1.4.It will take more than 100 years for the Rose Valley to recover after all is stopped. Should this be permitted as "not significant"?

4. Cumulative and Unavoidable Impacts

P4-53 4.1. The DEIR fails to mention that their are proposed geothermal projects on an additional 4,500 acres just north of Coso. Why haven't these projects been considered and addressed? If all of these projects go forward:

P4-54 4.1.1.How much more water will be needed?

P4-55 4.1.2.What will be the cumulative impacts on water, biology, air pollution, fugitive dust emissions, and air quality?

4.2. LADWP proposes the pump an additional 900 AFY of water

P4-56 4.2.1.The Hydrology Model says it includes the LADWP pumping in its projections from Coso's pumping.

4.2.2.But, what happens when LADWP begins to pump? Will both companies be allowed to pump at full maximum rates? Should the mitigation include an

P4-57 automatic pumping reduction?

5. Alternatives:

5.1. Little Lake Ranch has suggested a number of feasible alternatives:

P4-58 5.1.1.The use of treated wastewater from at least 15 plants throughout the immediate vicinity of Coso

P4-59 5.1.2. The retrofit of Coso's Plant to use air-cooled condensers to completely eliminate the loss of water at Coso through evaporation

P4-60 5.1.3. Reduction of Coso's production to conserve the geothermal reservoir

P4-61 5.1.4. Purchase of water from LADWP

P4-62 5.1.5. The ability of Coso to deepen its own production wells to tap new sources of geothermal fluids

P4-63 5.1.6. The availability of water from nearby aquifers, such as Owens Valley or Indian Wells Valley water basins

P4-64 5.2. None of these alternatives has been addressed in the DEIR.

P4-65 5.3. Under CEQA, it is not permissible to reject an alternative, without reason, solely because the applicant, Coso, thinks they are uneconomic or would reduce profits

P4-66 5.4. What are the bona fide reasons to not look at the alternatives?

P4-67 5.5. The DEIR does present 2 alternatives, Alternate 1 (pumping not more than 480 AFY, but continuing for 30 years) and Alternate 2 (pumping greater amounts of water, but for a far shorter time, i.e. 750 AFY for 6 years)

P4-68 5.5.1. Since the Rose Valley will be overdrafted by any pumping, either of the 2 alternatives is superior to the project.

P4-69 5.5.2. Neither is compared to the proposed pumping by Coso of 4,800 AFY for 30 years. Why not?

P4-70 5.6. The "No Project" alternative is not properly evaluated in the DEIR.

P4-70

5.6.1. There is no evidence that the No Project alternative would shorten the lifespan of Coso.

5.6.2. If Coso does not get the water, then it will just have to explore the alternatives mentioned above and spend some of its profits.

5.6.3. Coso will not simply go away without the water pumping project.

6. Mitigation Measures

P4-71

6.1. The proposed mitigation measures and triggers are not adequate to prevent the impacts from the Project.

P4-72

6.2. The Mitigation relies on Coso to do the monitoring and self-police itself. This is not a wise decision.

6.2.1. If a CUP is issued for 30 years, is there any question that Coso will do anything to keep pumping?

6.3. The Hydrology Model uses annual average conditions without considering the cumulative effects from pumping over a course of several drier than normal years.

P4-73

6.4. The triggers are not set at appropriate levels to prevent significant impacts:

6.4.1. They are based on average annual conditions.

6.4.2. There are no stated underground water table elevations on which they are based. Will the elevations be set at the highest, lowest or some interim level?

6.4.3. The triggers do not address the problem of pumping during several years of drought when the pumping will have greater effects.

P4-73 6.4.4. The triggers do not address the problem continuing and greater declines at Little Lake even after all pumping stops.

P4-74 6.5. Even if triggers are reached there are still time delays and a subjective evaluation of what caused the drawdown. There can be no room for debate.

7. Conclusions.

P4-75 7.1. The Hydrology Model is flawed and must be re-run.

P4-76 7.2. Because of all the errors and omissions in the DEIR, the answers to all questions must be answered, and then the DEIR should be submitted back to the public for further comment.

P4-77 7.3. Even based on the discussion contained in the DEIR, there is no mitigation plan that can avoid significant impacts. The Project should just be withdrawn.

P4 Gary D. Arnold
Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP
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P4-1 The project was addressed as proposed. All impact sections address potential impacts of the project as proposed at the full pumping rate. Please refer to Master Response A4 for further discussion of the impact analysis. Mitigation would be implemented to minimize effects and may result in a shortened duration of pumping; however, the project is analyzed as proposed. Consideration of mitigation is addressed as appropriate.

P4-2 Please refer to Master Response L3 for a discussion of how the alternatives were compared. The commenter is incorrect in stating that the alternatives were only compared to the project with mitigation. The impacts of Alternatives 1 and 2 are compared directly to the impacts of the project as proposed. It is stated on page 5-7 of the Draft EIR that, "The environmental effects of Alternative 1 would be largely the same in nature as the proposed action, but would take longer to occur. The alternative would reduce but not eliminate hydrological and biological effects from groundwater pumping." The comparison of alternatives compares the alternatives to the proposed project and the analysis on page 5-12 of the Draft EIR indicates that the "proposed project, without mitigation, would result in several potentially significant impacts." The impacts of the alternatives, like the proposed project, could be reduced by incorporating mitigation outlined in the Draft EIR.

P4-3 The comment regarding the commenter's opinion of the Hydrology Model is noted.

P4-4 Please refer to Master Response C2.1 for a discussion of the aquifer thickness. The appropriate thickness was used in the Hydrology Model. Please refer to Master Response C2.2 for a discussion of the aquifer hydraulic properties and specific yield. The appropriate ranges of values for specific yield were used in the Hydrology Model.

P4-5 The comment is noted regarding a request for peer review of the Hydrology Model. Additional peer review is unnecessary. The model has been analyzed by two hydrogeologists on contract, as well as by Inyo County. The model has been made available upon request. The model was made available to Little Lake and to the LADWP.

P4-6 The graphics titles and units can be used to determine the duration of pumping. For example:

- The title of Figure 3.2-16 is "Predicted Groundwater Table Drawdown at the North End of Little Lake Pumping at 4,389 Ac-Ft per Year for 30 Years."
- The title of Figure 3.2-17 is "Early Pumping Termination (1.2 years) Results."

The graphics state the duration of pumping in their titles. Refer to the title of the graphics for clarification of pumping rate. Figure 3.2-16 has been revised to show labels on the axis. See Chapter 3: Errata in this Final EIR.

P4-7 Table C4-2 in the Draft EIR states that groundwater elevations in the Little Lake Hotel well and the Little Lake North Dock well would be monitored using dedicated pressure transducer collecting hourly water level readings initially. No trigger levels would be established for these wells, as stated in Table C4-2. The monitoring data would be used to complete the hydrogeologic characterization of the Little Lake Ranch property and for Hydrologic Model recalibration.

Monitoring would be conducted at, and drawdown triggers have been established for, the Little Lake Ranch North well, located at the north end of the ranch property, as listed in Table C4-1. The Draft EIR does not identify any other wells on the Little Lake Ranch property that would be monitored during the Hay Ranch project. The verbal comments from Geologica in the public meeting were intended to reflect the fact that trigger levels had been established for all wells listed in Table C4-1, not that trigger levels would be established for all wells on the Little Lake Ranch property.

Trigger levels were only specified for wells that are not routinely pumped and that are suitably located and constructed so as to provide early warning of impending drawdown impacts. It is not intended, nor is it necessary to, monitor or set trigger levels for every well in Rose Valley. The Little Lake North **Dock** well would be intensively monitored during the baseline study period and throughout project operation (if permissible by the property owner); however, a trigger level was not specified in Table C4-1 for this well because of concerns that groundwater levels in the well may be affected by water level changes in Little Lake related to management practices. The trigger level for the Little Lake **Ranch** North well located near the north end of the ranch property was conservatively specified as 0.3 ft with a maximum allowable drawdown of 0.4 ft. The low trigger level for the Little Lake Ranch North well is intended to prevent a water level change of greater than 0.3 ft beneath Little Lake.

P4-8 The comment is noted regarding the review period. Please refer to Master Response A7.1 for a discussion of the adequacy of the review period for the Draft EIR.

P4-9 See page C4-14 of the Draft EIR, which identifies and describes the establishment of the baseline level from which triggers would be measured. The commenter is incorrect in stating that this information is not in the Draft EIR. It can be found on page C4-14 of the Draft EIR.

P4-10 The effects of pumping would be averaged over many years because of the physical configuration of the Rose Valley groundwater basin and the way drawdown effects propagate out from a pumping center. The effects of drought years and years of above average rainfall are likewise averaged out by the length of time required for infiltration or natural discharge from the basin. The use of conservative averages in the Draft EIR is the appropriate way to address long-term response in the reservoir.

P4-11 Please refer to Master Responses C4.4 and E2 for a discussion of the significance threshold of 10%. Mitigation is proposed to minimize effects to wetlands. The 10% significant threshold for loss of water at Little Lake falls within the natural variation that occurs at Little Lake. There appears to be some flexibility in the management of the wetland at Little Lake, though it is noted that any loss of water can impact the water table and wetland levels. Little Lake currently exports some of their water (approximately 6 ac-ft/yr) to a nearby pumice mine for non-wetland and consumptive uses. This exportation constitutes a loss of water, while Little Lake is still able to maintain the wetlands. This amount of drawdown would not impact the springs or cause the springs or lake to desiccate, according to the analysis and the Hydrology Model.

P4-12 See pages 3.4-40 through 3.4-44 of the Draft EIR, which discuss the impacts to wetlands and habitat from the potential maximum loss of 10% of water flowing to Little Lake. The comment is incorrect in stating that there is “absolutely no discussion in the Draft EIR about the indirect impacts from the project on these biological resources.” The first line of page 3.4-40 of the Draft EIR is the heading, “Potential Impact 3.4-4: The potential to have a substantial indirect adverse effect on general vegetation and sensitive habitats, including wetlands and riparian areas in the Rose Valley.” Page 3.4-42 of the Draft EIR has a heading for “Little Lake,” and addresses the indirect impacts of groundwater pumping on Little Lake. Further explanation for the setting of the significance criteria for impacts to wetlands at 10% is discussed in Master Response E2.

P4-13 Some loss of water from the aquifer is not necessarily a significant impact. Groundwater users would experience less than significant effects. Impacts to habitat from a small loss would be less than significant with implementation of mitigation, despite some loss of water from the aquifer. Previous decisions by Inyo County on other projects are irrelevant to the objective environmental analysis of the proposed project.

P4-14 Please refer to Master Response C2 for a complete discussion of the validity of the Hydrology Model. The comment is noted regarding a request for peer review of the Hydrology Model. Peer review at the request of a commenter is not required by CEQA and is unnecessary. The model was prepared by two hydrogeologists on contract with Inyo County, and was reviewed by Inyo County. The model has been made available upon request. The model was made available to Little Lake and to the LADWP. Please refer to Master Response A7, which provides the reasons why recirculation of the Draft EIR is unnecessary.

P4-15 The requested information, including data, software, programs and all other written or electronic aspects of the MODFLOW was provided by Geologica and sent to Gary D. Arnold of Arnold, Bleuel, LaRochelle, Matthews & Zerbel, LLP on August 22, 2008, at the first request for the information.

P4-16 Please refer to Master Response A7 regarding the review period of the Draft EIR. An extension of the review period was determined to be unnecessary.

P4-17 Please refer to Master Response C5.2 for a discussion of the connectivity between the Coso Hot Springs and the geothermal reservoir. The commenter is incorrect in suggesting that Geologica and the Navy claim that there is no connection. There is some connection; however, it is not a one-to-one correlation and other outside factors also influence the hot springs. The ITSI report, cited in the Draft EIR and provided to the commenter, also states that there is some connection but that it is not a direct and exclusive connection.

P4-18 Please refer to Master Response C5.2 for a discussion of the connectivity between the Coso Hot Springs and the geothermal reservoir. The relationship is complex and is not one-to-one. Additional information that addresses all questions in this comment is included in Master Response C5.2.

P4-19 The commenter is incorrect in stating that the geothermal operations have a direct impact on the Coso Hot Springs. Please refer to Master Response C5.2 for further explanation of the impacts of the proposed project on Coso Hot Springs. The analysis is based on science and provided as a good faith disclosure to the public. It cannot be deleted at the request of one commenter. Refer to pages 3.5-14 through 3.4-16 of the Draft EIR for a discussion of the impacts to the hot springs.

P4-20 Please refer to Master Response K1 for additional discussion of the Deep Rose project. Some text clarifications were made to address the larger area for leasing. The County is not aware of any currently proposed wind or solar projects in the project area. CEQA does not require that the cumulative analysis address speculative projects that have no accompanying project plans or applications.

P4-21 Refer to page 4-7 of the Draft EIR for a discussion of the cumulative impacts associated with the pumping of 900 ac-ft/yr by the LADWP. Please refer to Master Response K2 for further discussion. It is currently unknown if the LADWP project will occur, or if it will occur at the same time as the proposed project. The LADWP project would require Inyo County Water Department and CEQA environmental review, including evaluation of impacts to groundwater in the Rose Valley prior to issuance of a permit. It is likely that mitigation measures would be required. Mitigation in the Hay Ranch project EIR is not required at this time because the LADWP project is speculative.

P4-22 Please refer to Master Response L2 for a discussion of additional alternatives addressed in the Draft EIR. Several other alternatives were considered but determined infeasible for various reasons. The reason why imported wastewater is infeasible is provided in Master Response L2. The recharge from Coso Basin is discussed in Chapter 5: Alternatives in the Draft EIR. A discussion of buying water from the LADWP is included in Master Response L2. The alternative would be economically infeasible because the water would have to be purchased. There may still be groundwater impacts, depending upon from where the LADWP obtains the water, as well as impacts associated with a longer pipeline. Water taken from Owens Valley would also have groundwater impacts, and there are no known or reasonably assumed sites from where water could be pumped. Indian Wells Valley is too far from the Coso plants, and the cost of pipeline and electricity for pumping would render a project infeasible. Water from Indian Wells Valley would likely have similar groundwater effects, and there are no known or reasonably assumed sites from where water could be pumped.

P4-23 Please refer to Master Response L2 for a discussion of alternatives addressed. Please refer to Master Responses L1 and L5 for a discussion of CEQA requirements and the consideration of economic feasibility. CEQA does not require the County to adopt a project alternative that is economically infeasible. The commenter is incorrect in stating that these alternatives were excluded because “the applicant doesn’t want to pursue them.”

P4-24 The comment is noted regarding the commenter’s opinion of Coso’s intentions. The payment of taxes by Coso is irrelevant to this EIR because it is unrelated to the environmental analysis. Please refer to Master Response N9 for additional discussion of socioeconomic impacts and tax incentives.

P4-25 Please refer to Master Response N7 for a discussion of out of scope comments related to Coso’s financials and previous power agreements. Questions regarding Coso’s intention or speculation on the company’s future actions are irrelevant to this EIR.

P4-26 Please refer to Master Response N7 for a discussion of out of scope comments related to Coso’s financials and previous power agreements. Coso’s intentions and speculation on the company’s future actions are irrelevant to this EIR.

P4-27 Comments and questions on the merits of the project are noted. The Draft EIR addresses the impacts of the project. The project, with mitigation, does not allow for a perpetual importation of water. The project would not result in significant, unavoidable impacts with implementation of mitigation.

P4-28 Please refer to Master Response L2 for a discussion of alternatives considered. Comments on the merits of the project are noted.

P4-29 The comments on the merits of the project are noted. The project, with mitigation, would not result in significant, unavoidable impacts or enormous environmental harm. Royalties and tax incentives are not relevant to the environmental analysis presented in the EIR, and the project would not increase production of the Coso geothermal plants. Please refer to Master Response N9 for a discussion of tax incentives.

P4-30 Comments on Coso's intentions are irrelevant to the Draft EIR because they do not relate to environmental impacts of the proposed project. Comments on the merits of the project and the commenter's opinion of the project are noted. Please refer to Master Response L2 for a discussion of alternatives considered in the EIR. The comment regarding opinions on the source of water for the project is noted.

P4-31 The commenter's opinion on the adequacy of the Draft EIR is noted.

P4-32 The Draft EIR is adequate under CEQA. Please refer to Master Response A7.2. The Draft EIR does not require recirculation under CEQA. The comment regarding the submission of additional comments by the commenter's hydrologist is noted.

P4-33 The Draft EIR is adequate under CEQA. Please refer to Master Response A7.2. The Draft EIR does not require recirculation under CEQA. The comment regarding the submission of additional comments by the commenter's hydrologist is noted.

P4-34 The comments regarding the merits of the project are noted. Objection to the project is noted.

P4-35 Master Response C2 addresses the Hydrology Model. The model did not overestimate the amount of available water. The comment is noted regarding additional information to be supplied by the commenter's hydrologist. All comments received on the Draft EIR are addressed.

P4-36 Please refer to Master Response C2.1 for a discussion of the aquifer thickness. The appropriate thickness was used in the model. Please refer to Master Response C2.2 for a discussion of the aquifer hydraulic properties and specific yield. The appropriate ranges of values for specific yield were used in the Hydrology Model.

P4-37 Please refer to Master Response C2.5 for a discussion of the model calibration and why the simulation used a lower specific yield.

P4-38 Please refer to Master Response C2.5 for a discussion of the Hydrology Model calibration and why the simulation used a lower specific yield than would be expected from the proposed project. Please refer to Master Response C2.7 for a discussion of why the simulation used a lower specific yield and why values of 10, 20, and 30% were used in the analysis and Draft EIR. The 3% specific yield value was estimated based on a 14-day pumping test conducted at a constant rate of approximately 3,200 ac-ft/yr and extracted approximately 125 ac-ft of groundwater. The 14-day pumping test represents short-term aquifer response with minimal aquifer dewatering as result of pumping the Hay Ranch South well, as noted by several reviewers. In contrast, the mitigated project proposes pumping both Hay Ranch wells at a combined total rate of 4,839 ac-ft/yr, which would extract approximately 1,200 ac-ft of groundwater in the first 3 months of operation (nearly 10 times the volume of groundwater extracted in the 2007 pumping test). Significant aquifer dewatering would occur on the Hay Ranch property within a few months after starting pumping at the higher project rate; consequently, higher specific yield values reflecting greater soil pore drainage would apply.

P4-39 Please refer to Master Response C2.7 for a discussion of the specific yield used for the environmental analysis. The specific yield values used for the evaluation in the Draft EIR do not overestimate the amount of available water.

P4-40 Please refer to Master Response C2 for a discussion of the adequacy and accuracy of the Hydrology Model. The model does not need to be rerun. The commenter's opinion is noted.

P4-41 The comment is noted regarding a request for peer review of the Hydrology Model. Peer review at the request of a commenter is not required by CEQA. The model can has been made available upon request. The model was made available to Little Lake and to the LADWP.

P4-42 The commenter incorrectly characterizes the 10% threshold. The Draft EIR allows for up to a 10% loss of groundwater inflows to Little Lake. The amount of the loss in the overall aquifer would be fewer than 3%, even though the loss at Little Lake would be 10%. Please refer to Master Response C4.4 for further discussion.

P4-43 The commenter's opinion is noted.

P4-44 A full discussion of the justification for the significance criteria is presented in Master Response C4.4. Previous decisions by Inyo County on other projects are irrelevant to the objective environmental analysis of the proposed project.

P4-45 Please refer to Master Response C3.3 for a discussion of Portuguese Bench, Rose Spring, and Coso Springs and analysis in the Hydrology Model. It is not plausible that the Davis Spring at Portuguese Bench would be influenced by pumping at Hay Ranch given the distance, the low-permeability sediments, and the fact that the spring is more than 600 ft higher than water levels in the valley. Rose Spring is currently dry. The project would not have a significant impact on the flow in Coso Spring or other springs in the vicinity of Little Lake.

P4-46 Please refer to Master Response C3.3 for a discussion of why the springs are not included in the Hydrology Model. Given the distance, the low-permeability sediments, and the fact that the spring is more than 600 ft higher than water levels in the valley, it is not plausible that the Davis spring at Portuguese Bench would be influenced by pumping at Hay Ranch; consequently, they do not need to be represented in the Hydrology Model.

P4-47 The commenter is incorrect in stating that the Draft EIR did not address impacts to biology, including habitat and wildlife. Refer to pages 3.4-26 through 3.4-44 of the Draft EIR for a discussion of impacts to biology.

P4-48 The commenter's opinion of the Hydrology Model is noted.

P4-49 Pumping would cause a reduction in the aquifer. Some loss of water from the aquifer is not necessarily a significant impact. Groundwater users would experience less than significant effects. Impacts to habitat from a small loss would be less than significant with implementation of mitigation, despite some loss of water from the aquifer.

P4-50 Inyo County would issue the CUP if the project is approved. The CUP would contain conditions based on the analysis in the Final EIR. The duration of the project is not based on a specified timeframe, but on the trigger levels. Those may be reached before or after 1.2 years. Please refer to Master Response C2.7. The time elapsed before reaching the trigger levels determines the duration of the project. The Hydrology Model used is very conservative in order to be protective of the environment. It may turn out that there is much more water available to the aquifer than assumed and the project may be allowed to continue for a considerable period of time, should the project begin. Recovery of the aquifer may also be more rapid than modeled. It may be that pumping ceases after some time, the aquifer recovers quickly, and pumping may again resume without resulting in more than a 10% reduction of water available to Little Lake reservoir. The 30-year permit provides flexibility while being protective of the environment.

P4-51 More pumping could be allowed for a shorter timeframe with the same ultimate impacts or amount of drawdown. See Chapter 5: Alternatives in the Draft EIR for further explanation of the alternatives.

P4-52 Water levels would take considerable time to rebound; however, at no point would water inflow to Little Lake decrease by more than 10% as a result of the proposed project, during or after pumping has ceased. This amount of water loss at Little Lake was determined to be less than significant.

P4-53 Please refer to Master Response K1. Edits were made to the Draft EIR to include more details regarding the Deep Rose project. The EIR addresses the Deep Rose project in the cumulative effects section.

P4-54 The amount of additional water needed for the Deep Rose project is unknown at this time.

P4-55 See pages 4-4 through 4-12 of the Draft EIR for a discussion of cumulative impacts to dust, air pollution, etc.

P4-56 The comment is noted and the LADWPs project is included in Chapter 4: Cumulative Impacts in the Draft EIR. The commenter is correct that the additional pumping was evaluated in the Hydrology Model.

P4-57 Refer to page 4-7 of the Draft EIR for a discussion of the cumulative impacts associated with the pumping of 900 ac-ft/yr by the LADWP. Please refer to Master Response K2 for further discussion.

P4-58 Please refer to Master Response L2 for a discussion of use of wastewater as an alternative. This alternative was considered and evaluated but found to be infeasible, as discussed in Master Response L2.

P4-59 Please refer to Master Response L2 for a discussion of use of air cooled towers. Air cooled towers were determined infeasible.

P4-60 A discussion of alternative water from the LADWP is discussed in Master Response L2. This alternative would be economically infeasible because the water would have to be purchased. There may still be groundwater impacts, depending upon from where the LADWP obtains the water, as well as impacts associated with a longer pipeline.

P4-61 Please refer to Master Response L2 for a discussion of reduced production. Reduced flows would reduce the electricity production and would not meet the project's objectives.

P4-62 Please refer to Master Response L2 for a discussion of deepening Coso's wells. This alternative was determined infeasible. Coso has already drilled several deep wells near the limit of economic feasibility. A substantial new source of geothermal fluid was not identified.

P4-63 Please refer Master Response L2 for a discussion of alternative water sources from the Owens or Indian Wells Valleys. Indian Wells Valley is too far from the Coso plants and the cost of pipeline and electricity for pumping would render a project infeasible. Water from Indian Wells Valley would likely have similar groundwater effects.

P4-64 Please refer to Master Response L2 for a discussion of these alternatives.

P4-65 Please refer to Master Responses L1 and L5 for a discussion of CEQA requirements for alternatives and for determining feasibility. CEQA allows for the finding of alternatives as economically infeasible.

P4-66 The commenter is incorrect in stating that the Draft EIR did not consider alternatives. Refer to Chapter 5: Alternatives in the Draft EIR for the discussion of alternatives considered.

P4-67 The comment is noted regarding the two alternatives presented in the Draft EIR. Several other alternatives were also considered and presented, but were determined to be infeasible.

P4-68 Please refer to Master Response L3 for a discussion of the comparison of alternatives. The proposed project would be implemented with mitigation. The alternatives would also incorporate the mitigation.

P4-69 The commenter is incorrect in stating that the Draft EIR does not compare the alternatives to the proposed project. The comparison of alternatives compares the alternatives to the proposed project and the analysis on page 5-12 of the Draft EIR indicates that the "proposed project, without mitigation, would result in several potentially significant impacts."

P4-70 Please refer to Master Response L4 for a discussion of the No Project Alternative. The commenter is incorrect in stating that the No Project Alternative is not properly evaluated. The life of the power plant can be considered in terms of the energy source. The heat source in the KGRA is not impacted by development and does not have a defined life. The life of the plant can also be determined in terms of the life of the equipment at the plant. The plants would shut down before the end of the life of the equipment without supplemental injection water. Speculation as to the future actions of Coso and their intentions are not relevant to the environmental analysis of the proposed project. The commenter's opinion on the adequacy of mitigation measures is noted.

The commenter is incorrect in stating that the mitigation relies on Coso to do the monitoring and self-policing. Inyo County would be responsible for overseeing the monitoring program, approving technical staff proposed to conduct the monitoring, and evaluating the quality and objectivity of the monitoring program. Refer to Appendix C4 of the Draft EIR for further explanation of the County's role in the monitoring program.

Questions regarding Coso's intention or suspicion that they would not comply with legal requirements in the CUP and Final EIR are beyond the scope of this EIR.

P4-71 Please refer to Master Response C2.7 for a discussion of the impact analysis findings based on the Hydrology Model. The effects of pumping would be averaged over many years because of the physical configuration of the Rose Valley groundwater basin and the way drawdown effects propagate out from a pumping center. The effects of drought years and years of above average rainfall are likewise averaged out by the length of time required for infiltration or natural discharge from the basin. The use of averages in the Draft EIR is the appropriate way to address long-term response in the reservoir. Comments regarding Coso's intention and suspicion that Coso would not comply with legal requirements in the CUP and Final EIR are beyond the scope of this EIR.

P4-73 See the previous response for a discussion of the justification for using average annual conditions. The commenter is incorrect in stating that there are no stated underground water table elevations on which the trigger levels are based. See page C4-14 of the Draft EIR which identifies the establishment of the baseline level from which triggers would be measured. The baseline levels would be based on statistical analysis, prepared by a qualified person, and approved by the County.

P4-74 The commenter's opinion is noted.

P4-75 The commenter's opinion is noted. The Hydrology Model is not flawed. Please refer to Master Response C2 for further explanation on the adequacy and accuracy of the model.

P4-76 The Draft EIR is adequate under CEQA. Please refer to Master Response A7.2. The Draft EIR does not require recirculation under CEQA.

P4-77 The Draft EIR identifies mitigation to minimize all significant impacts of the proposed project. The commenter's objection to the project is noted.

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MEMORANDUM

To: Gary Arnold, Arnold, Bleuel, LaRochelle, Mathews & Zirbel, LLP
Walt Pachucki, TEAM Engineering & Management, Inc.

From: Andrew Zdon, P.G., C.E.G., C.Hg., Golden State Environmental, Inc.

Date: August 13, 2008

Re: Preliminary Comments Concerning Coso Operating Company Hay Ranch Water Extraction and Delivery System, Draft Environmental Impact Report

Golden State Environmental, Inc. (GSE) is providing the following preliminary comments concerning the draft environmental impact report (Draft EIR) described above. GSE's review has been focused on evaluating the hydrogeologic evaluation of the proposed project including conceptualization of the groundwater regime, aquifer testing, numerical groundwater flow modeling, recommendations for monitoring and mitigation, and overall reporting. Our preliminary, general comments are described below based on these criteria. GSE's final comments to the Draft EIR will be in the form of a letter that in addition to issues described below, will provide detailed comments to specific text, tables, and/or figures within the text. Note that the issues with modeling described below represent fundamental flaws in the environmental analysis and Draft EIR.

Conceptualization of the Groundwater Regime

GSE has identified a number of key deficiencies associated with conceptualization of the Rose Valley aquifer system as reported. Two key issues are provided below. More detailed issues will be presented in the final comment letter. As reported, the conceptualization of the Rose Valley aquifer system was based on the work conducted by the U.S. Geological Survey for the Owens Valley (Danskin, 1998). It is unclear why then, it some key areas, major deviations from the work by the U.S. Geological Survey are made, especially when data needed to support those deviations are lacking or absent. One example is the groundwater flow system with respect to aquifer thickness to an assumed thickness of 3,000 feet below ground surface (bgs).

P5-1

Danskin (1991) reports, *"Despite its large volume, the quantity of ground water flowing through or extractable from hydrogeologic unit 4 probably is minimal. Deep test drilling during 1988 by the Los Angeles Department of Water and Power (E.L. Coufal, oral commun., 1988) showed that most materials at depths greater than about 700 ft do not yield significant quantities of water to wells, generally less than 0.2 cubic feet per second."* In support of Danskin, this has generally been our experience in other alluvial basins in the desert southwest. Given the depths of existing wells reported in the Draft EIR, this also appears to have been the case in Rose Valley. It is unclear then, on what basis the presented groundwater flow model extends the depth of the aquifer system to 3,000 feet bgs. This deviation from Danskin (a carry-over from the Brown and Caldwell modeling effort), and used in the draft EIR, cannot be supported or used unless additional data are available to prove this assumption. As modeled, extending the aquifer to unrealistically great depth serves to significantly increase the estimated volume of groundwater in storage available for extraction to the project, could

P5-2

P5-2 serve to lessen predicted impacts, and would certainly not represent an environmentally conservative approach to the analysis.

P5-3 Another issue concerning the conceptualization of the groundwater system involves the description of Rose Spring. The Draft EIR refers to Rose Spring as dry. The Draft EIR also notes that a concrete structure and water pipes that once fed water from Rose Spring to the concrete structure are present, but are in a current state of disrepair. The disparity of ground surface elevation and the existing groundwater surface elevation (described as approximately 300 feet in Appendix C2) is noted. P5-4 Additionally, it is stated that Rose Spring is not connected to the saturated aquifer. Thus, the Draft EIR concludes that impacts to the spring are not predicted. That certainly is the case today. Based on the extended periods of time that would be required for water level recovery after the proposed project is complete (estimated at approximately 30 years using the current modeling effort), it is easily extrapolated that the current dry state of Rose Spring could be correlated with the overdraft of the Rose Valley system as a result of earlier agricultural pumping at Hay Ranch. In other words, the former agricultural pumping may well have caused Rose Spring to go dry, and the aquifer has not recovered sufficiently to restore the flow to Rose Spring. This concept is completely overlooked in the Draft EIR despite its consistency with modeled results.

Aquifer Testing

P5-5 Overall, the aquifer testing as reported appears to have been conducted in a reasonable and professional manner. Comments associated with aquifer testing and aquifer testing results will be primarily in the form of either requiring additional information or editorial in nature.

Numerical Groundwater Flow Modeling

P5-6 As reported, the numerical modeling conducted by Geologica does not follow protocols of standard professional practice, is based on faulty conceptualization as described above, and provides conclusions based on uncalibrated model results. Additionally, the lack of proper model documentation may lead to insufficient or inappropriate monitoring and mitigation.

P5-7 A major issue associated with the model includes the complete lack of the use of the calibrated groundwater flow model for conducting site predictions. Groundwater flow model calibration consists of adjusting aquifer parameters within reasonable geologic constraints in order to simulate existing groundwater conditions being modeled. Indeed, a key strength of numerical groundwater flow modeling is the ability to test the internal consistency of the assumptions that make up the conceptual model of the groundwater system. If unreasonable aquifer parameters are required for model calibration, a problem with the conceptual model may be apparent.

P5-8 As reported in Appendix C2, the model calibration resulted in a specific yield estimate of 3% for model layer 1. Appendix C2 on Page C2-18 states, *"This value is quite low for typical sand and gravel aquifers such as occur in Rose Valley and is believed to underestimate the specific yield value applicable to multi-year pumping."* We have been directly involved in a number of hydrogeologic modeling projects in and around Inyo County, and the aquifers therein. The estimated specific yield of 0.03 appears to be a reasonable estimate based on GSE's experience. However, it is unclear why if the modeler felt that 0.03 was unreasonably low, why the calibrated values of specific yield would not have been constrained to the higher estimates during calibration. It must be concluded that Geologica did not trust its own calibrated model. Particularly since the original model-calibrated value of specific yield was not used for any of the impact scenarios. In order to compensate for the assumed low estimate of specific yield, specific yield estimates of 0.10, 0.20 and 0.30 (an increase of 300% to 1000% above the value for specific yield of 3%) were used for the impact analysis (which would

P5-8 significantly decrease the rate at which impacts would be observed). As shown by the varying effects of specific yield to the impact analysis, specific yield is a sensitive parameter. Changing a sensitive parameter would undoubtedly require adjustment of other aquifer parameters in order to maintain model calibration. Reporting of additional recalibration after parameter adjustments was not disclosed in the Draft EIR. The Draft EIR does not contain a description concerning the evaluation of any changes in model calibration that should have occurred as a result of making each change in specific yield or other parameter adjustments. Therefore, the impact analyses were essentially based on three uncalibrated models, each with an untested yet sensitive specific yield estimate. This error in basic modeling principles undermines the reliability of all groundwater impacts predicted and the mitigation measures set forth in the Draft EIR.

P5-9 There are numerous other modeling issues which will be addressed later. As an example, however, the Draft EIR fails to provide sufficient reporting of any sensitivity analysis which is a key step in the
P5-10 modeling process. In addition, we believe that the Draft EIR has misinterpreted the results from the hydrogeologic model even if it were presumed to be valid. These will be listed in detail in our final comment letter.

Recommendations for Monitoring and Mitigation

P5-11 The monitoring and mitigation plan was based on assuming average annual conditions. Reviewing the precipitation records of the region will indicate that average annual conditions are rarely achieved. A dryer-than-average period of several years may be followed by one or two very wet years, and then followed by another dry cycle. Based on the flawed model, the effects of pumping for a given year, may last for a much greater period than for which pumping was conducted. Indeed, if the pumping rate were allowed during a succession of several dry years, the impacts would be far greater from the cumulative effects of the dry years and the pumping. It is unclear then how project pumping at the proposed rate (greater than 4,800 acre-feet per year) would affect the groundwater system including at Little Lake, if three or four consecutive dry years occurred and groundwater pumping could exceed recharge by as much as a factor of two. A convenient way to test this would be to recreate the precipitation or runoff conditions for the past 20 years or more assuming project pumping as planned, and as planned with proposed monitoring and mitigation plan. It appears that the mitigation plan is based upon average annual conditions. To avoid the maximum impact of a 10% loss at Little Lake, the mitigation measures would have to apply to a worst case scenario, assuming several dry years in addition to the proposed pumping. This analysis has not been performed, nor have the mitigation measures been adopted to prevent unreasonable impacts in a worst case scenario. This is particularly key due to the lag in time between pumping occurring and impacts being seen at Little Lake.

P5-12 A major concern is that as the flawed model currently predicts that impacts to the groundwater system (including at Little Lake) would continue to increase even after pumping is ceased (assuming pumping could continue for 30 years). Based on these results, once a trigger/threshold is reached and pumping is halted, impacts to Little Lake could continue to worsen causing serious impacts to the Little Lake area. To avoid the 10% decline at Little Lake, the triggers for pumping reduction or curtailment would have to be set at a level knowing that the impacts will continue and become even more pronounced after pumping stops.

P5-13 The basis for the monitoring and mitigation program (significant impact to Little Lake being a greater than 10% reduction in spring flow) appears to be a major paradigm shift in groundwater management in Inyo County. The County should recall the formerly proposed Western Water groundwater-export project in which any impacts to potentially phreatophytic vegetation were viewed as unacceptable by Inyo County. The County's prior policies would not have allowed any reduction in flow to springs in other areas, for other projects. The County and the Draft EIR are now suggesting that impacts to

P5-13 springs, phreatophytic vegetation, regional drawdown, and surface water flows are now acceptable so long as the decrease does not exceed 10%. The basis for such a paradigm shift in the policies of Inyo County to allow 10% decreases needs to be presented.

P5-14 Finally, the predictions based on the flawed model are described in Table C4-1, which states: *"Based on current groundwater flow model results, these maximum drawdown values listed above result from pumping the Hay Ranch production wells at design rates for 1.2 years, with specific yield values of 10%. These maximum acceptable drawdowns can occur several years after pumping at Hay Ranch ceases."* Based on this, and similar statements elsewhere, the monitoring and mitigation program makes the feasibility of maintaining the project pumping rate of 4,800 acre-feet per year for the lifespan of the 30-year project seem highly unlikely, if not virtually impossible, to achieve. It is clear that under the constraints of the monitoring program, the project is infeasible as proposed and alternatives are required.

Reporting

P5-15 The conceptualization of groundwater flow regimes, numerical groundwater flow modeling and impact analyses, and associated reporting involve extensive geologic interpretation, and that realm of professional practice requires that the work be conducted by, or under the direct supervision of, a California Professional Geologist. According to the California Business and Professions Code, Chapter 12.5, Section 7800 et seq,, geology is "*the science which treats of the earth in general; investigation of the earth's crust and rocks and other materials which compose it; and the applied science of utilizing knowledge of the earth and its constituent rocks, minerals, liquids, gases and other materials for the benefit of mankind."* Thus the study of groundwater (hydrogeology) falls under the purview of geology. Section 7835 goes on to state that, *"All geologic plans, specifications, reports, or documents shall be prepared by a professional geologist or a certified specialty geologist, or by a subordinate employee under his or her direction. In addition, they will be signed by the professional geologist, or registered specialty geologist, or signed and stamped with his or her seal, either of which will indicate his or her responsibility for them."* The interpretative reports presented in the Draft EIR show no evidence that the work complies with the foregoing standards, as the report and model are not signed or stamped. Thus, the work product appears to be in violation of the California Business and Professions Code.

The comments provided above have been provided by Andrew Zdon, a California Professional Geologist, Certified Engineering Geologist, and Certified Hydrogeologist, with more than 20 years of experience in hydrogeology including groundwater flow, numerical groundwater flow modeling, aquifer testing and associated reporting.

Closure

As described, there are abundant more detailed issues that will be addressed in the final comment letter to be provided at your request at a later date. We look forward to discussing these issues with you.

P5 **Andrew Zdon**
Golden State Environmental
9000 Crow Canyon Road, Suite S-402
Danville, California 94506

P5-1 Please refer to Master Response C2.1.

P5-2 Please refer to Master Response C2.1.

P5-3 Please refer to Master Response C3.2.

P5-4 Please refer to Master Response C3.2.

P5-5 The comment is noted.

P5-6 The numerical modeling conducted by Geologica does in fact observe the protocols of standard professional practice. The Hydrology Model conceptualization was not faulty. The impact analyses were conducted based on a calibrated numerical model. The modeling effort is sufficiently documented in Appendix C2 for the purposes of the Draft EIR with the exception that results of sensitivity analyses conducted during model simulation efforts have been reported in greater detail in the Final EIR to clarify and amplify the Draft EIR's conclusions. Responses to additional comments below elaborate on these issues.

P5-7 A calibrated numerical Hydrology Model was used for all model predictions described in the Draft EIR. The model was calibrated in two ways:

1) To steady-state water levels measured in the valley
2) To transient (changing) water levels measured during a 14-day pumping test.

This is common practice in groundwater modeling. Steady-state simulations do not use the storage coefficient term – it is used only for transient simulations. The transient simulation of the pumping test used a specific yield value of 0.03 (3%), as stated. However, it was pointed out that the pumping test represented only a 14-day period, and that the specific yield value over a longer time period of months to years would likely be higher. It is a widely-accepted phenomenon that during the early stages of pumping tests an unconfined aquifer commonly acts like a confined aquifer, with corresponding small values of storage coefficient. Later, the pores start to drain, the aquifer starts to act like an unconfined aquifer, and the storage coefficient values become larger. This phenomenon was discussed in detail by Danksin in his 1998 modeling report for Owens Valley. Please refer to Master Response C2.5 for additional details of this issue.

P5-8 See response for P5-7, and Master Response C2.5.

P5-9 Please refer to Master Response D2.6, Model Documentation. Additional information of the extensive sensitivity analysis has been provided in the Final EIR.

P5-10 The comment is noted, and is included in the project record

P5-11 The intent of the mitigation plan is to avoid causing an incremental loss of 10% of the typical natural flow of groundwater to Little Lake caused by pumping associated with the project. That is why it is based on typical steady-state conditions, rather than on dry seasons. The intent of the monitoring and mitigation plan is not to ensure that there would never be a decrease of 10% of groundwater inflow to the lake that is caused by natural changes in precipitation. It is recognized that there will be some changes in Little Lake levels caused by seasonal variations in precipitation, and some changes caused by landowner adjustments to the dam at the downstream end of Little Lake. This has historically resulted in some changes in Little Lake water levels. The applicant would not be required to reduce or cease pumping to account for the effect of a drought if the drought lowers groundwater levels to the established trigger levels. The Inyo County Water Department would recalculate the pumping rate to ensure a no greater than 10% reduction in groundwater flow based on the new reduced background level. This would likely result in reduced pumping because the maximum 10% reduction would be calculated based on the reduced availability of groundwater

P5-12 Potential drawdown following cessation of pumping is accounted for in the predictive simulations, which continue for more than 120 years. The trigger levels for hydrologic monitoring points incorporated model predictions regarding delayed effects at locations farther down the valley from Hay Ranch so as not to allow an exceedance at any time within the simulation period.

P5-13 Please refer to Master Response E4 and N5.

P5-14: The reviewer is correct that the Draft EIR concludes that pumping 4,839 ac-ft/yr for 30 years is unlikely to be feasible. The Draft EIR presents extensive analysis of how and why a mitigated project involving pumping at the full project rate for a shorter duration until trigger levels are reached, is feasible.

P5-15 Please refer to Master Response A3. All modeling work was conducted by a California-Professional Geologist with an advanced degree in hydrogeology, who has been conducting hydrogeologic investigations and groundwater modeling for over 20 years.

1240 S. CHINA LAKE BLVD
RIDGECREST, CA 93555

August 25, 2008

Pat Cecil, Planning Director
Inyo County Planning Department
P.O. Drawer L,
Independence, CA 93526

RE: 30 Day Review Period Extension Request on CUP # 2007-3/COC LLC

Dear Mr. Cecil:

P6-1 In consideration of the fact that there is quite an extensive amount of information contained within the Coso Operating Company Hay Ranch Water Extraction and Delivery System Draft EIR and the fact that the legal proceedings at the public comment meeting at Statham Hall, Lone Pine, CA on the night of August 20, 2008 did not include an appropriate court reporter and/or trained stenographer, I am respectively requesting a 30 (thirty) day extension for public comment on said project to include another public meeting with necessary staff.

Thank you for your anticipated cooperation. If you have any questions regarding this extension request, please contact me at 808-960-3777 CELL OR 808-329-1975 OFFICE.

Very truly yours,

T Metcalf 8/25/08

Terry Metcalf, Manager
Deep Rose, LLC

P6 **Terry Metcalf**
Deep Rose, LLC
1240 S. China Lake Blvd
Ridgecrest, California 93555

P6-1 Please refer to Master Response A7 for a discussion of the response to requests for an extension of the public review period. The County determined that an extension is not necessary. A stenographer or court reporter was not required at the meeting.

ARNOLD BLEUEL
LAROCHELLE MATHEWS &
ZIRBEL LLP
ATTORNEYS AT LAW

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August 26, 2008

RECEIVED
AUG 2008
INYO COUNTY
PLANNING DEPT.

Tanda Gretz, Senior Planner
Inyo County Planning Department
P.O. Box L
Independence, CA 93526

Re: Hydrology Model

Dear Tanda:

P7-1 I was disappointed to receive your e-mail message of August 26, 2008 initially denying our request to extend the public comment period for the Draft Environmental Impact Report (DEIR) on the Coso Project. Mr. Zdon and I received the Hydrology Model data and files, including the inputs, yesterday, August 25, 2008. Unfortunately, Mr. Zdon has not yet been able to run the Hydrology Model.

P7-2 Mr. Zdon has the MODFLOW program developed by the U.S. Geological Survey in the 1980s and the related Groundwater Vistas program, presumably used by Geologica. According to the DEIR, Geologica used the Groundwater Vistas program to accomplish the modeling tasks with MODFLOW. According to Mr. Zdon, he has not been able to run the MODFLOW model using the Groundwater Vistas program and is concerned that Geologica may have modified, or is using some other program or process to run and generate, the actual Hydrology Model. We need to ascertain exactly which version of MODFLOW and perhaps the Groundwater Vistas program Geologica was using in order to recreate the Hydrology Model.

P7-3 Mr. Zdon further notes that the Model files he received are all date-stamped last Friday, August 22nd. This was quite surprising, since the DEIR was released for public comment around July 23, 2008, and the Hydrology Model must have been completed prior to that date. Merely copying the input files would not have changed the date-stamp on the modeling files and inputs. Mr. Zdon is concerned that perhaps there were changes to MODLOW, Groundwater Vistas or the input data itself after the date the DEIR was released.

P7-4 We really need to be able to recreate the Hydrology Model. We now have less than 10 business days to provide final public comments, and the modeling files received do not allow us to run the Hydrology Model itself.

P7-4 It is requested that you have Dan Matthews, or some other representative of Geologica, contact Mr. Zdon directly. I will provide you again with Mr. Zdon's contact information in the e-mail message which will transmit this letter. In light of these circumstances, I must request once again an extension of the public comment time. This request is made not only because of the delays in providing the Hydrology Model and all of its input files, but also because we did not have immediate access to all of the reference material described in the DEIR. This has prevented Little Lake Ranch, and all other members of the public, to truly provide meaningful comments to the DEIR. I hope that you and Mr. Cecil will reconsider this crucial issue.

Very truly yours,

ARNOLD, BLEUEL, LaROCHELLE,
MATHEWS & ZIRBEL, LLP

Gary D Arnold

Gary D. Arnold

GDA:jw
cc: Little Lake Ranch (via e-mail)
Pat Cecil (via e-mail)
Geologica (via e-mail)

P7 **Gary D. Arnold**
Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP
300 Esplanade Drive, Suite 2100
Oxnard, California 93036

P7-1 The comment is noted. Please also see Master Response A7 addressing the extention of the comment period.

P7-2 Geologica has not modified the Groundwater Vistas program. Geologica used Groundwater Vistas Version 5.06 Build 2 to develop the Hydrology Model with MODFLOW “Original (88/96)” selected for model run file generation. No other software was used to run the model.

P7-3 The model files in question were opened using Groundwater Vistas to confirm that the correct files were identified. The files were then saved to a new directory using the Groundwater Vistas “Save As” function to facilitate burning the files to a CD. The date stamp on the model files reflects the day the files were resaved. No changes to MODFLOW, Groundwater Vistas or the input data were made.

P7-4 The comment is noted. Dan Matthews of Geologica contacted Andrew Zdon to assist him with using the files. The difficulties experienced by Mr. Zdon were not related to the files provided, the data, or the MODFLOW program.

ARNOLD BLEUEL
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September 3, 2008

Tanda Gretz, Senior Planner
Inyo County Planning Department
P.O. Box L
Independence, CA 93526

Re: Coso Operating Company
CUP 2007-03

Dear Tanda:

Enclosed please find a memorandum from Andrew Zdon of Golden State Environmental, Inc., dated September 3, 2008, who was retained by Little Lake Ranch, Inc. Please add the memorandum from Mr. Zdon to the various comments being submitted in connection with the Draft Environmental Impact Report on the Coso Project, CUP No. 2007-03.

Very truly yours,

ARNOLD, BLEUEL, LaROCHELLE,
MATHEWS & ZIRBEL, LLP

Gary D Arnold

Gary D. Arnold

GDA:jw
Enclosure
cc: Little Lake Ranch (via e-mail)
Pat Cecil (via e-mail)
Randy Keller (via e-mail)

GOLDEN STATE ENVIRONMENTAL, INC
Cultural, Environmental, Water Resources & Construction Services
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MEMORANDUM

To: **Gary Arnold, Arnold, Bleuel, LaRochelle, Mathews & Zirbel, LLP**
Walt Pachucki, TEAM Engineering & Management, Inc.

From: **Andrew Zdon, P.G., C.E.G., C.Hg., Golden State Environmental, Inc.**

Date: **September 2, 2008**

Re: Comments Concerning Coso Operating Company Hay Ranch Water Extraction and Delivery System, Draft Environmental Impact Report

Golden State Environmental, Inc. (GSE) is providing the following comments concerning the draft environmental impact report (Draft EIR) described above. GSE's review has been focused on evaluating the hydrogeologic evaluation of the proposed project including conceptualization of the groundwater regime, aquifer testing, numerical groundwater flow modeling, recommendations for monitoring and mitigation, and overall reporting. As part of this analysis, model files provided by Geologica were used to evaluate the modeling effort. Our comments are described below based on these files and the associated reporting. Although numerous, the following is a partial list of some of the major issues resulting from our review:

P8-1
- It is unclear why major deviations from the work by the U.S. Geological Survey are made, especially when data needed to support those deviations are lacking or absent, and can serve to lessen predicted project impacts.

P8-2
- As modeled, extending the aquifer to an artificial and unrealistic great depth serves to significantly increase the estimated volume of groundwater in storage available for extraction to the project; thereby artificially and unrealistically lessening predicted impacts.

P8-3
- Geologica provides no specifics as to why they chose 10% for the recharge value, this value being significantly higher than the estimates to the north or south, and may be a remnant of the calibrated estimate of the Brown and Caldwell model which was calibrated with differing boundary conditions and aquifer parameter estimates.

P8-4
- Geologica has arbitrarily increased the specific yield; thereby decreasing the predicted future drawdown due to pumping. With this arbitrary change, Geologica has artificially and unrealistically caused the model to under-predict drawdown during the simulation period.

P8-5
- The impact analysis is based on an uncalibrated model and faulty assumptions and analysis; therefore, the reliability of all groundwater impacts predicted and the mitigation measures set forth in the Draft EIR is critically undermined.

P8-6
Overall, the documentation of the modeling is incomplete in that specific input data are not detailed in the report, explanations of the use of certain data are unclear, and key results (such as groundwater budgets) are omitted. The model files provided by Geologica appeared to be a mix of MODFLOW-88/96 and MODFLOW-2000 files. As reiterated and further developed in this letter, fundamental flaws in modeling approach, omission of key results (e.g., groundwater budget), and the arbitrary change in aquifer parameters are far more significant than would non-working and/or inconsistent files.

CONCEPTUALIZATION OF THE GROUNDWATER REGIME

As reported, the conceptualization of the Rose Valley aquifer system was largely based on the work conducted by the U.S. Geological Survey for the Owens Valley (Danskin, 1998). The work conducted by Danskin represents the most in-depth hydrogeologic investigation of the Owens Valley region, and the numerical modeling presented in the Danskin report should form the basis of any more detailed modeling analyses in the region. The similarities between the area of the Owens Valley modeled by the U.S. Geological Survey and Rose Valley are readily apparent. It is unclear why then, in some key areas, major deviations from the work by the U.S. Geological Survey are made, especially when data needed to support those deviations are lacking or absent.

One example is the groundwater flow system with respect to aquifer thickness (assumed thickness of up to 3,000 feet). Danskin (1998) reports,

> *"Despite its large volume, the quantity of ground water flowing through or extractable from hydrogeologic unit 4 probably is minimal. Deep test drilling during 1988 by the Los Angeles Department of Water and Power (E.L. Coufal, oral commun., 1988) showed that most materials at depths greater than about 700 ft do not yield significant quantities of water to wells, generally less than 0.2 cubic feet per second."*

P8-7 In support of Danskin, this has generally been our experience in other alluvial basins in the desert southwest. Given the depths of existing wells reported in the Draft EIR, this also appears to have been the case in Rose Valley. It is unclear then, on what basis the presented groundwater flow model extends the depth of the aquifer system to 3,000 feet below ground surface. This deviation from Danskin (a carry-over from the Brown and Caldwell modeling effort), and used in the draft EIR, requires additional data to justify this assumption. As modeled, extending the aquifer to an artificial and unrealistic great depth serves to significantly increase the estimated volume of groundwater in storage available for extraction to the project; thereby lessening predicted impacts.

On page C2-8, it is noted that the total volume of precipitation in the area is 42,000 acre feet per year (AF/yr), and assumes that 10% of this rainfall would recharge the groundwater basin. It further notes that Danskin used a value of 6% of rainfall for recharge in the Owens Valley to the north, and Williams used a value of 8% of rainfall for recharge in the Indian Wells Valley to the south. Geologica provides no specifics as to why they chose a value of 10%, which is higher than the estimates to the north or south, other than Geologica used the calibrated estimate of the Brown and Caldwell model (the Brown and Caldwell model was calibrated with differing boundary conditions and aquifer parameter estimates). The 10% estimate used by Geologica would result in greater volumes of recharge to the basin than would the assumptions used by previous investigators, and would likely lessen the impacts of the proposed pumping.

Another issue concerning the conceptualization of the groundwater system involves the description of Rose Spring. The Draft EIR refers to Rose Spring as dry. The Draft EIR also notes that a concrete structure and water pipes that once fed water from Rose Spring to the concrete structure are present, but are in a current state of disrepair. The disparity of ground surface elevation and the existing groundwater surface elevation (described as approximately 300 feet in Appendix C2) is noted.
P8-8 Additionally, it is stated that Rose Spring is not connected to the saturated aquifer (a more detailed discussion of the source of groundwater for this condition should be included). Thus, the Draft EIR concludes that impacts to the spring are not predicted. That certainly would be the case today. Based on the extended periods of time that would be required for water level recovery after the proposed project is complete, it can be extrapolated that the current dry state of Rose Spring could also be

P8-8 correlated with the overdraft of the Rose Valley system resulting from earlier agricultural pumping at Hay Ranch. In other words, the former agricultural pumping may well have caused Rose Spring to go dry, and the aquifer has not recovered sufficiently to restore the flow to Rose Spring. This concept is completely overlooked in the Draft EIR despite its consistency with modeled results. Additional discussion concerning this scenario should be included in the DEIR.

NUMERICAL GROUNDWATER FLOW MODELING

P8-9 As reported, the numerical modeling conducted by Geologica does not follow protocols of standard professional practice, is based on faulty conceptualization as described above, and provides conclusions based on uncalibrated model results. Additionally, the lack of proper model documentation may lead to insufficient or inappropriate monitoring and mitigation.

Geologica's modeling approach started with the use of a previous model developed by Brown and Caldwell. Geologica completed a transient (changing conditions over time) recalibration of the Brown and Caldwell model based on a 14-day aquifer test at the Hay Ranch. Using the aquifer parameters from the transient calibration (based on the 14-day test), the steady-state (constant or equilibrium conditions) version of the model was then recalibrated by adjusting mountain front recharge rates and constant head boundary values. However, Geologica (pg. C2-16) also stated that they adjusted hydraulic conductivity and general head boundary conductance values during the steady-state recalibration. It is unclear what the transient calibration accomplished.

P8-10 More puzzling is the presentation of detailed hydrographs and groundwater elevation data from ten wells in the model area that date back as far as 1998 (most wells have at least 5 years of data). It is normal practice to calibrate a groundwater model with available groundwater elevation data such as those presented in Tables C2-2 and Figure C2-3. To "calibrate" the model using a 14-day aquifer test and ignore the opportunity to calibrate the model with over 5 years of groundwater elevation history cannot be considered acceptable practice.

The issue of modeling approach is significant in that the "use" of the model is to predict impacts associated with pumping over several years. Geologica "calibrated" the model using a combination of a single month of data (and assumed it represented steady-state conditions) and the drawdown data from a 14-day test. A far more robust calibration would have been to use the full dataset presented in their report.

P8-11 On page C2-18, Geologica stated:

> *The model calibration to the 2007 pumping test data yielded an estimated specific yield for the alluvial aquifer of 3 %. This value is quite low for typical sand and gravel aquifers such as occur in Rose Valley and is believed to underestimate the specific yield value applicable to multi-year pumping.*

The paragraph continues by citing references that correctly point out that specific yield results from short-term aquifer tests are often not representative of long-term specific yields. This affirms the previous comments regarding the need to calibrate a model with data that are consistent with the ultimate use of the model. In this case it would be far more appropriate to have calibrated the model with the more than five years of data from Table C2-2 and Figure C2-3 than to "calibrate" it to a 14-day test and a one-time measurement of groundwater elevations and assume that it is representative of "steady-state" conditions.

Geologica continues with references to "text-book" estimates of specific yield based on aquifer material, and concludes:

> *Because specific yield could not be determined from the pumping test data, a range of values corresponding to high, medium, and low values of 30, 20 and 10 % were used in the project development impact analyses discussed below.*

In the next section (also on page C2-18), Geologica reiterates:

> *All aquifer parameters were maintained as described for the calibrated model with the exception that specific yield in the uppermost model layer was set to values of 10%, 20% or 30% for individual model runs to assess sensitivity to this parameter.*

P8-11

The arbitrary increase in specific yield has the effect of decreasing the predicted future drawdown due to pumping. By making this arbitrary change, Geologica has artificially and unrealistically caused the model to under-predict drawdown during the simulation period.

Freeze and Cherry (1979, pg. 61) stated that the usual range of specific yield is between 0.01 and 0.30. While the "text-book" values that Geologica cites are likely accurate based on laboratory analysis of homogenous sediments as inferred in their Table C2-5, the Freeze and Cherry estimates are based on heterogeneous conditions normally encountered in field applications (see the discussion at the top of pg. 48 of Freeze and Cherry).

The "calibration" of the model to the data from the 14-day aquifer test yielded a specific yield result (0.03) that is well within the range cited by Freeze and Cherry. However, it is likely that this value may not be representative of a specific yield over several years. A more appropriate solution to this limitation is to calibrate the model to the multi-year dataset contained in the report. It is unacceptable to simply choose a new parameter estimate, especially one that will result in less drawdown under the proposed pumping condition.

P8-12

Further, changing the specific yield would undoubtedly require adjustment of other aquifer parameters in order to maintain model calibration. Reporting of additional recalibration after parameter adjustments was not disclosed in the Draft EIR. The Draft EIR does not contain a description concerning the evaluation of any changes in model calibration that should have occurred as a result of making each change in specific yield or other parameter adjustments. Therefore, the impact analyses were essentially based on an uncalibrated model. This error in basic modeling principles undermines the reliability of all groundwater impacts predicted and the mitigation measures set forth in the Draft EIR.

P8-13

A significant problem is in the specification of storativity. Inspection of the provided MODFLOW files and statements in the report yields the conclusion that they likely contain estimates of specific storage rather than storativity as reported. Of note is that the storativity presented in Appendix C2 (Page C2-16) is provided with dimensional units while storativity is essentially a ratio, i.e., is a dimensionless number. If it is assumed that specific storage is being referred to, the resulting storativities vary from cell to cell based on aquifer thickness and range three orders of magnitude for Layer 2 (10^{-3} to 10^{-6}, dependent on aquifer thickness); and for Layers 3 and 4 are more typical of semi-confined conditions (10^{-3} to 10^{-4}), an unrealistic condition for these very deep sediments. For Layers 3 and 4, these storativities appear high. Further, having lower storativities in Layer 2 than in Layers 3 and 4 seems highly unlikely from a geologic perspective. Given the lack of the presentation of a sensitivity analysis, it is unclear as to the effects of this issue. If storativity was supposed to be set at 7

P8-13 x 10^{-7}, an error in model data input occurred, and the input need to be corrected and the model recalibrated.

The following provide some additional specific comments concerning the numerical modeling:

P8-14 ***Page C2-13*** - Geologica states that mountain- front recharge is distributed amongst all 4 model layers. However, the model files (both the MODFLOW files and the Groundwater Vistas files) contain recharge in layers 2, 3 and 4, but not in layer 1. Either the text, or the Rose Valley model, needs correcting to resolve this issue. The absence of recharge in Layer 1 would be a major deviation from the conceptualization by the U.S. Geological Survey (Danskin, 1998) for the Owens Valley. This deviation would require additional discussion and justification.

P8-15 ***Page C2-14*** - The evapotranspiration rate is not specified in the report. All model files specify a rate of 2.52E-02 ft/day, which equals 9.2 ft/yr. This value appears to be significantly higher than similar estimates used in groundwater models of the Owens Valley without any explanation. Page C2-4 indicates that "*the area's annual evapotranspiration rate is reported to be 65 inches (CRWCB, 1993).*" This is apparently a data input error. Again, the lack of a reported sensitivity analyses results in not knowing the importance of this issue to the overall analysis.

P8-16 ***Page C2-14 and C2-15*** – Geologica stated that they chose to use General Head Boundaries (GHB) in the Little Lake area to simulate basin outflow rather than Drain (DRN) boundaries as Brown and Caldwell had done. Geologica's reasoning was as follows:

> *The MODFLOW drain package stops calculating flow to the drain when the local groundwater elevation drops below the base of the drain. It is anticipated that groundwater will continue to discharge to Indian Wells Valley at a reduced rate, even if pumping draws groundwater levels down below the level of Little Lake at some point in the future; thus the MODFLOW drain package does not adequately represent possible worst case conditions in the area. Use of MODFLOW GHB cells in this area better represents hydrogeologic conditions and allows both groundwater elevation and discharge rate to be easily monitored during simulations.*

Geologica is correct in stating that the basin outflow would be reduced to zero if the groundwater elevation dropped below the specified head of the DRN boundary. DRN boundary flow will decrease linearly with decreasing groundwater elevation until the groundwater elevation drop below the specified DRN boundary head, at which point flow is zero. It is therefore unclear what Geologica means when they state that DRN boundaries are not adequate to simulate the outflow. If the conceptualization is to permit outflow only at a rate that decreases with decreasing groundwater elevation, the use of the DRN package is appropriate.

The use of the GHB boundary results in a different situation where groundwater elevations drop below the boundary head estimate. With the DRN package, outflow would cease; with the GHB package, flow would reverse. Geologica has added the potential of groundwater flowing into Little Lake from the south by using the GHB package. This conceptualization is different than that used by Brown and Caldwell, and needs further discussion in the report. Essentially, this conceptualization would allow water to flow northward from Indian Wells Valley toward Rose Valley if groundwater levels dropped below those set in the GHB package. This would be an unrealistic condition.

P8-17 ***Page C2-15 to C2-16 and Figures C2-8 to C2-11*** – The horizontal hydraulic conductivity of all layers is apparently isotropic (equal in all directions) without any explanation.

P8-17 Estimates of vertical hydraulic conductivity were initially set equal to horizontal hydraulic conductivity which is physically unrealistic (given the typically layering of sediments present), and then "lowered to 1 ft/day to be more consistent" with the results of the aquifer test. During "recalibration" (discussed on page C2-16) it is stated that the vertical hydraulic conductivity was lowered further. Figure C2-8 to C2-11 show that "calibrated" vertical hydraulic conductivity estimates in the area of Hay Ranch (the location of the aquifer test) are 0.019 ft/day in layers 1 and 2, 0.003 ft/day in layer 3, and 0.28 ft/day in layer 4. If the aquifer test suggested a value of 1 ft/day, and the value had to be lowered this much to obtain a reasonable calibration, it suggests that 1) the test data were not reliable, 2) a calibration of the model using data presented in Table C2-2 and Figure C2-3 would be beneficial, or 3) the calibration is critically flawed. In either of the three cases, additional model calibration or reconceptualization appears to be needed prior to conducting the impact analysis.

P8-18 Finally, the concept that alluvial fan deposits, basin fill deposits (including those to 3,000 feet below ground surface) and the volcanic rocks between Hay Ranch and Little Lake would have identical aquifer characteristics throughout the region for each layer is not supportable from a geologic perspective. Clearly, volcanic rocks will have differing hydraulic characteristics than alluvial fan deposits. Discussion should be provided as to why the model parameter zonation didn't approximate the parameter zonation as presented in the Owens Valley numerical groundwater flow model prepared by the U.S. Geological Survey.

RECOMMENDATIONS FOR MONITORING AND MITIGATION

P8-19 Given the flawed modeling analysis as it currently exists, and which forms the basis of the monitoring and mitigation plan, it follows then that the monitoring and mitigation plan is based on faulty assumptions and analyses. Detailed review of the thresholds and triggers becomes a moot point because under the current analysis, there is no reliable basis from which to generate those threshold and triggers.

P8-20 A major concern is that the model currently predicts that impacts to the groundwater system (including at Little Lake) would continue to increase for an extended period of time after pumping has ceased (assuming pumping could continue for 30 years). Based on these results, once a trigger/threshold is reached and pumping is halted, impacts to Little Lake could continue to increase causing serious impacts to the Little Lake area. To avoid the 10% decline at Little Lake, the triggers for pumping reduction or curtailment would have to be set at a level assuming that the impacts will continue and become even more pronounced after pumping stops. Further, there is no discussion as to what baseline conditions for the trigger/thresholds presented will be. Establishing triggers and thresholds from an essentially moving target such as the groundwater surface over time as shown in the figures provided in Appendix C2 is problematic. How will drawdown attributability be established?

P8-21 The monitoring and mitigation plan will also need to address potential impacts at the Portuguese Bench area. Although the DEIR states that impacts are unlikely to spring flow at that location, the numerical model predicts that groundwater elevation declines on the order of 20 to 30 feet immediately adjacent to the springs at Portuguese Bench will occur. In fact, the only reason that impacts are not predicted by the model at Portuguese Bench is because the model domain was terminated immediately down-gradient from the springs at Portuguese Bench eliminating the ability of the model to evaluate those conditions. This model construction issue, is also a major deviation from the previous work in the region by the U.S. Geological Survey who extended their model boundaries up to the mountain-front as opposed to only half-way up the alluvial fans of the Sierra Nevada. Of note is that on the eastern side of Rose Valley, the model domain extends right up to the mountain-front of the Coso Range.

P8-21 It is not surprising, given the distance from the Hay Ranch to Portuguese Bench that the effects of pumping during the aquifer test were not seen at that location. That condition would likely take much longer than 2 weeks to develop. However, it is clear that significant drawdown in the Rose Valley would result in a steeper gradient across the faulted terrain that makes up Portuguese Bench, and would likely result in a reduction in spring flow. This is a simple groundwater-budget issue as described further in the Reporting section of this letter.

P8-22 Reviewing the precipitation records of the region will indicate that average annual conditions are rarely achieved. A dryer-than-average period of several years may be followed by one or two very wet years, and then followed by another dry cycle. Based on the model results, the effects of pumping for a given year, may last for a much greater period than that for which pumping was conducted. Indeed, if the pumping rate were allowed during a succession of several dry years, the impacts would be significantly greater from the cumulative effects of the dry years and the pumping. It is unclear then how project pumping at the proposed rate (greater than 4,800 AF/yr) would affect the groundwater system (including at Little Lake) if three or four consecutive dry years occurred and groundwater pumping could exceed recharge by as much as a factor of two. A convenient way to test this would be to recreate the precipitation or runoff conditions for the past 20 years or more assuming project pumping as planned, and as planned with proposed monitoring and mitigation plan. It appears that the mitigation plan is based upon average annual conditions. To avoid the maximum impact of a 10% loss at Little Lake, the mitigation measures would apply to a worst-case scenario, assuming several dry years in addition to the proposed pumping. This analysis has not been performed, nor have the mitigation measures been adopted to prevent unreasonable impacts in a worst case scenario. This is a particularly key issue due to the lag in time between pumping occurring and impacts being seen at Little Lake.

P8-23 With respect to the recommendations for additional monitoring at Little Lake Ranch, a discussion of the potential impacts caused by the construction of the new monitoring infrastructure and associated required permitting (California Department of Fish & Game; California Regional Water Quality Control Board – Lahontan Region, etc.) should be discussed in more detail. This would also include the potential impacts to wetlands near the Syphon Well and Coso Spring that would be caused if infrastructure was required to install a pump and associated infrastructure at Syphon Well. Additionally, if pumping from that well continues to be a proposed mitigation, analyses as to the impact on Coso Spring (in the immediate vicinity of Syphon Well) from pumping Syphon Well should be included. The concept of mitigating the loss of spring flow and wetlands at Little Lake Ranch due to project pumping by conducting additional pumping and adding to the imbalance in the groundwater system that would exist is not a suitable mitigation, in that it would simply exacerbate the impacts to the basin. Any monitoring program should be designed to eliminate this potential situation.

P8-24 Finally, the predictions based on the model are described in Table C4-1, which states: *"Based on current groundwater flow model results, these maximum drawdown values listed above result from pumping the Hay Ranch production wells at design rates for 1.2 years, with specific yield values of 10%. These maximum acceptable drawdowns can occur several years after pumping at Hay Ranch ceases."* Based on this, and similar statements elsewhere, the monitoring and mitigation program makes the feasibility of maintaining the project pumping rate of 4,800 acre-feet per year for the lifespan of the 30-year project seem highly unlikely, if not virtually impossible, to achieve.

REPORTING

P8-25 The Draft EIR states the overall proposal is for pumping of 4,839 AF/yr of groundwater, and the objective of the analysis is to evaluate the potential impacts of that pumping. When groundwater pumping begins in an area that has not been historically pumped (or has not been pumped significantly in several years as in the present case), three impacts will result: 1) increased groundwater inflow, 2) a decrease in natural outflows, and 3) a decrease in groundwater storage, manifested by decreased groundwater elevations. The primary purpose in developing a groundwater model for this type of analysis is to quantify each of these three impacts.

On page C2-11 of the report, a "conceptual groundwater budget" is presented. It appears to be from a steady-state simulation using the model since there are no storage terms. In this groundwater budget, total inflow and total outflow are about 5,000 AF/yr.

P8-25 Because the pumping proposed in the Draft EIR is nearly equal to the total groundwater inflow in the basin, it would be expected that impacts would be significant. In this case, the effects of the proposed pumping would likely result in increased inflow from the northern boundary of the model since that boundary is conceptualized as constant heads. This means that the model simulates an unlimited ability to send groundwater into the model area based on the hydraulic gradient and aquifer properties. Natural outflow from the system is through subsurface flow to the south and southeast and evapotranspiration. Because these sinks are located at a distance further than the inflow boundary, it is reasonable to expect that decreases in natural outflow would lag behind increases in inflow. Finally, because the proposed pumping is high in relation to the total flow through the system, groundwater elevation declines and, thus, groundwater storage declines, would be expected to be the dominant impact, especially in the initial years of pumping.

The Geologica report does not discuss these simple concepts, and, in fact, does not present any summary of a transient groundwater budget (which is readily available output from MODFLOW). In an analysis such as this, the common and accepted practice is to present a transient groundwater budget that allows for the quantification of the timing and magnitude of groundwater budget impacts due to pumping. The absence of this reporting results in an incomplete analysis from which to base conclusions regarding how the groundwater system changes over time in response to the project pumping.

P8-26 The Draft EIR fails to provide sufficient reporting of any sensitivity analysis which is a key step in the modeling process. As stated in Danskin (1998),

> "*As is always the case with numerical models, not all parameters of the model were known completely. Because some uncertainty is present in each (model) parameter, there is some uncertainty in the model solution. This uncertainty is reflected in heads and inflow and outflow rates that are somewhat in error. A sensitivity analysis identifies which parameters exert the most control over the model solution and, therefore, have the potential to generate the largest errors. An improved understanding of those parts of the aquifer system represented by the most sensitive parameters yields the greatest improvement in the ground-water flow model.*"

Although Appendix C-2 states that a sensitivity analysis was conducted, no quantitative results are provided. This despite that in the ASTM standards for groundwater flow model reporting, basic groundwater flow modeling text books, and standard professional practice, the inclusion of the results of a sensitivity analysis are considered a standard portion of any modeling report. Additionally, the results of sensitivity analyses can point to areas in which further data are needed to reduce the uncertainty that can result in modeling efforts such as this. In the context of the scope of the development of a numerical groundwater flow model, running a sensitivity analysis (particularly in MODFLOW2000) is a relatively minor effort. Quantitative results of the sensitivity analyses, in keeping with standard professional protocols, should be included in the report. Additionally, P8-26 discussion should be included as to how, or if, the results of the sensitivity analysis were used to evaluate future data collection as part of the monitoring and mitigation plan.

P8-27 Another example of incomplete documentation includes a discussion of the modeling software used in the creation of the Rose Valley model. A review of the model files provided to GSE by Geologica suggests that the numerical model was originally produced using the U.S. Geological Survey program MODFLOW2000 and then was saved using MODFLOW 88/96. The model files provided to GSE by Geologica included a MODFLOW2000 discretization package file for the Rose Valley model. This is not used in the version of MODFLOW for which the Rose Valley model was created and is presented. What is peculiar is that the discretization file appears to have been generated recently, despite the Groundwater Vistas file being set up for MODFLOW 88/96. A review of the model and how it is set up in Groundwater Vistas should be conducted to evaluate how this could occur, and whether this issue is affecting the creation of model files.

Further, it is unclear why the use of MODFLOW2000 was abandoned. This should be discussed. As a side note, the existing model creates drain (DRN) package files which are typically used to represent spring flow. However, in this model, there are no drains included. This is likely an artifact of the original Brown and Caldwell model.

P8-28 Finally, the conceptualization of groundwater flow regimes, numerical groundwater flow modeling and impact analyses, and associated reporting involve extensive geologic interpretation, and that realm of professional practice requires that the work be conducted by, or under the direct supervision of, a California Professional Geologist. According to the California Business and Professions Code, Chapter 12.5, Section 7800 et seq,, geology is "*the science which treats of the earth in general; investigation of the earth's crust and rocks and other materials which compose it; and the applied science of utilizing knowledge of the earth and its constituent rocks, minerals, liquids, gases and other materials for the benefit of mankind.*" Thus the study of groundwater (hydrogeology) falls under the purview of geology. Section 7835 goes on to state that, *"All geologic plans, specifications, reports, or documents shall be prepared by a professional geologist or a certified specialty geologist, or by a subordinate employee under his or her direction. In addition, they will be signed by the professional geologist, or registered specialty geologist, or signed and stamped with his or her seal, either of which will indicate his or her responsibility for them."* As presented, the interpretative reports presented in Appendix C of the Draft EIR show no indication of who wrote, or otherwise was the responsible professional for those reports, or even the company that prepared them. It is assumed that they were prepared by Geologica. In order to assure compliance with the Business and Professions code, the reports should be signed and/or stamped by an appropriate licensed professional.

The comments provided above have been provided by Andrew Zdon, a California Professional Geologist, Certified Hydrogeologist, and Certified Engineering Geologist, with more than 20 years of experience in hydrogeology including groundwater flow, numerical groundwater flow modeling, aquifer testing and associated reporting.

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P8-1 Responses to comments regarding specific perceived deviations from work conducted by the USGS in Owens Valley are addressed in detail in comment responses below.

P8-2 Please refer to Master Response C2.1 for discussion of comments regarding the aquifer thickness represented in the model.

P8-3 Please refer to Master Response C2.4.

P8-4 The values for specific yield and storativity were not chosen arbitrarily, they were based on sound logic and data from the USGS, from Owens Valley. Please refer to Master Response C2.2 for a discussion regarding specific yield and storativity values used in the model.

P8-5 All impact analyses presented in the Draft EIR were conducted using a calibrated numerical groundwater flow model. Please refer to Master Response C2.5 for a discussion of comments regarding model calibration procedures and Master Responses C2.1, C2.2, C2.3, and C2.4 for discussion of comments regarding model parameters and assumptions.

P8-6 The “specific input data” that were reportedly omitted from the Draft EIR are not identified by the commenter. The text and appendices of the Draft EIR have been revised in response to specific comments to improve readability and clarity and to provide more detailed groundwater budget results. The model files provided to Golden State Environmental were developed for MODFLOW-88/96 only, as discussed in Master Response C2.6. Responses to specific comments regarding modeling approach, results, and aquifer parameters are provided below.

P8-7 The thickness of the aquifer is represented realistically by assigning appropriately low values of hydraulic conductivity to the deeper sediments. Please refer to Master Response C2.1 for response to comments regarding the aquifer thickness represented in the model. Recharge values used in the model are not inconsistent with those used by Danskin in Owens Valley, as detailed in Master Response C2.4.

P8-8 Please refer to Master Response C3.2 for response to comments regarding possible impact of historic agricultural pumping on Rose Spring.

P8-9 The numerical modeling conducted by Geologica follows standard protocols of professional practice, is not based on faulty conceptualization, and utilized a calibrated model for impact evaluations. Please refer to Master Response C2.5 for detailed response to comments regarding model calibration procedures, including calibration to transient conditions.

P8-10 Please refer to Master Response C2.5 regarding model calibration procedures and Master Response C2.2 regarding specific yield values used in the model. Use of the groundwater elevation data cited by Mr. Zdon to calibrate the model to transient (changing) conditions was infeasible due to the lack of detailed information on pumping, and the apparent lack of significant pumping stresses in Rose Valley during that period, as discussed in Master Response C2.5.

P8-11 See response to comment P8-10.

P8-12 Please refer to Master Response C2.5 regarding model calibration procedures and Master Response C2.2 regarding specific yield values used in the model. The Hydrology Model was calibrated to time-drawdown data observed during the 21-day aquifer test conducted in October/November 2007, as discussed in Appendix C2; calibration to that data set yielded estimates of a number of aquifer parameters including short term specific yield. A different, larger value of specific yield was used for evaluation of impacts from long-term pumping, one that is more appropriate to long-term pumping, and is consistent with the value used by Danskin in Owens Valley, as discussed in the Draft EIR. Changing other aquifer parameters in addition to specific yield would not maintain model calibration as suggested by Mr. Zdon, and was not done for the Draft EIR. The HMMP discusses the need for recalibrating model aquifer parameters after pumping begins and drawdown data resulting from long-term pumping are obtained. This is consistent with good hydrological modeling practice.

P8-13 Please refer to Master Response C2.2 for response to comments regarding storativity values used in the model. Specific storage values were presented in Appendix C2 (page C2-6 of the Draft EIR) rather than storativity, as noted in Master Response C2.2.

P8-14 Mr. Zdon is correct, and Appendix C2 of the Draft EIR text has been change to note that recharge was applied to layers 2, 3, and 4 but not layer 1. See Chapter 3: Errata of this Final EIR for changes to Appendix C2 from the Draft EIR. Sensitivity analysis indicated that the absence of recharge in layer 1 has no significant impact on model results.

P8-15 The parameter value for evapotranspiration is reasonable based on independent data, and is not a “data input error”. Please refer to Master Response C2.4 for response to comments regarding the evapotranspiration rate used in the model.

P8-16 The hypothetical condition the commenter proposes that would make the GHB boundary invalid (groundwater elevations dropping below the boundary head estimate) never occurred, and therefore this concern is unfounded and additional analysis would be speculative. Please refer to Master Response C2.4 for a more detailed response to comments regarding the use of the GHB package to represent groundwater discharge at the southern end of the model domain.

P8-17 The values of the “Initial Aquifer Parameters” on page C2-15 of the Draft EIR, Section C2-3.4, were as described, initial values used during the early stages of model calibration. These initial values were adjusted during the calibration process to be more consistent with pumping test data first, and then further adjusted to provide a better fit to both the pumping test and the steady-state calibration. This is standard practice in calibrating a hydrology model, with iterative changes that are made to improve the “fit” of the model results to the observed data. Please refer to Master Response C2.2 for additional details regarding aquifer hydraulic conductivity properties used in the Hydrology Model.

P8-18 Available information regarding geologic conditions in Rose Valley is presented in Sections 3.2 and 3.3 of the Draft EIR. The hydraulic conductivity parameter zonation used in the numerical model is described in detail in Appendix C2 and varies by location and depth. Alluvial fan deposits, basin fill deposits, and volcanic rocks do not have identical aquifer characteristics in the model, contrary to the commenter’s assertion. See Figures C2-8, C2-9, C2-10, and C2-11, which clearly show the different zones of hydraulic conductivity used in the model.

P8-19 The modeling analysis is based on reasonable values for aquifer parameters and boundary conditions, and the results match the available water level data reasonably well. The calibrated model would be further enhanced following startup of pumping and re-calibration to the observed response of the aquifer to pumping, a process that is mandated in the Draft EIR. It thus presents a useful and reasonable method to identify drawdown triggers and thresholds, and to prevent substantial impacts from occurring.

P8-20 See response to comment P5-12. The lag time before drawdown develops at locations far south of Hay Ranch is accounted for in the predictive simulations, which simulate conditions for more than 120 years. The trigger levels for hydrologic monitoring points incorporate model predictions regarding delayed effects at locations farther down the valley from Hay Ranch so as not to allow an exceedance at any time within the simulation period. Please refer to Master Response C4.5 for a discussion of the establishment of base line conditions for calculating drawdown.

P8-21 Davis Spring at Portuguese Bench has a water level that is 600 ft above the water table in the valley, and is 2 mi away from the aquifer in the floor of the valley, illustrating the hydraulic isolation of the spring from the valley. The drawdown the commenter refers to in the valley nearest the Spring, 20 to 30 ft, is not what would occur under the permitted pumping restrictions – that drawdown would be far less. Please refer to Master Response C3.3 for a more detailed response to comments regarding potential impacts to currently flowing springs.

P8-22 The mitigation is designed to prevent a 10% reduction in the flow of groundwater available to Little Lake reservoir *caused by pumping at the Hay Ranch*. A reduction in groundwater caused by drought would not be caused by the pumping at the Hay Ranch and would not necessarily trigger a dramatic reduction in or cessation of pumping. The applicant would not be required to reduce or cease pumping to account for the effect of a drought if the drought lowers groundwater levels to the established trigger levels. The Inyo County Water Department would recalculate the pumping rate to ensure a no greater than 10% reduction in groundwater flow based on the new reduced background level. This would likely result in reduced pumping because the maximum 10% reduction would be calculated based on the reduced availability of groundwater

P8-23 The monitoring equipment and permits needed to monitor potential impacts to hydrologic features at Little Lake would have no significant impact on the surface water features and would not need to be “engineered” in the EIR. Most wells in the HMMP are existing wells. Any new wells would be installed in currently disturbed areas with access to minimize impacts. Permits are aquired from the Inyo County Water Department.

See pages 3.2-49 and 3.2-5 of the Draft EIR, pages C4-9 and C4-10 of the Draft EIR, and Master Response E5 for response to comments on the option of groundwater diversion to augment Little Lake. All of the points raised in this comment regarding potential impacts from the groundwater diversion option are raised and addressed in the Draft EIR.

P8-24 See response P5-14. The reviewer is correct that the Draft EIR concludes that pumping 4,839 ac-ft/yr for 30 years is unlikely to be feasible; however, the Draft EIR presents extensive analysis of how and why a mitigated project involving pumping at the full project rate for a much shorter duration, until trigger levels are reached, is feasible.

P8-25 Mr. Zdon is correct that the groundwater budget tabulated on page C2-11 of the Draft EIR is for the steady-state model. Changes in the groundwater budget as a result of pumping are also discussed and documented, for example, in Table 3.2.6 for the full project development. Pumping of the Hay Ranch wells increased the groundwater inflow across the northern boundary of the model by at most 26 ac-ft/yr (under full project development), which is less than 1% of the overall groundwater budget, as stated in the Draft EIR on page 3.2-42. The transient groundwater budget is not sufficiently different from the steady state budget to warrant a separate table. Predicted changes to the steady state groundwater budget are described on pgs. 3.2-42 through 3.2-46 and summarized in Table 3.2-6. See Chapter 3: Errata of this Final EIR for the revised report. Section 3.2 of the Draft EIR provides considerable discussion of the ramifications of pumping the Hay Ranch wells with respect to the timing of drawdown impacts at different locations in Rose Valley. Table 3.2-6 of the Draft EIR provides a tabulated listing of the magnitude of potential impacts to groundwater budget components for 30 years of pumping the Hay Ranch wells.

P8-26 An extensive sensitivity analysis was conducted and is documented in detail in the Final EIR.

P8-27 The reviewer is mistaken. MODFLOW 88/96 was used throughout the modeling effort. Please refer to Master Response C2.6.

P8-28 Please refer to Master Response A3. All modeling work was conducted by a California-Professional Geologist with more than 20 years of experience in hydrogeology and groundwater modeling.

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DIRECTOR – WATER RESOURCES

REGISTRATIONS and CERTIFICATIONS

Professional Geologist, California, 1994, No. 6006
Certified Engineering Geologist, California, 1995, No. 1974
Certified Hydrogeologist, California, 1995, No. 348
Registered Environmental Assessor I, California, 2003, No. 07774
Registered Geologist, Arizona, 1999, No. 33686
Certified Professional Geologist, American Institute of Professional Geologists, 1993, No. 8773

PROFESSIONAL HISTORY

Golden State Environmental, Inc., Principal Hydrogeologist, Director-Water Resources, 2008 to Present
TEAM Engineering and Management, Inc, Principal Hydrogeologist, 1996 - 2008
Woodward-Clyde Consultants, Hydrogeologist, 1992-1996
California State University, Los Angeles, Instructor, Groundwater Models and Management, 1993
County of Inyo, California, Assistant Hydrologist, 1991-1992
The MARK Group, Engineers and Geologists, Senior Staff Geologist, 1990-1991
Round Mountain Gold Corporation, Geologist, 1988-1990
Geothermal Surveys, Inc., Geologist, 1987-1988

EDUCATION

Bachelor of Science in Geology, Northern Arizona University, 1984

TRAINING

Professional training related to: groundwater resource management; numerical groundwater modeling including model calibration techniques, uncertainty analysis, and use of geographic information systems in conjunction with groundwater modeling efforts; and development of conceptual models and risk assessment associated with the cleanup of sites with soil and groundwater impacted by regulated compounds.

AFFILIATIONS

- American Institute of Professional Geologists, C.P.G. 8773: Southern Nevada Section Vice President (1998-1999)
- National Ground Water Association: Member of NGWA Monitoring Well Task Force (2001-2002)
- Groundwater Resources Association of California

- Nevada Water Resources Association

AWARDS

- California State Board of Registration for Geologists and Geophysicists, 2005 and 2006. Received Certificate of Appreciation for services as subject matter expert provided to the Board.

- California State Board of Registration for Geologists and Geophysicists, 2001. Received Certificate of Commendation for services as subject matter expert provided to the Board

- California State Board of Registration for Geologists and Geophysicists, 2000. Received two Certificates of Commendation for services as subject matter expert provided to the Board.

REPRESENTATIVE EXPERIENCE

Andrew Zdon has more than 20 years of experience in the fields of hydrogeology and geology. He has participated in a variety of regional and site-specific hydrogeology, engineering geology, and mining-related projects throughout the southwestern United States, New Zealand and Peru. Mr. Zdon is recognized as an expert in the area of numerical groundwater modeling and has been an instructor at California State University, Los Angeles in Groundwater Models and Management. Among his specialties in numerical groundwater modeling are: finite element and finite difference modeling of groundwater flow and groundwater / surface water interactions, contaminant transport, and dual-phase flow. Mr. Zdon has worked on water well, environmental, and minerals exploration drilling projects, and has supervised staff geologists, engineers, and technicians in carrying out soil and groundwater sampling and aquifer testing. Representative hydrogeology-related experience includes:

- Consultant to Mammoth Mountain Ski Area in a joint project with the Mammoth Community Water District regarding water resources issues associated with a proposed land transfer with the Inyo National Forest. Work involved developing conceptual model and associated preliminary numerical groundwater flow model of an eastern Sierra watershed, conducting field investigations to evaluate hydrogeologic parameters identified to be sensitive in the numerical model, and finalizing the numerical groundwater flow model through updating parameters and boundary conditions based on data obtained from the field investigations and performing a transient calibration. The final numerical model was used to evaluate potential groundwater impacts of the proposed project.

- Served as consultant to Mono County conducting groundwater availability assessments for several Mono County communities. Work included conducting field reconnaissance activities, developing groundwater recharge estimates, evaluating local groundwater budgets, identifying potential future impacts due to regional growth, water quality issues, etc. Have also provided hydrogeologic support to the County of Mono with respect to reviewing and evaluating groundwater modeling conducted to evaluate potential impacts caused by expansion of a geothermal plant in Mono County.

- Hydrogeologic consultant for the Owens Valley Indian Water Commission through the development of hydrogeologic data gathering, development of conceptual models for the Lone Pine Reservation, Big Pine Reservation and Bishop Reservation areas of the Owens Valley, and development of numerical groundwater models for each of these areas. The models developed provide these Paiute/Shoshone tribes with tools to evaluate the impacts on local reservations of water resource activities conducted by outside agencies.

- Management of environmental activities associated with a 7,000-gallon gasoline release that occurred during 1999 in faulted, volcanic terrain in the Eastern Sierra Nevada. Work conducted at the site has included characterization of bedrock units including the use of rotary drilling and oriented-core drilling, surface and down-hole geophysical surveys, and extensive vapor and groundwater sampling. Ongoing remediation has included vapor extraction within the vadose zone, and a multistage groundwater treatment process. Mr. Zdon had previously conducted environmental activities including site characterization and remediation (excavation of petroleum hydrocarbon-impacted soils) leading to site closure prior to the 1999 release. Also served as designated expert and providing testimony (deposition) concerning pre-existing site conditions and fate and transport modeling.

- Provided expert witness testimony (deposition and court testimony) concerning hydrogeologic conditions associated with petroleum hydrocarbon releases from underground pipeline, San Luis Obispo County, California.

- Hydrogeologic consultant to the Tri-Valley Groundwater Management District (Chalfant, Hammil, and Benton Valleys), Mono County, California with respect to analyzing the potential impacts of a proposed groundwater export project by the USFilter Corporation. Work included field surveys/reconnaissance of existing groundwater conditions in the Tri-Valley area.

- Technical consultant to the Inyo County Water Department regarding a proposed groundwater export project by the Western Water Company in the Olancha area of Inyo County. Services primarily included providing technical oversight of aquifer testing activities conducted by Western Water's consultants.

- Groundwater modeling (MODFLOW) for the Harper Dry Lake Valley, San Bernardino County, California. Modeling was conducted for this Mojave Desert basin to evaluate the feasibility of developing a well field to support the construction of a proposed solar power facility.

- Served as an expert witness with regard to a water rights dispute concerning a spring used as a domestic water supply in the Mono Basin, Mono County, California.

- Groundwater flow modeling (MODFLOW), water-budget analysis, and water right vs. use analysis for the Lower Virgin River Valley, Spring Valley, and Cave Valley, Nevada. Investigations included development of recharge estimates for these valleys. Groundwater modeling associated with the Lower Virgin River Valley highlighted interactions between lowered groundwater levels along the Virgin River and associated decreases in river flow.

- Groundwater flow and solute transport modeling (MODFLOW and MT3D) to evaluate potential effects of solvent, petroleum hydrocarbons, insecticide and/or herbicide spillage in planned artificial recharge facility along the Santa Clara River in Ventura County, California.

- Served as expert witness for plaintiff (property-owner) concerning hydrogeologic conditions associated with leaking oil pipeline impacting private property, San Luis Obispo, California. Work involved reviewing existing data concerning site soils, fate and transport modeling, aquifer testing, etc., conducting limited field investigation to confirm conditions, and testimony (both deposition and in court).

- Hydrogeologic characterization of Arco Pipeline Company Terminals 2 and 3, Port of Long Beach, California. Program included soil sampling, well construction, destruction of previously existing wells, groundwater sampling, hydrocarbon bail-down testing, and aquifer testing. Also developed dual-phase flow model (for groundwater and petroleum hydrocarbons using MARS) to evaluate remedial alternatives at both terminals. This complex modeling effort accounted for tidal fluctuations, and their effects on groundwater levels and transport of light non-aqueous phase liquids.

- Developed the methodology for the "Bishop Cone Audit," a surface water flow and usage auditing procedure being used by the County of Inyo and the Los Angeles Department of Water and Power as part of their long-term water management agreement. The audit determines surface water usage on lands owned by the City of Los Angeles, and derived from an extensive series of natural streams, canals and ditches within the Bishop, California area.

- Developing finite difference groundwater flow model (MODFLOW) to evaluate potential groundwater management activities including artificial groundwater recharge projects, future groundwater production well placement, and development of source water protection capture zones for the Murrieta County Water District, Murrieta, California.

- Developed finite-difference groundwater flow model (MODFLOW) to evaluate impacts of proposed groundwater pumping by the Owens Lake Soda Ash Company on nearby springs along Owens Lake, Inyo County, California.

- Finite element modeling (SEEP-2D) of groundwater seepage with respect to evaporation ponds for a proposed winery, San Luis Obispo County, California. Results were used to evaluate pond-sizing, potential effects of seepage with respect to the stability of nearby slopes, and to evaluate the volume of effluent that would reach the water table at that location.

- Provided technical oversight for finite element groundwater seepage modeling (SEEP/W) and hydrogeologic evaluation of tailings mitigation, Coeur Gold Golden Cross Mine Tailings Impoundment, New Zealand. Modeling was conducted to evaluate practicability of tailings dam dewatering schemes.

- Finite element modeling (SEEP/W) of groundwater seepage with respect to mitigation and sludge reclamation for closure of the Manukau Wastewater Treatment Plant, New Zealand. Groundwater modeling was used to evaluate groundwater and surface water interactions and the associated volume and locations of potential seepage into the plant's evaporation ponds before and after reclamation.

PUBLICATIONS - Available upon request.

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September 3, 2008

Tanda Gretz, Senior Planner
Inyo County Planning Department
P.O. Box L
Independence, CA 93526

Re: Coso Operating Company
CUP 2007-03

Dear Tanda:

Enclosed please find a letter dated August 14, 2008, from Ronald DiPippo, the geothermal consultant engaged by Little Lake Ranch, in connection with the Draft Environmental Impact Report on the Coso Project, CUP No. 2007-03. Please add the enclosed letter from Ronald DiPippo, Ph.D. to the comments made to the Draft Environmental Impact Report.

Very truly yours,

ARNOLD, BLEUEL, LaROCHELLE,
MATHEWS & ZIRBEL, LLP

Gary D Arnold

Gary D. Arnold

GDA:tg
Enclosure
cc: Little Lake Ranch (via e-mail)
Pat Cecil (via e-mail)
Randy Keller (via e-mail)

Little Lake\Coso\Letters\Gretz Ltr 08

Ronald DiPippo, *Ph.D.*

RENEWABLE ENERGY CONSULTANT -- GEOTHERMAL & WIND SPECIALIST

August 14, 2008

Inyo County Planning Department
168 North Edwards Street
Post Office Drawer L
Independence, CA 93526

Dear Sir/Madam:

The attached letter is submitted in response to your invitation for the public to offer input to the Planning Department on the matter of the Draft Environmental Impact Report (DEIR): Conditional Use Permit #2007-03/Coso Operating Company LLC (Coso Hay Ranch Water Extraction, Export, & Delivery System).

I have also included my up-to-date *Curriculum Vitae* which shows my experience in geothermal power plants dating from the mid-1970s.

If you have any questions, I will be glad to answer them.

Sincerely,

Ronald DiPippo, Ph.D.

P.O. Box 80144 · South Dartmouth, MA 02748-0144
Telephone: 508-996-6576 (home & office) · E-Mail: rondipippo@comcast.net
Web Page - http://www.umassd.edu/engineering/mne/people/faculty/dipippo.cfm

P9-1 I have been retained by Little Lake Ranch ("LLR") to assist in the evaluation of the environmental impacts arising from the pumping of groundwater to supply the Coso geothermal power plant ("Coso") with reinjection water, and to address reasonable alternatives to the Project.

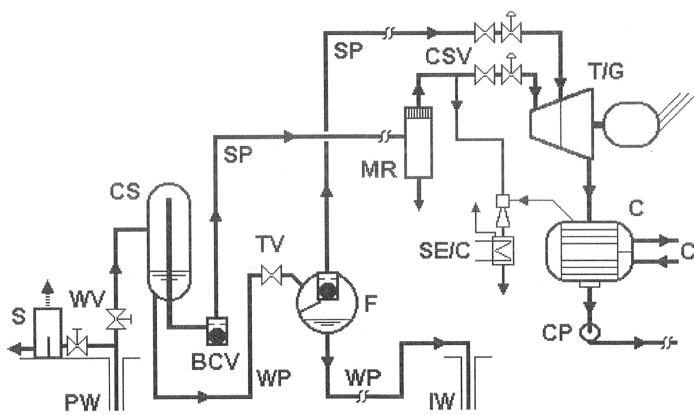
My professional background is in geothermal power generating systems, and as such, my comments will focus on possible means to reduce water consumption at Coso, as well as to suggest alternative means to obtain additional water for reinjection if all else fails and this becomes absolutely necessary. I have attached a copy of my *Curriculum Vitae* to demonstrate my competency in commenting upon the matters set forth herein.

P9-2 For the purposes of this letter, a "fluid" is any substance that flows; it can include steam, vapor, gas and liquid. "Geofluids" will refer to the fluids that are produced by Coso from their production wells. These geofluids are then processed in separators and flashers. The steam will be the vapor form of the geofluid which is used to drive the turbines. The liquid (sometimes called "brine") is that portion of the geofluids which is not flashed to steam and remains in liquid form.

Coso uses a double-flash steam system for eight of the nine power generating units. A simplified schematic of a generic double-flash system is depicted in Figure 1. To explain Figure 1 very briefly, Coso has drilled around 100 wells to produce and bring to the surface from the geothermal reservoir a mixture of hot water and steam, the "geofluids," through its production wells (PW). The geofluids are first separated in a cyclone separator (CS) into steam and liquid. The steam is transmitted to the turbines that drive the generators (T/G). The generators produce the electrical energy sold by Coso. After the steam flows through the turbine, it is condensed (C) and piped to the water cooling towers (WCT) (not shown in Fig. 1; see Fig. 4A). The functions of the WCT are discussed below. In the double-flash system, the liquid from the separator undergoes a flash process (F) by means of a throttle valve (TV) designed to produce low-pressure steam that is admitted to the turbine and yields more power. That portion of the geofluid which is not flashed into low-pressure steam remains a liquid (or brine), and is available for injection back into the geothermal reservoir through a series of injection wells (IW). Similarly, a certain small fraction of the condensed steam, now a liquid, after flowing through the WCTs is also available for reinjection. The flow of the geofluids, steam and liquid, through the Coso plant can be followed by reference to the small arrows on the darker lines in Fig. 1 representing the piping system throughout the facility.

The only Coso unit that differs in its energy conversion system is the last one constructed, BLM West. BLM West uses a single-flash process, even though the equipment that was ordered and is on site could be used in a double-flash plant. Figure 2 shows a *Google Earth* image of the BLM West plant. The nine power units were installed on a fast-track schedule between 1987 and 1989.

By the time that the last unit, BLM West, was built in 1989, it had already become clear that the reservoir in that part of the field was changing from a liquid-dominated reservoir to a liquid-vapor (two-phase) reservoir. This meant that there would be insufficient liquid at the wellhead to permit the second flash process (F). Thus, since the power equipment was already being manufactured, it was necessary during operation to abandon the double-flash concept and take a portion of the high-pressure steam from the cyclone separator and throttle it down to the proper pressure for use as low-pressure steam to keep the turbine balanced. Thus the effective operation is shown in Figure 3. Of course, this was an inefficient way to utilize the high-pressure steam, but was necessary because of the steam requirements of the dual-pressure turbine.



P9-2 Fig. 1. Double-flash flow diagram. Nomenclature: PW, Production Well (typ); S, Silencer; WV, Wellhead Valve; CS, Cyclone Separator; BCV, Ball Check Valve; SP, Steam Piping; MR, Moisture Remover; CSV, Control & Stop Valves; WP, Water Piping; TV, Throttle Valve; F, Flasher; T/G, Turbine/Generator; C, Condenser; CP, Condensate Pump; SE/C, Steam-Jet Ejector/Condenser; CW, Cooling Water (to and from a cooling tower, not shown).

Fig. 2. Aerial view of Coso BLM West power plant courtesy of *Google Earth*.

P9-2

Coso, at a very early stage, must have realized that the liquid portion of the geofluid in the reservoir was being depleted while the steam component was increasing. This phenomenon is widespread through similar geothermal reservoirs and occurs as the underground waters in the geothermal reservoir are withdrawn and the reservoir pressure falls. One of the contributing factors for this effect is the lack of sufficient reinjection resulting from the operation of the water cooling towers.

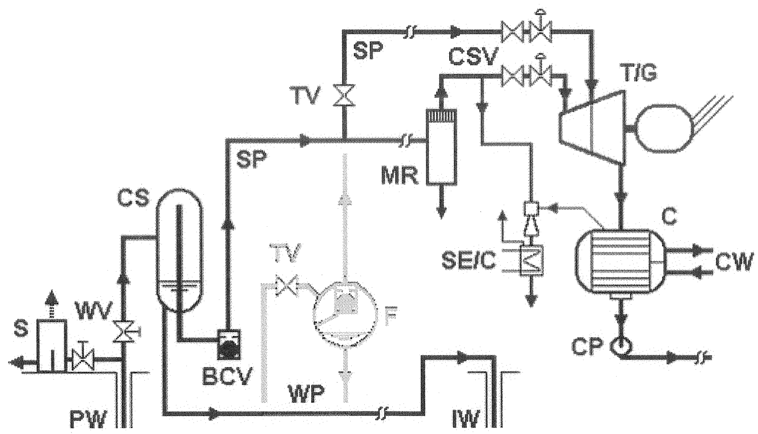


Fig. 3. Coso BLM West effective operation of the double-flash equipment as a single-flash plant. Nomenclature: Same as Fig. 1.

All of the power units are equipped with water cooling towers (WCT) that provide chilled water for the condensers. Since the geothermal steam condensate can be used as the cooling water (CW in Figures 1 and 3) after being cooled in the WCT, there is no need for the vast amounts of cooling water taken from external sources as is the case for fossil- or nuclear-fueled power plants. Nevertheless, the evaporative process that cools the water in the WCT consumes roughly 85% (by mass) of the steam that flows through the turbine. This water is released to the atmosphere through the cells of the WCT as water vapor. Even with this water loss, the WCT produces about 15% excess chilled water (more than is required to condense the steam from the turbine). This excess liquid is available to be reinjected and returned to the geothermal reservoir via injection wells. In addition to this amount, the liquid fraction of the geofluid remaining after the separation and flashing processes can also be reinjected.

The water balance and flow diagram is represented in Figure 4A for a typical early-life condition at Coso. Note that roughly 68% of the total geofluid produced from the reservoir is being reinjected. Note: Red pipelines carry steam and blue ones liquid.

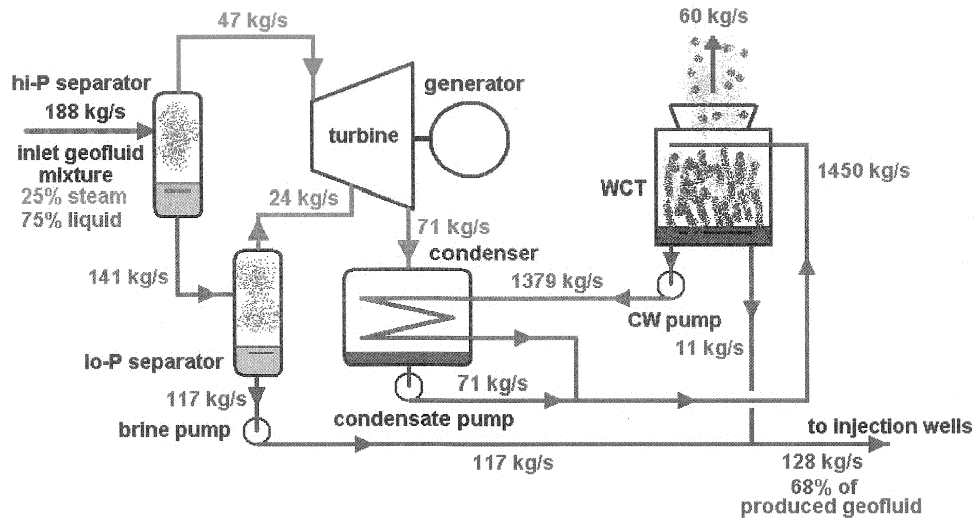
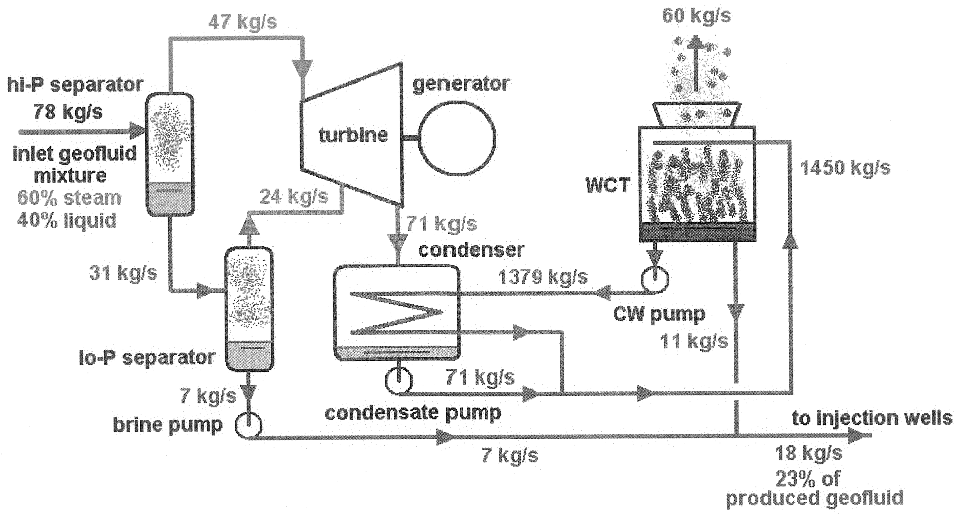


Fig. 4A. Water balance for typical conditions at a double-flash unit at Coso during early operating conditions.

P9-2 In the case of a 240°C (464°F) liquid-dominated reservoir (similar to Coso) at the beginning of its operation, the maximum theoretical amount of liquid that would be available for reinjection is about 76% (by mass) of the geofluid received from the production wells. Thus, at best, there is a 24% deficiency in reservoir recharge even if all the available geofluid is reinjected. Over time, this can lead to reservoir drawdown (a lowering of the reservoir pressure) and can change the fluid characteristics in the reservoir from liquid-dominated to two-phase, liquid-vapor conditions.

Coso started out with practically all liquid in the reservoir but now there is both liquid and steam within the reservoir. The geofluid coming out of the wells has less and less liquid and more and more steam, as time goes on. As the reservoir "dries out", the production wells yield a two-phase fluid with increasing percentages of steam and decreasing percentages of liquid. As a result there is less liquid left for reinjection now than was true when the plant started operating in 1987.

Figure 4B depicts what happens when the reservoir undergoes drying out. The steam flows to the turbine have to be maintained according to the specifications from the manufacturer for efficient operation. It can be seen that now only 23% of the produced geofluid mass is available for reinjection, a dramatic shortfall compared to the original operation. This will further accelerate the drying out process in the reservoir. We will return to this discussion later in this report.



P9-2 Fig. 4B. Water balance for typical conditions at a double-flash unit at Coso after change-over to vapor-dominated reservoir condition. Note: Steam flows to turbine have been kept the same as in Fig. 4A.

If this situation is allowed to continue, all the liquid may disappear from the production wells and only steam will come out. At that point, the reservoir becomes vapor-dominated (such as at The Geysers in northern California) and no liquid is produced at all. Then Coso will have only about 15% of the produced mass of steam left for reinjection as condensate.

P9-3 This condition - having all steam coming from the wells - may sound like an advantage because it is the steam that drives the turbines and the generators for the production of electricity, but when it happens to a liquid-dominated system as a result of short-term exploitation, rather than over hundreds or thousands of years of natural activity, the condition is usually short-lived and the reservoir eventually becomes unproductive. The reason is that it is likely that the permeability of the producing reservoir will be severely reduced because of scaling in the fractures in the producing part of the reservoir as liquid flows toward the producing wells and flashes into steam within those fractures. The liquid keeps retreating, leaving precipitation in the fractures. In other words, the fractures slowly become encrusted with a variety of chemicals and minerals from the receding geofluids, thereby reducing the ability of the fractures to transmit geofluids. This problem is apparently present in the Coso reservoir, as it is reported in the Draft Environmental Impact Report ("DEIR") that the reservoir has become partitioned into three weakly connected sections (DEIR, page 3.2-26). The steam flow can be expected to decline and eventually to stop altogether. In that case, Coso might try re-drilling some of the now-nonproductive wells, but my suggestion would be to drill to deeper depths to get at a possible hotter "parent" liquid reservoir. The DEIR makes the point that there are so many wells now existing that there is no space for any more (DEIR, page 5-4), but there is no analysis or suggestion in the DEIR to consider the possibility of drilling to deeper depths to restore the greater production of geofluids. This alternative should be studied.

P9-4

Figure 5 shows the calculated theoretical trend in the percentage of the produced mass of geofluids that are available for reinjection as a function of the wellhead steam quality (percentage by mass of vapor in the two-phase mixture) for conditions like Coso.

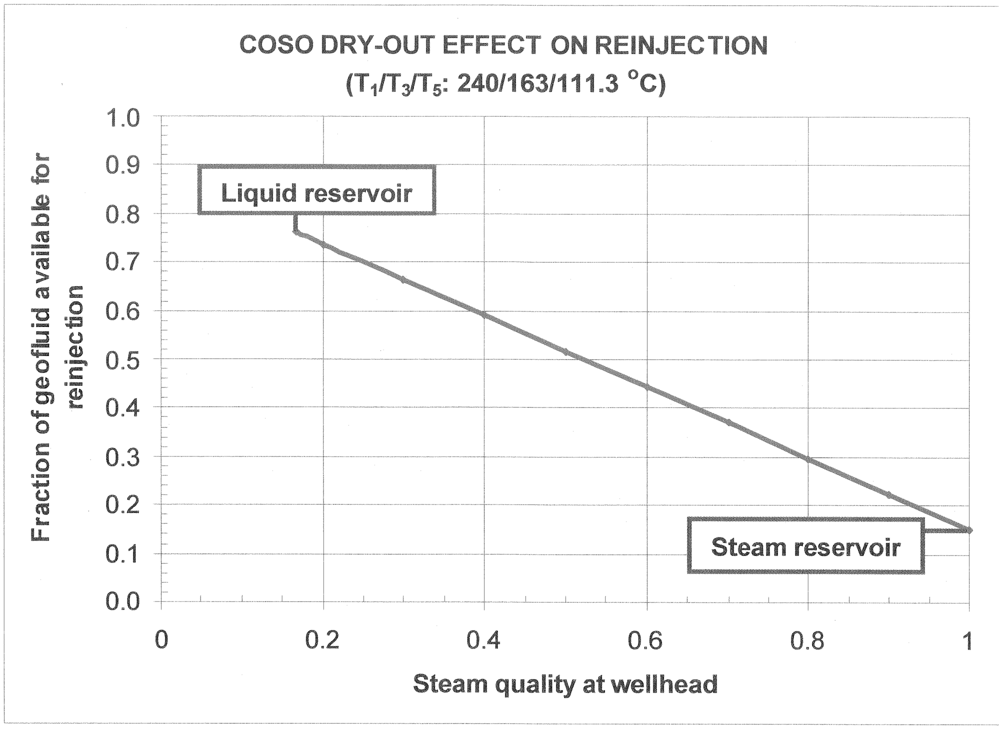


Fig. 5. Theoretical calculated change in fraction of the geofluid available for reinjection for conditions similar to those at Coso.

It is interesting to compare this theoretical curve to the actual record of reinjection at Coso since its commissioning; this is shown in Figure 6 where the data were taken from the most recent compilation from the California Division of Oil, Gas and Geothermal (CA DOGGR) web site (See: http://www.consrv.ca.gov/dog/geothermal/manual/Pages/production.aspx)

P9-4

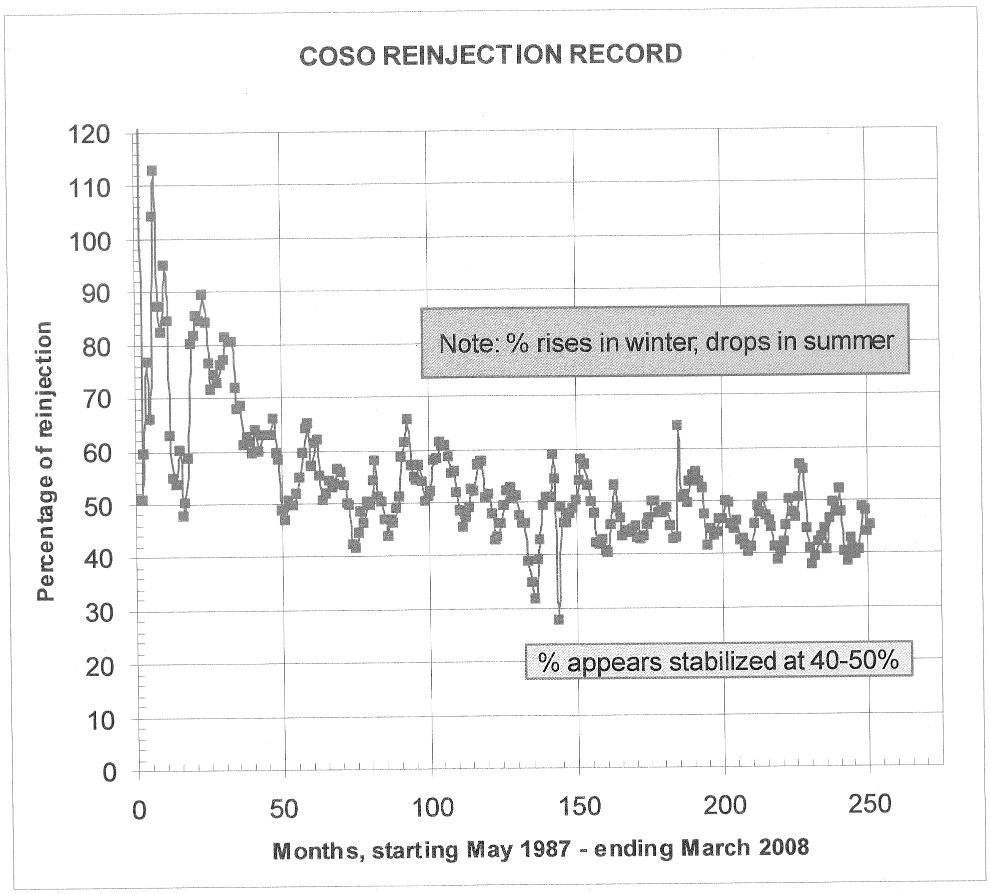


Fig. 6. Percentage of reinjection relative to production at Coso, all units.

Comparing Figures 5 and 6, it is possible to estimate that the average wellhead quality is now between 55-65%. What this means is that the relative portion of liquid compared to steam in the geofluids at Coso has steadily declined. Ultimately, this results in a smaller portion of the geofluids being available for injection as a direct result of the type of geothermal facility designed by Coso and its use of WCTs, through which a significant portion of the produced geofluid is lost through evaporation. Perhaps more revealing are the monthly records of the actual production and reinjection amounts (in 1000 kg) shown in Figures 7 and 8. The mass being produced from the reservoir is in steady decline, foretelling a time when the field will no longer be able to support power generation at any level.

P9-4

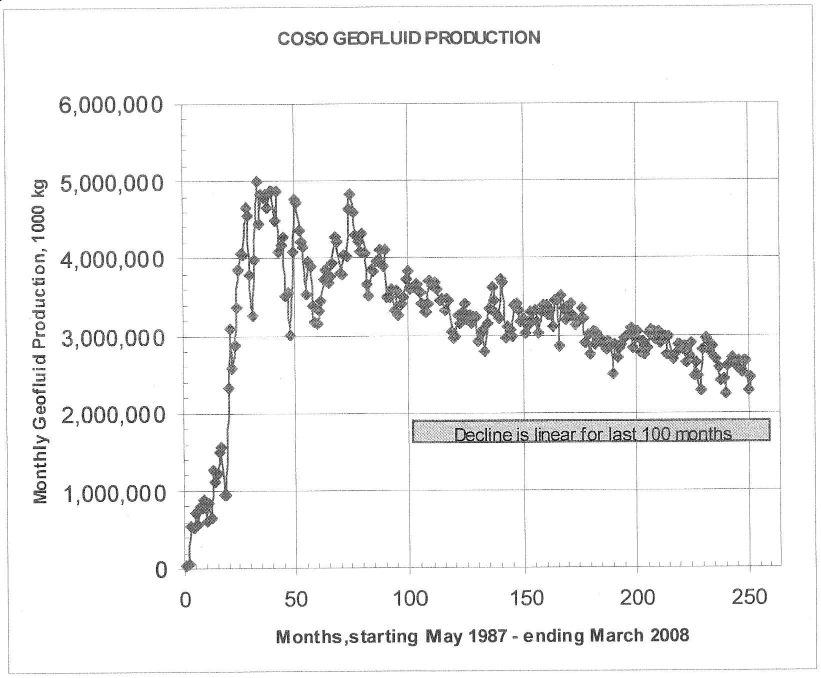


Fig. 7. Monthly production history at Coso.

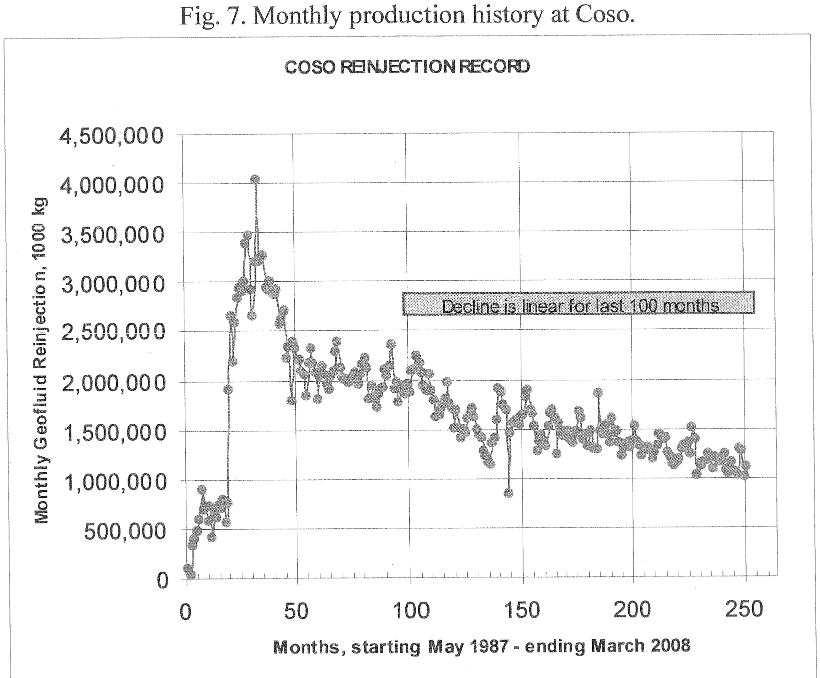


Fig. 8. Monthly reinjection history at Coso.

Reservoir depletion is a common phenomenon at geothermal reservoirs. Given the availability of sophisticated reservoir simulation and modeling computer programs, reservoir engineers can predict with a reasonable degree of reliability the changes in reservoir characteristics, and recommend steps to alleviate the situation. For example, at The Geysers, which was a vapor-dominated reservoir from the inception of exploitation, the depletion became so severe that it was found advantageous (and economic) to construct water pipelines from two communities, Santa Rosa (SR) and Lake County (LC), to transport treated wastewater to The Geysers where it is being used to augment the reinjection. This has eased the reservoir decline, improved power production, and evidently extended the operating lifetime of the plants.

P9-5

Given the monthly totals for geofluids produced and reinjected, it is possible to analyze Coso's geothermal plant to calculate the steam mass fraction at the wellhead, assuming that 15% of the steam flow through the turbines is available for reinjection. Figure 9 shows the results. There are seasonal variations but the trend is clearly upward, towards drier conditions. The black line is the best fit of a logarithmic equation to the data. The previous theoretical estimate of 55-65% steam is borne out by the actual data (most recent value = 60%).

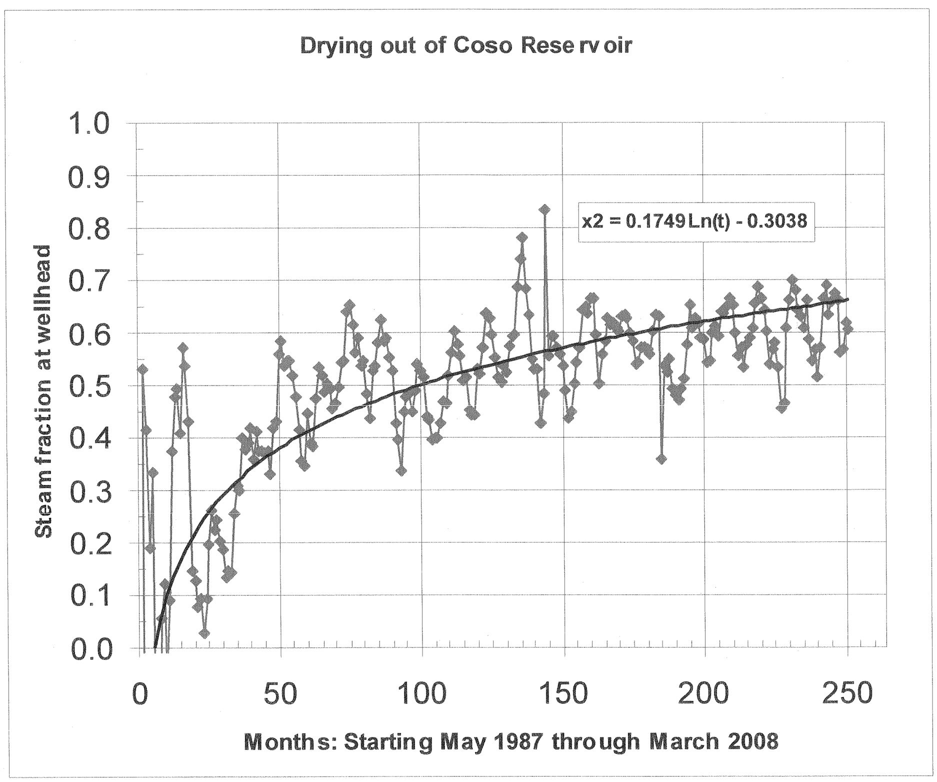


Fig. 9. Actual steam fraction by mass at the wellhead calculated from DOGGR data.

P9-5

With the results of Figure 9, one can now calculate the steam flow rate available at the wellheads. The results are shown in Figure 10. Although the total mass (steam and liquid) being produced from the reservoir is declining significantly, because the steam fraction at the wellhead is actually increasing (Fig. 9), this means that the monthly steam production (in tonnes or 1000 kg) is declining less significantly, about 20% over the last 14 years. This is a lot less than the 42% decline in total mass production of geofluids over the same period. Since the steam is what drives the turbines, the power level from the plant at the current time should be between 190-220 MW. If this trend continues unabated, the plant might be reduced to as low as 180 MW in 4-5 years. Again, the DEIR states that the power level is now under 200 MW (DEIR, page 5-3).

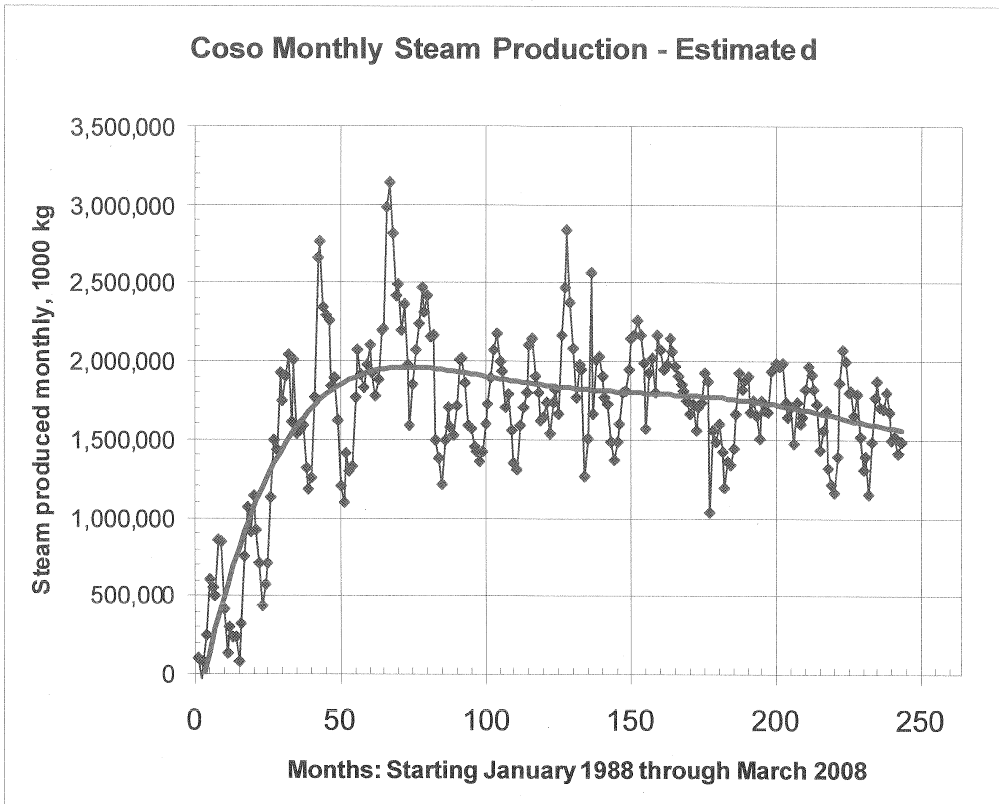
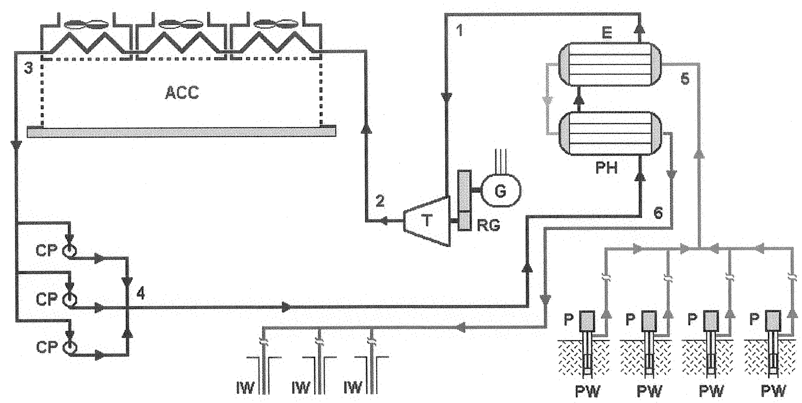


Fig. 10. Calculated monthly steam production trend at Coso.

When confronted with this problem, Coso has two fundamental alternatives. First, Coso may seek ways to reduce water consumption in the power plant to conserve as much of the geofluid as possible for reinjection. Or, second, Coso could decide to maintain its current geothermal facility intact, but to import water to replace the water being lost through evaporation of the WCTs as a consequence of the original design of its facility.

Among the options is one that allows effectively 100% reinjection of the produced geofluids; namely, the use of an air-cooled system, i.e., an air-cooled condenser (ACC), in place of water-cooling towers and separate condensers. For example, at the Mammoth (Casa Diablo) binary plants north of Coso (see Figure 11), essentially all the produced geofluids are reinjected, and both power production and geofluid production have been steady, on average, and may be sustainable over a long time frame. Figures 12 and 13 illustrate this using data from the CA DOGGR. The sharp step increases seen in production (Fig. 12) correspond to new units being brought online. The percentage of reinjection has remained generally above 95%, averaging 97.5% over the entire life of plant operation, some 23 years.



P9-6

Fig. 11. Binary-type geothermal power plant with air cooling. Nomenclature: Same as Fig. 1 except: P, Well Pump; E, Evaporator; PH, Preheater; RG, Reduction Gear; ACC, Air-Cooled Condenser.

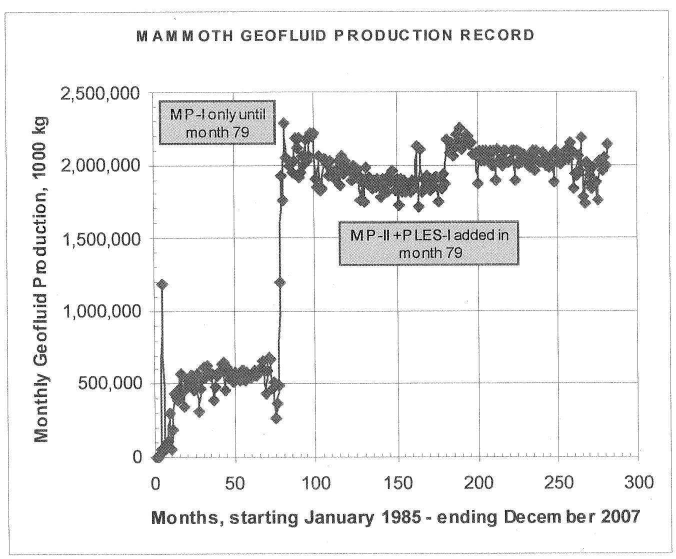


Fig. 12. Production history at Mammoth binary plant (Casa Diablo), California.

P9-6

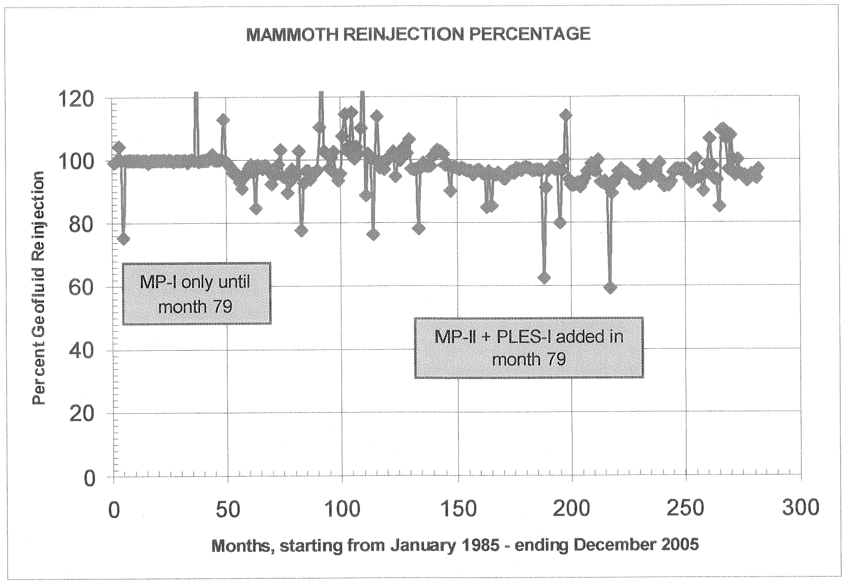
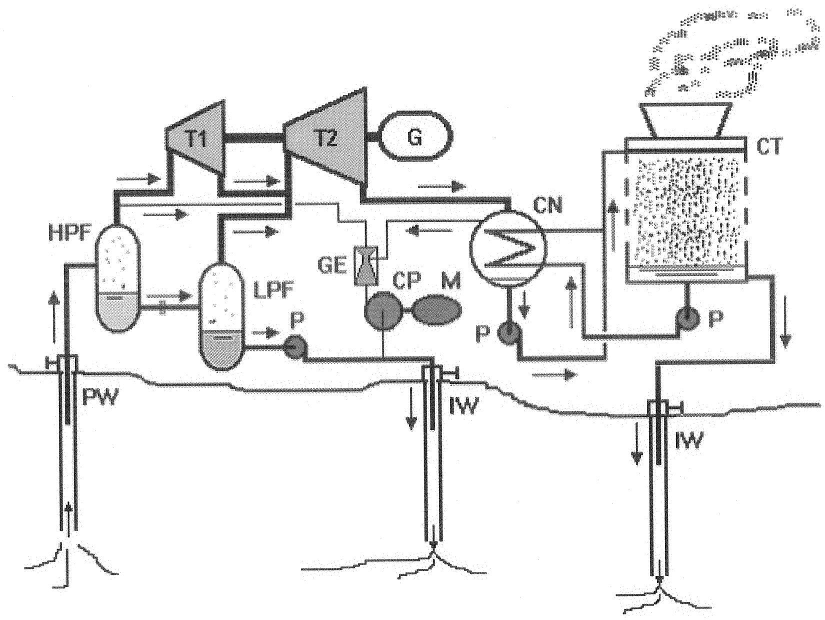


Fig. 13. Reinjection history at Mammoth binary plant (Casa Diablo), California.

While the use of air cooling is fairly common in binary-type geothermal plants (ones that use a secondary working fluid that is heated by the geofluid; see Fig. 11), it has not been employed in flash-steam plants to date for two basic reasons: (1) it leads to lower energy conversion efficiency, and (2) it is more costly from a capital cost standpoint.

However, it is technically feasible at flash-steam plants, as is illustrated in Figures 14A and 14B which depict a Coso-like plant equipped first with a WCT (Fig. 14A) and then with an ACC (Fig. 14B). Generally, ACC systems are more costly than plants with WCTs because they require more expensive components, and they occupy more land for the same power rating. Nonetheless, the advantages of using an air-cooled system in a facility such as Coso are evident. If alternative sources of water for importation are not reasonably available, then the use of an air-cooled system would reduce, or even arrest the rate at which Coso's geothermal reservoir is drying out, leading to prolonged production and an extended plant lifetime.



P9-6 Fig. 14A. Coso-type plant equipped with a water cooling tower. Nomenclature: Same as Fig. 1 except: HPF, High-Pressure Flasher; LPF, Low-Pressure Flasher; GE, Gas Ejector; CP, Compressor; M,Motor; CN, Condenser; CT, Cooling Tower; P, Pump.

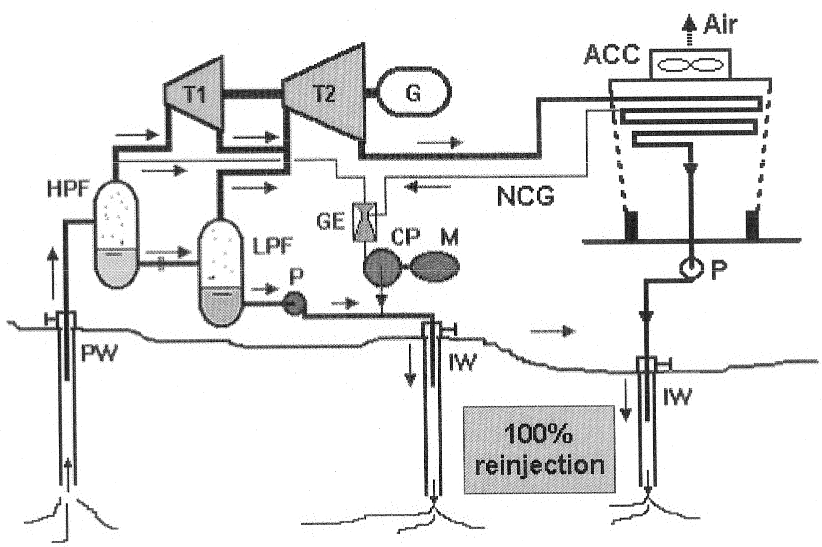


Fig. 14B. Coso-type plant equipped with an air-cooled condenser; possible design. Nomenclature: Same as Fig. 12A except: NCG, Noncondensable Gases; ACC, Air-Cooled Condenser.

P9-6

A recent design comparison from the Miravalles plant in Costa Rica showed that an ACC would cost more than three times as much as a WCT, would weigh more than two and a half times as much, would cover about three times as much surface area, and would consume about three times more fan power than a WCT. Generally speaking, WCT systems lead to higher net electrical production, a smaller footprint, less noise, lower capital cost, but at the expense of water consumption that could be used for reinjection. On the other hand, ACC systems do not need any water, but are much more expensive, have higher noise levels due to the numerous fans needed, occupy a larger footprint, have higher parasitic power requirements, and produce less net electricity. Even so, if there are compelling environmental reasons against using water-cooled systems, then air-cooled systems may be the system of choice. Given the desolate terrain at the Coso field (see Figs. 2 and 4), the larger footprint of ACC systems would seem to be easily accommodated, but the extra cost would need to be weighed against the projected revenues over the remaining extended life of the plant.

No information has been provided in the DEIR that addresses in any meaningful way the option of converting Coso's WCTs to an ACC system. I can provide, however, some conceptual estimates of the changes in power output from the current situation if ACCs were to replace the WCTs in use. As noted briefly above, the conversion of Coso from a WCT system to an ACC system would also reduce the amount of power generated by Coso. Assuming that Coso is now generating approximately 200 MW (net) power, which as we have seen is steadily declining under current operating procedures, I estimate that Coso's net power production utilizing an ACC system would be about 178 MW. This assumes that 8 power units (out of the 9 installed) are needed to produce 200 MW (net) and that the ACC fan power would increase the parasitic power load by 2.7 MW per power unit.

The advantage of using the ACC system, of course, would be the reduction in the steady decline of geofluid production. It would also prolong the likely life of Coso for tens of years, thereby adding to the total amount of energy (electricity) that could be produced from Coso over its life, when compared to the inevitable shutdown of production as soon as Coso depletes its geothermal reservoir to a point where it is no longer economically viable. These added revenues must be weighed against the cost of installing the ACC system. Given the escalation in building costs that we are seeing nowadays, it is impossible for me to even estimate the cost of such a conversion, but it should be given a thorough examination before this option is discarded.

To better appreciate the differences between a WCT system and an ACC system, I refer the reader back to Figures 4A and 4B. In Fig. 4A which represents the early stages of plant operation (say 1990 or so), 188 kg/s of geofluid was produced from production wells per power unit, of which 75% (by mass) was liquid and 25% was steam. Approximately 71 kg/s of steam were condensed to liquid in the condensers and transferred to the WCT along with 1,379 kg/s of cooling water that has just been used to condense the steam. Thus 1,450 kg/s of still hot water is sent to the top of the cooling tower, where some 60 kg/s is lost through evaporation. Thus only 11 kg/s of the steam condensate is then available for injection. The total liquid available for injection is 128 kg/s because the 117 kg/s of brine from the flasher is added to the excess steam condensate. In other words, 68% of the 188 kg/s taken from the reservoir can be returned via injection wells. There is a further water requirement; in order to put the power plant into operation initially, a large volume of water must be loaded into the sump of the WCT since 1,379 kg/s of cooling water must be continuously recycled between the WCT and the condenser.

Figure 4B shows roughly the state of affairs currently at Coso after the geothermal reservoir has been constantly drying out over the years. The production wells now produce roughly 60% steam and only 40% liquid. For the specified turbine steam requirement, there is a much smaller amount of liquid available for injection. Indeed, whereas initially 117 kg/s of brine would be available to add to the 11 kg/s of steam condensate for injection, now we find only 7 kg/s of brine, and therefore only 18 kg/s or 23% of the produced geofluid mass is available for reinjection.

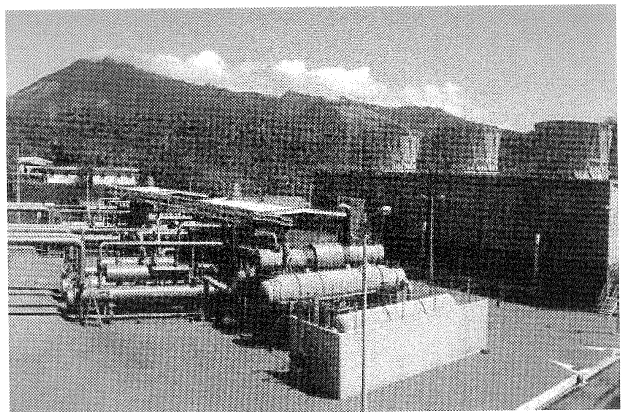
If an ACC system were used instead of this (see Fig. 14B), no water inventory is needed since the WCT is eliminated, and 100% of the produced geofluid can be returned to the reservoir. At current production conditions, that would amount to 78 kg/s of liquid compared to 18 kg/s. This additional 60 kg/s amounts to roughly 1,000 GPM, or about 1/3 of the proposed flow rate from the Hay Ranch wells. Since Coso has already indicated that a flow rate of 500 GPM is economical when looking at alternative sources of water (DEIR, page 5-5), it follows that the air-cooled option may turn out to be advantageous, particularly since it would supply far greater than 500 GPM.

P9-6

The loss of water through the use of a WCT system can be easily explained. After the steam leaves the turbines, it enters a condenser and comes into contact with tubes carrying cold water from the WCT. This leads to the steam condensing. This condensed steam, which is still fairly hot, say, 46°C (115°F), is pumped to the top of the WCT. The water is then sprayed down into the tower through many nozzles which atomize the water into extremely small droplets. Fans operating at the top of the WCT cause air to be drawn into the WCT through the outside, passing up through and around the extremely small water droplets. This causes a fraction of the water to evaporate and results in heat being removed from the rest of the water, dropping its temperature. The water vapor generated by the evaporation is then driven up and out of the system by virtue of the fans which also create, in effect, a vacuum within the WCT to draw in the outside air.

Photograph 1 shows a 3-cell WCT at the Miravalles Unit 5 binary power plant in Costa Rica, and Photograph 2 is a close up view of the same WCT showing the cascade of cooling water being deflected by the incoming air stream. Photograph 3 shows Coso Navy 1 plant (3 units) with an impressive vapor plume from its WCTs. And lastly, Photograph 4 shows a section of the ACCs at the Steamboat 2 binary plant near Reno in Nevada.

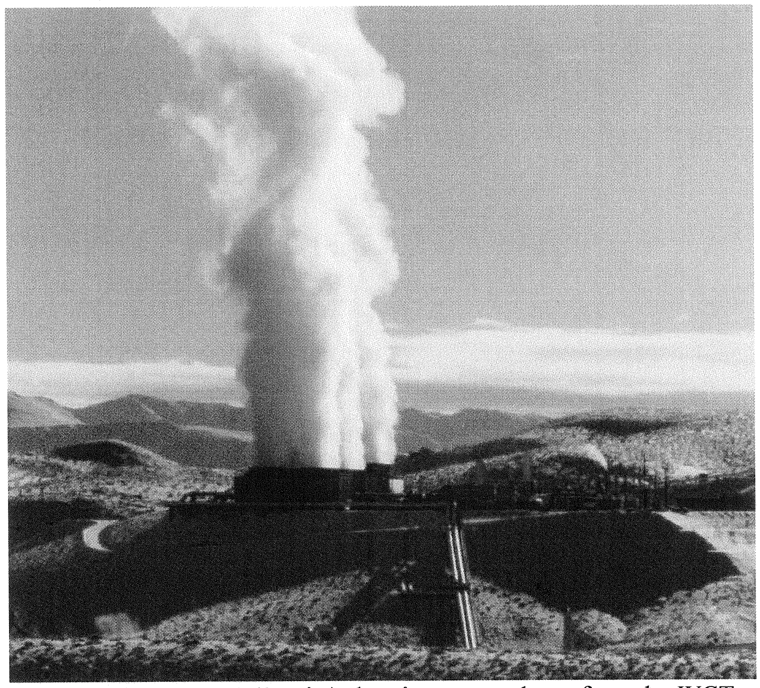
P9-6



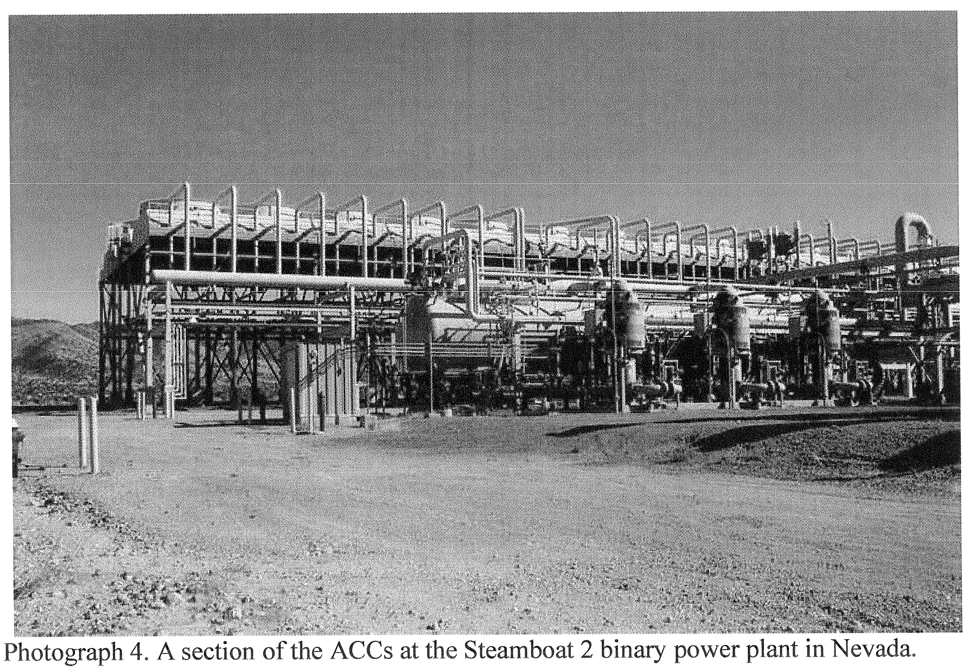
Photograph 1. Miravalles Unit 5, Costa Rica. WCT is on the right.

Photograph 2. WCT at Miravalles Unit 5, Costa Rica.

P9-6



Photograph 3. Navy 1 (3 units) showing vapor plume from the WCTs.



Photograph 4. A section of the ACCs at the Steamboat 2 binary power plant in Nevada.

P9-6 The conversion of Coso to an air-cooled system would require the utilization of more land. Given Coso's locale, additional land should not present an acquisitional or environmental problem. I estimate that each air-cooled unit serving one 25-MW power unit would require roughly 10,900 m^2 (117,500 ft^2 or 2.7 acres). From aerial views of the Coso units (*Google Earth*), it is clear that ample, reasonably flat, open area is available to the northeast of Navy 1, to the southwest of Navy 2, and to the west of both BLM plants to accommodate ACCs. A portion, but not all, of the air-cooled equipment and piping, could probably be installed within the current physical footprint of the separate geothermal facilities, thereby reducing the actual need for more land.

P9-7 Another method to arrest the drawdown and continual drying out of the reservoir is to reduce geofluid production levels (and consequently, the power output) to seek the sustainable, long-term equilibrium balance between the rate of geofluid production and the sum of the rates of the natural recharge and reinjection. For example, the Wairakei geothermal field in New Zealand, the first liquid-dominated reservoir to be commercially developed, was initially over-exploited, having 193 MW installed in several small units. Very soon, it became clear that the field could not sustain this level of production, and three units were removed, leaving 157 MW online, which continues to operate to this day. At that time (c. 1960), the value of reinjection was not fully appreciated and the separated liquids were simply dumped into a nearby river; this practice has changed and most of the liquid is now reinjected.

Coso might consider a variation of this strategy to attain a sustainable operation. Since they have nine modestly sized power units (25-30 MW ratings), they might take a few of them off-line, reduce production, and monitor the reservoir response. Furthermore, by rotating which units are on-line and off-line on some appropriate cycle, reservoir production could be balanced across the field with no one area subjected to excess exploitation. In this way, they may be able to achieve a long-term sustainable operation without the need for an external supply of reservoir make-up water.

P9-8 Yet another approach that Coso might consider is drilling new, deeper wells in an effort to reach a deeper, hotter, and most likely liquid-dominated reservoir. Should this prove successful, production from the new production zone would restore the percentage of liquid available for reinjection. If the new reservoir has a temperature of 280°C (535°F), the percentage of produced geofluid that would be available for reinjection would be about 70%. In fact, an exploratory well on the east side of the field encountered very high temperature, of the order of 370°C, but unfortunately the permeability was insufficient. There are examples of fields around the world where deeper reservoirs have been discovered after years of production and depletion using shallower zones, and perhaps Coso might be another one.

P9-9 After exploring these (and perhaps other alternatives) and if they are found to lack technical or economic merit, Coso should also consider the use of treated wastewater from nearby communities, as is being done at The Geysers. The city of Ridgecrest and the China Lake Naval Air Weapons Station together generate wastewater in a volume rate that I estimate is roughly one-half the rate they are seeking from the new water wells at the Hay Ranch. The scope of such a project would be comparable to The Geysers pipelines in terms of length (SR, 41 miles; LC, 53 miles; Coso, 40-45 miles, est.) and elevation rise (SR, 3000 ft; LC, 2000 ft; Coso, 2000

P9-9 ft, est.). The projected economics of such an endeavor may or may not look favorable, but the concept is worth a careful study. For instance, the cost incurred by The Geysers to install the SR pipeline and the related facilities to transport the wastewater from 41 miles away was approximately $200 million. The estimated added revenues per year were $67 million. Obviously, The Geysers felt that such capital expenditure was economically justified and the County should conduct a similar study.

P9-10 The first of the suggested modifications (DEIR, page 5-4) relating to increasing the output without (a) utilizing more resources or (b) increasing system efficiency is not a true alternative since there is no way to accomplish such a goal without doing at least one of these two things. This alleged alternative should be deleted.

P9-11 In my professional opinion, it appears that Coso designed and operated its geothermal plant to maximize the short-term production of energy and the sale of electricity for the generation of immediate profits, rather than designing and operating a facility which would provide longer-term energy production on a sustainable basis. It also appears that Coso installed and operated roughly one more turbine-generator unit than could be sustained by the geothermal reservoir. Coso may not have realized this at the time they ordered the last of their nine units, BLM West, but they must have become aware of it very soon thereafter. The installation of the last unit together with its immediate conversion to a single-flash system, seems to prove the overexploitation of the geothermal reservoir. While this often happens for economic reasons in order to produce the greatest amount of energy, albeit over a relatively shorter period of time, it nevertheless exacerbates the decline of the productive capacity of the geothermal reservoir itself.

P9-12 By using one or more of the alternative designs and strategies mentioned herein, it is not too late for Coso to minimize its reservoir decline and achieve a greater measure of sustainability for a longer production of electricity, albeit at a somewhat higher capital cost for equipment, and a somewhat lower annual production of energy and profits. Nonetheless, these alternatives must be fully studied when balanced against the environmental harm that appears to be a definite possibility, since the importation of water from the Hay Ranch wells, even at the lowest production rates and for the shortest duration, is still predicted to cause Little Lake to lose at least 10% of its water supplies. Rather than accept this inevitable consequence, the geothermal alternatives should be carefully studied.

P9-13 The DEIR states that the life of a geothermal power plant is indefinite (DEIR, page 2-1). While it is more or less true that the <u>heat</u> available in the reservoir rocks may continue to be available indefinitely, it is not valid to conclude that a typical geothermal power plant's life is indefinite. A geothermal plant relies upon the water sources interacting with the hot rocks to create the hot geofluids by which the power plant can operate. Obviously, a decline in the available geofluids would cause a power plant that is dependent on the geothermal reservoir to have a limited life. The faster the geofluids are produced and the greater the fraction of the geofluids that are lost through evaporation in WCTs, the faster that the available geothermal reservoir will dry out and not be available for commercial production.

Thus, the geothermal reservoir, and the power plant itself, can only be said to have an indefinite life if the geofluids are properly managed so that there is no net withdrawal of

P9-13 geofluids. That is, the rate of production is balanced against the rate of reinjection and the natural recharge rate. Since the DEIR states that currently there is no natural recharge (DEIR, page 3.2-24), it is obviously essential to reinject every drop of geofluid that is produced to have any hope of achieving long-term sustainability.

Respectfully submitted,

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August 14, 2008

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Sc.B., Mechanical Engineering, 1962; *Cum Laude*
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Honors and Awards

Corporation Scholarship, 1958-1962
ASTM Student Prize, 1961-1962
Tau Beta Pi Engineering Honor Society, 1962
Sigma Xi Research Society, 1962
Outstanding Educators of America, 1972, 1974
Top ASEE Campus Activity Coordinator for NE Region, 1975
University Service Award, 1976
AT&T Foundation Award for Excellence in Instruction of Engineering Students, 1989
Unsung Hero Award, Admissions Office, UMD, 2003
Ben Holt Power Plant Award, Geothermal Resources Council, 2007

Biographical Listings

American Men and Women of Science
International Scholars Directory
Dictionary of International Biography
Who's Who in Technology Today
International Who's Who in Engineering
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Who's Who in Frontiers of Science and Technology

Professional Societies

Geothermal Resources Council, ASME, ASEE, Sigma Xi Research Society.

Avocational Interests

Photography, travel, hiking, reading, sudoku and crossword puzzles.

FULL-TIME AND PART-TIME APPOINTMENTS

1. **ITT-Grinnell Corporation, Providence, RI**
   Draftsman, 1958-59;
   Design Engineer, 1960-61.
2. **U.S. Naval Underwater Systems Center (now NUWC), Newport, RI**
   Mechanical Engineer, 1966-68.
3. **Brown University, Providence, RI**
   Post-Doctoral Fellowship, 1966;
   Research Associate, 1968-70;
   Visiting Professor of Engineering (Research), 1976-79;
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   Adjunct Professor of Engineering, 1988.
4. **University of Massachusetts Dartmouth, North Dartmouth, MA**
   Associate Professor of Mechanical Engineering, 1967-1974.
   Professor of Mechanical Engineering, 1974-1997.
   Chancellor Professor of Mechanical Engineering, 1997-2004.
   Granted Tenure, 1973.
   Chairman, Mechanical Engineering Department, 1973-79, 1987-1995.
   President, Faculty Senate, 1974-1976; 1997-1999.
   Director Industry Relations, College of Engineering, 1994-1995.
   Associate Dean, College of Engineering, 2001-2004.
   Courses taught: Engineering Thermodynamics I, II; Refrigeration and Air Conditioning; Aircraft and Rocket Propulsion Systems; Geothermal Energy; Statics; Dynamics; Fluid Mechanics; Introduction to Design; Computer Programming; Applied Thermodynamics Laboratories; Analysis of Energy Conserving Systems; Power Plant Design and Engineering; Heat Transfer; Classical Thermodynamics (graduate).
5. **Massachusetts Institute of Technology, Cambridge, MA**
   Visiting Lecturer & Researcher, 2005-present.

ADMINISTRATIVE EXPERIENCE

1. **Chairman, Mechanical Engineering Department, 1973-79, 1987-1995.** Responsible for all activities of a 14-faculty person department; annual budgets of $750,000-950,000; 2 degree programs, BSME & BSMET; student body of 250; developed proposal for and won approval for MSME degree; prepared teaching assignments; carried out personnel annual evaluations; made contract renewal and tenure decisions; certified ME and MET for graduation; total of 14 years of service as chairman.
2. **President, Faculty Senate, 1974-1976; 1997-1999.** Leader of elected body of 51 faculty and librarians; responsible for all matters academic; worked closely with chancellor and deans, and with Senate presidents from other UMass campuses; worked to have the Faculty Senate recognized as the sole legitimate body for mandating all academic regulations and requirements; provided leadership in developing and implementing General Education program; collaboratively established guidelines for new academic centers and their evaluation.
3. **Director Industry Relations, College of Engineering, 1994-1995.** First person to hold this position; developed relations with regional companies to allow engineering students to gain internship experience while continuing their education; this led to the current Cooperative Education program.
4. **Associate Dean, College of Engineering, 2001-2004.** Responsible for Freshman-Year program called IMPULSE (Integrated Math, Physics, Undergraduate Laboratory Science and Engineering) involving 12-16 faculty from 4 departments and 2 colleges, 12-16

teaching assistants, and 100-120 freshmen; works with Admissions Office setting standards for acceptance; works with Financial Aid Office in administering engineering scholarships; responsible for maintaining academic and ethical standards among the students including probation, dismissal and readmission; organizes and conducts the annual 1-week residential Freshman Summer Institutes for 100 new freshmen involving 20 faculty and staff, and 12 resident and teaching assistants; responsible for all publications including the engineering sections in the General Catalogue; responsible for certifying all undergraduates for graduation.

SPONSORED RESEARCH PROJECTS

1. **Experiential Partnership for the Reorientation of Teaching (XPRT).**
   Principal Investigator, UMass Dartmouth, 1975-78.
2. **Ground-Source Heat Pump Facility.**
   Principal Investigator, UMass Dartmouth, 1997-2000.
3. **Raytheon Corporation Grant to Enhance Freshman Engineering.**
   Principal Investigator, UMass Dartmouth, 2001-2004.
4. **Raytheon Corporation Grant to Promote Engineering Among K-12.**
   Principal Investigator, UMass Dartmouth, 2003-2004.

RESEARCH REVIEW PANELS

1. **Meridian Corporation, Falls Church, VA**
   Member Research Advisory Panel, 1981-1983.
2. **U.S. Dept. of Energy, Washington, DC**
   Chairman, Energy Conversion Program Review Panel, 2005.
   Member, Co-Produced Geothermal Fluids Review Panel, 2007.
3. ***Geothermics***
   Member, Editorial Advisory Board, 2001-present.

INTERNATIONAL & REGIONAL ADVISORY BOARDS

1. **Instituto Costarricense de Electricidad, San Jose, Costa Rica**
   Member, Geothermal Advisory Panel, 1984-present; Chairman, 1999-2006.
2. **Los Alamos National Laboratory, Los Alamos, NM**
   Member, Central American Energy Resources Project Advisory Committee, 1985-1990.
3. **Instituto Nacional de Electrificacion, Guatemala City, Guatemala**
   Member, Geothermal Advisory Panel, 1986-1995; Chairman, 1986-1987.
4. **Interamerican Development Bank, Washington, DC**
   Consultant, 1991-1992.
5. **Comision Ejecutiva Hidroelectrica del Rio Lempa, San Salvador, El Salvador**
   Member, Geothermal Advisory Panel, 1992-1999; Chairman, 1997-1999.
6. **Kenya Power & Lighting Company, Ltd., Nairobi, Kenya**
   Member, Geothermal Board of Consultants, 1992-1995.
7. **Greater New Bedford Regional Vocational Technical High School, Massachusetts**
   Member, Advisory Committee for Engineering Technology program, 2001-present.
8. **Town of Dartmouth, Massachusetts**
   Member, Alternative Energy Committee, 2003-2005; Chairman, 2005-present.
   Member, Technical Research Group, 2007-present.
9. **University of Masasachusetts Dartmouth**, College of Engineering,
   Member, Industrial Advisory Committee, 2005-present.
10. **City of New Bedford, Massachusetts**
    Member, Mayor's Sustainability Task Force, 2007-present.

PROFESSIONAL CONSULTING CLIENTS

1. **Hammel-Dahl, Warwick, RI**, 1969.
2. **Francis Associates, Marion, MA**, 1970-72.
3. **Electric Power Research Institute, Palo Alto, CA**, 1979-1990.
4. **National Rural Electric Cooperative Association, Washington, DC**, 1980.
5. **Advanced Energy and Technology Association, Dover, NJ**, 1980.
6. **Stone & Webster Engineering Corporation, Boston, MA**, 1981-1984.
7. **Ryan, Beck & Company, West Orange, NJ**, 1981.
8. **Imperial Energy Corporation, Los Angeles, CA**, 1982.
9. **Occidental Research Corporation, Irvine, CA**, 1982.
10. **Cape Building Systems, Mattapoisett, MA**, 1982.
11. **EG&G Idaho, Idaho Falls, ID**, 1982-1990.
12. **Biphase Energy Systems, Placentia, CA**, 1983-1986.
13. **Visualizations, Providence, RI**, 1984, 1986.
14. **Mother Earth Industries, Scottsdale, AZ**, 1984-1992.
15. **William E. Nork, Inc., Reno, NV**, 1985.
16. **Utah Power & Light Company, Salt Lake City, UT**, 1985.
17. **Dow Chemical USA, Freeport, TX**, 1986.
18. **California Energy Company, San Francisco, CA**, 1988.
19. **First Reserve Corporation, Greenwich, CT**, 1988.
20. **City of Provo, Provo, UT**, 1988.
21. **Radian Corporation, Austin, TX**, 1988-1990.
22. **Calpine Corporation, San Jose, CA**, 1993.
23. **Ormat, Inc., Yavne, Israel**, 1994.
24. **Southern California Edison, Rosemead, CA**, 1995-1999.
25. **Kutak Rock LLP, Omaha, Nebraska**, 2002-2003.
26. **Tetra Tech Environmental Management Inc., Rancho Cordova, CA**, 2002-2003.
27. **Ormat International, Sparks, NV**, 2002-2003.
28. **Highland Capital Partners, Lexington, MA**, 2004-2005.
29. **GeothermEx, Richmond, CA**, 2005-present.
30. **GeoTek, Dripping Springs, TX,** 2005-present.
31. **Geodynamics, Brisbane, Australia,** 2005-present.
32. **Massachusetts Institute of Technology, Cambridge, MA**, 2005-present
33. **CH2M HILL, Inc., Redding, CA**, 2007.
34. **Viking Installations, Calgary, Canada**, 2008.
35. **Khosla Ventures II, LP, Menlo Park, CA**, 2008.
36. **Advanced Technology Ventures, Palo Alto, CA**, 2008.
37. **Little Lake Ranch, Inyo County, CA**, 2008.
38. **National Renewable Energy Laboratory, Golden, CO**, 2008.

Publications on Geothermal Energy & Power Plants

Books:

1. *Geothermal Energy as a Source of Electricity: A Worldwide Survey of the Design and Operation of Geothermal Power Plants,* R. DiPippo, U.S. Department of Energy, U.S. Government Printing Office, 1980, 370 pages.
2. *Sourcebook on the Production of Electricity from Geothermal Energy*, J. Kestin, Editor-in-Chief; R. DiPippo, H.E. Khalifa and D.J. Ryley, Editors, U.S. Department of Energy, U.S. Government Printing Office, 1980, 997 pages.
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1. "Geothermal Power Technology", R. DiPippo, Chap. 18 in *Handbook of Energy Technology and Economics*, R.A. Meyers, Ed.-in-Chief, John Wiley & Sons, Inc., New York, 1982, pp. 787-825.
2. "Geothermal Power Systems", R. DiPippo. Sect. 8.2 in *Standard Handbook of Powerplant Engineering, 2nd ed.*, T.C. Elliott, K. Chen and R.C. Swanekamp, eds., pp. 8.27-8.60, McGraw-Hill, Inc., New York, 1998.
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2. "Geothermal Power Plant Database", R. DiPippo, *Geothermal Information Series, Part 3*, DCN 90-213-142-03-01, Electric Power Research Institute, Palo Alto, CA, 1990.

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1. "Hybrid Fossil-Geothermal Power Plants", H.E. Khalifa, R. DiPippo and J. Kestin, *Proc. 5th Energy Technology Conference*, Washington, DC (1978) pp. 960-970.
2. "An Analysis of an Early Hybrid Fossil-Geothermal Power Plant Proposal", R. DiPippo, *Geothermal Energy Magazine, 6* (March 1978) 31-36.
3. "The Geothermal Power Station at Ahuachapan, El Salvador", R. DiPippo, *Geothermal Energy Magazine, 6* (Oct. 1978) 11-22.
4. "Hybrid Geothermal-Fossil Power Plants", J. Kestin, R. DiPippo and H.E. Khalifa, *Mechanical Engineering, 100* (Dec. 1978) 28-35.
5. "Geothermal Preheating in Fossil-Fired Steam Power Plants", H.E. Khalifa, R. DiPippo and J. Kestin, *Proc. 13th Intersociety Energy Conversion Engineering Conference, 2* (1978) 1068-1073.
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22. "Worldwide Geothermal Power Development: An Overview and Update", R. DiPippo, *Proc. Seventh Annual Geothermal Conference and Workshop*, Electric Power Research Institute, AP-3271 (1983) 6.1-6.16.
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25. "Worldwide Geothermal Power Development: 1984 Overview and Update", R. DiPippo, *Geothermal Resources Council BULLETIN, 13* (Oct. 1984) 3-12.
26. "Geothermal Energy: A Viable Supplementary Energy Source", R. DiPippo, *Proc. Int. Symp. on Solving Corrosion and Scaling Problems in Geothermal Systems*, Nat'l Assn. of Corr. Engineers, Houston, TX, 1984, pp. 1-19.
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2. Visualizations, Providence, RI: *1 report*

P9

Ronald DiPippo
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South Dartmouth, Massachusetts 02748-0144

P9-1 The comment is noted, and is included in the project record.

P9-2 The background information on the Coso project, system, and equipment is noted.

P9-3 All Coso production wells produce some steam at the wellhead as a result of wellhead pressures that are below the saturation pressure of water at the enthalpy of the reservoir fluids. Some wells at Coso produce 100% steam or "excess" steam. Excess steam refers to steam that is present in higher amounts than would be expected if a 100% liquid phase water at reservoir temperature and pressure flashed at the wellhead pressure.

Vapor-dominated or steam zones are developed by pressure decreases related to extracting a greater mass of fluid than is recharging a hot geothermal reservoir (a negative net withdrawal). This imbalance can be caused by exploitation, as in many geothermal fields that were initially liquid-dominated systems (e.g., Wairaki, New Zealand (Clotworthy 2000)) or partially liquid and partially vapor (e.g., Los Azufres and Los Humeros, Mexico (Barragan et al. 2002)) or by natural venting (e.g., The Geysers, California (White, Muffler and Truesdell 1971)). The development of steam zones does not in and of itself indicate poor reservoir management or the end of production. Reservoir management including the management of production and injection can maintain production in these fields for many years: Wairaki has been producing for 48 years, and The Geysers has been producing for 45 years.

The Coso geothermal system has been active for over 300,000 years. The partitioning of the Coso geothermal reservoir appears to have occurred during the development of the modern geothermal system (within the last 10,000 years), but prior to the onset of exploitation and is probably related to the disappearance of shallow groundwater (Adams et al. 2000). Fluid inclusion and gas geochemical studies indicate that there have been steam dominated zones within the Coso reservoir prior to exploitation (Dilley et al. 2006).

The loss of permeability related to boiling is due to scaling. This is typically a concern in areas of low permeability and near well boiling, and has been an issue at some geothermal fields (e.g., Cerro Prieto (Ocampo et al. 2000)). The scaling problems in the production wells at Coso are primarily related to calcite, which deposits rapidly after brine flashes. Calcite scaling is not considered a significant problem where the reservoir temperatures are high (>250^{o}C) because the solubility of calcite above 250 ^{o}C degrees is low. Reservoir temperatures at Coso are greater than 270 ^{o}C. Silica also becomes supersaturated upon boiling and cooling, but because silica scaling is delayed after boiling it is typically not an issue in production wells but manifests in surface facilities and injection wells. Silica scaling is observed in some injection wells at Coso (Park et al. 2006).

Please refer to Master Response L2 for a discussion of other alternatives investigated. Coso has already drilled several deep wells near the limit of economic feasibility. A substantial new source of geothermal fluid was not identified.

P9-4 The background information provided on wellhead quality, steam production, production of geofluids, etc. is noted.

P9-5 The comment is noted. A decline of 20% of steam flow to a typical geothermal power plant would produce approximately 90 MW decrease in output using an industry standard steam rate (17.5 kph/MWe). From the maximum capacity of 270 MW, a 20% decline in steam would suggest that Coso is at 190 MW or less than 200 MW, as indicated in the Draft EIR. Coso has implemented several projects to maximize use of injection water. These include tracer testing, downhole injection well surveys, chemical monitoring, adjustments in injection rates and mitigating scale in injection wells.

P9-6 The comment is noted. The commenter notes that while air cooling can reduce the water consumption of a geothermal power plant, air cooling is more expensive and reduces the overall efficiency of conversion of geothermal energy to electrical power. The capital cost of air cooling towers are 8 to 10 times higher than dry cooling towers at the same efficiency and can increase the total capital cost of a geothermal plant significantly. Replacing existing wet cooling towers with dry cooling towers has a higher cost as the wet towers have already been purchased. Power plants with air cooling typically decline in output approximately 1% for every 1^{o}C in temperature increase and an air cooled plant in the western United States can decrease as much as 50% in summer when energy is in demand (Kutsher and Costeneman 2002).

P9-7 Production decline rates at Coso have stabilized at approximately 10% over the last several years and total production of electrical power has already been reduced to less than 75% of installed capacity, larger than the 80% reduction noted at Wairaki.

P9-8 Please refer to Master Response L2 for a discussion of other alternatives investigated. Coso has already drilled several deep wells near the limit of economic feasibility. A substantial new source of geothermal fluid was not identified.

P9-9 Wastewater sources in the area are located at a much greater distance from Coso than Hay Ranch and would cost more to develop. Note that in the example provided by the commenter, Santa Rosa Waste Water, the cost of the pipeline to The Geysers was born by the City of Santa Rosa, not the geothermal operators of The Geysers. The operators of The Geysers were reluctant to participate in the project unless the very high capital cost was shared, even though the augmented injection is attributed with reducing reservoir pressure and production declines at The Geysers, which has been a substantial economic benefit to the geothermal energy producers at The Geysers. Geysers operators paid for the distribution lines and provided power for the pumping.

P9-10 Three classes of contemplated modifications have been investigated

1. Those providing additional output without utilizing more resource or system efficiency improvements
2. Those providing water savings through a reduction in the evaporative water losses associated with the cooling towers
3. Other sources of water for injection

Modifications considered under (i) are identified as system efficiency improvements, which provide additional output without utilizing more resources.

P9-11 The commenter's opinion is noted. Please refer to Master Response N6 for discussion of out-of-scope comments/past intentions and past actions of Coso. The past operation of the Coso plant does not pertain to the analysis of the proposed project. The geothermal power plants have had separate environmental review and all impacts were found to be mitigable.

P9-12 Please refer to Master Response L2 for a discussion of the alternatives that were considered. See pages 5-4 of the Draft EIR for a discussion of the power plant modifications that were considered.

P9-13 The life of a geothermal project depends on the productive capacity of the resource, the life of the power plant, and the economics of the cost power generation relative to the price of power. The life of the project is not indefinite because these factors are variable, but it may be indeterminate.

Good reservoir and project management of geothermal energy development projects requires optimizing the use of the resource in an economically reasonable way. Inefficient energy conversion systems (e.g., air cooling, binary at Coso reservoir temperatures) waste resource and limit the project as inappropriate reservoir management. The primary tool currently used in the geothermal industry for extending the life of a geothermal resource is injection. Coso is currently reinjecting all available fluids and managing the injection so as to maximize the returns of injection in the form of stabilized reservoir pressure. The proposed project would contribute positively to the life of the plants.

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September 3, 2008

Tanda Gretz, Senior Planner
Inyo County Planning Department
P.O. Box L
Independence, CA 93526

Re: Coso Operating Company
CUP 2007-03

Dear Tanda:

P10-1 I am sending to you by Federal Express one (1) complete copy of the documents referenced in Little Lake Ranch's formal letter, dated September 3, 2008, providing comments to the Draft Environmental Impact Report in connection with the Coso Project, CUP 2007-03. A list of the Reference Materials is attached. The documents will be contained in six (6) boxes. Also enclosed is a CD which contains electronic copies of the documents.

Please add these materials to the planning file for the Coso Project. Should you have any questions or comments in this regard, please do not hesitate to contact the undersigned.

Very truly yours,

ARNOLD, BLEUEL, LaROCHELLE,
MATHEWS & ZIRBEL, LLP

Gary D Arnold

Gary D. Arnold

GDA:jw
Enclosures
cc: Little Lake Ranch (via e-mail)
Pat Cecil (via e-mail)
Randy Keller (via e-mail)

Little Lake\Coso\Letters\Gretz Ltr 07

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SEPTEMBER 3, 2008

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Geologica 2006: Coso Hot Springs Monitoring Report 2005-2006, prepared by Geologica, Inc.

Geothermal PEIS: Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States prepared by Bureau of Land Management and the United States Forest Service.

Geothermal Sustainability 2006: Article in GRC Transactions, Vol. 30, 2006, by L. Rybach and M. Mongillo.

Geothermal Today 2003: 2003 Geothermal Technologies Program Highlights, Geothermal Today by U.S. Department of Energy.

Groeneveld Article: Owens Valley, California, Plant Ecology: Effects from Export Groundwater Pumping and Measures to Conserve the Local Environment, by David P. Groeneveld

Habitat Plan: Upper Little Lake Ranch, Inc. Habitat Restoration and Enhancement Project, dated October 14, 2000 (Current through April 20, 2001)

Habitat Plan Update: Upper Little Lake Ranch Habitat Restoration and Enhancement Project, dated November 30, 2000

Haggerty E-Mail 2-27-08: E-Mail from Sean Haggerty of BLM to Kermit Witherbee, dated February 27, 2008.

Haizlip CV: Qualifications of Jill R. Haizlip according to the public website for Geologica, Inc.

Harris E-Mail 9-2-08: E-Mail from Charles Harris to Gary Arnold, dated September 2, 2008.

ICPD Agenda 4-30-08: Copy of an agenda for a conference call, with a fax date stamp on the agenda of April 30, 2008 contained in the Inyo County Planning Department files.

ICPD Cost Memo: Draft memo apparently received by the ICPD on December 20, 2007, and contained in the Inyo County Planning Department files.

ITS Hydrologic Analysis 2006: Hydrologic Analysis of the Coso Geothermal System: Non-Technical Summary dated April 26, 2006, prepared by Innovative Technical Solutions, Inc.

LLR MND: Draft Initial Study and Mitigated Negative Declaration prepared in conjunction with the Upper Little Lake Ranch Habitat Restoration and Enhancement Project, dated April 4, 2002.

LLR History-Neuman: A pictorial and narrative history of Little Lake Ranch, including its creation, predecessors and significant events.

LLR History-Pearson: A report by James Pearson of the historical events in and around Little Lake.

Larsen E-mail 9-26-07: E-mail from Janice Larsen to Laurie McClenahan Hietter of MHA on September 26, 2007.

Laurel Heights v. Regents: The judicial decision rendered by the California Supreme Court entitled "*Laurel Heights Improvement Association of San Francisco, Inc. v. The Regents of the University of California*" (1993) 6 Cal.4th 112.

Little Lake FEIR: Final Environmental Impact Report for the Upper Little Lake Ranch Habitat Restoration and Enhancement Project, February 2004.

Little Lake Well Locations: Brief description of locations and uses of water well on the Little Lake Ranch property.

MHA Letter 11-20-07: A letter from MHA to the ICPD dated November 20, 2007

MIT Report: The Future of Geothermal Energy, Impact of Enhanced Geothermal Systems (EGS) on the United States in the 21st Century.

Matthews License: Report of the licenses held by Daniel Matthews from the website for the California Board of Geologists and Geophysicists.

Oberoi License: Report of the licenses held by Varinder Oberoi from the website for the California Board for Professional Engineers and Land Surveyors.

Pollution Workplan 2008: Pollution Prevention Report and Two-Year Workplan for 2006-2008, California Environmental Protection Agency

Ridgecrest Chamber Report: Ridgecrest Chamber Report of Commerce report of largest employers in Ridgecrest

Rockwell Report 1980: "Geology and Hydrology Technical Report on the Coso Geothermal Study Area" conducted by Rockwell International dated April, 1980.

Rose Basin 6-56: California's Groundwater Bulletin 118.

Rose Progress Report: Progress Report for Year Ending December 31, 2006: Creation of an Enhanced Geothermal System through Hydraulic and Thermal Stimulation, Peter Rose1, Principal Investigator; Open Meeting on Enhanced Geothermal System, Summary Report, Reno Nevada, September 26-27, 2002; Geothermal Today, US Department of Energy, 2003 Geothermal Technologies Program Highlights

Save Round Valley Alliance: California Court of Appeal decision entitled "Save Round Valley Alliance v. County of Inyo".

Scoping – LADWP: Letter from LADWP dated November 1, 2007.

Scoping – MHA: Meeting notes from meeting dated October 22, 2007 among Inyo County staff and the EIR consultant, MHA/RMT.

Scoping – NAHC: Letter from the Native American Heritage Commission dated October 22, 2007.

Scoping – OVC: Letter from Carla Scheidlinger, president of Owens Valley Committee, dated November 2, 2007.

Scoping – Geologica: Memorandum from Geologica dated October 29, 2007 discussing the proposed pumping tests.

Scoping – Prather: Letter from Mike Prather, former chairman of the Owens Valley Committee received by County on October 30, 2007.

Scoping – Tribal Council: Letter from Bishop Tribal Counsel dated November 6, 2007.

Scoping – Water Board: Letter from California Regional Water Quality Control Board, Lahontan Region, dated October 29, 2007.

Stanislaus v. County of Stanislaus: The judicial decision rendered by the California Court of Appeal entitled *"Stanislaus Natural Heritage Project v. County of Stanislaus"* (1996) 49 Cal.App. 4^{th} 727.

WD Memo 9-29-06: Memorandum from the County of Inyo Water Department ("ICWD") to the Inyo County Water Commission ("Commission"), dated September 29, 2006.

Wicks – Deformation: Steady-State Deformation of the Coso Range, East-Central California, Inferred from Satellite Radar Interferometry, by Charles W. Wicks 2001.

Zdon Memorandum 9-2-08: Memorandum from Andrew Zdon, P.G., C.E.G., C.Hg., associated with Golden State Environmental, Inc.

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P10-1 The comment regarding additional project references is noted. The references have been added to the project record for the Coso project.

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September 3, 2008

Tanda Gretz, Senior Planner
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Re: Coso Operating Company
CUP 2007-03

Dear Tanda:

This letter contains the formal comments of Little Lake Ranch, Inc., to the Draft Environmental Impact Report on the Coso Project, CUP No. 2007-03. Please address all of the comments and questions presented below.

INTRODUCTION

P11-1 Coso Operating Company, LLC ("Coso") seeks to pump 4,839 acre-feet per year (AFY) of water from the Rose Valley Basin for 30 years ("Project"). The draft Environmental Impact Report ("DEIR") prepared by the County of Inyo ("County") for the Project states that the exported water will be used for injection to replenish the subsurface geothermal fluids ("Geofluids") due to water lost caused by evaporation. For the purposes of this letter, I will refer to the fluids produced by Coso from the underground geothermal reservoir as Geofluids. "Fluids" are all substances that flow, and can include water, steam, vapor, gas and liquids. In general, the Geofluids consist of both liquids and steam. (See DiPippo Report.)

P11-2 Coso is in need of imported water for two fundamental reasons. First, Coso installed and is operating more Geofluid production wells than can be sustained by the geothermal reservoir. Second, Coso's geothermal power plant uses evaporative water cooling towers (WCTs), through which a substantial portion of the Geofluids is lost through evaporation. Coso has sacrificed the geothermal reservoir to extract more Geofluids than the geothermal reservoir can safely support to generate the maximum amount of energy possible over the shortest possible term. Coso wants to take water from the Rose Valley Basin to offset its poor management decisions that were made in the interest of short-term profit alone.

P11-3 This Project was never conceived by Coso to help the State of California comply with its renewable energy goals. If Coso truly wanted to preserve its geothermal resource and foster renewable energy, it would have designed and operated an entirely different generation plant. Instead, the Project only helps Coso defer inevitable capital costs, in exchange for short-term profits, all to the damage of the environment.

P11-4 The DEIR presents a new numerical groundwater flow model for the Rose Valley Basin ("Hydrology Model") which predicts what will happen upon the commencement of pumping by Coso. For the reasons noted below, the Hydrology Model is fundamentally flawed and unreliable. Nonetheless, even the Hydrology Model predicts that (a) if Coso pumps and transports water at a rate of 4,839 AFY, Coso would have to completely stop pumping after 1.2 years to avoid causing Little Lake to lose more than 10% of its water, or (b) under the most optimistic assumptions, Coso can only pump 480 AFY of water for 30 years to avoid reducing Little Lake's water supplies by more than 10%.

P11-5 The Little Lake Ranch certified hydrogeologist, Mr. Andrew Zdon, has reviewed the Hydrology Model. His report is being submitted concurrently with this letter. For the reasons stated, the Hydrology Model is not reliable and must be completely revised. It substantially overstates the ability of the Rose Valley Basin to support the pumping Project, and it hugely understates the impacts. In summary, the Hydrology Model must be redone because:

- The thickness of the aquifer was arbitrarily increased beyond reasonable estimates.
- The recharge of the aquifer was arbitrarily increased beyond reasonable estimates.
- The specific yield of the aquifer was arbitrarily increased beyond reasonable estimates.
- There are errors in the model or inputs regarding differences using measures of storativity compared to specific storage.
- The impacts to Rose Valley and Little Lake were not based on a calibrated model.
- The unreasonable and arbitrary inputs and assumptions used in the Hydrology Model, which are at variance to prior reports, were not discussed or justified.
- The reasons for excluding the Portuguese Bench springs are not supported by the model.
- There is an unexplained and questionable use of the MODFLOW 88/96 model software rather than MODFLOW-2000 software.

- There is an unexplained and questionable use of data only from the recent 14-day pumping test, rather than use of all available data to provide inputs.
- Even using the flawed Hydrology Model, the triggers are not adequate to protect the Rose Valley and Little Lake from increasing harm after pumping stops.

P11-6 We have researched the qualifications of the individuals who participated in the preparation of the Hydrology Model. According to the list of contributors, the only consultants who presumably could have worked on the Hydrology Model were Jill Haizlip and Dan Matthews, both associated with Geologica, and Varinder Oberoi.

P11-7 We searched the Board of Geologists and Geophysicists for the State of California website. This search revealed that Mr. Matthews holds a license as a geologist. (See Matthews License.) The field of geology includes the study of water. Neither Mr. Oberoi nor Ms. Haizlip is licensed by the Board of Geologists and Geophysicists. We performed another search of the website for the Board for Professional Engineers and Land Surveyors, and found that Mr. Oberoi holds a license as a civil engineer. (See Oberoi License.) Ms. Haizlip was not shown as holding a license from either the Board of Professional Engineers and Land Surveyors or the Board for Professional Engineers and Land Surveyors. According to the public website for Geologica, Jill R. Haizlip holds no professional registrations or licenses in the State of California whatsoever. (See Haizlip CV.)

P11-8 It is disturbing to discover that the Hydrology Model was apparently not prepared by a certified hydrogeologist, or at least supervised by a certified hydrogeologist. Although Mr. Matthews holds a basic license as a geologist, and as such he is permitted under California law to prepare hydrology models such as the one described in the DEIR, he has not undertaken the additional education, training and examinations to become a specialist in the field of hydrology. Indeed, the titles used in the DEIR for Ms. Haizlip (Principal Hydrologist), Mr. Matthews (Senior Geohydrologist) and Mr. Oberoi (Engineering Hydrologist) are all misleading, as none of them hold a certificate as a "Hydrogeologist". Was the Hydrology Model subject to any professional peer review by a certified hydrogeologist? If so, please name the person or persons, describe his or her involvement and provide his or her qualifications. Since the Hydrology Model

P11-9

P11-9 qualifications, his views should be accepted. In the alternative, the County should at least have the Hydrology Model be subjected to an independent peer review by a certified hydrogeologist.

P11-10 The DEIR also presumes that a 10% loss of the water resources at Little Lake is not significant. How was this determination made? Neither Little Lake nor any resident of Rose Valley should be forced to suffer a water loss by virtue of the Project. The County has never before approved a water project that will cause an overdraft. Any loss of water in the high desert is significant. Even a 10% decline, particularly during a normal drought, could destroy most, if not all, of the lakes, ponds and wetlands at Little Lake and Rose Valley, as well as the wildlife on which they depend. We disagree with the threshold assumption that a 10% loss of water is not significant.

P11-11 The DEIR fails to adequately address a number of feasible alternatives, including (a) the use of treated wastewater from sources throughout the immediate vicinity, (b) the retrofit of Coso's Plant to use air-cooled condensers (ACCs) to completely eliminate the loss of water at Coso through evaporation, (c) the better management of the geothermal reservoir by reducing production and output, (d) the purchase of water from LADWP, (e) the exploration of alternate water sources in Owens Valley, Indian Wells Valley and Upper Coso Valley, (f) the ability of Coso to deepen its own production wells to tap new sources of Geofluids, or (g) a combination of the alternatives to eliminate Coso's dependence upon the Rose Valley Basin. None of the stated alternatives were studied. The only reason given is that Coso believes they are too costly or not economical.

P11-12 We are submitting concurrently with this letter, a report from Ronald DiPippo, Ph.D, a recognized geothermal expert, which illustrates the operations of Coso, explains why Coso's geothermal reservoir is drying out and identifies methods to preserve Coso without the importation of water from Rose Valley. (See DiPippo Report.) The DiPippo Report confirms that Coso's problems are of its own making. The report includes a number of <u>feasible</u> methods for Coso to minimize the decline and allow for the sustainable production of energy.

P11-13 The County must evaluate and respond to comments relating to significant environmental issues. There must be a good-faith, reasoned analysis in response to comments received. Conclusionary statements unsupported by factual information will not suffice. More importantly, the *Laurel Heights v. Regents* decision holds that if the lead agency adds significant new information to the EIR after the close of the public comment period, CEQA <u>requires</u> that the lead agency provide a new public comment period (*Laurel Heights v. Regent*). For the reasons stated herein, the County must prepare an entirely new Hydrology Model and substantially study and evaluate feasible alternatives. This new Hydrology Model will substantially change the discussion of the impacts to the environment. Accordingly, the new DEIR, after it is revised, must be made available again for public comment.

EXECUTIVE SUMMARY

P11-14 For obvious reasons, the Executive Summary (ES) of the DEIR only briefly summarizes some of the information contained in the balance of the DEIR. To the extent that any changes to the DEIR are made in the body of the document, then the same changes or corresponding modifications to the ES must also be made. Similarly, my comments to the ES portion of the DEIR will be limited, but some of which may be duplicated in the body of my comments. Ultimately, the ES, the body of the DEIR and all of its Appendices will have to be conformed for consistency. Having observed the foregoing, the following are my comments to the ES portion of the DEIR.

P11-15 By necessity, many of our comments will be repeated throughout this letter. Similar to the repetition of data or statements by the DEIR itself, we find it necessary to repeat comments or questions each time a faulty or misleading comment is made by the DEIR.

P11-16 **Page ES-1:** The summary of the Project Description is incomplete. None of the Project objectives are described.

P11-17 **Page ES-2, Figure ES 1-1:** The schematic only shows Navy 1 and Navy 2 power plants. Where is the BLM power plant and why is it not included?

P11-18 **Page ES-3, Figure ES 1-2.** Are the existing two Hay Ranch wells capable of truly sustaining the amount of water pumping contemplated by Coso? Does the utilization of the Hay Ranch property owned by Coso eliminate from future development the Hay Ranch for agricultural purposes? Is the "injection system location" the sole location from which the water is to be injected? If not, what will be the distribution pipeline systems for the injection of water?

P11-19 **Page ES-5, Table ES.1.1** – What has caused the annual decline in reservoir productivity? Has Coso, through inefficient or antiquated equipment or processes, depleted the geothermal reservoir? Has Coso over-exploited the capabilities of the geothermal reservoir? How much energy or electricity will be required to pump the wells to generate water?

P11-20 **Page ES-6, Table ES.1-3:** Has BLM updated its environmental assessment for the right-of-way over BLM to lay the pipelines? Has the China Lake Naval Air Weapons Station, managed by the U.S. Navy ("US Navy"), updated its environmental assessment in consideration of the DEIR? Why is there no mention of the required consultation with the Paiute Indian Tribes mentioned?

P11-21 **Page ES-6:** Not all of the comment letters regarding the scope of the DEIR have been represented. Additional comments and letters were received but not copied. See below for full list.

P11-22 **Page ES-7:** What is the evidence on which the County concludes that Portuguese Bench and Rose Spring would not be impacted? Would the removal of subsurface waters not impact surface springs? If so, explain why. What is the hydrologic evidence to support the conclusion? Does the Hydrology Model predict a decline of 20 to 30 feet adjacent to the Portuguese Bench? Why wouldn't such a decline in the underground water level in such proximity to the springs therein have an effect? Please explain the rationale for not including the Davis Spring in light of the prior modeling performed in Owens Valley. (See Danskin Report.) It seems that the geographic boundary of the Hydrology Model is not supportable and must be changed. (See Zdon Memorandum 9-2-08.)

P11-23 **Page ES-7:** It is asserted that Little Lake Ranch is "currently undergoing habitat restoration efforts." The habitat restoration project was completed and Little Lake is responsible for the continuing maintenance of the habitat. Please correct the DEIR.

P11-24 **Page ES-7:** Please define your use of the term "perched groundwater" as the source of Little Lake's waters. Was this factor included as part of the Hydrology Model? Does the DEIR suggest that the perched water does not connect to the larger aquifer? Were any tests performed on water composition to prove this perched water theory?

P11-25 **Page ES-8:** Further explain or justify the conclusion that a 10% or less reduction in water available to Little Lake is not considered "substantial." Is this a different standard than the term "significant" under CEQA? Explain the difference. Has the County ever granted permission to overdraft an underground aquifer? Would an approval of the Project constitute a change of policy for Inyo County?

P11-26 In an arid environment, does not even a 10% loss of available water or moisture significantly impact surface vegetation and wildlife? Remember that in a desert environment seasonal fluctuations in moisture occur cyclically, such that an additional 10% loss of water would magnify or exacerbate the loss of water during drought conditions.

P11-27 **Page ES-8:** The DEIR states that the injection of water under the Project "theoretically could counter the pressure differential that the system is currently experiencing and result in a decrease or stabilization of the steam-dominated portion of the reservoir and a decrease or stabilization in water level and temperature in the hot springs." In all previously published reports, there has been a rejection of the observations that the geothermal operations at Coso have any impact upon the Coso Hot Springs. Is there now recognition that there is a direct connection between the Coso's operations and the Coso Hot Springs? If data was previously inconclusive that there was any connection, please provide the data which would suggest the water injection system could somehow now benefit the Coso Hot Springs. Describe how the injection of cold water into a hot geothermal reservoir could cause the reversal of effects. What is the empirical or theoretical basis for asserting that the injection of water from the Rose Valley aquifer could restore the Coso Hot Springs? What reports is the DEIR relying on? Would not a

P11-27 more logical effort be to stop the excessive withdrawal of the Geofluids to restore the Coso Hot Springs?

P11-28 Production of Geofluids from a hydrothermal reservoir for use in power or thermal energy generation can lower the water table, adversely affect nearby geothermal natural features (e.g., geysers, springs, and spas), create hydrothermal (phreatic) eruptions, increase the steam zone, allow saline intrusions, or cause subsidence (MIT Report, Section 8.2.9).

P11-29 **Page ES-10:** The statement that the Project would not conflict with the land use or zoning designations because Coso is only pumping water is misleading and inaccurate. Previously, the Hay Ranch was used for agricultural purposes and Coso's ownership of the property solely for the purposes of the water transfer negates the preferable use of the property for any sort of agriculture. Indeed, because the Hay Ranch is now fallow, it is contributing to air pollution by increasing the amount of fugitive dust arising from the property. Steps should be taken to restore either agricultural use on the property or prevent dust emissions.

P11-30 **Page ES-10:** Merely screening construction activities is insufficient to mitigate the impact on the aesthetics of the surrounding area. The Project proposes to create permanent above ground improvements which will detract from the natural beauty of a high desert environment.

P11-31 **Page ES-10:** The suggestion that vegetation in the Rose Valley does not rely on ground water as a water source is wrong. The withdrawal of water from the underground will deplete the natural moisture available to all surface vegetation. (See Desertification Article) In addition, such reduction in the basic moisture in and around the surface of the Rose Valley will contribute to dust creation, particle emission, air visibility and the like.

P11-32 **Page ES-10:** With respect to the impacts of the Project on the aesthetics of Little Lake, the impacts are obvious. Even a 10% reduction in surface flows would lower the average water level available of Little Lake, decrease the amount of water available to replenish all of the ponds, wetlands and riparian habitat south of Little Lake, retard or harm natural vegetation, and reduce water available for wildlife. The Project, even with mitigation measures, will deplete water resources by overdrafting the Rose Valley Basin. These impacts on biology will continue for over 100 years after pumping stops. This fact, in and of itself, is a significant impact which is not proposed to be mitigated in any fashion. There is no question but that surface vegetation, habitat and wildlife will be thereby affected. Why aren't these impacts analyzed by the DEIR?

P11-33 **Page ES-10:** The Hazards and Hazardous Materials section of the DEIR fails to address the contamination of the Rose Valley Basin water injected into the geothermal reservoir and the potential contamination of the Rose Valley Basin by underflow from the Coso geothermal reservoir. While available data suggests that there is limited underground connection between the geothermal reservoir and the Rose Valley Basin, any water drawn from the Rose Valley Basin will be injected into the geothermal reservoir. Is the water in the Rose Valley Basin potable?

P11-33 Will the injection of fresh water into the geothermal reservoir contaminate the fresh water from the Rose Valley by subjecting it to hazardous chemicals and substances naturally present in the geothermal reservoir? Assuming the water is then returned to the surface via Coso's production wells, the fluids will then also be subject to loss, exposure to the environment, accidental discharge, etc. The design of Coso's plant does not allow for a closed system in which all of the Geofluids produced from the geothermal reservoir are returned to the geothermal reservoir by injection. Indeed, Coso is already one of the largest hazardous waste generators in California (Pollution Workplan). The replenishment of the geothermal reservoir in the manner proposed by Coso will perpetuate the generation of such hazardous substances and the necessity for continued storage thereof, to the potential detriment of the populace. These impacts have not been discussed or considered.

P11-34 **Page ES-11:** The air quality section of the DEIR only deals with construction activities. This section utterly fails to address the conversion of the Hay Ranch from agricultural to a fallow condition, the failure to conduct habitat enhancement activities on the Hay Ranch allowing additional dust and contamination, the impacts from the loss of natural habitat and vegetation necessary to reduce fugitive dust during the duration of the Project, and the removal of valuable water resources, both from the surface and the underground, which provide necessary moisture for the healthy propagation and maintenance of habitat, all of which serve to reduce PM10 emissions. All of these factors need to be addressed and evaluated.

P11-35 **Page ES-12:** The alternatives mentioned to the Project fail to consider or address numerous alternate solutions that are required in accordance with CEQA. Moreover, it is difficult to fully consider what alternatives may be feasible because the DEIR does not accurately and consistently describe the basic Project objectives. It is recognized that the Project and any alternatives must be considered in light of the Project objectives themselves and, absent such an expression of the objectives, there is no basis for the community to assess viable alternatives (*Save Round Valley Alliance*).

P11-36 **Page ES-12:** The only Project alternatives considered are reducing initial pumping levels at varying rates, or possibly the duration of pumping. Why aren't all the charts depicting the results of the Hydrology Model presented in the same location of the DEIR? (See the last graphs at Figure 3.2-15, Figure 5.4-1, Figure 5.4-2 and Figure C4-2). Why have the graphs been buried and not compared together? The suggestion that the alternative pumping rates are "largely the same as the proposed project" is patently inaccurate and misleading. Is the DEIR really suggesting that pumping only 120 AFY for 30 years will have the same environmental impacts as pumping 4,839 AFY for 30 years? Or, is the conclusion really saying that pumping 120 AFY for 30 years is equivalent to only pumping 4,839 AFY for 1.2 years? If that is the assertion, then the CUP can only be issued for 1.2 years to comply with CEQA. What assumptions are being made as to the quantity of water storage in the Rose Valley Basin? Based upon virtually all published reports to date and the current model, Coso's Project will overdraft the Rose Valley Basin. All of these reports and studies are based on estimates and theoretic models. Nonetheless, if these models are accurate, the Project will overdraft the Rose Valley Basin, P11-36 simply meaning that more water is used, discharged and consumed in excess of the recharge to the Rose Valley Basin. As such, the Project will absolutely and without question substantially impact and degrade the Rose Valley Basin itself. Each of the presented alternatives will also reduce Little Lake's water by 10%, and what is then not clarified by the DEIR is that such impacts will last for longer than 100 years after all pumping stops. Will the Rose Valley Basin ever recover from any level of pumping? How quickly? Why aren't the lasting impacts on the Rose Valley Basin clearly identified and discussed?

P11-37 **Page ES-12:** The environmental analysis of the "No Project" alternative is flawed. The statement that the No Project alternative would shorten the lifespan of Coso is not supported by any evidence. The statements regarding the life of geothermal projects and the loss of revenue to the federal government and the County should be deleted from the DEIR. The reduction in energy production coupled with the conversion of Coso's water-cooling towers (WCTs) to an air-cooled condenser (ACC) system could actually prolong the operation of Coso indefinitely, admittedly at the cost of new equipment costs and reduced energy production. This option should be evaluated for the preservation of the Coso geothermal reservoir itself and to totally eliminate the other environmental impacts set forth in the DEIR. Moreover, the possible conversion of the Coso generating plant to other more environmentally friendly designs, such as a binary facility, must be evaluated to reduce or eliminate many of the environmental impacts already being caused by Coso, and would be made worse by the injection of water, leading to higher production rates.

P11-38 **Page ES-12:** The No Project alternative discussed in the DEIR further suggests that the Coso Hot Springs would return to a natural state sooner if geothermal operations ceased. Previously, there has been a vigorous assertion that there has been no demonstrated connection between the geothermal plant and Coso Hot Springs. Is such a connection now conceded? If so, has not the operation of Coso impacted a valuable cultural and historical resource well beyond any expectation? Should not appropriate steps be taken to correct, limit or minimize this impact?

P11-39 **Page ES-13:** When addressing the alternatives based upon lower pumping rates, it is difficult if not impossible to analyze the feasibility of the alternatives, when Coso, without supplying any evidence whatsoever, has merely "indicated that their minimum economic pumping rate may be 3,000 acre feet per year". What is the basis for this assertion? Has anyone independently verified the cost to build the Project, or has the DEIR simply relied on Coso's statements? What is Coso's expected rate of return on investment? How much energy does Coso expect to generate with respect to the injected water? How much does Coso earn on each kilowatt/megawatt of electricity produced? Is Coso including its debt service (particularly considering that Coso has already captured many times over its initial investment cost)? How does Coso's assessment of its minimum economic pumping rate of 3,000 AFY compare to its statement that a pumping rate of 500 gallons per minute (GPM) is economic? (See page 5-5, Section 5.2.3.) The DEIR should use consistent terms to measure effects, and not switch between AFY or GPM or other measures of volume of the water. What is the going market rate for the sale of an acre-foot of water or a gallon? How much in water costs is Coso saving by pumping the water compared to buying supplemental water at fair market rates? How much will Coso collect by way of energy sales for each acre-foot of water injected?

P11-40 **Page ES-13:** All of the alternatives still suggest that environmental impacts from reduced pumping will be the same, but only take longer to be realized. This is only true if the duration of the CUP for the Project is only 1.2 years. But, the Project is really for 30 years. What if the recharge to the Rose Valley Basin allows for smaller pumping and water transfers in perpetuity? Would not a reduced pumping program then permanently eliminate the environmental impacts being discussed? Absent true and long-term testing of recharge in consumption, how can a definitive conclusion be drawn that reduced pumping would ultimately yield the same environmental impacts as a much higher pumping rate? Even the charts and graphs presented do not confirm this assertion.

P11-41 **Page ES-13:** The section on Environmentally Superior Alternatives fails to consider a number of potentially feasible and far superior environmental alternatives. Unless the alternatives mentioned below are fully evaluated, it is misleading to suggest that the alternatives are not superior to the proposed Project. It is not permissible under CEQA to compare the alternatives to the Project, with mitigation. The Project itself (pumping 4,839 AFY for 30 years) must be compared to the alternatives. Clearly, the alternatives are superior.

P11-42 **Page ES-13:** This section further suggests that Coso is currently generating around 200 MW of power although its power plants are rated at somewhere between 260 MW to 280 MW, depending upon the source of information. While Coso has received the necessary "permits" to design, construct and build its three power plants at Navy 1, Navy 2 and BLM, that does not necessarily mean that Coso has been a good steward of the geothermal reservoirs available to it. Indeed, it is typical for a private power generation company to exploit the resource for the maximum amount of short-term profit at the expense of the natural resource. (See DiPippo 2008, at Section 12.7, pages 294-295.) It is only after the geothermal reservoir has been largely exhausted or depleted to the point of decline, that the operator commences a phased shutdown of its operations only to ultimately achieve an appropriate balance of power production compared to the sustainable scope of the geothermal reservoir. The dilemma of Coso was preordained, because it sought approval and obtained permits to expand its operations and power production to the detriment of the resource itself.

P11-43 **Page ES-13:** The geothermal reservoir is a part of the environment and demands protection and appropriate management. Coso's facility and its owners have exceeded the reasonable and sustainable output from the geothermal reservoir thereby threatening the resource. Thus, Coso seeks to deplete another valuable natural resource, namely the Rose Valley Basin, to support its greed and unwarranted exploitation of its geothermal reservoir. Rather than perpetuate the systematic decimation of the natural water resources at Rose Valley Basin, which will only delay the elimination of the geothermal reservoir, is it not environmentally superior to require Coso to design its plant and manage its resource to seek the sustainable production of electricity in perpetuity?

P11-44 **Page ES- 14, Table ES.2-1:** The mitigation measures of Hydrology-2 depend upon the good faith of Coso to monitor, evaluate and contact the owners of wells about any possible impacts. Coso has no incentive to do anything required of them. Coso has demonstrated throughout this process an inclination to conceal the facts, surreptitiously seek permits and obfuscate the process to the detriment of the concerned community. The reliance on Coso to "do the right thing" is misplaced. The County, or an independent consultant, should verify the application of all mitigation measures, at the expense of Coso. Would the County accept the self-serving assertions or evaluations of the Los Angeles Department of Water & Power ("LADWP")? All users, landowners and owners of wells throughout the Rose Valley must be personally contacted regarding this Project and made aware of the environmental impacts from the Project. Regular and comprehensive reports need to be provided to carefully monitor all impacts from the Project. Baseline studies of all existing wells, springs, artesian wells and other water uses throughout the Rose Valley should be conducted at least one year before any pumping is allowed. In addition to the "equipping or deepening" of wells, Coso should subsidize the energy costs to operate wells that are impacted. Coso's mitigation operations should be extended to any new wells or water uses from owners of overlying ground. Any permit to transfer water off the Rose Valley Basin to Coso should be expressly subordinated to the rights and interests of overlying owners. If any owner overlying the Rose Valley Basin detects or perceives an impact, such as a lessening of the water table, Coso's pumping must immediately stop, without the requiring anyone to prove that Coso's pumping has not caused the impact. Since Coso's pumping would overdraft the Rose Valley Basin, as demonstrated by the Hydrology Model, shouldn't the pumping stop upon any decline in the water table or supplies? Rather than the County serving as an arbitrator in any disputes, any disputes should be resolved by independent arbitration, with the initial costs borne by Coso and the ultimate costs borne as determined by the arbitrator.

P11-45 **Page ES- 14, Page ES-14:** Define the meaning of "important changes and trends in water levels." (Hydrology-3.) Clearly define all monitoring points, including each and every spring or natural artesian well within Rose Valley. The reduction of monthly monitoring reports to quarterly should only be done if the reports have shown no detectable changes. Two years is too short a time for the suspension of monthly reports.

P11-46 **Page ES-15:** How was the "significant" impact of a 10% decrease in groundwater and surface inflows to Little Lake determined? Is this an arbitrary number or a number based upon actual consideration of the impacts to the lake, ponds, wetlands and riparian habitat? Would a 5% decrease or lower be more appropriate? Why should Coso be allowed to overdraft the Rose Valley Basin at all? If the pumping Project harms existing users and owners of land overlying the Rose Valley Basin, why should they suffer any adverse impact? Monetary compensation to deepen wells and retrofit equipment does not mitigate the permanent loss of water. While there can be differences of opinion with respect to "significant", this is not a situation where Coso has a current legal right to deplete the Rose Valley Basin to the detriment of other proper and lawful owners of land overlying the Rose Valley Basin. The standard to permit the appropriation of

P11-46 water off basin should be the complete elimination of any impacts. (See *City of Barstow v. Mojave*, which establishes the priority of rights of overlying the aquifer and the complete subordination of rights by an appropriator). By suggesting the approval of the Project and accepting a 10% decrease in the water to lawful owners and users, would not the County be approving the same type of water transportation as LADWP? Since Coso has no current vested rights to deplete the Rose Valley Basin in the manner suggested, should not the County absolutely forbid any water pumping and transfer project which depletes the Rose Valley Basin? What is the justification for the County to permit an overdraft?

P11-47 Would the County accept a 10% reduction of its tax collections because it is not significant? Would LADWP accept mandatory cutbacks of 10%? Would any air pollution control district accept increases in pollution emissions of less than 10% as not significant? Would auto makers accept as less than significant a mandatory 10% increase in average automobile mileage? Would Great Basin accept increases of 10% in the air quality of the Owens Valley as less than significant? Would the CDFG accept losses of 10% or less of endangered or threatened species in an area as being less than significant? Would the State Water Control Board accept unpermitted waste discharges of 10% or less as not significant?

P11-48 **Page ES-15:** The proposal at Hydrology-4 also suggests the possibility of replacing lost water at Little Lake and downstream ponds by pumping water from an existing well at Little Lake or a new well. Would not this exacerbate the problem of the depletion of the underground water basin? How would this reverse the excessive pumping by Coso when a newly drilled or increased pumping regimen from an existing well would pump water from the same underground water basin? How long would this process continue? This is akin to "robbing Peter to pay Paul." Would not this increase the likelihood that the natural springs at Little Lake would be interrupted or stopped by the further reduction of localized underground water level decreases?

P11-49 **Page ES-17:** Potential Impact 3.2-3 suggests that the temperature of water changes to Coso Hot Springs from the injection Project is considered less than significant. It has previously been observed that the Project and Coso's continuing operations have a direct impact on Coso Hot Springs. Thus, both the injection of much cooler water into an extremely hot geothermal reservoir and Coso's continued excessive production of Geofluids through the resource must be evaluated. There is little doubt that Coso Hot Springs was impacted at the commencement of geothermal activities at Coso, despite current comments that there was no visible or conclusive evidence of a connection. Don't the reported graphs and surveys of the water level and heat at Coso Hot Springs, corresponding to the commencement of geothermal operations, demonstrate a real connection? Likewise, how can the County conclude without any evidence that the injection of cool water from the Rose Valley into the geothermal reservoir and the continuing production of Geofluids would not have a further detrimental impact on Coso Hot Springs?

P11-50 **Page ES-17:** Potential Impact 3-2.6 states there are no impacts to water quality or the degradation of existing water quality. The Project would overdraft the Rose Valley Basin. It will decrease the available supply of water. All of the overlying owners of the Rose Valley

P11-50 Basin rely exclusively upon the underground for water for a variety of purposes, including irrigation, drinking water, domestic use, dust control, supplemental sources for wildlife and vegetation. While the percentage of the water removed from the Rose Valley Basin may be relatively low compared to the total water in storage, the depletion of water may affect water quality. Moreover, the removed water from the Rose Valley Basin will be injected into the geothermal reservoir and subjected to numerous toxic and hazardous substances. Thus, the otherwise fresh water from the Rose Valley will itself become contaminated. What is the mitigation for these impacts? What is the mitigation for the loss of potable water, due to its intentional contamination?

P11-51 **Page ES-18:** Potential Impact 3.3-1 ignores the substantial depletion of the underground aquifer in the Rose Valley. The Project will deplete the underground water levels of the Rose Valley Basin leading to the potential of subsidence. (See DiPippo 2008, Section 19.5.1, page 396.) Coso is removing far more Geofluids than it is injecting, even with the addition of the proposed water from Rose Valley Basin. This may also cause subsidence. If geothermal fluid production rates are much greater than recharge rates, the formation may experience consolidation, which will manifest itself as a lowering of the surface elevation, i.e., this may lead to surface subsidence (MIT Report, Section 8.2.6).

P11-52 **Page ES-18:** Potential Impact 3.3-2 ignores impacts from potential increases of seismic activity. There has further been no consideration given to the effects on the geothermal reservoir when cool water is injected. The very purpose of the various enhanced or engineered geothermal systems ("EGS") is to inject water into geothermal reservoirs specifically for the purposes of creating fractures or fissures to create new areas from which Geofluids can be produced. (See Rose Progress Report and MIT Report.) Coso itself has been a test site for EGS. (See Geothermal Today 2003.) One of the concerns of EGS projects is the creation of seismic activity and the resulting possibility of landslides and other surface impacts. Might the injection of water from the Rose Valley contribute to seismic activity at Coso? What is the possibility of environmental harm from this activity?

P11-53 **Page ES-18:** Potential Impact 3.3-3 involves the possibility of exposing people to volcanic hazards. Geothermal production and activity by its very nature involves connections between the surface and the extremely hot, and potentially volatile, resources at depth. Geothermal reservoirs routinely manifest themselves by surface activity, such as the Coso Hot Springs. Could the injection of cool water into the hot underground geothermal reservoir cause an increase in volcanic activity? Could the injection of cool water into the hot underground geothermal reservoir cause a decrease of surface manifestations, such as Coso Hot Springs? What evidence is there to support a negative conclusion to these questions?

P11-54 **Page ES-19:** Potential Impact 3.4-1 involves the Project potential to adversely impact native vegetation, wildlife or wildlife movement. Will the aboveground structures interfere with normal wildlife migration? How does Coso plan to distribute the water at its facility for injection? Does it propose to build new pipelines and distributions systems? Will new injection

P11-54 wells be constructed or drilled? Will the CUP conditions expressly prevent the construction of new pipelines or injection wells? The noted impacts only assess the areas within the actual construction footprint of the Project, but utterly fail to address impacts upon vegetation and wildlife as a result of the water losses throughout the Rose Valley and Little Lake. The DEIR would allow a water loss of 10%. Will even a 10% water loss affect vegetation and wildlife? If so, how much?

P11-55 **Page ES-19:** Potential Impact 3.4-2 seems to provide adequate protection for any harm or impacts to the Desert Tortoise. Notably lacking are similar protections and mitigations for the Mojave Ground Squirrel (MGS), whose habitat lies within the Project area, other than reference to outdated studies and mitigation measures. Where is the rationale for not affording similar mitigation measures for the MGS?

P11-56 **Page ES-21:** Potential Impact 3.4-4 deals with indirect adverse effects on vegetation. However, does a permanent reduction in underground water levels, even limited to 10%, decrease the moisture otherwise available to surface vegetation? What is the likely result of this reduction in moisture needed by plant life, and the wildlife which relies on it? If the water losses of 10% at Little Lake continue for over 100 years after pumping stops, isn't it obvious that vegetation and wildlife will also suffer during the Project and for 100 years later? Why weren't impacts to Biological Resources over the entire 30-year Project, at full pumping rates, studied?

P11-57 **Page ES-25:** Potential Impacts 3.8-1 and 3.8-2 both deal with conflicts with the potential agricultural use of the property in question. The Hay Ranches were indeed previously used for alfalfa hay production. By buying and converting the Hay Ranch to a site solely to be used for water pumping and transportation activities, Coso has precluded any other person from seeking the utilization of this land for agricultural purposes. Moreover, the lowering of the underground water table makes the economic utilization of the surface more difficult and the cost to pump and use water from the lowered underground more costly. Has the Hay Ranch ever been used or designated as prime agricultural land? Based on its former use, would the Hay Ranch be considered as prime agricultural land? Steps should be taken to restore either agricultural use on the property or prevent dust emissions. The elimination of the Hay Ranch from possible agricultural use should be evaluated.

P11-58 **Page ES-26:** Potential Impact 3.9-1, dealing with impacts to aesthetics and visual resources, only deals with construction activities, but not the permanent erection and operation of improvements as part of the Project. More importantly, this section ignores the visual blight which could occur from the depletion of available water resources throughout Rose Valley. Highway 395 is considered to be a scenic highway, or at least a candidate for scenic highway status. It is literally traveled by millions of people seeking recreational and visual benefits of the Owens Valley and the Eastern Sierra corridor. A water loss, coupled with the degradation of vegetation and wildlife, may dramatically impact the available visual resources. If the County allows a decrease of up to 10% of the water resources at Little Lake and a reduction in the

P11-58 underground water table, how will it maintain surface vegetation and wildlife? What is the mitigation?

P11-59 **Page ES-26:** Potential Impact 3.9-2 raises the same questions as above, but more importantly, any water losses will have a dramatic effect upon water-dependent wetlands and riparian habitat. Given the arid nature of Rose Valley, what are the compensating values to replace the presumed water losses which are deemed "acceptable" by the County?

P11-60 **Page ES-26:** Potential Impact 3.10-2 involves the emission of or exposure to hazardous materials. The Project as proposed by Coso will increase the generation of steam through the Geofluids. Consequently, gaseous emissions result from the discharge of non-condensable gases (NCGs) that are carried in the source stream to the power plant. For hydrothermal installations, the most common NCGs are carbon dioxide ($CO2$) and hydrogen sulfide ($H2S$), although species such as methane, hydrogen, sulfur dioxide, and ammonia are often encountered in low concentrations (MIT Report, Section 8.2.1). Although steam is condensed when passing through a turbine, non-condensable gases such as carbon dioxide, hydrogen sulfide, sulfur dioxide, mercury, and several others pass through the turbine without condensing and are released into the atmosphere (Geothermal PEIS, Section 3.8.6, page 3-103). Of the 5% of non-condensable gases present in the steam, 75% or more is carbon dioxide. While the existing operations of Coso help to manage the NCG by converting H2S into a sulfur compound, nonetheless, Coso generates a tremendous amount of contaminated materials which must be disposed of. The Project will compound this problem, whereas a different technology and design, such as a binary design or a steam-binary hybrid, would eliminate the problem. An evaluation of alternative designs, the costs of implementing alternative designs, and the impacts upon power production should be assessed.

P11-61 The primary human health issue is the possible inhalation of NCGs that form when Geofluids turn to steam, including primarily hydrogen sulfides (H2S), but also such things as mercury, radon and benzene. The abatement systems for hydrogen sulfide were mentioned through the use of chemicals, including hydrogen peroxide, caustic soda, and catalytic compounds containing iron and nickel resulting in primarily a waste sludge of non-commercial sulfur (Geothermal PEIS, page 3-216).

P11-62 **Page ES-27:** Potential Impact 3.11-2 dealing with the adequacy of existing "water supplies" is probably a misnomer under the current circumstances for the Project. Nonetheless, Coso has no entitlement to utilize in the Rose Valley Basin water derived from its Hay Ranch water wells. As such, it does not have adequate water supplies and the Project will then reduce the water supplies available to those persons and owners having a prior right. The relative water usage rights of Coso, compared to the other overlying owners, should be examined. (See *City of Barstow v. Mojave.*)

P11-63 **Page ES-27:** Potential Impact 3.11-4 deals with the possibility of the generation of waste. No mention is made of how Coso currently handles the discharge of the waste created during its

P11-63 operations. By seeking the injection of water to prolong the presumed life of Coso, it will by necessity increase or extend the generation of waste products, such as the NCGs and the H2S compounds. How can the DEIR conclude that such waste generation is less than significant? What is the magnitude of the waste? What are its components? How is it being handled? How much more waste will be created as a result of the Project? Where is the waste being stored? Is there adequate storage? What are the health risks from the additional hazardous substances?

P11-64 **Page ES-28:** Potential Impact 3.13-1 regarding issues relating to the State Implementation Plan for the Coso junction PM10 planning area is at least suspect, particularly with respect to the conclusion that no impacts arise from the Project. As mentioned above, the elimination of water from the underground and potentially at Little Lake will naturally cause a substantial drying out of all of the surface features throughout Rose Valley. The loss of water from the Rose Valley, and Little Lake in particular, may cause a significant increase of dust, small particulate emissions, loss of air quality and related contamination. These impacts should be evaluated.

SPECIFIC COMMENTS TO DEIR

P11-65 The balance of this document will provide specific comments and details regarding the main text of the DEIR. To the extent that the County makes changes in the substantive part of the DEIR, then corresponding changes must be made to the Executive Summary. Likewise, if changes are made to the Executive Summary, similar changes are required in the body of the DEIR.

P11-66 **Page 1-1:** The Project Overview only addresses the extraction of water and delivery of the water for injection at Coso. The overview does identify the decline in the underlying geothermal reservoir as a result of the evaporation of Geofluids from the power plant cooling towers. The overview does not define the objectives or goals of the Project.

P11-67 **Page 1-2:** The Project location as shown in Figure 1.1-1 fails to identify the related BLM power plant. Why?

P11-68 **Page 1-3:** The DEIR identifies earlier environmental impact statements (EISs) done in the early 1980s. While suggesting that the early EISs established baseline reports for air quality, geology, hydrology and other impacts, there is little doubt that much has changed in environmental analysis in the succeeding 30 years. Should new baseline studies be performed? Why does the DEIR rely upon previous studies which were clearly done in a completely different context?

P11-69 The DEIR suggests that the use of groundwater from Rose Valley was considered in these earlier environmental documents. While accurate, this one sentence fails to also mention that all of such reports <u>rejected</u> the possibility of the use of the water from the Rose Valley as being unlikely. (See 1980 EIS, page 1-28.)

P11-70 **Page 1-3:** The DEIR states that the environmental impacts from the existing geothermal power plant operated by Coso to generate electric power ("Electric Plant") were not evaluated because they were considered under earlier environmental reports. What is the legal or factual basis for this conclusion? While the Coso Electric Plant was approved, was there any analysis of the impact of its production on the geothermal reservoir itself? Does an environmental analysis performed 20 or 30 years ago supplant the need to analyze current environmental impacts based upon the current state of the art? Won't the current Project increase the production of steam from current baseline levels? Shouldn't the DEIR address the cumulative impacts from greater steam production?

P11-71 The current Project to pump and import water for injection is a fundamental modification of Coso's permits to operate. Simply because Coso has one or more permits to operate its Electrical Plant and produce up to 270 MW, does not provide an exception under CEQA to study the new impacts caused by the Project. (*Communities v. South Coast.*) Coso's existing permits are not the baseline for environmental analysis. The Project will change the way Coso operates. The permits do not reflect existing physical conditions as a baseline. The Court of Appeal in the *Communities v. South Coast* decision concluded that "a project's baseline is normally comprised of the existing environmental setting - - not what is hypothetically allowed pursuant to existing zoning or permitted plans." Similarly, the Court of Appeal in *Communities v. South Coast* further concluded that the increased use of existing equipment must be evaluated as part of the DEIR. The capacity of the current equipment of Coso is not part of the baseline. (*Communities v. South Coast*) The DEIR's reliance upon Coso's existing permits to avoid any discussion of modifications to its Electrical Plant or to consider additional impacts from the Project is flawed and contrary to the mandates of CEQA (*Communities v. South Coast*).

P11-72 The DEIR then suggests that the proposed Project would not extend the life of Coso's power plant beyond what was permitted. What is the basis for this assertion? What was the original expected life of Coso? Was it anticipated that the plant would operate until 2035? Did the original permits contemplate or allow the importation of water from Rose Valley? Did Coso exceed a sustainable production of Geofluids? Would a lower production of Geofluids extend the life of Coso without the importation of water? What is the justification for the importation of water? What is the economic benefit to Coso of importation of water? Did any of the prior environmental reports indicate the presumed production capability of the Coso plant? Wouldn't the Project extend Coso's life beyond the current baseline duration? What is the factual support for all answers to all of the foregoing questions?

P11-73 The 1988 EA addresses questions about the projected life of Coso. According to an earlier study performed by Dykstra in April, 1985, he estimated the potential power beneath the 4,195 acres of the Navy land, and calculated that this would represent a 30-year life for a 239-MW power-plant. (Dykstra 1985, Page 2-4) Additional tests and studies have been made and in September, 1986, Dykstra again estimated geothermal reservoirs on the BLM lands at 30 years. (Page 2-4) What is the justification for assuming a 50-year life? The 1988 EA also found that the

P11-73 steam condensate from Coso would supply all of the water requirements for the cooling system (Page 1-32). Similarly, the 1988 EA says the power plants will use geothermal condensate as the source for cooling water, and also if not evaporated would be injected at depth into the reservoir. (Page 3-8) Does this now seem like an overstatement?

P11-74 Some mention is made throughout the DEIR about economics of Coso in a range of different comments (expense of alternatives, reliance on revenues generated, etc.). Allegedly, Coso's has the capacity to generate enough electricity to provide power to approximately 250,000 homes. Coso employs approximately 91 people and is one of the largest taxpayers in Inyo County, including the generation of approximately $5,000,000 average tax revenues for Inyo County. None of this should be relevant to an analysis of the environmental impacts of the Project. Nonetheless, if these comments are to remain in the DEIR, then the County should ask and provide answers to the following questions: How much does the Electrical Plant really benefit Inyo County, other than through the receipt of tax dollars? According to the last census in 2000, Inyo County only has approximately 18,000 residents, living in 7,700 homes. Who is receiving the electrical power generated at Coso? Proportionately, very little of the power is used in Inyo County. The closest large town is Ridgecrest, located in Kern County. Where do Coso's employees shop and spend their employment compensation? The answer is most likely in Kern County. What government and public services must Inyo County supply to Coso, and at what cost? Should the residents of Inyo suffer the environmental damage caused by the Project, so that Coso, a private, for-profit company, can continue to earn approximately $50,000,000 per year in net income? (See Coso's 10-K 12-31-2004.) Approximately 90% of Coso's employees reside in Ridgecrest, in the County of Kern. (See Ridgecrest Chamber Report.) Coso received total electricity revenues of $2.3 billion from 1987 through 2003. (GAO Report 2004, page 2) Why cannot Coso use some of its enormous resources to design and operate a more efficient electric generating plant, and truly minimize the environmental harm it expects to cause?

P11-75 **Page 1-3:** The DEIR mentions that both the US Navy and the Bureau of Land Management ("BLM") have an independent obligation to consider the environmental impacts from the Project. While BLM has performed an environmental assessment (EA) under the National Environmental Protection Act ("NEPA"), this comment fails to disclose that the EA was performed over three years ago and failed to consider all of the environmental impacts which are now introduced by the DEIR. How can the current Project be logically evaluated by the US Navy and BLM based upon the current data provided by the DEIR? Why wasn't a joint environmental document under CEQA and NEPA prepared?

P11-76 What is the basis for the assertion that BLM has not finalized the EA? BLM has failed to respond to numerous letters from the undersigned regarding the updating of the EA. Are the Project and the approval of the DEIR contingent upon such new updating or revision of the EA? If not, why not?

P11-77 **Page 1-5:** While an initial study was performed in 2006, a new environmental initial study was performed in 2007. The County never determined that an EIR should be prepared.

P11-77 Rather, due to the objections raised by Little Lake Ranch, Coso withdrew its earlier application and prepared a new application for the Project in 2007. The statements of Section 1.2.2 should be revised to accurately state the background.

Page 1-5: At Section 1.2.4, some but not all of the public comments in connection with the scope of the pending DEIR were included. All of the submitted letters and scoping comments should be incorporated in the DEIR, including:

1. Letter from California Regional Water Quality Control Board, Lahontan Region, dated October 29, 2007. (Scoping – Water Board)
2. Letter from Mike Prather, former chairman of the Owens Valley Committee received by County on October 30, 2007. (Scoping – Prather)
3. Letter from Carla Scheidlinger, president of Owens Valley Committee, dated November 2, 2007. (Scoping – OVC)
4. Letter from the Native American Heritage Commission dated October 22, 2007. (Scoping – NAHC)

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5. Meeting notes from meeting dated October 22, 2007 among Inyo County staff and the EIR consultant, MHA/RMT. (Scoping – MHA)
6. Memorandum from Geologica dated October 29, 2007 discussing the proposed pumping tests. (Scoping – Geologica)
7. Letter from Bishop Tribal Counsel dated November 6, 2007. (Scoping – Tribal Council)
8. Letter from LADWP dated November 1, 2007. (Scoping – LADWP)

Was there a particular reason for not including these letters as part of the DEIR? If not, please add them.

In a letter from MHA to the ICPD dated November 20, 2007, MHA reported on the comments presented to the scoping meeting for the EIR (MHA Letter 11-20-07). The purpose of the letter was to describe all of the comments which would have required MHA to perform P11-79 studies or analysis beyond the scope of its contract with the County. There is no indication of the County's response. What was the outcome of these discussions? Have all of the comments outlined in MH's letter been addressed in the DEIR? If not, specify exactly the reasons that the DEIR did not address the comments and the basis for the refusal to do so.

P11-80 **Page 1-6:** Section 1.2.6 describes the process for the approval and certification of the DEIR, following the process to address any questions or comments on the DEIR. However, this section ends with the Planning Commission. The section should be modified to also indicate that the certification of the DEIR by the Planning Commission may be appealed to the Board of Supervisors for a hearing de novo.

P11-81 **Page 1-7:** With respect to Section 1.2.7, see the comments regarding Section 1.2.6.

P11-82 **Page 1-7:** Section 1.2.8 mentions that the Mitigation Monitoring and Reporting Program ("MMRP") is not required to be included in the EIR. The various mitigation and reporting requirements of the DEIR are scattered throughout and not comprehensively provided as part of the DEIR. While perhaps not required by CEQA, the establishment of the MMRP would greatly assist the consideration of the Project, its impacts on the environment, and what steps are proposed to minimize the impacts. Why is a comprehensive mitigation plan not included, notwithstanding minimum CEQA requirements? Can the MMRP be provided for public review and comment?

P11-83 **Page 2-1:** In order to adequately assess all of the environmental impacts from any project under CEQA, a fundamental requirement is to adequately describe the proposed Project and to clearly define the objectives of the Project. The Project description, even with the various components of the Project described in Article 2, is deficient. The objectives are only written to maintain energy production and resulting tax revenues to the County. These are not valid objectives under CEQA.

P11-84 State the total number of power generators located at Coso and the number of generators at each of the independent projects known as Navy 1, Navy 2, BLM West and BLM East. What is the rated capacity of each power generator? Which of the generators are still being used to generate electricity? What is the capacity of those generators currently being used? How much energy is actually being produced at each generator? Provide a summary of the amount of power generated by Coso over the last 20 years and the revenues and profits generated therefrom. Would the water injection from the Project allow Coso to resume generation from any of the mothballed generators? Without the Project and if Coso took no remedial action, what is the estimate of the number of generators removed from production and over what period of time?

P11-85 Has the County requested access to and analyzed the geothermal reservoir model of Coso? Does the County understand the geothermal reservoir? Has Coso justified its request for the transportation of water from Rose Valley? If so, what is the proof and evidence? Has the County or Coso considered ways to avoid the importation of water?

P11-86 **Page 2-1:** It is suggested that the supplemental injection of water would help minimize the reservoir decline and production decline through the replacement of lost Geofluids. This sentence alone raises numerous questions and issues which are not addressed in the DEIR. What is the annual production of Geofluids? What is the relative portion of liquids compared to

P11-86 steam? Over the past 10 years, what is the total amount of fluids produced and the relative proportion between liquids and steam? How has the energy production varied depending upon production of fluids? What has been the annual production of electricity by megawatt (MW) compared to fluid production? What has been the relationship of the number of production wells compared to fluids produced and in MW hours? What is the available production of fluids compared to natural recharge of the geothermal reservoir? Has Coso exceeded the natural recharge of the reservoir by excessive production wells?

P11-87 The only known public reports dealing with the production of Geofluids and the related re-injection thereof are those annual reports published by the California Department of Conservation Division of Oil, Gas, & Geothermal Resources ("DOGGR"). Refer to the annual reports of DOGGR published in 2006 and 2008 (DOGGR 2006 Report and DOGGR 2008 Report). These reports do reflect a steady decline in both production and injection rates, however, the injection rate as a percentage of the produced Geofluids continues to widen. The cause, of course, is evaporation at the WCTs, and it is this aspect of the Coso facility that must change.

P11-88 At Section 2.1.2 the primary purpose is stated to be to supply supplemental injection of water to the Coso geothermal reservoir. What will the injection water be used for specifically? When will injection occur? What is the injection distribution system? How many wells will be injecting water? What is the energy being used to both extract water, transport it to Coso and inject it? What is the predicted result of the injection? Will the injected water partially be used to seek an enhanced geothermal system (EGS) solution to the decline? Is the Project really to allow Coso to conduct theoretical experiments regarding unproven EGS technology? If not, will the CUP conditions forbid the use of the water for EGS studies or tests?

P11-89 Coso has been involved in multiple studies to prove EGS technology and increase output by using EGS. (See Geothermal Today 2003, pages 24-25.) What are the results of these studies? What water was used to conduct the studies? Does Coso have any ongoing EGS projects? Explain the status of all EGS projects and the contemplated source and use of water.

P11-90 The third sentence of Section 2.1.2 admits that a major cause of the decline is the loss of Geofluids through evaporation in Coso's water-cooling towers (WCTs). Why did Coso build a geothermal power plant in an arid high desert environment utilizing WCTs? Could the water loss be reduced or eliminated through the use of air-cooled condensers (ACCs)? Why should the environment suffer due to business decisions made 30 years ago? Was any consideration made to the use of ACCs compared to WCTs 30 years ago? Is the goal of profits for a private concern more important than environmental impacts? Has any consideration been given to the balance of water production from the geothermal reservoir compared to natural recharge? If not, why not? What is the basis for any economic considerations compared to environmental hazards? What is the current percentage of steam compared to liquids from the produced fluids? Are there other systems which would allow 100% recapture of the Geofluids to be injected? Should Coso create

P11-90 a sustainable power plant, without reliance on imported water and without extreme environmental harm? (Geothermal Sustainability 2006.)

P11-91 To easily explain the operation of a typical water-cooling tower, refer to the Wikipedia article which describes a "counterflow" water-cooling system such as is used by Coso (Cooling Towers -- Wikipedia). These types of systems are further explained in the DiPippo Report, and depicted in the Photographs contained therein. Note the huge amount of water vapor lost to the atmosphere.

P11-92 The DEIR at Section 2.1.2 then asserts that the injection of 4,839 acre-feet per year (AFY) of water would reduce the reservoir decline by 50%. Does this refer to the steam component of the Geofluids, or all of the Geofluids? What is the current decline rate that the 50% reduction would apply to? What is the factual basis on which this conclusion was made? Where are the studies? What is the proof that injection of the water would actually result in increased production at Coso? How much water has been lost through evaporation during each of the preceding 20 years? What is the rate of injection over the preceding 20 years? How much has it declined per year?

P11-93 **Page 2-1:** The DEIR then suggests that the slower decline rate of the geothermal reservoir would allow megawatt production to be maintained at an economical level. Who determines what the economic level is? Why is that considered in the DEIR? Should the sentence be deleted? What is the alleged profit standard of Coso to satisfy the economical level? Please produce the financial report to prove what is or is not an economical level of production. Is Coso's debt service part of the analysis? Has the County considered that Coso has completely paid for all of its capital improvements, likely many times over, in assessing the profitability of Coso?

P11-94 **Page 2-1:** The next observation of the DEIR is the pending Project would not extend the operating period of Coso beyond "planned operating periods". Please identify the presumed or expected operating period. Were the permits granted for a specific period of time? How can this DEIR estimate or conclude what the projected life span of Coso was? What would be the planned life expectancy of Coso if it extracted Geofluids from the reservoir at a lower mass flow rate? What if Coso's production of fluids were balanced against the natural recharge plus reinjection? What would be the estimated life span if Coso had used ACCs rather than WCTs?

P11-95 The DEIR suggests that when Coso was first developed, it could continue to operate until 2031. This indicates that Coso had an anticipated lifetime of almost 50 years without water importation. This is far in excess of the normal anticipated lifetime of a geothermal facility, and particularly for Coso. What is the evidence to support this conclusion?

P11-96 It was Coso that wanted to maximize production, not any of the governmental agencies giving Coso permits, or the utilities buying the energy. Why should the environment suffer because Coso determined to produce more energy than the resource would permit on a renewable

P11-96 basis? Why shouldn't Coso be limited to natural recharge of the geothermal reservoir in order to maintain a fully sustainable geothermal facility? The 1980 EA says the estimated life of the field is unknown. The 1980 EA assumed that a 50 MW power plant will use approximately 2,300 AFY of which 600 AFY would be replaced by natural recharge resulting in a deficit of 1,700 AFY. The importation of water is assumed but not planned, because the injection of imported water to preserve the Geofluids is considered unrealistic in an area as arid in water resources as in the CGSA. (Page 1-28) What new studies have been performed to confirm, modify or reject this assumption? Please provide the data. Knowing of the water losses in advance of operations, why didn't Coso use ACCs?

P11-97 **Page 2-1:** The DEIR then makes a rather presumptuous statement that "the life of the power plant is indefinite." What is the factual basis for this statement? Is this conclusion true regardless of the amount of production from the geothermal reservoir? If Coso exceeds natural recharge, how can it be stated that the life of the power plant is indefinite? Should the statement really say that the geothermal reservoir in the form of the heat available is indefinite, but the overutilization of the Geofluids contained in the resource could render a power plant to have a limited life?

P11-98 The DEIR continues to indicate that the existing permits for Coso are to be reviewed in 2031. Which permit so states? Provide copies of all Coso permits. Was there any analysis at the time of the capacity of the geothermal reservoir?

P11-99 Section 2.2 suggests that the "Project" is centered at the Hay Ranch adjacent to Highway 395. This is hardly an accurate description of the location. While the water wells are located on the Hay Ranch, within a relatively small footprint, the major aspects of the Project involve the construction of and operation of the 9-mile water transmission lines, the distribution of the water throughout the extensive footprint of the Coso geothermal facilities, the potential impacts in all of the surrounding areas, and the injection of the produced water into the geothermal reservoir.

P11-100 **Page 2-4:** Under the section entitled Construction, a 4.75-acre pad would be leveled and drainage would sheet flow from the components. Has the change in drainage been studied? Will this create additional erosion? Are additional permits required for the construction or drainage?

P11-101 **Page 2-4:** Under the Operation and Maintenance section, it is suggested that a replacement well may be drilled and an existing well abandoned. Such a future project is beyond the scope of the DEIR. Where would the replacement well be located? What regulations would be consulted to determine abandonment and redrilling? This sentence should be deleted.

P11-102 **Page 2-9:** Under the section entitled Substation and then Component Description, the power usage is described as 2.5 megawatts (MW). No time period or length of power generation is stated. Is the 2.5 megawatts measured by hour, week, month or year? There is a further comment that a portion of the Hay Ranch property will be sold to Southern California Edison (SCE). What portion of the property is contemplated? Why does the sale occur? What is the

P11-102 impact from this transaction? What are the benefits or detriments of the sale to SCE? Does this represent a cumulative impact from the Project that must be studied?

P11-103 **Page 2-10:** Landscaping is proposed to filter the views from the use of the substation from Highway 395. The mitigation measures are not adequate. Consider all of the viewshed mitigation standards as proposed by the Programmatic Environmental Impact Statement for Geothermal Leasing within the BLM and the United States Forest Service (USFS) land ("Geothermal PEIS"), including the Visual Resource Managements set forth in Exhibit A. A portion of the pipeline will be buried, but a portion will be aboveground. Do these aboveground sections interfere with any wildlife migration routes?

P11-104 **Page 2-13:** Under the continued section concerning the Water Storage Tanks, the very large 1.5 million-gallon storage tank is proposed to be located on Navy property. Have this location and the environmental impacts therefrom been analyzed under NEPA? What will the environmental impacts be from this storage tank? What permits or approvals are required for Coso to locate, design, construct and operate the storage tank?

P11-105 **Page 2-14:** At the section heading Injection System the transported water is stated to connect to the existing injection system at Coso. Are all pipelines and injection wells already in existence? Are new distribution systems planned? What additional environmental impacts will be caused from injection facilities? Will the CUP be conditioned to forbid new injection systems, except upon further environmental review?

P11-106 **Page 2-14:** Section 2.4 briefly addresses the construction schedule and personnel. However, no information is provided regarding the variable operational expenses, nor the expected energy production compared to cost. In considering the feasibility of alternatives, at least to the extent that any alternative is considered infeasible due to cost and benefit, a baseline of the projected cost and benefits from the Project is essential. What calculations have been done? What information has been provided by Coso to determine a cost versus benefit analysis?

P11-107 **Page 2-17:** The list of permits may not be complete. Depending on the final monitoring program used at Little Lake, additional permits may be required from the California Department of Fish and Game and the California Regional Water Quality Control Board – Lahontan Region to construct and operate the monitoring equipment. (See Zdon Memorandum 9-2-08.)

P11-108 **Page 3.1-2:** At Section 3.1.5, should additional Project components be listed, including the Rose Valley Basin, the water itself as pumped, transported and injected, the existing or new pipelines, and new injection well distribution systems at Coso, the geothermal reservoir, the roads or other access to each of the foregoing components, the air surrounding the physical components of the Project, and the new monitoring wells and components?

P11-109 **Page 3.1-2:** The statement that the Project would not extend the life of the plant beyond what is currently permitted may or may not be true, but is also misleading. What is the current

P11-109 permitted duration of Coso? What is the expected life of Coso without the Project? What is the existing baseline environment consisting of Coso's utilization and completion of the geothermal reservoir? Would a reduction in output extend the life of Coso without the Project? By injecting fresh water from the Rose Valley Basin, will not that fresh water become contaminated in the geothermal reservoir and be returned to the surface? What environmental impacts arise from water produced at Coso resulting from the injection that should be addressed? Are there other means or alternatives to extend Coso's life without the Project? While Coso may be permitted to produce the Geofluids as quickly as it deems economically prudent, which also depletes that resource, is that sufficient justification for the impacts arising from the Project? Did the permits or environmental studies ever authorize the taking of water from Rose Valley? Did Coso's earlier environmental studies specifically reject the importation of water, or at least doubt that it would be a viable alternative? In light of Coso's knowledge that the Rose Valley should not be used as a water source, why did not Coso manage the geothermal reservoir for sustainability? Does the profit generated by Coso and the taxes or royalties it pays to the County, US Navy and BLM justify the environmental harm?

P11-110 The MIT Report at Chapter 8 deals almost exclusively with the environmental impacts from proposed EGS developments. While presented in connection with EGS systems, the analysis relates almost identically to current geothermal plants and their impacts upon the environment. The design of the plants themselves may need to take into consideration these environmental impacts to reduce the environmental impacts to the extent possible. Section 8 of the MIT Report presents a comprehensive overview of environmental issues, summarizes the body of experience from hydrothermal plants, contrasts geothermal operations with alternative systems, and estimates the impact from EGS operations, although virtually all are equally applicable to all geothermal facilities (MIT Report, Section 8.1).

P11-111 **Page 3.2-1:** The thesis prepared by Charles Bauer in 2002 called the Hydrology of the Rose Valley and Little Lake Ranch, Inyo County, California, is a source of considerable factual data (Bauer Thesis). This document was compiled as a master's thesis by a student. How reliable is the data? Should new or similar studies be performed by an experienced hydrologist over a longer period of time? What were the prevailing weather conditions during the time of Bauer's measurements?

P11-112 **Page 3.2-2:** There are repeated references to the "long-term pumping test" conducted in November and December, 2007. The characterization of the 2007 pumping test as "long term" is misleading and should be deleted. The test only lasted for 14 days. A 14-day pumping test should not be described as "long term". Indeed, only multi-year or even decades long monitoring of surface wells, spring flows, underground water table levels and the like can effectively provide meaningful data as to water availability, recharge, discharge, water balances, etc. Rather than being argumentative about the length of the test, wouldn't it be better to just call it the 2007 Pumping Test or replace it with the 14-day pumping test, or use some other neutral description? Similarly, referring to the test as lasting 20 days is also misleading. The actual pumping lasted for 14 days, while monitoring occurred for an additional 6 days.

P11-113 **Page 3.2-2:** The use of the word "defensible" to characterize the forecast of the aquifer behavior is troublesome. Should it be deleted? The purpose of the DEIR is not to defend the Project, but rather properly evaluate environmental impacts.

P11-114 **Page 3.2-4, Figure 3.2-1:** This figure omits the Deep Rose property situated very close to the Hay Ranch. It purportedly has a water well. The Little Lake property west of Highway 395 also contains a significant seep. What other significant wells, springs, seeps and other water features have been omitted, deleted or overlooked? Some, but certainly not all, of the springs evident in the Rose Valley are briefly described and reflected on Figure 3.2-1. A number of springs which provide water to Little Lake are not shown. All springs should be identified.

P11-115 **Page 3.2-5:** The DEIR uses different reference points for describing where the springs are and their relationship and elevations in comparison to the Hay Ranch wells, and the groundwater table at the Hay Ranch. All springs and other water features should be measured from the Hay Ranch wells and their relative elevations should be also stated to avoid confusion. For instance, the Davis Spring discharge is stated to be 600 feet higher than the groundwater table at Coso Junction, but no distance from the Hay Ranch is given. Coso Junction is far south of the Hay Ranch. The Hay Ranch has a much higher elevation than Coso Junction, but the comparison to Davis Spring is not noted. Thus, it is difficult, if not impossible, to confirm the observation that the Davis Spring is unlikely to be affected by the pumping. What is the test data or other evaluation used to reach this conclusion? What tests or monitoring has been done to confirm the source of the waters in the Davis Spring?

P11-116 **Page 3.2-6:** An accurate description of the Little Lake history is not provided. An archaeological analysis of sediment cores taken from the Lake in 1974 provides a fairly accurate history of water availability for the last 5,300 years. From about 5,000 to 3,000 years ago, the Little Lake catchment consisted of salt grass meadow, marsh and ponds, and then the sediments and fossils indicate a shallow lake, with a brief return to marsh deposits at about 2,200 B.P. Sediment structure at the coring sites near the present center of the Lake suggests a seasonally dry lake edge at about 1,500 and 900 years ago. The presence of surface water, whether in the form of permanent springs, streams, lakes or ponds was an extremely important consideration for prehistoric people of the region. The fact that this locality comprised an oasis-like environment for several millennia was probably one of the most significant elements affecting use and habitation. Few archaeological sites in California exhibit the abundance of cultural material or as much evidence of prehistoric occupation as does Little Lake. (See LLR History-Pearson)

P11-117 More information about the history of Little Lake, its water sources, the loss of water following an earthquake in or about 1971, and the efforts of the members of Little Lake Ranch to manage the property can be seen from the pictorial work and narrative supplied by one of its oldest and longest members, Dr. Richard Neuman, a member of Little Lake Ranch since 1965. (Refer to the LLR History-Neuman.) Dr. Neuman is also an accomplished amateur biologist, who is well known for his biology work.

P11-117 Following the substantial depletion of the Lake in 1971, the members began drilling the well called the Little Lake North Dock Well in late 1974. The water from this well helped to replenish the Lake. The members also located at least two springs in 1975 which fed into the Lake, and began a process of digging them out and removing debris which affected their function. Dr. Neuman was himself vitally important to this process, and we are in the process of naming one of the springs and a small cove towards the northwest side of the lake "Neuman's Cove" in his honor. By 1980 or so, the Lake had recovered and no further water was needed from the well. The springs to date have fully provided all of the water needed to maintain the Lake. (See LLR History-Neuman.)

P11-118 **Page 3.2-6:** The former chief planner of ICPD, Janice Larsen, sent an e-mail to Laurie McClenahan Hietter of MHA on September 26, 2007 (Larsen E-mail 9-26-07). Ms. Larsen suggested that the EIR "describe Little Lake as a privately held 'reservoir' (not a natural 'lake') and it is being operated as a private duck hunting preserve. It is NOT a 'ranch' because one of the conditions of their grants for habitat reservation was that there was to be no grazing." While perhaps not germane to the DEIR, this certainly suggests a significant bias on the part of at least one member of the Inyo County Planning Department staff to characterize and demean the efforts of the Little Lake members to manage their habitat and preserve their property without impact from the Coso Project. What is the purpose of such a statement other than to prejudice the community against Little Lake? This statement is also not factually correct. Little Lake has been a water resource for thousands of years. The objection to the characterization of the property as a "ranch" is also wrong. The mere grazing of animals is not an exclusive characterization of a ranch. Fortunately, the thoughts of Ms. Larsen were not incorporated into the DEIR, but the existence of this type of communication calls into question the objectivity of the DEIR and how the planning process was conducted. What other data in the DEIR was slanted in favor of the Project?

P11-119 The references described in the DEIR include an e-mail dated November 9, 2007 from Steven Bjornstad with the US Navy to Chrissy Spanoghi, a consultant with MHA, or its parent RMT (Bjornstad E-Mail 11-9-07). In discussing the availability of access to the Coso Geothermal Plant and the larger Coso area in general, Mr. Bjornstad said "Did you know that an LA Times reporter has been '<u>blustering</u>' around the project the past few days? It is unclear who has him spun up, although we suspect the Little Lake folks." This e-mail from November 9, 2007 obviously refers to the community efforts to obtain information about the proposed Coso water-pumping project. The concluding sentence or two certainly indicates that Mr. Bjornstad, an employee or representative of the US Navy, seems exasperated by the attention of the public and reporters. Does this indicate a preconceived bias against the legitimate interests of Little Lake and the community?

P11-120 **Page 3.2-6:** Reference is made to the mitigated negative declaration prepared in conjunction with the Little Lake Habitat Restoration Project. ("LLR MND") The LLR MND was never certified. Instead, LLR was required to process and obtain a full environmental

P11-120 impact report ("LLR EIR"). The Project was further described in an updated report which should be attached ("Habitat Update"). A copy of the LLR EIR and Habitat Update should be attached to the DEIR as well. The baseline environmental condition of the LLR should be included. (See DU Letter 8-29-08 describing the importance of Little Lake to local and migratory biological resources.)

P11-121 **Page 3.2-16:** See comments above about how to describe the 2007 Pumping Test.

P11-122 **Page 3.2-18:** The DEIR indicates that only 300 acres of the 1,200-acre Little Lake Ranch property hosts plants. How was this conclusion reached? What is the basis of asserting that only 300 acres of land are used by habitat? Indeed, the figure should be much higher. Although Little Lake is located within a high desert area, it has a plethora of plant life, all of which depends upon water resources. Should the DEIR differentiate between the riparian wetlands habitat versus the natural habitat throughout the area?

P11-123 The cinder mine operations on Cinder Road actually receive water from Little Lake's wells. The general manager indicates that the cinder mine does not have its own well or access to any other water sources. Little Lake supplies approximately 45 truckloads of water per month, averaging 3,800 gallons per truckload, or 171,000 gallons per month. There are 325,851 gallons in 1 acre-foot, so Little Lake provides the Cinder Block facility about 6.3 AFY of water. Should this consumption be factored into the Hydrology Model? If Little Lake suffers a 10% loss of water supplies, it may be unable to continue water deliveries. How would this water loss be mitigated?

P11-124 Use of the word "conservative" to describe how the groundwater budget was determined is questionable, in light of the information contained in the Zdon Memorandum 9-2-08. It appears that the consultant did not use real data nor make good-faith assumptions in preparing both the groundwater budget and the Hydrology Model. The Hydrology Model should be conservative to avoid impacts. This should be made clear and the DEIR be presented in objective fashion.

P11-125 **Page 3.2-19:** There is a sentence regarding the outflow of saline geothermal brines from Coso. Is this surface discharge or subsurface underflow? Does Coso actually discharge brine water, or is it only re-injected Geofluids? What is the chemical composition of the brines? Are they hazardous? Where do the brines travel from the geothermal reservoir? Does the reinjection of brines increase the level of contaminants in the geothermal reservoir?

P11-126 **Page 3.2-21:** Samples of the Little Lake group of water reflects a slightly higher amount of total dissolved solids (TDS) of 1200 mg/L compared to those of the Indian Wells Rose Valley and Coso-Argus Group waters. What accounts for the higher level of TDS at Little Lake? Is the much higher TDS level associated with the geothermal brine at Coso, estimated at 10,000 mg/L, a possible cause of the declining water quality? Is the geothermal brine being injected at lower levels in the geothermal reservoir? Is the brine being discharged at the surface, allowing for

P11-126 more percolation and recharge into the Rose Valley Basin? What is the depth at which Coso injects a portion of the produced Geofluids? How do the Geofluids impact the water quality of the Rose Valley Basin and the Little Lake group of waters? Will the reduction of water by the Project reduce water quality within the Rose Valley Basin? Will the reduction of cleaner and fresher water of the northerly Rose Valley waters reduce water quality at Little Lake?

P11-127 **Page 3.2-23:** This suggests that the waters at Little Lake are generated primarily by the more southerly portion of the Sierra Nevadas within the Rose Valley, and perhaps geothermal waters from the east and not as significantly from the underground waters around the Hay Ranch area. The DEIR notes that "significant evaporation" would have to occur at Little Lake to change its water chemistry to contradict this presumption. Is not evaporation and transpiration of the Little Lake group of waters already occurring? Is not the evaporation at Little Lake far higher at Little Lake than anywhere else in Rose Valley? How much more evaporation would have to occur before it is considered "significant"?

P11-128 **Page 3.2-24:** The stated injection rate at Coso of approximately 50% in the 20 years of production has resulted in a decline in pressure. Provide a chart accurately reflecting the amount of Geofluids produced per year compared to injections. Has there been a continuous decline in injection rates? What accounts for the decline in injection rates? What are the means by which the injection of Geofluids at Coso could be increased?

P11-129 **Page 3.2-24:** The DEIR states that there is no natural recharge of the geothermal reservoir. What is the evidence that there are no natural recharges to the geothermal reservoir? Have any studies been performed on this assertion? When was the lack of recharge first discovered? Did Coso know about this assertion when it designed its plant? If not, why not? What design decisions did Coso make in recognition of the lack of recharge? If there is no recharge, why was WCT used in lieu of an air-cooled system?

P11-130 Recharge to the Coso geothermal reservoir has been considered previously. According to the Fournier Recharge Study, recharge to the geothermal reservoir seems to come from "rain and snow that falls on the Sierra Nevada about 25 to 45 km west of Coso. This recharge water probably descends along east-dipping faults in the Sierra Nevada granites (the field and others and press) and migrates deep underground toward the Coso geothermal area." (Fournier Recharge Study, page 16.) In the conclusions from the Fournier Recharge Study, the conclusion was that "recharge into the deep part of the geothermal system probably comes predominantly from the Sierra Nevada. The main upflow in the hydrothermal system appears to be along a north-northeast-trending fault beneath Coso Hot Springs." (Fournier Recharge Study, page 23.) What is the natural recharge rate of the Coso geothermal reservoir, if any? At what rates could Geofluids be produced without exceeding natural recharge? Has the rate at which Coso produced Geofluids exceeded natural recharge rates? Will the geothermal reservoir suffer less of a decline by reducing production rates? What would be the impact upon energy production by a reduction of production rates?

P11-131

Additional conclusions drawn from the Fournier Recharge Study include the following:

> "Figure 5 is a west-east cross section showing our preferred model for the recharge of the hydrothermal system at Coso. In that model, recharge for a deep, chloride-rich, hot water comes predominantly from rain and snow that falls on the Sierra Nevada about 25 to 45 km west of Coso. This recharge water probably descends along east-dipping faults in the Sierra Nevada granites [cite omitted] and migrates deep underground towards the Coso geothermal area".
>
> "Some local underground oiling takes place below Coso Hot Springs, Devils Kitchen, and a few other localities to furnish the steam and acid gases that are responsible for the fumaroles and acid sulfate pools at the earth's surface."
>
> "However, as discussed above, an impermeable barrier formed by mineral deposition probably prevents much migration of the geothermal fluid into the Rose Valley aquifers. We find no chemical indication of influx of thermal water into the Rose Valley gravels."
>
> "The deuterium concentration in the deep geothermal water is similar to that in the Sierra Nevada groundwater and is different from that in the Coso range water. Therefore, recharge into the deep part of the geothermal system probably comes predominantly from the Sierra Nevada."
>
> "The main upflow in the hydrothermal system appears to be along a north-northeast-trending fault beneath Coso Hot Springs."

P11-132

According to the MIT Study, most geothermal reservoirs completely recharge on average in approximately 100 years. (See MIT Report.) If the geothermal reservoir is not recharged, does not logic dictate that 100% of all Geofluids produced must be reinjected to maintain the geothermal reservoir? Is not the use of Coso's water-cooling towers fundamentally causing the destruction of the geothermal reservoir? Did Coso knowingly allow for the depletion of the geothermal reservoir?

P11-133

California Energy Company, Inc. ("Cal Energy") submitted a Plan of Operations on July 29, 1985 as the operator of Coso Land Company which is a joint venture between Cal Energy and Caithness Geothermal 1980, Ltd. The Plan of Operations was prepared to conduct geothermal exploration activities under a Coso lease, CA-11402. The purpose of the Plan of Operations was to drill a sufficient number of geothermal wells to define the geothermal reservoir and predict commercial production capability. A total of 8 potential drilling sites were selected. (1985 EA, Pages 2-3) Coso, or its predecessor, should have been well aware whether the geothermal reservoir was being recharged or not as part of the extensive exploration phase of the development, given the number of wells being drilled.

P11-134 Cal Energy, acting as the operator for the Coso Land Company, then proposed production and injunction injection wells within the KGRA on Lease No. CA-11402. Eight exploratory well pads were approved and 17 additional well pads and related structures are now proposed. (1988 EA) According to the 1988 EA, if water demands during the operations of Coso exceeded capacity, water may also be obtained from a water well at the power plant office site on BLM land in Rose Valley, from private wells at Coso Junction, or another observation well in the Upper Coso Basin (1988 EA, at page 1-34). The Rose Valley wells were permitted by BLM in October 1983 as part of a transmission line right-of-way. Applicant obtained a permit from the Inyo County Health Department in August 1985. Water withdrawals may be as much as 10,000 gallons per day in Rose Valley (1988 EA, at page 1-34). Note that Coso, or its predecessor, did not own the Hay Ranch at the time. Moreover, the water extractions were limited to 10,000 gallons per day, while Coso now wants to pump at a rate of 3,000 gallons per minute.

P11-135 **Page 3.2-24:** According to the DEIR, Coso has operational permits through 2031. Do all of the separate power plants (Navy 1, Navy 2 and BLM) all have the same Project permit duration? Should not the current Project be limited in duration to Coso's existing permits to operate at most? At the most, should not the Project CUP be limited to run concurrently with Coso's other permits?

P11-136 **Page 3.2-26:** The Coso process results in the separation of steam and waste brine, and the DEIR suggests that Coso reinjects the spent brine and steam condensate. This is a misleading observation suggesting that all of the steam, through the steam condensate, is injected. How much of the original steam produced by Coso ends up as steam condensate? What are the ongoing water losses from the water-cooling towers? What percentage of the produced steam in the Geofluids is actually reinjected as steam condensate? If the geothermal reservoir is now compartmentalized into three weakly connected volumes, what effect will the new injection have on each of the separate zones of the reservoir? Will this actually be effective in maintaining power levels at all power units?

P11-137 What was the condition of Coso Hot Springs ("CHS") before production began? What has occurred to the Hot Springs since production commenced? What is the interconnection between Coso Hot Springs and the geothermal operations? (See my comments above regarding the impacts to CHS.)

P11-138 The Coso geothermal system is changing from a liquid only to a liquid and steam system. As fluid was withdrawn, pressures decreased and led to the creation of steam. Steam forms in a geothermal field when liquid water under high pressure is removed during production. The increase in steam flow could account for the rise in water levels and temperatures in the south pools of the Coso Hot Springs (ITS Hydrologic Analysis). Isn't this additional proof of a connection between the geothermal operation and Coso Hot Springs? The timing of the south pools water level temperature changes correlates with the onset of geothermal production. Thus, it cannot be ruled out that changes in Coso Hot Springs activity are due to natural causes.

P11-139 The 1980 EIS further addressed the impacts the Electrical Plant may have on the Coso Hot Springs. Indeed, the Bureau of Land Management ("BLM") has added the Coso Hot Springs as an area of potential effect ("APE") as part of its consideration whether to grant a right-of-way to Coso for its Project. The 1980 EIS mentions that water flows to Coso Hot Springs could be altered. It goes on to state: "The integrity of Coso Hot Springs, highly valued by the Native Americans, may be lessened." The flows at the Hot Springs may increase or decrease due to geothermal production and connectivity. The effect cannot be quantified. (1980 EIS, page 2-76.)

P11-140 Numerous cases can be cited of the compromising or total destruction of natural hydrothermal manifestations such as geysers, hot springs, mud pots, etc. by geothermal developments. (MIT Report, Section 8.2.10)

P11-141 Carl F. Austin states that when compared to Deep Rose, the potentially greater effect on surface thermal manifestations (i.e. CHS) may be caused by the planned injection of cold water into the Coso reservoir. Depending upon the nature of the system, such an injection could quench the surface manifestations.

P11-142 **Page 3.2-30:** Other than requiring an NPDES storm water permit, does the Federal Clean Water Act apply to the Project? Is the contamination of the fresh water from the Rose Valley Basin covered by the Clean Water Act?

P11-143 **Page 3.2-31:** The DEIR confirms that the Project is subject to Inyo County regulations as it regulates water transfers from one groundwater basin to another. Specifically identify that the Coso Plant is outside of the Rose Valley Basin. Confirm that the proposed Project will transfer water from the Rose Valley Basin to the Coso groundwater basin.

P11-144 **Page 3.2-32:** All relevant goals and policies of the Inyo County General Plan are not set forth or addressed. The DEIR does not recite all of the relevant General Plan requirements, including:

> **General Plan 8.4.2 Existing Setting:** The potential for development and enhancement of energy resources in Inyo County is somewhat limited. Several hydroelectric and geothermal power plants are currently in operation, producing as much as 322 megawatts (MW) of electricity per day, but further development of this resource is limited by the hydrology and environmental sensitivity of the rivers and streams and the availability of geothermal reservoirs.
>
> **General Plan 8.5.2 Existing Setting:** The management of water resources in the County has been a long-standing controversial issue. The County faces water resources management problems relating to export of water, local control, fulfillment of economic development needs, and environmental damage.

P11-145 While Coso's Project would use the water from the Rose Valley Basin within the County, the water would still be exported off the Rose Valley Basin and lost forever as a result of Coso's operations. Is this consistent with Policy 8.5.2?

> **General Plan Section 8.5 Water Resources:** Although most areas of the County can be defined as a desert based on annual rainfall totals, some parts of the County are still rich in water resources. This topic area was included in the General Plan to ensure the protection of the County's water resources from over-utilization, export, and degradation.

> **General Plan 8.5.4 Policy WR-1.1:** The County shall review development proposals to ensure adequate water is available to accommodate projected growth.

P11-146 Coso's Project will deplete water resources, making future development in Rose Valley impractical if not impossible. No accommodation has been made to force a reduction in or curtailment of the water pumping proposed by Coso to allow for projected growth. Because Coso's Project proposes to overdraft the Rose Valley Basin and export the water off of the aquifer, Coso should suffer future losses in water supplies, rather than prevent development within Rose Valley. None of these policies are met by the Project. The Rose Valley Basin will be overdrafted and no management plan is even mentioned in the CUP or DEIR. Why hasn't Policy WR-1.1 been addressed in the DEIR?

P11-147

> **General Plan Table 8-4 Implementation Measures, 17.0:** The County shall require that exports not damage the County's environmental and economic resources by ensuring that "no unreasonable effect" occurs in the transfer and withdrawal of water resources pursuant to Section 1810 of the Water Code and the Inyo County Groundwater Ordinance.

> "No unreasonable effect" shall be defined as the following:

- The action would not contribute to a significant decline in the population of any sensitive or protected plant, fish, or wildlife species;
- The action would not reduce water levels in any existing public or private groundwater wells to levels that preclude withdrawal by existing users or would significantly increase the costs or such withdrawal;
- The action would not contribute to a significant change (degradation) in water quality or would reduce water quality below health standards or federal/state water quality standards;
- The action would not contribute to effects on water quality that would result in a deficiency by the water treatment agency's or individual's ability to treat water to

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appropriate standards;

- The action would not reduce available groundwater or surface water resources to levels that would make access and/or use of these waters uneconomical for development planned in accordance with this General Plan;

- The action would not directly or indirectly discharge contaminants into surface or groundwater resources; and

- The action would not result in a land subsidence.

The DEIR has not addressed these items. The Project will contaminate the Rose Valley water when it is injected at Coso. No discussion of this issue is contained in the DEIR.

P11-148

Consider the conclusions from earlier reports and studies. "Increased water consumption may lower regional or local water tables. This would reduce the amount of groundwater and storage, and alter groundwater flow rates and direction. In certain situations, it could affect natural surface vegetation and/or water quality." (Rockwell Report 1980 at page II-1) "The Rose Valley groundwater basin presently is near hydraulic equilibrium. Unless further study indicates greater recharge from precipitation or areas north of Rose Valley, available data and analysis suggests that additional significant groundwater withdrawal would lower the water table." (Rockwell Report 1980 at page II-121)

P11-149

"If groundwater is used from Rose Valley, the water table would be lowered, with a potential for drying Little Lake. Flow to Coso Hot Springs would be altered." ("1980 EIS")

P11-150

It is assumed that a 50 MW power plant will use approximately 2,300 AFY of which 600 AFY would be replaced by natural recharge resulting in a deficit of 1,700 AFY. The importation of water is assumed but not planned, because the injection of imported water to preserve the Geofluids is considered unrealistic in an area as arid in water resources as in the CGSA. (1980 EIS, at page. 1-28.) The 1980 EIS got it pretty close, but it assumed water losses from WCTs. If an air-cooled system had been used, the water losses would have been much less.

P11-151

Does the removal of water from the Rose Valley Basin substantially prevent future agricultural use of property throughout Rose Valley? Does Coso's decision to use the Hay Ranch solely for water-pumping activities and not agriculture, remove agricultural land from production?

P11-152

The cooling water for geothermal purposes from the Rose Valley Basin could displace other uses or degrade other supplies. (1980 EIS 2-68). The 1980 EIS recognized the significant impacts to the Rose Valley should a water transfer project such as the Project be implemented. For instance, the 1980 EIS states that utilizing the water in Rose Valley to provide cooling water for geothermal production may cause a lowering of the water table from 60 to 100 feet resulting

P11-152 in the loss of groundwater storage, reduction of underflows, lowering the water level at Little Lake, effects on surface vegetation, and degradation of natural water. (1980 EIS 2-72) Section 6.0 discusses any irreversible or irretrievable impacts to resources. Groundwater could be irreversibly degraded depending upon any use in excess of recharge. (1980 EIS 6-1)

P11-153 The amount of acceptable water table may be lowered in the Rose Valley must be determined and accepted by BLM, USGS, Lahontan Water Quality Board, Inyo County and DWP (1980 EIS 3-5). Lessees, such as Coso, would have to submit a Plan for Production ("PFP") to include any importation of water from sources other then Rose Valley, monitoring and artificial recharge of Little Lake, and injection of Geofluids in Rose Valley (1980 EIS 3-6). The third requirement applies if the lowering of the water table in Rose Valley is unacceptable. If springs used by wildlife appear to be drying as a result of the Project, the springs will be replenished by artificial means, at the cost of lessees. (1980 EIS 3-6) A "Hydrology Monitoring Plan" ("HMP") will be implemented to deal with the lowering of the lake water levels and actual groundwater recharge in Rose Valley. Little Lake will be maintained at levels within the current (1975-1980) annual and seasonal variations as per discussions among BLM, USGS, USFWS, CDFG, Inyo County, Lahontan Water Quality Control Board, and DWP. It was presumed that the possible injection of geothermal fluid at the bottom of Rose Valley, because it is somewhat heavier then fresh water, would help to keep or raise the water table. Nonetheless, there would still be a reduction in usable groundwater in storage. (3-6 and 3-7)

P11-154 Has the consultation occurred as required by the 1980 EIS? What are the results? Has an agreement been reached as a result of the environmental studies? Is such a consultation proposed? When will it happen? Is this a prior requirement of the CUP?

P11-155 The GT Model 6-30-04 states at the last paragraph of Section 4.3.2 at page 12, "The pumping of 2,000 GPM for 18 hours per day...would result in 2,420 acre-feet of groundwater or 0.12% of groundwater in storage per year being <u>removed</u> from the Basin."

P11-156 **Page 3.2-32:** Before the DEIR starts discussing potential impacts to hydrology and water quality, why isn't there a single reference to the full impacts of the water-pumping Project over 30 years? There are no brief, clear and definitive statements of what the Hydrology Model predicts as a result of the proposed pumping. Why hasn't the DEIR clearly identified the predicted impacts? Before impacts can be discussed, wouldn't it be better to summarize the findings of the Hydrology Model and provide all of the graphs which depict these findings?

P11-157 **Page 3.2-33:** It is presumed that the reduction in underflows to Indian Wells Valley is not significant because it represents only a small portion of the water budget for Indian Wells Valley. What is the water budget? Is the Indian Wells Valley Basin in a state of overdraft? Are there additional waters available in the Indian Wells Valley to supply to Coso? Could the underflow be tapped from a well in the Indian Wells Valley to supply all or a portion of the water wanted by Coso?

P11-158 **Page 3.2-34:** The Hydrology Model on which the entire DEIR is fundamentally flawed is described in the memorandum from Mr. Zdon. The actual results and predictions from the Hydrology Model as run were not even presented. CEQA requires that all environmental impacts of the proposed Project be identified, studied and reported in the DEIR, without the effects from mitigation. Yet, the only impacts noted are assuming that mitigation occurs. This is contrary to CEQA.

P11-159 The entire Hydrology Model must be recalibrated and rerun. The DEIR must contain the accurate results from the rerun Hydrology Model. The impacts of the Project, regardless of mitigation, must be stated. Once the two results are known, the mitigation measures would have to be redrafted and new trigger points set. (See Zdon Memorandum 9-2-08)

P11-160 **Page 3.2-35 Figure 3.2-14:** This figure seems to only reflect an aggregate 5 feet of the drawdown groundwater table at the Little Lake Ranch well. However, the Hydrology Model actually predicts the possible much greater drawdown at the Little Lake North Dock Well. The figure should be explained or corrected. Since Little Lake depends upon natural springs, would not such a drawdown have the potential to eliminate spring flow?

P11-161 It is obvious that the results and impacts reported in the DEIR from the flawed Hydrology Model substantially overstate the amount of water available for pumping and further underestimate the impacts from such pumping. Rerunning the model will produce worse results for Coso. Nonetheless, even the impacts reflected by the Hydrology Model itself show unavoidable significant environmental impacts which cannot be mitigated.

P11-162 **Page 3.2-36 Table 3.2-5:** This reflects a drawdown at Little Lake in the water table from 4 feet to 11 feet. Since Little Lake is a shallow lake averaging 3 feet to 5 feet in depth, will this maximum drawdown completely destroy Little Lake? What would happen to the habitat, wildlife, viewshed, air quality, water quality and other environmental issues?

P11-163 **Page 3.2-36:** The projected drawdowns are simply listed by reference to Table 3.2-5 and Figure 3.2-14. Why does the DEIR rely only upon the table and the figure? Why not provide in plain English the immediate and dramatic impacts on Rose Valley and Little Lake if the Project were to be approved for 30 years? Why not advise the public in English that to avoid significant impacts, the Project cannot be approved? Indeed, doesn't the Hydrology Model only permit between 120 to 480 AFY of pumping for 30 years to avoid substantial impacts? Doesn't the Hydrology Model state that Coso could only pump at the rate of 4,839 AFY for less than 15 months to avoid the substantial impacts? Why aren't these facts plainly stated and even highlighted in the DEIR?

P11-164 Why does the DEIR bother with the questions regarding the assumed values for aquifer-specific yields? Wasn't the Hydrology Model calibrated and run on an assumption of a 3% specific yield? On what basis can the DEIR arbitrarily assume different specific yields to predict the impacts than were set forth in the Hydrology Model itself? What is the evidence to vary

P11-164 specific yields? If the Hydrology Model wants to assume higher specific yield assumptions, doesn't the entire Hydrology Model have to be rerun and recalibrated to determine whether these assumptions can be sustained in actual practice? Was a sensitivity analysis conducted on the Hydrology Model? If so, describe the results. If not, why not?

P11-165 **Page 3.2-38:** The information contained in Figure 3.2-15 is illuminating, but frightening. In particular, examine the last graph which involves Little Lake. Not only are the impacts of the complete pumping for 30 years not realized for many years after pumping stops, but in none of the scenarios, regardless of specific yield, does Little Lake return to its pre-pumping condition, even after 100 years have elapsed after the cessation of pumping. Since we have learned that the County and the DEIR assume that only a 10% loss of water is acceptable, how can the Project possibly be approved? Why are there no specific warnings to the public about the long-term impacts to the Rose Valley Basin by the Project? Are not all water uses in Rose Valley at risk? How long will it take after pumping stops for the Rose Valley to regain 100% of the losses through natural recharge? Does this reflect a permanent and irretrievable loss at Little Lake? Is any permanent loss of water table elevations a significant environmental impact?

P11-166 **Page 3.2-39:** The mitigation measures require Coso to fund adjustment to existing wells to maintain functionality. Who determines when and if adjustments are needed? Who will be responsible for additional energy costs to operate the wells? What cumulative impacts to the environment will occur by additional energy usage to drill the deep wells, or lift the underground water higher by the pumps? Have all current water well owners or users been personally contacted and notified about the Project? Have all water uses within Rose Valley been specifically advised of the potential for impacts? What was the nature of the notice of the Project to all water users within Rose Valley? Have actual and direct communications been established with all water users and the County? Should disputes regarding the adjustment of wells be resolved by an independent third party arbitrator rather than the County?

P11-167 **Page 3.2-39, Hydrology-2:** All of the mitigation measures rely upon Coso to conduct the monitoring and notify both the County and other owners in Rose Valley. What happens if Coso refuses? Is Coso anymore likely to voluntarily suspend pumping than LADWP? What are the chances that Coso will voluntarily and in good faith adhere to the mitigation measures? Shouldn't all of this work be performed by the County itself, but funded by Coso? Should an independent monitor or water master be appointed and funded by Coso? If the County believes Coso's dire predictions of the imminent demise of the Electrical Plant, how can it risk relying upon Coso to reduce or eliminate its pumping once it is given permission to do so? Any excessive drawdown, regardless of cause, should force the immediate imposition of the mitigation measures. Coso must not be given any opportunity to debate the "cause" of the drawdown.

P11-168 **Page 3.2-39:** Impacts to the Indian Wells Valley Basin are discussed. Can the Indian Wells water basin provide a source of imported water to Coso? If so, how much could be imported per year? Assuming the higher estimated underflow of water to the Indian Wells

P11-168 Valley Basin of 1,300 AFY, would the pumping and transfer of water from the Indian Wells Valley Basin be less damaging to the environment?

P11-169 **Page 3.2-39:** Impacts to Little Lake could continue for well over 100 years following even a cessation of pumping. Why does the text of the DEIR suggest that it may take more than 30 years to recover, when Figure 3.2-15 shows that the Rose Valley Basin will not fully recover even after 100 years or longer? This error should be corrected. What are the possible impacts to springs from a complete termination of water availability? Once water flow to a spring is interrupted, what are the chances of a permanent loss of the spring regardless of later water recharges? Is there not evidence to suggest that removal of current water availability may permanently destroy a spring? Did the former agricultural pumping at the Hay Ranch cause Rose Spring to go dry? (See Zdon Memorandum 9-2-08)

P11-170 **Page 3.2-40:** At the very end of the discussion on Section 3.2.4, it is noted, without explanation, that groundwater recovery would occur more rapidly if pumping rates are reduced or pumping ceased sooner. Why not explain at this point the differences? Why not add a few sentences which would show the vastly reduced rate of pumping which the DEIR considers safe, and that Coso can only pump at the full project rate for 1.2 years?

P11-171 **Page 3.2-40:** What is the support for the supposition that the Project will unlikely affect the Portuguese Canyon, Davis and Rose Springs? What studies or evaluations have been made to confirm the foregoing? Is it possible that the former agricultural pumping on the Hay Ranch caused Rose Spring to go dry? (See Zdon Memorandum 9-2-08.) Please explain your answers.

P11-172 **Page 3.2-41:** Does the moisture and pressure content of the underground basin, even at Portuguese Bench and the other springs, facilitate or assist in the expression of waters through the springs? How can the results from the limited and short-term pumping test provide any significant evidence of the lack of impact on the Davis Spring?

P11-173 **Page 3.2-42:** According to Bauer, the groundwater elevation of the Little Lake North Dock Well appears to be 3 feet higher than the lake level (Bauer Thesis). This estimate seems questionable as the elevation of the Lake can vary over the course of an average year based upon the availability of water, and how Little Lake manages the Lake level for the utilization of the waters downstream and south of the Lake. What is the relationship between water levels throughout Little Lake and its springs? In order for the springs to function, must there be a minimum available water level and/or pressure or water head? Could even a minor reduction in elevation level interfere with the operation of the springs? How accurate is the data that the North Dock Well is, and always has been, 3 feet higher than the average elevation of the Lake?

P11-174 **Page 3.2-43:** The DEIR states that the drawdown at the Little Lake North Dock Well ranges from 3 feet to nearly 8 feet if the Project continues for 30 years. However, Figure 3.2-15 seems to show at least a 4-foot drawdown up to as much as a 12-foot drawdown. What accounts for the difference? Is the graph correct, or are the words? Shouldn't they be the same?

P11-175 **Page 3.2-43:** The last paragraph contains a number of assumptions and conclusions regarding water availability, discharge rates and the potential changes to the spring outflow. On what basis are these conclusions drawn? What is the evidence that a decrease in water level of the Lake will allow a proportionally larger discharge of the water at the Coso Springs? If the Hydrology Model is used to support the conclusion, why was Coso Springs not included within its boundaries? While a larger portion of the available water downstream of the Lake from Coso Springs may occur, isn't there overall loss of water at the Little Lake property? What is the predicted magnitude of the total water losses?

P11-176 **Page 3.2-44, Figure 3.2-16:** This graph is incomplete. There are no references of drawdown or length of time. This appears similar to, but somewhat different than, the last graph of Figure 3.2-15. Please add the pertinent numbers and explain the significance of this figure.

P11-177 **Page 3.2-44, Figure 3.2-17:** This figure predicts drawdowns at Little Lake even after a very relatively short-term pumping from the Project (1.2 years). This predicts nearly a 4-inch drop in the water table which will continue for decades and decades even after pumping termination. The figure does not even reflect a return to pre-pumping levels for longer than 100 years. How is this virtually permanent loss of the water table mitigated? Doesn't this conclusively prove that even a very short duration of pumping by Coso will almost indefinitely impact Rose Valley and Little Lake? If such a relatively small drawdown is experienced at Little Lake, won't the rest of Rose Valley be similarly impacted, and perhaps at even greater drawdown levels?

P11-178 During my review of the Inyo County Planning Department (ICPD) file, I found a copy of an agenda for a conference call, at least between ICPD and MHA, if not others, bearing a fax date stamp on the agenda of April 30, 2008. (ICPD Agenda 4-30-08). The ICPD Agenda 4-30-08 contains several charts for discussion. Some of these charts are quite similar to those reproduced in the DEIR, but different in fundamental ways. With respect to each graph, please explain what additional evaluations were undertaken to change the graphs as presented compared to those in the DEIR. It appears that initially a trigger level of a 2-foot drawdown at Little Lake was proposed, rather than 0.3 feet. Who developed this preliminary trigger? Explain the process by which the final trigger levels were determined as set forth in the DEIR. Describe each and every change of the Hydrology Model from April 30, 2008 which allowed it to predict the results of pumping as reflected in the DEIR compared to the results shown in the ICPD Agenda 4-30-08.

P11-179 Apparently, there was some proposal for a limited initial pumping for 5 years, and then an automatic reduction in pumping to 1,800 AFY for another 5 years. Indeed, the mitigation suggested that pumping could only be continued after 5 years with the prior approval of the County. Why was the concept of a limited initial duration of pumping dropped?

P11-180 The ICPD Agenda 4-30-08 at Section 3.b. contained a statement that 3,000 AFY represents the minimum economic pumping rate. How is this quantified? What evidence establishes what the economic rate is? Is it based upon the cost to pump water? Is it based upon the presumed value of the water? Is it presumed upon what energy production at Coso will be?

P11-181 The final graph on page 3 of the ICPD Agenda 4-30-08 is extremely troubling. This graph was not presented in the DEIR, but appears to show a 2-foot drawdown at Little Lake, rather than the estimated allowable drawdown of .3 feet (less than 4 inches) in the DEIR, assuming a much lesser pumping rate continuing for just 5 years. Was this graph based upon the same Hydrology Model incorporated into the final DEIR? Were any of the assumptions of variables developed by the Hydrology Model changed after this point? What changes were made to the Hydrology Model to allow the modification of this graph compared to the similar graph in the DEIR? If so, please describe each and every change in the data inputted into the Hydrology Model to develop the final DEIR. Please explain all of the differences from the presented graph in the ICPD Agenda 4-30-08 compared to the final graphs in the DEIR.

P11-182 Does the last graph contained in the ICPD Agenda 4-30-08 reflect the impacts at Little Lake assuming pumping at the rates stated for only 5 years, after which pumping stops? If so, does the graph reflect a 2-foot drawdown at Little Lake, but only after 25 years have elapsed from the cessation of pumping? How does this graph compare to figure 5.4-2 in the DEIR which reflects pumping rates at 750 AFY, 1,500 AFY and 2,000 AFY? Please explain all of the different factors which allowed the Hydrology Model to show the last graph on the ICPD agenda 4-30-08 compared to figure 5.4-2.

P11-183 Let me explain my concern more directly. The graphs in the DEIR seem to suggest that the Rose Valley and Little Lake will be impacted from pumping over even a short duration. The hydrology analysis performed by Brown and Caldwell ("B&C Model") indicated that impacts were not likely to be felt at Little Lake for 4 to 5 years after pumping commenced. Was the new Hydrology Model purposely designed in a way to show faster impacts? When pumping actually begins, and the impacts occur more slowly consistent with the B&C Model, will the County then assume that the Hydrology Model is wrong, and allow Coso to keep pumping even though the real impacts being created will just take longer to be felt? Given the questionable objectivity of the DEIR, this device would allow Coso to pump for several years before the actual impacts were registered at each of the monitoring points. However, the enormous destruction of the Rose Valley and Little Lake would be assured. The assumptions used in the Hydrology Model might have been arbitrarily selected to forecast immediate impacts, when a more likely model would show later impacts. Was the Hydrology Model constructed in a way to artificially allow Coso to pump for years even though the real and dramatically worse impacts were still to come?

P11-184 The differences between the B&C Model and the Hydrology Model must be explained. Why are the impacts from the B&C Model different than the Hydrology Model? What inputs or assumptions were made in the B&C Model that were changed in the Hydrology Model? Please describe each and every assumption difference and explain why the Hydrology Model made the

P11-184 changes. The B&C Model said that Little Lake would lose over 60% of its water supply if Coso pursued its pumping project. How much water losses are predicted by the Hydrology Model? What are the assumption changes?

P11-185 Precise and complete explanations of the suggested triggers and graphs shown in the ICPD Agenda 4-30-08 compared to the B&C Model and graphs in the DEIR must be provided. It is at best unusual that we would see such a discrepancy in data from the hydrology consultant as late as April 30, 2008 when the DEIR was released a short time later. The pumping test was conducted in November 2007. Surely, the hydrologist would have completed and calibrated the Hydrology Model well before April 30, 2008. What changed? What assumptions were modified? What new variables were inserted into the Hydrology Model after April 30, 2008 compared to the variables and assumptions used prior thereto?

P11-186 Perhaps many of these questions could have been answered, and errors avoided, if Little Lake had been allowed input into the creation of the Hydrology Model. Our consultants, Team Engineering of Bishop, California, attempted to assist Geologica in this process. They attempted to communicate with Geologica very early in the process, but never received a reply.

P11-187 **Page 3.2-45:** The DEIR rejects an analysis of the impacts from the Project on the biology of Little Lake, arguably because Little Lake can transfer its water resources to improve and enhance vegetation, which also serves as a habitat for wildlife. Obviously, the ability of Little Lake to manage its water supplies depends upon the existence of water supplies. This is not the same as "manipulation," which implies wrongful conduct. The suggestion that water resources at Little Lake are "highly manipulated" is argumentative at the least. The conclusion is also absurd. Little Lake can only manage and transfer water it has. If water is reduced by any amount, let alone 10%, how is Little Lake supposed to manage something that doesn't exist? Anybody in the world residing in a relatively arid environment would attest to the fact that a 10% loss of water is significant. The habitat and wildlife will not survive as well with 10% less water.

P11-188 The DEIR also fails to address the impacts to the biology of Little Lake resulting from pumping at the rate of 4,839 AFY for 30 years. These impacts must be shown, assuming drawdowns of 4 to 12 feet at the north end of Little Lake. CEQA demands and requires such an analysis of impacts.

P11-189 The Hydrology Model shows that adverse impacts will continue for maybe centuries, even at much reduced pumping rates. How is this not significant? If the water is not available, how will vegetation and plant life survive? If there is no habitat, or a drastically reduced habitat, what will be the impacts upon wildlife? If Little Lake dries up, where will the migratory fowl go for stopovers, resting and nesting activities? Whether Little Lake can transfer water resources from one area to another can change biology in specific regions around the ranch, is there any question that a loss of water resources would dramatically impact vegetation and wildlife? Even a 10% loss of water to Little Lake and the Rose Valley would constitute a taking under the

P11-189 Federal and California Endangered Species Act, the Migratory Bird Treaty Act, and the Bald Eagle Protection Act. Why has there been no attempt to address these impacts? Isn't Little Lake considered a critical stopping point for the migratory fowl along the Eastern Sierra Flyway? What will happen to the migratory fowl if Little Lake no longer exists?

P11-190 What has the County's policy been in the past when considering water transfer projects? Has the County routinely accepted a 10% loss of water or impacts to vegetation and wildlife as not significant? If so, identify any similar project approved by the County in which similar water losses have been allowed.

P11-191 While the DEIR suggests that the mitigation will prevent a more than 10% loss, the Project itself and the Hydrology Model show a completely different story. Pumping at the full Project rate for the entire 30-year term will destroy Little Lake, its ponds, riparian habitat, and wetlands. Relying on Coso to stop pumping is misplaced. No contract, signed paper, CUP, condition in the CUP, legal standard, requirement imposed by the County or stated mitigation measures will prevent Coso from continuing to pump at the maximum rates until and unless a court orders otherwise. To assume the contrary is foolish.

P11-192 **Page 3.2-46:** Where is the biological report that a permanent 10% loss of water flow would not adversely affect vegetation or wildlife? Since mitigation measures would only reduce or curtail pumping after the trigger point is reached, but the impacts of pumping may not fully be realized for years or decades after the cessation of pumping, how does mitigation protect the habitat? Is not the only way to protect the habitat by not pumping in the first place?

P11-193 **Page 3.2-46:** The Hydrology Model suggests that even if the pumping completely stopped after 1.2 years, Little Lake would not even feel the full impacts for 30 years or longer after cessation and that these impacts may increase with time. Given that the Hydrology Model only provides predictions, does not this represent a severe risk to Little Lake and Rose Valley? Since the Project clearly contemplates an over-pumping of the Rose Valley Basin in excess of natural recharge, what is the conceivable justification for permitting the pumping and transfer?

P11-194 **Page 3.2-47:** The nature of monitoring and frequency thereof is briefly summarized. Given the predicted water reductions at Little Lake, even under the best of circumstances, full monitoring and evaluation costs should be borne by Coso. As Little Lake will likely suffer more dramatic impacts than any other user, Little Lake by necessity will need to engage the services of its own independent hydrologist to monitor and evaluate the reports. Should not Coso also fund the reasonable costs associated with the evaluation of the data? The environmental impacts would not arise but for the Project. Why should Little Lake Ranch be forced to incur any costs to verify Coso's compliance with mitigation measures? Why is a representative of Little Lake excluded from the assessment of the damages and to recalibrate the Hydrology Model? Doesn't Little Lake have more to lose than the County or Coso, at least with respect to environmental impacts?

P11-195 **Page 3.2-48 Table 3.2-7:** The structure of this table seems odd. Should not the distance from the Hay Ranch wells be used to organize the table, with the closest wells stated first and the further wells later? (See all other comments regarding Hydrology-3 herein.)

P11-196 **Page 3.2-49, Hydrology-4:** This entire mitigation measure is far too subjective, uncertain and virtually incapable of objective assessment or realization. The last full paragraph on page 3.2-49 suggests that there may be some reduction of pumping to a lesser degree. What does this mean? Who determines when pumping should be reduced and to what extent? Why doesn't Little Lake have any input in this process, since it will be the likely recipient of the harm? To afford certainty, shouldn't pumping reductions and/or cessation be mandatory upon the attainment of specified triggers?

P11-197 **Page 3.2-49:** The proposed option in the mitigation plan to pump from an existing well or newly drilled well at Little Lake to restore water flow at the Lake seems unrealistic. Additional subsurface pumping would only exacerbate the overdraft problem caused by the Project in the beginning. Such pumping would cause the immediate further drawdown of the underground water table, thereby further impacting the natural flow of water through the springs. This could easily require pumping in perpetuity to preserve the Lake, ponds and wetlands. Is this option entirely conditioned upon the approval of Little Lake? May Little Lake Ranch withhold its consent in its sole and absolute discretion? Will the mitigation measure prevent this option from applying except upon Little Lake Ranch's consent? If so, why is this option even included? Shouldn't the public have a right to comment on all mitigation measures? Based upon the Hydrology Model, won't Little Lake continue to suffer losses of water for more than a century after the cessation of pumping? Will Coso fund this alternate pumping throughout the duration of adverse impacts? How can Little Lake Ranch be assured that Coso will fund alternate pumping for 100 years or longer?

P11-198 **Page 3.2-50:** Most of the discussion following Mitigation Measure Hydrology-4 is nothing more than guesswork. The discussion is based upon pure conjecture without any study. It is fairly obvious that none of the consultants bothered contacting Little Lake Ranch about this proposal, or obtaining any of the background information recited, such as the historical pumping to reestablish the Lake following an earthquake. Why weren't studies conducted at Little Lake? Why wasn't Little Lake involved with the process of assisting with the DEIR? The purported remedy of challenging the CUP or trying to revoke the CUP is entirely illusory. Coso earns tens of millions of dollars a year. It is unrealistic to assume that anyone, including Little Lake Ranch or the County, would have the resources to pursue a legal challenge. Why should the County create a system wherein Coso wins by default? Should a small group of private citizens be forced to raise the resources necessary to fight a utility company?

P11-199 Pursuant to CEQA Guidelines § 15126.4, "[f]ormulation of mitigations measures should not be deferred until some future time. However, measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way." (14 Cal. Code Regs. § 15126.4.) Accordingly, the deferred

P11-199 analysis and identification of mitigation measures necessary to address a project's environmental impacts until after project approval generally do not comply with CEQA.

P11-200 The seminal case with regard to the issue of deferred mitigation is *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296. In *Sundstrom*, the petitioner challenged the County of Mendocino's certification of a mitigated negative declaration for a proposed motel project. The project included a private sewage treatment plant intended to serve the new development as well as the applicant's existing motel complex. As a condition of project approval, the county required the applicant to conduct additional, post-approval hydrological studies to address the project's potential impacts on adjacent sewage disposal systems and surface and groundwater hydrology, to adopt mitigation measures recommended by such future studies, and to secure subsequent approval of plans for sludge removal. The court held that by conditioning the project on additional future studies, the county improperly deferred a meaningful analysis of the project's potential hydrological impacts until after the project had already been approved, at which time it would be too late to effectively address any identified impacts revealed by the subsequent studies. (*See Sundstrom*, 202 Cal.App.3d 306-08.) Moreover, by permitting the analysis of the project's potential impacts to be conducted following project approval and, thus, following the completion of the CEQA process, the county improperly shielded such analysis from public review and scrutiny. (*See id.* at 308-09.)

P11-201 In *Stanislaus Natural Heritage Project v. County of Stanislaus* (1996) 48 Cal.App.4th 182, the court overturned the defendant county's certification of an EIR in connection with the approval of a specific plan calling for the creation of a multi-phase 29,500-acre, 5,000 residential unit destination resort and residential community on the basis that the EIR failed to adequately address the means of providing water for the development. Acknowledging that the completed project would require a quantity of water far in excess of then-available water supply (available supply was anticipated to meet the project's needs for only the first 5 years of development), the EIR attempted to mitigate the project's water supply impacts by conditioning any development beyond the 5-year build-out upon the applicant's demonstration to the county's satisfaction that adequate water supplies had been made available and that any environmental impacts of utilizing the identified water sources had been mitigated. The EIR also provided that additional environmental review of subsequent water acquisition projects would be required as part of the water acquisition process or as part of further environmental review relating to future phases of the proposed development.

Addressing the EIR's discussion of water supply impacts, the court observed that "[t]he County in essence approved an EIR for a 25-year project when water for the project had not been assured beyond the first 5 years of the 15-year first phase of the project." (*Stanislaus Natural Heritage Project*, 48 Cal.App.4th at 195.) The court held that the county's deferral of an analysis of the impacts relating to the project's long-term water supply requirements violated the purpose of CEQA to inform the public and responsible officials of the environmental consequences of a proposed project so that decisions regarding the project can be made with such consequences in mind, stating that "[t]o defer any analysis whatsoever of the impacts of water supply to this project until after the adoption of the specific plan calling for the project to be built would appear to be putting the cart before the horse." (*Id.* at 195-96, 200.) The court concluded as follows:

> We are not concluding respondent must first find a source of water for the "project" before an EIR will be adequate. We are concluding that an EIR for this project must address the impact of supplying water for the project. *It is not mitigation of a significant environmental impact on a project to say that if the impact is not addressed then the project will not be built.* The decision not to
> P11-201 build may well rest upon the absence of a suitable or adequate water source. However, the decision to approve the EIR of this project does require recognition that water must be supplied, that it will come from a specific source or one of several possible sources, of what the impact will be if supplied from a particular source or possible sources, and if that impact is adverse how it will be addressed. *While it might be argued that not building a portion of the project is the ultimate mitigation, it must be borne in mind that the EIR must address the project and assumes the project will be built.*

(*Id.* at 205-06 (emphasis added).)

Most recently, in *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, the court set aside the county's certification of an EIR in connection with the approval of a conditional use permit to expand an existing aggregate mining operation. Among other grounds for rejecting the EIR, the court found that the EIR failed to adequately analyze the impact upon local groundwater supply resulting from the expansion of the existing mining operation. (*San Joaquin Raptor Rescue Center*, 149 Cal.App.4th at 662-64.) Further, the court rejected a mitigation measure providing that the project must maintain the existing consumptive use, stating as follows:

> P11-202 [A] mitigation measure cannot be used as a device to avoid disclosing project impacts. [Citation.] An EIR must analyze the impacts of providing water to the *entire* proposed project . . . . Since maximum production levels (approximately double the baseline) are specifically authorized by the proposed CUP, the EIR should disclose how much groundwater pumping would be needed to support such operations and analyze the impacts thereof. Under the circumstances, CEQA does not allow the EIR to simply assume, without substantial evidence or reasoned analysis, that the same amount of consumptive water will be used at maximum production as is currently being used.

P11-202 Proper mitigation measures may not include future study or the formulation of future mitigation measures. (See *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 306.) Deferring evaluation of environmental impacts until after a project's approval improperly avoids the required public review and agency scrutiny which are the foundation of the CEQA process. The DEIR cannot properly consider the issuance of a CUP to allow pumping for 30 years at a rate of 4,800 AFY, when the Hydrology Model tells us that pumping will have to stop in just 1.2 years, at best, to avoid a greater than 10% water loss at Little Lake. It is impermissible to rely on further studies to allow the continuation of pumping.

P11-203 Moreover, the *Stanislaus Natural Heritage* case contains discussion supporting the position that it is improper to issue a CUP for a 30-year project when available water supplies will support the project for a much shorter period of time. Merely assuming that the operation of the Project will be curtailed or discontinued at the point when specified triggers are met is not sufficient to support the conclusion that the Project's water supply impacts will be effectively mitigated. Instead, if the County intends to issue a CUP for the Project spanning a 30-year period, then the DEIR must analyze the impacts of the Project as a whole – i.e., through the entire 30-year period of the CUP. The DEIR must contain specific information of what happens to Little Lake and Rose Valley if pumping continues at 4,839 AFY for the entire 30 year duration. There are no discussions in the DEIR about the impacts, without mitigation.

P11-204 **Page 3.2-51:** Please further define or explain the concept of the "steam cap". How have the geothermal operations increased the "steam cap" and how has this factor caused the change at the Coso Hot Springs? Why would the injection of water into the geothermal reservoir increase its pressure? The public are not engineers. Explain this concept in plain English. Will the injected water completely offset Coso's water losses through its water-cooling towers? If the water loss exceeds the water injection, how can one assert that the injection will restore the pressure? Isn't one of the crucial objectives of the Project to minimize the decline? Does the DEIR actually suggest that the Project will not only minimize the decline, but actually reverse the decline to allow for even greater production of Geofluids? How much of the proposed new injection water will actually enter the reservoir and how much will go to each of the three now weakly connected sections? Will this liquid make more or less steam from the production wells? How much Geofluids (both liquid and steam) are produced annually at Coso in terms of acre-feet? Why are different measures used at different places in the DEIR, such as gallons per minute, acre-feet, mass, weight measures, etc.? Shouldn't the same measures and definitions be used throughout the DEIR? Of the produced Geofluids, how much is reinjected in terms of acre-feet? How does this compare to the proposed injected water? What is the temperature of the Geofluids currently being injected by Coso? What is the average temperature of the water from the Coso Valley Basin? Will the cooler water react differently in the Coso reservoir? By injecting cooler water, could this have an adverse impact upon Coso Hot Springs? Would the cessation of geothermal operations at Coso reduce adverse impacts of Coso Hot Springs? Would the reduction of Geofluids production at Coso, reduce or lessen the impacts on Coso Hot Springs?

P11-205 **Page 3.2-52:** Temperatures of the Coso Hot Springs rapidly rose immediately following the commencement of geothermal operations. The rise continued until 1993 and stabilized until 2002, at which time they fell. How do the temperature fluctuations correlate with available data from Coso operations? Did the amount of Geofluids produced at Coso correspond with temperature variations? Has there been any evidence that the temperature and water levels changed over the last 10 years as the geothermal reservoir has been drying out? If not, what is the basis for asserting that the injection of water from the Rose Valley Basin may benefit Coso Hot Springs?

P11-206 The US Navy has conducted regular monitoring of the Coso Hot Springs. The DEIR contains references to at least two of the more recent monitoring reports, namely Coso Hot Springs Monitoring Report 2004-2005 and 2005-2006, both prepared by Geologica, Inc., the hydrology consultant for the DEIR. (Geologica 2005 and Geologica 2006.) At page 13 of the Geologica 2005 report and page 14 of the Geologica 2006 report, the same conclusions were reached. In summarized form, both reports indicate that Coso Hot Springs has shown "temperature increases" and "expanded thermal activity". Two decades of surveys have recorded "the steady increase in temperatures in shallow aquifers <u>beyond well established seasonal variations</u>". "Increased temperatures, expanded thermal activity and geochemical evidence of increasing steam influx have been relatively consistent since 1993." "Previous monitoring reports noted the correlation between increased thermal activity along the Coso Hot Springs fault, declining water levels, boiling and temperature increases in Coso #1." Moreover, the reports continue to state that "<u>declines in cold water recharge alone cannot account for the changes in wells and surface manifestations in the Coso Hot Springs area</u>". Finally the reports indicate that "changes in fluid chemistry appear to be the result of slightly increased steam or steam condensate input and/or decreased brine discharge in the shallow outflow of the Coso geothermal system".

P11-207 Do the Geologica monitoring reports confirm that the fluctuations of temperature and water levels in the Coso Hot Springs area cannot be explained by normal fluctuations? What are the real conclusions reached by Geologica in plain English? Are the changes in the Coso Hot Springs related to the geothermal operations of Coso? If the temperature increases and thermal activity <u>cannot</u> be attributed to natural causes or consistent with normal seasonal variations, what is left except Coso's geothermal operations? Why was Coso and its operations not even mentioned? What steps have been taken to reverse the impacts on the Coso Hot Springs from Coso's geothermal operations? Have all interested members of the community, and in particular the Paiute Indian Tribes, been advised of this causal connection? Does the 1979 MOA require remedial action?

P11-208 **Page 3.2-53:** The DEIR contains certain summary predictions on the geothermal reservoir behavior based on <u>conversations</u> with Coso personnel. Has Coso presented its reservoir model? On what basis does the DEIR make the conclusions set forth? Is there any data other than observations based solely upon verbal and anecdotal information from Coso? Is the reservoir model available for public review and input? If not, how is the public to verify the

P11-208 predictions and assumptions provided by Coso itself? Should not the public be entitled to evaluate all relevant evidence to determine the efficacy of the Project to produce the expected results? If there are no public studies available to confirm the assertions, shouldn't the unsupported statements be deleted from the DEIR?

P11-209 **Page 3.2-54:** See all of our comments regarding the MOA appearing at Appendix E below. Please incorporate all of the questions and observations herein. Most importantly, the MOA required the cessation of geothermal operations if a perceptible change to the surface activity of the Hot Springs occurred. Why didn't this happen 20 years ago when impacts to Coso Hot Springs first became evident?

P11-210 **Page 3.2-55:** 59.5 acres of land will be disturbed. Has Coso obtained a Stormwater Pollution Plan Permit? What are the requirements of the Plan?

P11-211 **Page 3.2-58:** The observation that the Project is unlikely to have an impact upon groundwater or surface water quality is questionable and not supported. Will not the reduction in underground water cause a greater interaction between the remaining waters and the surrounding rocks, sand and other below ground surfaces? Will not increased interaction directly affect the amount of TDS of the underground water? Will the reduced water flow into Little Lake prevent the natural replenishment of cleaner and fresher water sources? Will the concentration and the reduction of overall water, also affect water quality? Is not the water quality of the Rose Valley Basin far superior to the Geofluids present in the geothermal reservoir? Will not all of the water transported to Coso thus suffer an extraordinary loss of quality? Will all of the transported water be unavailable for use in Rose Valley? Because of the large evaporation and evapotranspiration at Little Lake, does it not require larger amounts of fresh water to prevent undue contamination and concentration of solids? If there are no impacts to water quality, why do the Hydrologic Monitoring and Mitigation Program include the monitoring of water quality and even triggers to curtain or reduce pumping due directly to a reduction in water quality? (See page C4-18)

P11-212 Little Lake is shallow. Due to its shallow depth and the relatively flat angle of incline of its banks, even a small decrease in water level has the potential to (a) significantly decrease its surface area, (b) harm the quality of water, and (c) damage the ability of Little Lake to sustain plants, biological resources and fish in the Lake and ponds. As with most bodies of water, Little Lake's water quality depends on the movement and exchange of water. A reduction of inflow and/or outflow is likely to result in the stagnation of Little Lake's water and seriously diminish its quality. This, in turn, could have serious ramifications for dependent vegetation and wildlife. No study or evaluation of this issue has been performed or addressed as part of the Project.

P11-213 The Geothermal PEIS suggests that the large volume and long duration of geothermal fluid production could have the greatest potential for impacts for hydrologic resources and water qualities. The result could include reduction and spring discharge rates, lowering of water levels in wells, the introduction of low-quality fluids to groundwater pathways, and the quality of available water. (Geothermal PEIS, at page 5-26)

P11-214 **Page 3.3-7:** Will the water injection by the Project stimulate seismic activity? Will it cause or possibly lead to new fractures in the geothermal reservoir? Since the commencement of operations of Coso, what has the general level of seismic activity been associated with the Coso operation? Does Coso plan on using any of the water to create or operate and enhanced/engineered geothermal system (EGS)? Does Coso continue to perform under any EGS contracts or test programs? What is Coso's water needs to conduct EGS tests? Will the limitations and mitigation of the Project preclude the use of water for EGS tests? If not, what is the resulting probability of seismic activity? (See studies of enhanced seismic activity related to injection and EGS in Rose Progress Report.)

P11-215 One of the other aspects of project economics and of project feasibility is the potential of the site for induced acoustic emissions, so there is always the potential for induced seismicity that may be sufficiently intense to be felt on the surface. There is some risk that, particularly in seismically quiet areas, operation of an EGS reservoir under pressure for sustained periods may trigger a felt earthquake (MIT Report, Section 5.7, page 5-8).

P11-216 **Page 3.3-8:** Does the DEIR accurately assess subsidence potential? Will the withdrawal of significant water resources from the Rose Valley Basin contribute to subsidence concerns? The likelihood of subsidence in prior geothermal studies is explored. (DiPippo 2008, Section 19.5.1, page 396). Additional studies and analyses are required.

P11-217 The risk of subsidence occurs at both Rose Valley and Coso. The pumping of water from Rose Valley will deplete underground water resources that could lead to subsidence. Moreover, because Coso is producing much more Geofluids than it injects (even with the Project), there is not only a risk of subsidence, but it is occurring. (See Wicks – Deformation.) Accordingly, all of the Geofluids should be captured and re-injected, not just a portion.

P11-218 **Page 3.3-9:** Impacts on geologic resources and seismic issues must be evaluated. The high pressure injection of fluids directly into fault zones has been related to increases in seismic activities (Geothermal PEIS Section 4.3.2, page 4-18).

P11-219 **Page 3.3-11:** Are only the current injection wells being used at Coso? Will the Project prohibit the construction of new injection wells or a larger distribution footprint? If new injection wells are proposed, where will they be? How many additional pipelines will be built to distribute the water? What will be the resources used to further distribute the water? What are all the environmental impacts from such an enhanced distribution system?

P11-220 The high pressure injection of fluids directly into fault zones has been related to increases in seismic activities. (Geothermal PEIS, Section 4.3.2, Page 4-18) The Geothermal PEIS then notes that the high pressure injection of fluids from outside the geologic system is not the same as where Geofluids are withdrawn and then re-injected for a near zero net change, and would represent a much lower risk of increasing seismic activity (Geothermal PEIS, Page 4-19). This

P11-220 conclusion ignores the dramatic loss of heated liquids from evaporation when WCTs are employed at the facility for cooling purposes. Indeed, if there is no source of make-up water from nearby surface waters or underground water basins, and a WCT system is used, then the geothermal reservoir can be substantially depleted of water over time, actually increasing the possibility of seismic activity.

P11-221 **Page 3.3-12:** The 1980 EIS mentions the possibility of soil subsidence in Rose Valley as a result of the withdrawal of groundwater at page 2-49. Subsidence could occur with extensive long-term overdraft of the groundwater reservoir. This impact must be studied and evaluated. The Geothermal PEIS notes that subsidence can also occur when groundwater is pumped from underground aquifers at a rate exceeding the rate at which it is replenished. (Section 4.3.2, page 4-19) More evaluations of the subsidence potentials are required. Also, subsidence at Coso must be considered based on its decisions to use WCTs depleting the geothermal reservoir. Would the use of ACCs minimize subsidence risk?

P11-222 **Page 3.3-13:** Is the statement that the total water pumped during the course of the Project would only equate to approximately .27% of total aquifer volume accurate? Where is the estimate for aquifer volume? Describe all facts to prove the estimate. There is no mention of the predicted water in storage in the Rose Valley Basin in the Hydrology Model. It appears that the Hydrology Model substantially overstates the estimated water in storage. (See Zdon Memorandum 9-2-08)

P11-223 **Page 3.3-14:** The statement that groundwater pumping would not result in significant reductions in "surface water levels" in Rose Valley is inconsistent with the impact analysis at Little Lake. There is actually an express direct impact in the lowering the surface area of Little Lake and its related ponds and streams. Losses to the springs could also reduce surface waters. Such reductions could affect soil erosion as well as fugitive dust emissions. The lowering of the groundwater table could also reduce moisture to the surface and therefore reduce the quantity of vegetation at the service. This again could affect erosion and air pollution. Even a 10% reduction in surface water levels could in fact increase windblown soil erosion. The first paragraph on page 3.3.14 should be rewritten and reanalyzed.

P11-224 **Page 3.3-15:** Impacts upon a possible "mineral resources" are mentioned. Impacts to the geothermal reservoir itself are entirely missing or non-existent from the DEIR. While perhaps not classically a mineral resource, the geothermal reservoir, containing the reservoir of Geofluids, heated rocks and the entire geothermal system, is indeed an environmental resource which must be properly managed. While there are unsupported and conclusionary assertions in the DEIR that the injection of cool water from Rose Valley may actually help to restore, or at least lessen the decline, of the geothermal reservoir, there have been no substantive studies or evaluations of the subject contained in the DEIR to support these statements. Likewise, there has not been a proper evaluation of alternatives to the Project by comparing the admitted environmental impacts from withdrawal of water from Rose Valley, to alternative methods to preserve Coso's geothermal reservoir. The geothermal reservoir does not need to be steadily

P11-224 drawn down to a point where it becomes extinct and unable to support any energy production. Coso made economic decisions 20 years ago, knowing that the design of its plant and the level at which Coso wanted to extract Geofluids would inevitably lead to a drying out of the reservoir. (See my earlier comments regarding Coso's poor decisions.)

P11-225 The baseline condition of the Coso geothermal plant upon which the pending Project must be based is Coso's geothermal reservoir currently being in a steady-state of decline. The Project is intended to minimize the decline, but not increase production.

P11-226 **Page 3.4-16:** DEIR says the Lake was created in 1905. Little Lake is not man-made, nor was it created in 1905. Water has naturally occurred on site for around 11,000 years. Toward the end of the Pleistocene Era, about 16,000 years ago, wetter conditions created great river and lake systems that filled the low-lying areas. Owens Lake overflowed to the south and formed a series of lakes including China Lake, Searles Lake, and Panamint Lake, evidenced by ancient shorelines and lake beds. A broad, shallow lake was formed just above the constriction at the lower end of what is now Little Lake, and remained while the channel was being eroded through the lava flow that dammed the south edge of the Rose valley. This channel was cut back approximately a mile through the basalt, terminating in a rock formation that we know as Fossil Falls. From about 5,000 to 3,000 years ago, the Little Lake catchment consisted of salt grass meadow, marsh and ponds, and then the sediments and fossils indicate a shallow lake, with a brief return to marsh deposits at about 2,200 B.P. Sediment structure at the coring sites near the present center of the Lake suggests a seasonally dry lake edge at about 1,500 and 900 years ago. The presence of surface water, whether in the form of permanent springs, streams, lakes or ponds was an extremely important consideration for prehistoric people of the region. (See LLR History-Pearson.)

P11-227 The County should review the photographs contained in the LLR History-Neuman. Dr. Neuman collected old photos spanning five decades of Little Lake Ranch. This provides an excellent example of the biology, habitat and wildlife abounding at and around Little Lake. You may also see the dramatic improvements to the property. The Project imperils all of the work and effort that went into making the Little Lake property a shining example of habitat improvement and restoration.

P11-228 Refer to the letter received by the County from Ducks Unlimited, dated August 29, 2008. (DU Letter 8-29-08) This letter confirms the vital importance of Little Lake to migratory fowl and a host of other critically important wetlands, riparian habitat and wildlife. Any reduction in water supplies could destroy this rich environment.

P11-229 **Page 3.4-25:** Each and all of the County General Plan requirements must be addressed at Little Lake and throughout the Rose Valley. The DEIR should contain comments covering the following standards:

> **General Plan 8.6.4 Policy BIO-1.2:** Important riparian areas and wetlands, as identified by the County, shall be preserved and protected for biological resource value.

Little Lake's riparian areas and wetlands threatened by Coso's Project are barely mentioned in the DEIR, let alone preserved and protected. Won't a 10% reduction of water available to the habitat and biology resources have an impact? Has this decline been addressed in the DEIR? How does a 10% reduction of water protect Little Lake's riparian areas and wetlands?

> **General Plan Table 8-5 Implementation Measure, 2.0:** On project sites that have the potential to contain species of local or regional concern, sensitive natural communities or special-status species, the County shall require the project applicant to have the site surveyed and mapped by a qualified biologist. A report on the finding of this survey shall be submitted to the County as part of the application and environmental review process.

Despite the mandatory nature of this Implementation Measure, there is no requirement for a survey of Rose Valley or Little Lake. The Hydrology Model predicts over a huge decline in Little Lake's surface water if the Project is approved for 30 years, leading inevitably to losses to natural communities and special-status species. The impacts continue for over 100 years, even after pumping stops. Why hasn't the Rose Valley been surveyed and mapped as required? What steps are taken to prevent loss?

P11-229

> **General Plan Table 8-5 Implementation Measure, 3.0:** On project sites with the potential to contain wetland resources, a wetlands delineation shall be prepared using the protocol defined by the Corps of Engineers. A report on the findings of this survey shall be submitted to the County as part of the application process.

No wetland delineation study has been required. The Project does not comply with this Implementation Measure. Why not? Given a 10% projected loss of water resources at Little Lake, isn't it obvious that wetlands will be impacted?

> **General Plan Table 8-5 Implementation Measure, 4.0:** The County shall review development proposals in accordance with applicable federal, state, and local statutes protecting special-status species and jurisdictional wetlands. Appropriate mitigation measures will be incorporated into each project, as necessary.

The Project will directly impact at least two endangered species, the Desert Tortoise and the Mojave Ground Squirrel. While these species have been noted in the DEIR, no sufficient safeguards have been imposed to protect them. It seems questionable that adequate attention to these impacts has been considered by the appropriate agencies, particularly when recalled that the water losses at Little Lake will decimate possible habitat areas on which they rely.

General Plan Table 8-5 Implementation Measure, 8.0: The County shall support the appropriate preservation, restoration, and enhancement of sensitive natural communities or special-status species habitats conducted by land management agencies in the County.

P11-229

There has been no required study, nor the adoption of any preservation and management plans.

General Plan Table 8-5 Implementation Measure, 12.0: Project proponents will be required to survey and implement prevention measures, abatement measures, and post-project monitoring of noxious weeds as a component of land management or land development projects.

There has been no required study, nor the adoption of any preservation and management plans. Why not?

P11-230

Page 3.4-26: The overview of impacts and most of the following stated possible impacts deal with the physical confines of the Hay Ranch and the area directly within the construction and operation of the pipeline consisting of approximately 59.5 acres. To the extent that impacts on biological resources are limited to analysis of the habitat and wildlife within the confines of this geographical area of the Project, the DEIR should more clearly express this point. The indirect impacts from water drawdowns and impacts to surface water should be clearly and separately identified. Indeed, as to each separate potential impact 3.4-1 through 3.4-3, a separate discussion should follow with respect to ancillary or indirect impact at Portuguese Bench and Little Lake.

P11-231

Has the importance of Little Lake as part of the Eastern Sierra Flyway and as a stopping ground for migratory fowl been considered? What percentage of migratory fowl rely upon Little Lake and its surrounding areas as a stopping point, resting area, feeding grounds, and nesting source to maintain migratory fowl? If the drawdown caused by the Project, when considered with the LADWP and Deep Rose Projects, increases impacts, where will the migratory fowl go? (See DU Letter 8-29-08)

P11-232

While Little Lake is just outside the CGSA, it is a fresh water habitat nearly unique within the region. The riparian vegetation and fauna depending on the vegetation are vulnerable to any reduction of water levels. (1980 EIS, at page 2-101) The relative importance of Little Lake and Haiwee Springs should be protected as oases not readily present within the surrounding habitat. (1980 EIS, at page 2-103) The habitat at Little Lake will be affected if groundwater levels are lowered. Projected water use in the Rose Valley exceeds recharge. Because Little Lake is a very shallow body of water, lowered groundwater levels from water use in excess of recharge could reduce spring flows and return the Lake to a marsh. (1980 EIS 2-106) The riparian vegetation on the borders of Little Lake is particularly sensitive. There is a high probability that the water level of Little Lake will be lowered if water utilization for the proposed

P11-232 program reaches projected levels. If groundwater is used in the quantities projected, Little Lake has a high probability of decreasing in volume, and hence a valuable habitat for water fowl and other wildlife species may be endangered. (1980 EIS 4-5)

P11-233 The California Native Plant Society lists at least one very rare and endangered plant species known as Spartina Gracilis, also known as desert or alkali cord grass, existing on the western shore of Little Lake. (1980 EIS 2-120) The lowering of Little Lake could cause the loss of the rare cord grass, as well as other species that can only exist in oases. (1980 EIS 2-124.) Would a reduction in water levels further threaten this endangered species?

P11-234 Please explain the reasons for the DEIR apparent disagreement with the comments made in the Groeneveld Article, including the following:

> "Within arid or semi-arid climates, diversion of surface water and uncontrolled groundwater pumping has the potential to degrade native vegetation cover by reducing direct supply and recharge with subsequent sub-irrigation from groundwater. The degree of this impact is in direct proportion to the amount of water required by the vegetation cover."

> "The lowering of regional water tables due to ground-water pumping has probably played the most important role in driving large-scale changes from grass-dominated cover to shrub cover."

> "For all practical purposes, the changes in vegetation cover and composition due to water export must be regarded as permanent."

> "Unfortunately, annual runoff is predictable only across scales of months while groundwater pumping affects water tables for periods of years."

P11-235 **Page 3.4-28:** The CEQA analysis for the Coso geothermal project in 1988 allegedly addressed mitigations for habitat loss of the Mohave Ground Squirrel (MGS). Provide a map which delineates the exact footprint of the land and project considered by the 1988 CEQA document. Are all of the mitigation measures for the MGS included and incorporated herein? On the map of the 1988 project area, also delineate the precise limits of the 59.5-acre portion of the Project described herein. Verify that all of the lands within the Project area were previously considered and incorporated as part of the Coso Project. How much of the 2,193 acres of habitat used for geothermal projects has been used? How much remains? Is the 1988 plan still effective for the current Project? Was the MGS a threatened species in 1988 when protection, conservation and mitigation were being addressed? Should a new and updated assessment be performed for the MGS after a 20-year lapse from the previous study?

P11-236 **Page 3.4-29:** In 1988, allegedly 885 acres of disturbance had occurred of the permitted 2,193. What has occurred in the following 20 years? How much additional land has been

P11-236 disturbed or made unavailable to the MGS? Why haven't the complete and applicable provisions of the 1988 mitigation plan been incorporated and described in the DEIR? The public cannot realistically determine whether the mitigation is adequate without seeing what they are. Incorporate and list all of the measures in the DEIR.

P11-237 **Page 3.4-31:** Mitigation measures for the Desert Tortoise are set forth. Will Coso obtain a separate incidental take permit from California Department of Fish and Game ("CDFG")?

P11-238 **Page 3.4-41:** Type E classifications of vegetation include areas where water is provided to enhancement/mitigation projects. While perhaps this classification refers to the mitigation and enhancement projects performed by the County, but funded by LADWP, this type of vegetation could also refer to and be consistent with the habitat enhancement efforts of Little Lake. Little Lake Ranch is actively managing its current and available water supplies to support a variety of re-vegetation projects. Even a marginal loss of water could impact these efforts or eliminate the ability of Little Lake Ranch altogether. No mention of Type E classification vegetation is described in the EIR. Why not?

P11-239 **Page 3.4-42:** The DEIR continues to assert that the Portuguese Bench Spring is hydrologically separated from the balance of Rose Valley. Is this conclusion based on solely the 14-day pumping test? (See Zdon Memorandum 9-2-08.) What happens if Portuguese Bench and the Davis Spring are suddenly impacted following the commencement of pumping? What will the mitigations measures be in such an eventuality?

P11-240 **Page 3.4-42:** Similar to Portuguese Bench, the DEIR suggests that Rose Spring is not connected to the balance of Rose Valley. See and address all of the same questions posed above regarding Portuguese Bench, and apply it to Rose Spring.

P11-241 **Page 3.4-42:** Little Lake Ranch rejects the notion that a 10% reduction or less is not significant. Even assuming the Lake and the ponds could suffer a 10% decline but survive, what about the attendant impacts upon the surrounding habitat? The final amount of surplus waters from the water flowing through Little Lake are exactly the waters which allow Little Lake Ranch to enhance the wetlands and riparian habitat, extend water for irrigation to surrounding food plots and habitat communities, and generally enhance and preserve the water depending on the plant community. Additional mitigation is necessary, such as Coso funding a water project to provide supplemental water to Little Lake. The source of the water should be outside the Rose Valley.

P11-242 **Page 3.4-43:** There is no question but the amount of precipitation and water flow through Little Lake vary seasonally and over a normal cycle of wet and dry years. While a 10% reduction on a temporary basis may fall within a normal fluctuation, a permanent reduction of surface flows by 10% would never be compensated by later wet year increases. The DEIR and the pumping Project would permanently deprive Rose Valley and Little Lake of valuable water resources. How is the permanent and irretrievable reduction in underground water levels and

P11-242 surface flow not significant? Before condemning Little Lake and the Rose Valley to a permanent water loss, the County must explore other alternatives.

P11-243

Page 3.5-1: Refer to the history of Little Lake prepared by one of the Little Lake Ranch's member, James Pearson (LLR History-Pearson). Jim is an archeologist. The use and occupation of the Little Lake area by Native Americans is completely omitted. A brief summary of the area follows, and should be used in the DEIR.

Native Americans were the first inhabitants of this area and they have been in this land for a very long time. Archaeological research suggests that humans were using the Little Lake environs for at least 10,000 years or more – perhaps as early as 14,000 B.P. (before present). The fact that this locality comprised an oasis-like environment for several millennia was probably one of the most significant elements affecting use and habitation. Few archaeological sites in California exhibit the abundance of cultural material or as much evidence of prehistoric occupation as does Little Lake. (See LLR History-Pearson.) Like Coso Hot Springs, Native Americans use Little Lake to this day for religious purposes, but no mention of this is made in the DEIR.

Another important factor to show the use of Little Lake was the availability of high quality volcanic glass (obsidian) for use in making stone tools. Sugarloaf Mountain lies about eight miles to the northeast of Little Lake and obsidian has been quarried from Sugarloaf for thousands of years. The people of the area transported large pieces of obsidian to Little Lake where they turned it into projectile points and other implements. This is the reason that we see so much lithic debris at the ancient archaeological sites on and near the Ranch.

Surveys have identified more than 60 archaeological sites within a quarter of a mile radius of Little Lake. The north end of the Ranch property contains one of the best known archaic sites in all of California – the Stahl site. In the summer of 1947 Willy Stahl, an amateur archaeologist, reported to Mark Harrington, then curator of the Southwest Museum in Highland Park, that he had located a large site immediately north of Little Lake. In November of that year Harrington did a reconnaissance of the area and found weathered chips and fragments of obsidian, fire-broken stones, and projectile points. Harrington began excavating in the spring of 1948 and continued intermittently until the summer of 1951. The excavations yielded nearly 500 projectile points, numerous scrappers, chipped stone implements, manos, metates, hammerstones and other artifacts.

During the 1990s, a number of excavations were conducted not only at the Stahl site, but also at another site at the northwestern edge of the lake known as "Pagunda" ("lake"). Data recovered during these excavations suggest that the major occupational sequence at the Stahl site began about 6,000 years ago and lasted for roughly 2,000 years. The onset of activity at the Pagunda site began around 3,000 years ago and reached its apex about 1,900 B.P. In historic times (the last 150 years or so) there was a fairly large Coso Shoshone village at the Pagunda site with upwards of 100 inhabitants.

P11-243 One of the most extraordinary cultural features that can be seen on the Ranch property is the rock art. Most of the art consists of engraved or pecked images called petroglyphs. Archaeologists who are experts on the subject tell us that much of the rock art was created by shamans to depict visions they experienced during altered states of consciousness. The Coso Range was thought of as a place where weather shamans could seek and acquire supernatural power, and spirit helpers that would enhance their rainmaking ability (LLR History-Pearson).

P11-244 **Page 3.5-15:** The DEIR again suggests that the injection of water from the Project could counter the pressure differential in the geothermal reservoir and decrease water level and temperature at the Coso Hot Springs. When the geothermal reservoir was exploited in the early years, the water level and temperature of Coso Hot Springs increased dramatically. Such increase continued for many years during production and re-injection activities. Insufficient data has been presented to demonstrate that injection of the new water source would reverse the trend. (See my earlier comments regarding this issue.)

P11-245 The Paiute and Shoshone Indian Tribes engaged the services of Robert R. Curry, Ph.D. to investigate the causes of perceived changes at the Coso Hot Springs. Dr. Curry reviewed all of the monitoring information at Coso Hot Springs and compared it to the geothermal operations at Coso and the relevant changes or influence through natural causes, such as rainfall and potential recharge (Curry Report 2004).

The essential findings of Dr. Curry can briefly be summarized as follows:

- Temperatures increased from 100° F to over 200° F by 1994 and have remained at the elevated levels ever since.
- Seasonal variations in the South Pool elevations fluctuated between 45' from 1979 through 1989. Beginning in 1989, the South Pool elevations rose as much as 10' to 11' and seasonal variation increased by as much as 8', which has continued to date.
- Changes in rainfall and potential recharge do not coincide with changes in temperature and pool volume nor do they correlate with observed changes in regional precipitation.
- It is possible to find the increased temperatures at Coso Hot Springs as a result of decreases in shallow groundwater upgradient as deeper geothermal fluids are extracted and diminished at the Coso geothermal unit called Navy 1.

P11-245

- Observed changes in the seismicity associated with exploration drilling and production of geothermal resources could be contributing to the observed changes recorded at Coso Hot Springs.
- An equally likely cause is the consumption of all net groundwater recharge and meteoric water resources by the Coso Navy 1 Geothermal Development such as the cool water resources now absent, the Coso Hot Springs temperatures would reflect only the recycling of geothermal fluids.
- Changes in ground elevation and in particular subsidence is patently obvious as well as the presence of dying vegetation.
- Navy 1 would have intercepted potential groundwater flow and increased the rate of water loss as steam such that these activities prevented the dilution of Coso fumarole fluids. This can explain the observed temperature changes simply on intercepted groundwater flow and the time correlates with the activities at Coso's geothermal operations at Navy 1.
- Fracture porosity increased between 1990 and 1995 as small earthquakes increased in numbers in response to geothermal protection. These seismic signals indicate changes in fracture patterns that allow the much hotter water to flow into the Coso Hot Springs with increased volume and temperatures.
- The loss of hot spring and fumarole activity is to be expected when a site is developed for geothermal production.
- The changes at Coso Hot Springs are believed to be the result of increased circulation of hot geothermal waters coupled with a possible decrease inflow from non-hydrothermal groundwater.
- The increases in circulation and recirculation of hot geothermal water is believed to be the result of increased reservoir rock fracturing induced by the geothermal development.

P11-246

Page 3.8-3: Not all of the County's policies on the support of agriculture have been addressed. Consider and comment on each of the following according to Section 8.3.4 of the General Plan for the County:

Goal AG-1: Provide and maintain a viable and diverse agricultural industry in Inyo County.

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Policy AG-1.1: Identify Important Agricultural Lands. Support and encourage the identification of important agricultural lands within the County. [New policy]

Policy AG-1.2: Continue Agricultural Production. Support and encourage continued agricultural production activities in the County.

Policy AG-1.3: Conversion of Agricultural Land. Discourage conversions of productive agricultural lands for urban development.

The purchase of the Hay Ranch by Coso, only to use its water wells, has removed the entire 300 acres from possible use for agricultural activities. Yet, there is no discussion of this impact or mitigation measures, consistent with the foregoing goals and policies.

P11-247

Page 3.8-4: The utilization of the Hay Ranch by Coso has, either directly or indirectly, eliminated 300 acres from useful agricultural production. As the owner of the property, Coso has chosen not to conduct agricultural activities and its Project will make the future utilization of the Hay Ranch, or any other land within Rose Valley, far less likely. As the depth to groundwater increases directly due to the pumping, the economic cost to pump water to the surface for any sort of agricultural use will increase. Will the continued operation of the Project effectively preclude future uses of the water? Limiting the impacts from the Project to only the 5 acres of the substation, a well site and pipelines ignores the real loss of the entire 300 acres of land for agriculture.

P11-248

Previously, the Hay Ranch was used for agricultural purposes, and Coso's ownership of the property solely for the purposes of the water transfer negates the preferable use of the property for any sort of agriculture. Indeed, because the Hay Ranch is now fallow, it is contributing to air pollution by increasing the amount of fugitive dust arising from the property. How much alfalfa did Hay Ranch produce per acre? How long did the Hay Ranch operate for agricultural purposes? What were the dates of agricultural use? Based on its former use, would the Hay Ranch be considered as prime agricultural land? Could the land produce a profitable alfalfa crop?

P11-249

Please refer to the Larson E-mail 9/26/07. Ms. Larsen addresses the issue of whether the Hay Ranch property could be considered "prime farmland" in the DEIR concerning agricultural impacts. The e-mail confirms that the Hay Ranch could be considered prime farmland. Ask George Milovich, Agricultural Commissioner for Inyo County, about whether the Hay Ranch could be considered prime farmland property. Ms. Larsen concludes part of the discussion by the statement, "we just don't want the opponents to bring this up..." It is troublesome that Ms. Larsen, the chief former planner for this Project, appears to be biased toward the Project and against Little Lake. It is absolutely inappropriate for a staff consultant to conceal or misstate known facts or information in the DEIR. What other information critical to the Project and its environmental impacts was concealed? Accordingly, a full discussion of the utilization of the Hay Ranch for agricultural purposes is absolutely required.

P11-250 **Page 3.9-2:** US 395 bisects part of the Little Lake property in the south end of Rose Valley and is immediately adjacent to the Project in the Hay Ranch. US 395 is eligible for designation as a scenic highway (California Streets and Highway Code Section 260, et seq.).

P11-251 The Project still impacts scenic views in two ways. First, it will construct visible above-ground improvements including the substation, two storage tanks and a small portion of the pipeline. Second, the drawdown of the water table and the predicted decrease of surface water at Little Lake, will likely impact the visual beauty of the vegetation, habitat and wildlife visible to all residents of Rose Valley and motorists. The viewsheds should be protected. It is suggested that the County and the DEIR adopt the visual resource standards as set forth in the Geothermal PEIS. Exhibit A attached is a summary of the best management practices (BMP) which are set forth in the Geothermal PEIS for the appropriate Visual Resource Management (VRM) policies and procedures from page D-46 through D-51

P11-252 **Page 3.9-3:** BLM's assessment of the scenic quality of the Project area, and in and around the Hay Ranch, is not highly rated. Part of the problem consists of the two abandoned, dilapidated mobile homes, and storage shed on the Hay Ranch itself. Apparently, Coso has made no effort to rehabilitate or restore its own property. The mitigation for the Project should include the enhancement of the Hay Ranch itself, including the elimination of the mobile homes and storage shed.

P11-253 **Page 3.9-6:** Two water storage tanks will be constructed. The first, constructed on the Hay Ranch, will hold 250,000 gallons and be less than 20 feet tall. Nonetheless, it will be highly visible from Highway 395. All efforts should be made to comply with all appropriate visual screening techniques such as those discussed above.

P11-254 The second tank will be much larger, but the size is not mentioned under the aesthetics. It will be a 1,500,000-gallon tank (six times the size of the tank at the Hay Ranch) and it will be 100 feet in diameter and 28 feet tall. It is not clear from the DEIR whether the second tank will be visible from Highway 395. Will the second tank be visible from Highway 395? What efforts are being made to minimize its impact to the viewshed?

P11-255 **Page 3.9-8**: Impacts to the scenic quality region by indirect effects to regional water-dependent vegetation are noted. The assumption is that the Project, <u>with mitigation,</u> will minimize visual impacts. What happens without mitigation? What are the full impacts of the proposed Project? CEQA requires this analysis over the full 30-year Project at full pumping rates. Even a 10% water loss is significant. It is the last portion of the water that can be used by Little Lake to enhance and preserve the wetlands, riparian habitat and all of the other vegetation in and around the range. Any loss of water will dramatically impact Little Lake's ability to irrigate and support the habitat and viewshed.

P11-256 **Page 3.10-5:** Potential impact 3.10-2 purports to address the potential of the Project to those individuals or the environment through the emission of or exposure to hazardous materials, substances and waste. The DEIR fails to address several significant impacts all related to the Project, the injection of water in the geothermal reservoir, and the operation of the geothermal facility itself (both in its existing configuration and to the extent that the production of energy is increased and/or extended by virtue of the injection of water).

P11-257 First, the relatively clean water of the Rose Valley Basin is proposed to be injected. This water will be then contaminated by all of the naturally occurring chemicals already existing in the geothermal reservoir (MIT Report, Section 8.2.1; Geothermal PEIS, Section 3.8.6, page 3-103).

P11-258 Second, the only stated reason for injecting of the water is for the creation and generation of additional Geofluids which may then be brought to the surface from Coso's production wells. The proposed Project will allow Coso to generate more Geofluids than it currently produces. What types of additional wastes will be generated and how much per year? How will they be handled? The County should examine all of the better ways to capture all of the Geofluids for re-injection so that these very CWC 181 wastes are not discharged into the environment. What is the composition of the Geofluids? What portion of the Geofluids consists of non-condensable gases (NCG)? What is the process for handling NCG? How much of these materials are considered hazardous? How will Coso dispose of the hazardous substances? Will this add to the already overtaxed hazardous substances, landfills or waste depositories? What different types of technologies or equipment could Coso use to eliminate the additional hazardous waste?

P11-259 The second largest quantity by category of hazardous wastes produced in California is identified as California Waste Codes ("CWC") 181, which includes waste generically identified as: "Other inorganic solid waste" which includes such substances as "environmentally hazardous waste substance solid NOS (nickel, cadmium), hazardous waste solid, NOS, (mercury) (fluorescent light tubes) (steel and garnet blast)." (Pollution Workplan 2008) CWC 181 materials accounted for a full 52% of the total Recurrent Waste going to landfill disposal sites (page 64-65) and 6% of total hazardous wastes sent to incineration for disposal (page 67). The Pollution Workplan goes on to identify the top 25 generators of CWC 181 wastes. Coso is the sixteenth largest generator of all CWC 181 wastes in the State of California; discharging a full 3,168.928 tons of CWC 181 wastes (see Table 25, page 74). Putting this in further comparison, the Pollution Workplan identifies a total of 55,026 total generators of wastes, so Coso must be regarded as a significant producer of hazardous wastes.

P11-260 There is no mention of heat pollution from the Coso facility. All electrical generation plants emit vast quantities of heat. Indeed, per unit of power generated, geothermal plants produce and emit heat in far greater proportion than hydrocarbon and other types of generation plants. (See DiPippo 2008, Section 19.5.8, page 406; MIT Geothermal Report, Section 8.2.9.) The Project proposes to allow Coso to generate additional quantities of energy and extend its likely economic life for an unstated number of years. Will both of these factors increase the

P11-260 amount of heat emissions from Coso? How much residual heat is emitted to the atmosphere in appropriate measurement standards (per month or per year, and based upon the volume or quantity of Geofluids produced)? What portions of the environment are affected by such heat emissions? What is the likely effect on the habitat, including vegetation and wildlife? What are the impacts upon the workers at Coso? What method should be employed to minimize any impacts? How can the heat loss be reduced?

P11-261 Although thermal pollution is currently not a specifically regulated quantity, it does represent an environmental impact for all power plants that rely on a heat source for their motive force. Heat rejection from geothermal plants is higher per unit of electricity production than for fossil fuel plants or nuclear power plants, because the temperature of the geothermal stream that supplies the input thermal energy is much lower for geothermal power plants. Considering only thermal discharges at the plant site, a geothermal plant is two to three times worse than a nuclear power plant with respect to thermal pollution, and the size of the waste heat rejection system for a 100 MW geothermal plant will be about the same as for a 500 MW gas turbine combined cycle (MIT Report, Section 8.2.13).

P11-262 **Page 3.11-3:** Potential Impact 3.11-1 addresses impacts to existing public services, one of which is waste disposal. For the reasons noted above concerning the hazardous waste generated by Coso, and any increase in such waste as a direct result of the Project, no information has been provided about the capacity or local or regional waste facilities to handle the additional waste generation by Coso. As such, the DEIR is deficient in this regard and must be updated.

P11-263 **Page 3.11-5:** The DEIR perpetuates and continues to state as fact, an erroneous assumption that the Hay Ranch used as much as 3,000 AFY of water for agricultural uses. The fallacy of the assumption has been set forth on several occasions. Reference to the prior Coso Mitigated Negative Declaration (MND) and Staff Report, neither of which were based on actual water-pumping records or any other reliable source, must be rejected. These are nothing more than conjecture, and patently inaccurate speculation.

P11-264 County should refer to the WD Memo 9-29-06 which states: "While the amount of water pumped for irrigation [from the Hay Ranch] is unknown, we can assume that it was in the range of 5 to 10 acre-feet per acre, which would result in 1,500 to 3,000 acre-feet pumped for irrigation." Why has the County adopted solely the estimate of 10 AFY for historical use? The DEIR must not rely upon the faulty historical use of the water from the Hay Ranch wells. First, the agricultural pumping was only done seasonally during the dry summers, and not 365 days per year as proposed by Coso. Second, the agricultural pumping only continued for a period of 3 to 4 years, but the impact from the pumping may take 3 to 4 years before an impact on Little Lake is noticed or occurs. Third, and perhaps most importantly, the prior agricultural pumping was to use the water on the Rose Valley Basin, while the Project contemplates the transport of the pumped water to a completely separate water basin, thereby leaving the Rose Valley Basin with a net loss of water of 4,800 acre-feet per year. The water generated from the earlier pumping

P11-264 was either returned to the Rose Valley Basin or prevented further evaporation from the Rose Valley Basin. Once the water transported by Coso leaves the Rose Valley Basin, it cannot recharge or otherwise benefit the Rose Valley Basin. Fourth, there is an assumption that the alfalfa on the Hay Ranch was irrigated at a rate of 10 feet of water per acre for the 300 acres of alfalfa fields, resulting in a groundwater use of approximately 3,000 acre-feet per year. In fact, this represents a huge overestimation of the actual use of water on alfalfa. Alfalfa needs only 5 to 6 acre-feet of water per year. Thus, the prior pumping probably only generated approximately 1,500-1,800 acre-feet of water per year, or less. Fifth, the pumping only occurred for a relatively brief period of time, whereas the current Project contemplates sustained and continual pumping for 30 years. Sixth, could the agricultural pumping have caused Rose Spring to dry up? Please address and respond to the observations made:

P11-265 **Page 3.11-6:** It is noted that the output has decreased due to the loss of water from evaporation. See all comments herein related to the amount of water loss.

P11-266 It is then indicated that injected water would be injected below localized groundwater tables and would not impact local groundwater supplies (Page 3.11-6). Is this statement inconsistent with earlier observations that some of the Geofluids may migrate to the Rose Valley? If Rose Valley water is injected, and contaminated, won't there be an increase in the likelihood of contamination flowing back to Rose Valley?

P11-267 **Page 3.11-7:** Potential Impact 3.11-4 deals with the generation of waste beyond capacity, or to create a nuisance from waste. See the questions posed above regarding Coso's waste generation.

P11-268 **Page 3.12-1:** Noise from geothermal operations is typical of many industrial activities. The highest noise levels are usually produced during the well drilling, stimulation, and testing phases when noise levels ranging from about 80 to 115 decibels. During normal operations of a geothermal power plant, noise levels are in the 71 to 83 decibel range at a distance of 900 meters. (MIT Report, Section 8.2.3.) Have these noise levels been addressed?

P11-269 **Page 3.13-6:** Potential Impact 3.13-2 addresses impacts that may arise which would contribute to the violation of air quality standards or contribute to violations regarding fugitive dust. The DEIR does not truly address the loss of even 10% of water. The reduction of the water table may well have an impact on the moisture of the surface and the health and vitality of surface vegetation. There is a predicted drawdown in the water table and a consequent impact on the surface. Has Great Basin fully addressed the drawdown of the water table and likely creation of more fugitive dust?

P11-270 **Page 3.13-8:** Potential Impact 3.13-3 also deals with the emission of pollutants. As mentioned previously, the Project proposes to inject water and increase production of produced Geofluids. This will allow for the increased and longer continued emissions of carbon dioxide, a greenhouse gas, and the possible emission of hydrogen sulfides, unless properly managed by the

P11-270 design of Coso. Will the additional emissions from the injected water be properly disposed of? What additional contaminants or hazardous waste will be emitted to the atmosphere?

P11-271 **Page 3.13-9:** For the same reason described above relating to the increased and continued emissions from expanded production of Geofluids, Coso may generate more noxious odors, at least affecting its own workers and staff. Staff and personnel from the surrounding China Lake Naval Weapons Station may also be impacted. These impacts should be noted and evaluated.

P11-272 **Page 4.3:** Section 4 involves the analysis of any cumulative, growth-inducing, and significant unavoidable impacts. The Deep Rose, LLC Project is noted, but appears to be outdated and inaccurate. Deep Rose, LLC has transferred its Project to Deep Rose No. 16 LLC and received an extension to continue geothermal explorations until 2010. (See CSLC Permit Extension 5-1-08) Also, the DEIR only references that portion of the Deep Rose Project within Section 16 consisting of approximately 640 acres managed by the California State Lands Commission. In addition to this limited exploration project, Deep Rose and others have applied for geothermal exploration permits for a total of 4,500 acres of land managed by BLM. In an e-mail from Sean Haggerty of BLM to Kermit Witherbee, dated 2/27/08, there were a total of 25 pending geothermal lease applications in California. (Haggerty E-Mail 2-27-08) There were three pending projects in the West Coso region identified as CACA-43993, 43998 and 44082, containing the aggregate of 4,460 acres. The applications were filed by Terry Metcalf (Deep Rose) and Maxx Management Corp. A table with the summary of applications was provided. (See Haggerty E-Mail 2-27-08) Deep Rose further owns a relatively small piece of property very close to the Hay Ranch, from which it intends to extract water. While the initial provision of water was only for exploration purposes, it nonetheless can provide an additional source of water to explore, construct and operate any future geothermal facilities on its described resources. Has the full extent of the Deep Rose plans been considered? If so, why does the DEIR only reference the very limited 640-acre Project? Shouldn't the full extent of the potential Deep Rose exploration be considered as part of the current Project?

According to Charles Harris, an attorney representing Deep Rose, the Deep Rose project is moving forward. Mr. Harris indicates that BLM has already budgeted and funded an environmental impact statement for Deep Rose. (See Harris E-Mail 9-2-08) Thus, the full extent of the Deep Rose project must be considered and evaluated for its cumulative impacts.

P11-273 **Page 4-4:** The DEIR concludes, without analysis or consideration, several impacts which it states will have less than significant impacts, including geology and soils, hazards and hazardous waste, and public services and utilities. Given the very foreseeable Deep Rose explorations and developments, these conclusions are at least suspect and should be reexamined once the full extent of the Deep Rose Project is considered.

P11-274 **Page 4-4:** How much water may be extracted before subsidence may occur in the Rose Valley? LADWP proposes an additional 900 AFY of extractions per year. Will this be added to

P11-274 the Coso Project? If Deep Rose operates a geothermal facility, will Deep Rose also seek water extractions and in what amount? How much will this contribute to subsidence potential?

P11-275 **Page 4-5:** With respect to hazardous materials, see all of the questions above regarding the creation and disposal of hazardous materials from Coso. If Deep Rose pursues a geothermal plant in the immediate vicinity, would not the same or closely identical creation of hazardous materials occur at Deep Rose? Given the much larger size and footprint of Deep Rose, what would be the overall impacts from heat emissions, air pollution, fugitive dust emissions, and air quality?

P11-276 **Page 4-5:** See the issues and questions above on public services and utilities regarding Coso. Consider the additional and cumulative impacts from the full extent of the Deep Rose Project. Clearly, the Deep Rose Project was minimized or not considered at all.

P11-277 **Page 4-5:** Cumulative impacts on aesthetics are noted by virtue of the LADWP Leakage Recovery Project, at least insofar as potential loss of wetlands, wildlife and vegetation of Little Lake. The proposed extraction by LADWP would add 900 acre-feet of water per year. Not only is vegetation at Little Lake impacted, but throughout Rose Valley with respect to the lowering of the water table. No mention is also made of the structures that would have to be constructed in order to facilitate the LADWP Project. There would be wells, power stations, pipelines, access roads, and any number of other visual aspects to the Project which may detract natural viewshed along Highway 395. Yet, none of these additional aesthetics is mentioned. Why not?

P11-278 **Page 4-6:** Cumulative impacts to agricultural resources are mentioned as potentially impacted by LADWP, Crystal Geyser, and Deep Rose. The comment acknowledges that groundwater tables are expected to be lowered, but these projects would not "deplete the groundwater aquifer in the Valley." What is the total storage capacity? Do not all and each of these projects exacerbate groundwater depletion? To the extent that any of the lands are taken out of agriculture production, or made unavailable for production, there is also a loss of agricultural resources. The gratuitous statement is made that as groundwater is lowered, "wells can be deepened or pumps set lower." What are the costs of these retrofits? What is the additional electricity or other production costs? To what extent are these additional costs likely to further prevent agriculture production?

P11-279 The State of California identifies and evaluates all of the groundwater basins within the state. A compilation of the data and findings are set forth in California's Groundwater Bulletin 118. While acknowledging the available data for Rose Valley is scarce, California estimates that the total storage capacity is 820,000 acre-feet of water. (See Rose Basin 6-56.) This refers to storage capacity, not how much water is actually stored in the basin, which is likely less. If Coso is permitted to pump 4,800 AFY, it would deplete the Rose Valley Basin by a total of 144,000 AFY over the 30-year period of the Project, representing over 17% of the entire basin. How can the County allow such water consumption to the detriment of all current and future water users within the Rose Valley?

P11-280 **Page 4-6:** Air quality and, in particular, the increase of dust emissions and air pollution, must be further examined. It is odd that the Little Lake habitat restoration would be considered a positive impact, which it would be with sufficient water resources, but will turn to a severe negative impact if water supplies are reduced as projected by the Project and the studies presented in the DEIR. Only the LADWP Project addresses increased dust emissions from water removals, but the Deep Rose Project is hardly mentioned at all. If Deep Rose pursues the same design and environmental footprint of Coso, the emissions from the power plant, as well as fugitive dust, will be exacerbated. In a non-attainment area, this analysis seems suspect at best.

P11-281 In discussing the possibility of air pollution, it is noted that flash and dry-steam power plants emit geothermal vapors to the atmosphere, potentially releasing a range of pollutants (Geothermal PEIS Section 4.8, page 4-54). The increase of air pollution due to the higher rate of the production of Geofluids at Coso is not mentioned. Why not? What happens if Deep Rose is built and operated?

P11-282 **Page 4-6:** As with other impacts, the cumulative impact assessment sorely and inadequately addresses impacts from the LADWP Project and Deep Rose. The LADWP Project is a nearly 20% increase of water consumption in Rose Valley, compared to the Project. The Deep Rose Project's needs for water have not even been addressed, whether for the related 640-acre project or the much more extensive 4,500-acre Project currently in process. Each of these Projects could substantially reduce the underground water level, impact and reduce biological resources during construction, operation and water drawdown, and otherwise harm the environment. Yet, virtually no analysis is provided. Why not? Do the water models separately add the predicted water drawdown by LADWP? Why is there no similar analysis for Deep Rose?

P11-283 **Page 4-6:** While cultural resources are mentioned as a cumulative impact, it completely ignores the Deep Rose Project and what impacts it may have on Coso Hot Springs. Deep Rose is located within the same general vicinity and will explore and produce Geofluids from a related geothermal reservoir. The Deep Rose Project is not even mentioned in connection with the Coso Hot Springs. Why not? Moreover, given the relative size of Deep Rose, shouldn't additional consideration be given to further impacts?

P11-284 **Page 4-7:** The discussion of hydrology and cumulative drawdowns of the water table are mentioned, but the relative impacts are woefully insufficient and inconclusive. Given the pending Project, and the proposed LADWP Project, both projects should be fully analyzed together. Will the Coso Project be expressly conditioned and limited to obligate a pumping curtailment if LADWP seeks and obtains a permit? Will the CUP absolutely prevent any vested rights?

P11-285 If a CUP is issued, will Coso's Project have a priority right for water extraction prior to every other geothermal project? Why is Deep Rose not even mentioned in the hydrology? Is the

P11-285 County aware that Deep Rose owns private property with a well from which it can extract water? As the Deep Rose exploration progresses, won't it need water for exploration, construction and operation? Where will the water come from? Depending upon the design of Deep Rose, will it also require supplemental injection waters in the future? Why has the Deep Rose Project been completely ignored under the hydrology section?

P11-286 LADWP proposes an additional 900 AFY of water extractions per year. Allegedly, the Hydrology Model purports to include the LADWP Project in its projections from Coso's pumping. What happens to the predicted impacts when LADWP begins to pump? Will both companies be allowed to pump at full maximum rates? Should the mitigation measures and CUP conditions include an automatic reduction in Coso's pumping if and when LADWP is given permission to pump?

P11-287 Regarding water quality, see the questions on water quality above. All of the questions apply more completely when considering the LADWP Project and Deep Rose. Why has there been no assessment of water quality issues in the DEIR?

P11-288 **Page 4-7:** Cumulative impacts regarding recreation are perfunctorily addressed. How much recreation can occur, whether hunting or fishing, if there is no water in Little Lake?

P11-289 **Page 4-8:** The analysis of an individual project on the worldwide issue of global warming is indeed difficult, if not speculative. Little Lake Ranch recognizes that electricity generated from geothermal reservoirs likely contributes far less to global warming as a result of a relatively minor release of CO_2, compared to hydrocarbon generating facilities.

A geothermal resource should be protected. The overexploitation of the resource by Coso, causing its ultimate demise, is not good management. The utilization of water-cooling towers, and its attendant evaporation, is causing an enormous loss of the liquids. The essence of good stewardship of natural resources is sustainability. (See Geothermal Sustainability 2006.) The reduction of greenhouse gases depends upon the availability of alternate energy systems. Why hasn't the global warming analysis considered the steps needed to assure the sustainability of this geothermal reservoir? Will the water imported from Rose Valley really result in the perpetual generation of electricity from Coso? What happens after 30 years, or the earlier cessation of pumping? Is imported water really the answer?

P11-290 Coso has complained about the cost of changing its practices. It has asserted that the mentioned alternatives are uneconomic and, therefore, infeasible. Weren't these same complaints registered by virtually all factories, manufacturers and hydrocarbon plants when society demanded that air pollution be reduced? Didn't the public ultimately demand expensive retrofits to reduce tons of toxic waste from polluting the atmosphere? Before relying upon a simplistic assertion from Coso that "it's too expensive," shouldn't we demand proof?

P11-291 If global warming is fact, then the public needs and should demand the perpetual operation of clean and renewable resources. The design of Coso's Plant and the overexploitation of the resource have turned a sustainable resource into a limited resource. Perhaps consideration should be made of what the present value of a perpetual energy resource is, compared to a limited and depleting resource when that resource is improperly managed.

P11-292 **Page 4-11:** The DEIR states that the operation of the proposed Project would not result in additional emissions of CO_2 other than minor vehicle emissions. According to published reports, this is an inaccurate statement. Geothermal plants do emit CO_2, even though the so-called Project (the water transportation from Rose Valley to Coso for injection) would not in and of itself create CO_2. However, the injected water, to the extent that it results in higher levels of Geofluids production, will cause an increased level of CO_2 emissions from baseline standards. While perhaps not significant compared to hydrocarbon energy facilities, CO_2 emissions do exist. The DEIR should at least actually report the facts. The Project will cause increased Geofluids production and the extension of the life of the Plant which would not otherwise exist without the Project. These environmental impacts must be addressed.

P11-293 **Table 4.3-1:** It is stated that 19% of all electricity is used to convey, treat, distribute and use water and wastewater in California. If there are alternatives to avoid the exportation of water from Rose Valley to Coso, and avoid using the energy to do so, wouldn't that be consistent with the State's mitigation strategy. Why hasn't the County considered the primary alternatives, discussed below, to completely avoid the Project?

P11-294 **Page 5-1:** Public Resources Code § 21002 states the general legislative policy that "public agencies should not approve projects as proposed if there are <u>feasible alternatives</u> or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects. . . ." (Pub. Res. Code § 21002.) CEQA Guidelines § 15126.6 states as follows: "<u>An EIR shall describe a range of reasonable alternatives</u> to the Project, or to the location of the Project, which would feasibly attain most of the basic objectives of the Project but would avoid or substantially lessen any of the significant effects of the Project, and evaluate the comparative merits of the alternatives... The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives."

CEQA Guidelines § 15364 defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

"The underlying policy and express provisions of CEQA limit the approving agency's power to authorize an environmentally harmful proposal when an economically feasible alternative is available." (*County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 203.) The California Supreme Court has stated that "[o]ne of [an EIR's] major functions . . . is <u>to ensure that all reasonable alternatives</u> to proposed projects are thoroughly assessed by the [lead agency]." (*Laurel Heights Improvement Assoc. of San Francisco, Inc. v. Regents of the University of California* (1988) 47 Cal.3d 376, 400.)

"Even as to alternatives that are rejected . . . 'the EIR must explain why each suggested alternative either does not satisfy the goals of the proposed project, does not offer substantial environmental advantages[,] or cannot be accomplished.' ...The explanation must be sufficient to enable meaningful public participation and criticism." (Save *Round Valley Alliance v. County of Inyo* (2007) 157 Cal.App.4th 1437, 1458.) "The fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability are sufficiently severe as to render it impractical to proceed with the project." (*Citizens of Goleta Valley v. Board of Supervisors* (1988) 197 Cal.App.3d 1167, 1181 (Goleta Valley I).)

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"Nor can an agency avoid an objective consideration of an alternative simply because, prior to commencing CEQA review, an applicant made substantial investments in the hope of gaining approval for a particular alternative. . . . The lead agency must independently participate, review, analyze and discuss the alternatives in good faith." (*Kings County Farm Bureau*, 221 Cal.App.3d at 736.) [T]he agency preparing the EIR may not simply accept the project proponent's assertions about an alternative. . . . [T]he willingness or unwillingness of a project proponent to accept an otherwise feasible alternative is not a relevant consideration." (Save *Round Valley Alliance*, 157 Cal.App.4th at 1460 & fn. 10)

The consideration of feasible alternatives is not just a procedural step under CEQA, but it is specifically mandated as a requirement. Refer to the environmental article written by Douglas Carstens (Carstens 3-08). Each public agency shall mitigate or avoid significant effects whenever it is feasible to do so (Pub. Res. Code §21002). The County may not rely solely upon project objectives that are unnecessarily restrictive or inflexible. (Carstens 3-08, pg. 206)

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During the public comments associated with the scoping of the DEIR, Little Lake Ranch identified a number of possible alternatives. None of these alternatives are discussed in the DEIR, nor was any valid reason under CEQA given for the rejection of the alternatives. Based upon further review and reflection of the DEIR, and our analysis of which alternatives may be feasible, Little Lake Ranch continues to believe that the DEIR should address additional alternatives, including (a) the use of treated wastewater from sources throughout the immediate vicinity of Coso, (b) the retrofit of Coso's Plant to use air-cooled condensers to completely eliminate the loss of water at Coso through evaporation, (c) the better management of the geothermal reservoir by reducing production and output, (d) the purchase of water from the Los Angeles Department of Water and Power (LADWP), (e) the ability of Coso to deepen its own production wells to tap new sources of Geofluids, (f) the availability of water from nearby aquifers, such as Owens Valley, Coso or Indian Wells water basins, or (g) a combination of the alternatives.

P11-296 Refer to the DiPippo Report. Mr. DiPippo identifies several feasible alternatives, none of which have been studied or considered to date.

P11-297 **Page 5-1:** Section 5.1.2 purports to describe the "objectives" of the Project. Not surprisingly, the only objective stated is directly from the mouth of Coso, namely, to import whatever water it wants. This is hardly an objective or set of objectives by which the Project can be analyzed by the public for the analysis of the Project's objectives compared to the environmental harm. As written, the only way to achieve the "objective" is through the importation of water. CEQA requires far more. Are the Project's objectives defined by the County or Coso? Are the objectives only stated on the short-term or long-term?

Page 5-1: The stated objectives for the Project include the following:

1. To provide supplemental injection water;
2. To minimize annual decline in reservoir productivity;
3. To replace Geofluids lost through the cooling towers;
4. To sustain production capacity; and
5. To sustain the useful economic life of the existing power plant units.

Both the definition of the Project and the objectives of the Project have been stated solely and exclusively to provide short-term profits to Coso and, on a much lesser scale, to maintain the payment of taxes and royalties by Coso to the US Navy, BLM and the County. The definition of the Project and the description of the objectives have been designed to preclude any rational exploration of alternatives which could preserve the geothermal reservoir as a productive and beneficial community resource, and avoid all of the stated environmental impacts in the DEIR.

P11-298 The first stated objective "to provide supplemental injection water" is nothing more than a description of the Project itself. It is not the type of objective on which an environmental analysis can be made, nor does it allow for the consideration of any alternatives which may be superior from an environmental standpoint. As such, this objective cannot form the basis for a valid evaluation of alternatives.

P11-299 Were the Project's objectives defined by the County or Coso? Are the objectives only stated on the short term or long term? Would reduction of production also minimize the annual decline of the reservoir? If the decline in the geothermal reservoir is due to evaporation from the water-cooling towers, why hasn't consideration been given to air-cooled condensers which eliminate the water loss? If a reduction of production or the use of air-cooled condensers prolongs the life in perpetuity of Coso's Plant, shouldn't the cumulative long-term production of power compared to the short term be analyzed?

P11-300 The only alternatives studied by the County would actually not achieve the objectives. However, many of the alternatives suggested by Little Lake Ranch would, and do so without harm to the environment. Each of the alternatives must be considered in light of the stated

P11-300 objectives. Objectives 1 and 3 are both achieved by replacing the WCTs with ACCs, which would increase on-site liquid injection. Importing water from sources other than Rose Valley can be used. Objective 2 is directly achieved by eliminating the cause of the annual decline by replacing the WCTs with ACCs. Objective 4 can be achieved by replacing the WCTs with ACCs and importing water from sources other than Rose Valley. Objective 5 is achieved by replacing the WCTs with ACCs, importing water from sources other than Rose Valley, and reducing Coso's annual production of Geofluids to a level consistent with the natural recharge of the geothermal reservoir. A number of the other alternatives can achieve, in whole or part, each and every one of the objectives. Contrary to CEQA, however, none of the alternatives was studied.

P11-301 Coso will always have the "capacity" to produce energy. The generating equipment and physical improvements on site define the capacity. Coso's poor choices to excessively exploit the resource and allow water loses through evaporation have diminished the ability of the resource to produce power.

P11-302 Contained in the Inyo County Planning Department files concerning the Coso Project, there was a draft memo apparently received by the ICPD on December 20, 2007 (ICPD Cost Memo). This five-page memorandum contains a number of cost estimates with respect to the Project itself, but also to convert the Coso facility in a number of different ways. Some of the types of improvements include changing the turbine blade configurations, redesign of the units, replacement of steam turbines, a switch to binary systems, conversion of the water-cooling towers to dry-cooled systems, change in injection systems, and resorting to alternate water sources. The memo also talks about improvements related to gas removal systems of the non-condensable gases (NCG).

In virtually each case, Coso rejected the upgrades or improvements due to the presumed cost. However, there was no evaluation of the actual costs, what impacts they would have on energy production, how much water could be saved and/or reinjected, and what the timeframe for cost recovery would be. The ICPD must have realized that some analysis of relative costs was required. Yet, not even these preliminary studies were included as part of the DEIR. Why not? How is the public or the County supposed to understand the feasibility of the alternatives without basic cost information and what the revenues from increased injection will be? Obviously, Coso itself has evaluated these alternatives and undoubtedly has detailed cost and benefit analyses. Before environmental harm is done, let Coso produce the studies. The DEIR should present the alternatives and their costs for public consideration. The self-serving objections of Coso cannot replace proper environmental analysis under CEQA.

P11-303 Perhaps the County should consider the economic benefits which Coso may derive from the Project under the Energy Policy Act of 2005. A portion of this enactment is called the John Rishel Geothermal Steam Act Amendments of 2005 and it modifies provisions of the Geothermal Steam Act of 1970 (30 U.S.C. 1001 et seq.). Under Section 224 of the Energy Policy Act of 2005, Coso would be eligible to receive tax incentives and/or royalty reductions by increasing its production by 10% or more. What is the full extent of the incentives? To what

P11-303 extent would they lower Coso's cost of operation? Have the tax and royalty benefits been considered in connection with the proposed project? What is the economic implication of the Energy Policy Act of 2005 to Coso?

P11-304 **Page 5-2:** The DEIR dismisses out-of-hand modifications to Coso's facility or operations. Changes to Coso's Plant are discounted with the conclusionary statements, unsupported by even the identification of the alternatives, as being "uneconomical" and result in "stranded investment costs." Whose fault is it that there now may be "stranded investment costs"? Who decided to construct the capacity? Who over-built the Coso facility to an extent that it could not be utilized based on the available geothermal reservoir? Are not all oil wells abandoned or stranded when the supply of oil runs out? Would an enormously polluting manufacturing plant be allowed to continue, merely to avoid stranded investment costs? Why is the amount spent by Coso on its capital costs even part of the DEIR discussion? It was Coso which knowingly caused its own problems over 20 years ago. It has already recouped all of its costs, and has generated massive profits on top of the cost recovery.

P11-305 The DEIR asserts that the changing of geothermal technologies for the intentional reduction of electrical generation does not have to be considered, as they may "conflict with the applicant's obligations under existing Power Purchase Agreements." When were these agreements negotiated? Were they signed by Coso at a time that Coso knew its annual production was declining? Why should Coso's obligations under a contract it freely negotiates and signs have any bearing on the environmental assessment from the Project? Did Coso contract to supply more energy than its current facility could produce? Is this a proper subject for analysis under CEQA?

P11-306 Let's examine the economics of Coso. While admittedly a few years old, the data is the only public information available. For the fiscal year ending December 31, 2004, Coso earned $50,000,000 during the year 2004, after the payment of all operating expenses, royalties and taxes. The expenses obviously include the royalties and taxes paid to the County of Inyo, US Navy and BLM. There is no question that these agencies rely upon the revenue generated by Coso. However, there is also no question but that Coso can easily afford significant changes to its operations and still generate enormous profits.

P11-307 There is no question but that Coso has fully repaid all of the capital improvements it made to the facility. Indeed, it is likely that Coso has paid for the improvements many times over. For instance, refer to the report prepared by the US General Accounting Office in 2004 called "Information on the Navy's Geothermal Program," wherein it was reported that the US Navy had received about $249 <u>million</u> in royalties from 1987 through 2033, based on total electricity revenues of $2.3 <u>billion</u> received by Coso during the same period (GAO Report 2004, page 2). Nonetheless, Coso, in a further disregard of its responsibilities to the community and the environment, may contend that its debt service to pay for outstanding bonds prevents it from retrofitting the facility. Coso has decided to borrow the money. Should Coso's business judgments override impacts to the environment?

P11-308 The entire problem with Coso is that it has chosen to exploit the geothermal reservoir beyond reasonable limits of sustainability. It chose to install excessive capacity, which had the direct and immediate result of a precipitous decline in geothermal production. Coso made the judgment of how far to expand its production and to enter into the power contracts, before it had any reason to believe that the present Project would be approved. Coso's economic business decisions to overbuild its plant, produce more Geofluids than was prudent, and then enter into agreements on the assumption that the County and Rose Valley would bail Coso out of its premature and unreasonable economic decisions, cannot be used as a basis for environmental analysis or the rejection of reasonable alternatives. Had it made wiser decisions during the initial sizing and placement of its facility, we would not now be talking about the possibility of reducing Coso's capacity to a manageable level.

P11-309 Refer to the GAO Report 2004 wherein it is stated "With proper management—not withdrawing too much fluid too fast and reinjecting fluids as needed—a geothermal field can potentially be productive indefinitely. In the absence of proper management, the productive life of the resource may be greatly reduced." (GAO Report 2004, page 25.) Coso's decision to install water-cooling towers, which of course allowed Coso to increase power generation but at the cost of enormous losses of waters through evaporation at its water-cooling towers, has precipitated its very dilemma. Why should Coso be permitted to now cause severe environmental damage based upon faulty economic decisions?

P11-310 Fortunately, Coso's self-inflicted wounds described above do not need to be fatal. A prudent re-design of its facility and a more reasonable management of the geothermal reservoir can sustain production at its current level, or close to it (which, of course, is the baseline by which the Project and all alternatives must be compared) would preserve a valuable environmental resource, the geothermal reservoir itself. With these factors in mind, an analysis of the stated alternatives can be addressed.

P11-311 **Page 5-2:** The basic Project's objectives are described at Section 5.1.2. Section 5.1.2 only speaks to minimizing the annual decline and to sustain production. At Section 5.2.2, the DEIR states a different objective of "increased power generation." Why is this not stated as an objective of the Project? What is the current power generation and how much should it be increased? Is this really a Project objective? What evidence exits that such a result would occur, even if the Project is approved?

P11-312 **Page 5-2:** The alleged alternatives of Section 5.2.2 are all apparently based upon information provided by Coso, none of which is being shared with the public. The second paragraph refers to incremental additional power generation output as predicted by Coso. The projections are based on a reservoir simulation performed by Coso. The projections of total mass flow produced, total mass injected, and the enthalpy of the fluid produced are again all supplied by Coso. Why aren't these projections and models provided to the public? Either produce the reports and studies for pubic review, or delete all reference to them. Define the word "enthalpy"

P11-312 for the benefit of the public. What is the reason for the change in the enthalpy of the Geofluids produced by Coso? Isn't the reason that the enthalpy has increased mostly because of the aggregate water losses through evaporation, rather than any purported plant modifications made by Coso? Isn't the increased enthalpy just a consequence of Coso's lost water through evaporation?

P11-313 The third paragraph continues with the forecasts spanning through the year 2035. However, Coso's permits are allegedly only through 2031, but the Project is stated to have a 30-year term which would presumably end sometime in 2039. If these projections and forecasts are being used to assess the feasibility of the alternatives, then it is fundamental that the public be provided with the raw data so that it can determine for itself whether the forecasts are legitimate. A reference is made to some apparent report called "Global Power Solutions 2008," but the list of references on which the DEIR is based does not contain such a described document. Rather, the only apparent support for these conclusions is based upon the verbal reports and personal communications from Coso's personnel itself. (See references Coso Operating Company.2007 and Coso Operating Company.2008.) How can anyone rely upon the self-serving projections from the applicant itself? Did the Global Power Solutions 2008 contain an independent analysis of Coso, or did it only accept and report Coso's own predictions?

P11-314 The DEIR continues to then suggest that the proposed Project would have a cost of $13,400,000 to produce, on average, nearly 18 megawatts (MW) of power, presumably from the inception of injection through 2035. This gross Project cost and the estimated power generation is then translated in a cost-per-kilowatt of $750. Where are the studies to support this conclusion? How much will Coso generate in additional revenues by the increase in power? If the increase in power is going to be used to justify the Project, where is the economic analysis? Should Coso provide full copies of its contracts to ascertain the revenue potential? Without knowing how much additional revenues Coso receives, how can the public determine what alternatives may be feasible, at least from a cost perspective? (See DiPippo Report.)

P11-315 The files of the ICPD also contain a document called Reservoir Model Forecast, received by ICPD December 20, 2007 (Coso Reservoir Model 12-20-07). A series of graphs were presented which were used to compare Coso's production rates without injection compared to production rates with injection. These graphs were not presented in the DEIR nor updated and confirmed by independent analysis. Moreover, if the results are contained in the DEIR, should the public be given access to the Coso Reservoir Model 12-20-07? Why isn't the public allowed to know what the complete effects of the Project will be?

P11-316 **Page 5-3:** Figure 5.2-1 presumably is a chart produced by Coso. Where are the facts and evidence on which this chart is based? Where is the geothermal reservoir model? Where is the comparison of the proposed output in contrast to the likely continued output from Coso without the Project? Depending upon the revenues generated by Coso from additional output, how long will it take before the alleged cost of $13,400,000 is recaptured through the sale of energy? What is Coso's rate of return on the cost?

P11-317 Figure 5.2-1 further raises some rather striking questions. Assuming injection begins at 2009, there appears to be a fairly gradual to even nominal increase of output for the first 3 years, and then an explosive growth of output in the following 3 or 4 years. Output remains somewhat constant from years 6 through 11. Then, there is a precipitous decline from the year 2020 to 2023, after which output steadily increases for a few years. What accounts for these unexplained spikes and declines in output? If the injection rates constant, why are there such marked differences in production of energy?

P11-318 **Page 5-3:** The DEIR asserts that Coso generated approximately 250 megawatts in the early years. Nowhere in the material provided in the DEIR is this established. There are a number of published reports dealing with the "capacity" of Coso's generators, but there are no published reports to the knowledge of the reader that verify Coso's actual energy output. The DEIR then states that current output is under 200 megawatts. Where is the proof? Where are the public reports? If the feasibility of alternative 5.2.2 or any other alternative is going to be based upon the output of Coso, shouldn't the public have access to detailed output information? How is the public to confirm the statements? Are we to rely solely upon the verbal statements of the applicant's own personnel? What would Coso's current output have been if it had (a) installed and utilized less than 270 megawatts of capacity, or (b) used air-cooled condensers, thereby injecting 100% of the Geofluids, rather than its wasteful water-cooling towers?

P11-319 The Geothermal PEIS, at Table 2-7, indicates that the projected MW production at the Coso area in the year 2015 will be 75, and it is projected to be 150 MW at the year 2025. (Geothermal PEIS, page 2-35). What accounts for this substantial reduction in current production? Is the Geothermal PEIS correct in its estimate? What accounts for the increase in capacity and not a decrease?

P11-320 The DEIR then claims that the "mass fluid produced" has declined from 15,000 kilograms per hour (KPH) to approximately 9,000 KPH. Refer to DOGGR 2008 Report, and show how these figures were calculated and describe the times during which the decline occurred.

P11-321 **Page 5-4:** The so-called contemplated power plant modifications are briefly mentioned, and then rejected. Allegedly, Coso has considered the modifications and rejected them due to poor economic returns. Since when is the applicant's assessment of poor economic returns the basis for environmental analysis? Did the EPA refuse to order hydrocarbon power generators to install scrubbers because it would cost the power generators money or reduce output? Would the government have never forced manufacturers and other polluters to change their factories because it was costly or deprived the manufacturers of economic returns? Where is its analysis of cost versus benefit? Environmental analysis must not be subordinated to the profit motives of the applicant.

P11-322 **Page 5-4:** Finally, the consideration of using an air-cooled system in lieu of Coso's water-cooling towers is at least mentioned. Again, only Coso evaluated this proposal. To avoid public debate or information, Coso declared that "these modifications are very capital-intensive and result in a loss of net generated power for their water savings." Has Coso shared the estimated cost? If not, why not? Would an air-cooled system allow for 100% of Geofluids injection? Would such a system completely avoid the necessity of water importation and injection? How is the public, or the ultimate decision-makers, supposed to examine or know whether this is a feasible alternative, when it has nothing more than Coso's self-serving objections as a basis for decision?

P11-323 By converting Coso to an air-cooled system, Coso would immediately have an additional 85% of the steam component of the Geofluids available for re-injection. No analysis of the costs versus benefits has been provided, nor the actual amount of additional water that could be injected. The air-cooled system may prolong the economic life of Coso, while minimizing environmental impacts related to water usage. The DiPippo Report indicates that somewhere around 1,000 acre-feet would be available for injection Coso has already indicated that a flow rate of 500 GPM is economical when looking at alternative sources of water. If true, why is the air-cooled system not considered, as it would supply far greater than 500 GPM? (See Page 5-5 of DEIR.)

P11-324 The County should recall its own General Plan standards. Goal PSU-3 is stated "To ensure that there will be a safe and reliable water supply sufficient to meet the <u>future</u> needs of the County." Then, Policy PSU-3.1 entitled "Efficient Water Use" continues to state that "The County shall promote efficient water use and reduced water demand by:

- Requiring water-conserving design and equipment in new construction;
- Encouraging water-conserving landscaping and other conservation measures;
- Encouraging the retrofitting of existing development with water-conserving devices."

Despite the goals and policies adopted by the County, the DEIR dismisses without consideration the retrofit of Coso's plant with an air-cooled system. This is precisely the type of water conservation measure that the General Plan calls for.

P11-325 Geothermal reservoir utilization could affect groundwater resources because of consumption of water by evaporation and the need to re-inject water to replenish the geothermal reservoir (Geothermal PEIS Section 4.7.3, page 4-44). The magnitude of the effects varies depending upon groundwater conditions and the type of geothermal plants. Availability of water resources could be a limiting factor, affecting the expansion of geothermal reservoir development in a given area (Geothermal PEIS Section 4.7.3, page 4-44).

P11-326 Cooling water is generally used for condensation of the plant working fluid. The waste heat can be dissipated to the atmosphere through cooling towers <u>if make-up water is available</u>. Water from a nearby river or other water supply can also serve as a heat sink. There are

P11-326 opportunities for recovering heat from these waste fluids (and possibly from the brine stream) in associated activities such as fish farms or greenhouses. An alternative to water-cooling is the technique of air-cooling using electric motor-driven fans and heat exchangers. This approach is particularly useful where the supply of fresh water is limited, and is currently used mainly for binary power plants. (MIT Report, Section 8.2.9.)

P11-327 Air-cooled systems use less cooling water and are more common in arid regions. Air-cooled systems would have fewer impacts associated with cooling water (Geothermal PEIS, page 4-45).

In general, a 50 MW plant would utilize a site area of between 25 acres to accommodate needed equipment of which the power plant itself would occupy 25% of the area for a water-cooled plant, or about 50% for an air-cooled plant (Geothermal PEIS, Section 2.5.1, page 2-45).

P11-328 Figure 4A of the DiPippo Report depicts how much of the Geofluids is lost in a liquid-dominated resource. The evaporation losses are actually about 85% of the incoming steam component. Each time the fluids pass through the WCTs, evaporation continually reduces the volume/mass of the fluids, thereby depleting the amount of fluids available for injection. This process causes a depletion of the geothermal fluid resource. When this is coupled with the overexploitation of the geothermal reservoir, the resource dries out. As Coso (or any geothermal plant) loses excessive water during evaporation, the geothermal resources starts moving toward a steam-dominated resource and the steam component of the Geofluids greatly increases. However, this means more steam proportionately enters the plant, and less of the Geofluids is available for injection. For example, see Figure 4B of the DiPippo Report which shows the difference. This is exactly why an air-cooled system is superior to WCTs from a reservoir preservation point of view when there is no available source of make-up water.

P11-329 Photo 3 of the DiPippo Report is a picture of Coso Navy 1 showing its three water cooling towers. Photo 3 clearly depicts the water loss by evaporation by the use of WCTs.

P11-330 The final sentence is not only confusing, but undoubtedly wrong. It states "the water savings, if re-injected, would not offset the power loss." If the use of air-cooled systems would increase the Geofluids available for injection, why would it not offset the power loss? How can Coso say that the re-injection of its own Geofluids would not perform the same beneficial purpose as injection of water from Rose Valley? Isn't this statement a complete conflict with the supposed objectives of the Project? (In support of the air-cooled alternative, see the DiPippo Report.)

P11-331 **Page 5-5:** Table 5.2-1 is a rather meaningless chart of alleged Electric Plant modification possibilities considered by Coso and rejected because of the cost. Who did the analysis? What is the documentary evidence to establish that any of these improvements were actually considered by someone other than Coso? How is the public to decide for itself the efficacy of these stated improvements?

P11-332 **Page 5-5:** The DEIR concludes its evaluation of the plant modifications alternative by concluding "none of the system efficiency alternatives are competitive with the proposed water augmentation project." Since when do project alternatives need to be assessed based upon being competitive? Isn't this just a subtle way of saying that Coso doesn't want to spend the dollars to protect the environment? Does this mean that the environment will be sacrificed for Coso's profit motives? Does this mean that the alternatives need to generate the most economic benefit to Coso, without assessing environmental harm?

P11-333 **Page 5-5:** Section 5.2.3 addresses the alleged alternative sources of water. What is suspicious is that only Coso identified alternative sources of water, and the selection of the stated alternatives arose from personal conversations with a Coso representative. It was only Coso that estimated what an alternate water source would have to produce in order to be "economically feasible." Since when is the applicant in charge of presenting the only alternatives it wants considered? Does this meet CEQA standards? Where did the information for Table 5.2-2 come from? Who performed pumping tests? Who provided the estimate of potential productivity? Where are the test results and analysis? How can the public assume the accuracy of the information provided?

P11-334 Why is there no analysis of the Coso Basin as a source of alternative water? How much water is in storage at Coso Basin? California Bulletin 118 indicates there may be as much as 390,000 acre-feet of storage capacity (Coso Basin 6-56). According to the 1985 EA, there is an annual natural recharge of the Coso Basin of 300 to 1,000 AFY (1985 EA, page 44-45). Have any new studies been performed to support, modify or reject this estimate? Given the short distance to the injection wells, why is this source of water rejected? If the Coso Basin receives natural recharges of at least 300 AFY, and maybe considerably more, why wouldn't this provide an adequate water source? Please provide all test results to show flow rates. Was a hydrology model prepared for the Coso Basin? Why not? Does anyone rely on the Coso Basin for water supplies? Would mining for water in the Coso Basin have less of an environmental impact?

P11-335 The alternative water sources conveniently omitted by Coso should be considered. Indeed, there has been no identification of a number of other options. Most of these have been previously described in the comments to the scoping of the DEIR from the outset. Yet, there has been no consideration of why the alternative sources are not viable. First, the north and south Haiwee Reservoirs are filled with untold thousands of acre-feet of water. These are controlled by LADWP and provide water service to the City of Los Angeles. LADWP owns and operates an aqueduct that provides delivery of the water to the City which parallels Highway 395. This is an existing water source. There has apparently been no effort whatsoever to consider this alternative water source. Why not? The County should review the case of *Save Round Mountain*, in which the County itself was the defendant, which rejected an EIR due to insufficient analysis of alternatives. The County should well know that the failure to address proper alternatives to the proposed Project may be fatal to the EIR. More than a telephone call is needed. Serious discussions should ensue with the LADWP to determine whether a portion of

P11-335 the water which is already being pumped and transported from the Owens Valley can remain within the County of Inyo for the County's needs.

P11-336 Attached as Exhibit B is a list of at least 15 wastewater facilities within 60 miles of the Coso Plant. Why hasn't any consideration been given to the importation of wastewater for injection? What are the capacities of the identified plants? May some of them be located along the same general route of a proposed pipeline to provide ample economic justification to use wastewater? The Geysers geothermal facility in Napa encountered virtually the identical situation. The Geysers built 2 pipelines, one for 50 miles in length and the other over 25 miles in length, to import reclaimed wastewater. Why couldn't the same strategy work for Coso? (See also the DiPippo Report.)

P11-337 Refer to the County's General Plan. Water Resources Implementation Measures, at Table 8.4, Section 3.0 states: "The County shall work with private industries to support the development of reclaimed water systems for non-potable uses. These efforts may include obtaining funding for subsidizing reclaimed water systems." The County should comply with its General Plan. At least, the DEIR should study this option.

P11-338 There is no mention of possible water sources from adjacent aquifers that may provide a preferable source of water, including the Owens Valley, Coso and the Indian Wells water basins. Has anyone considered whether the Project could be satisfied by drilling and pumping water from those underground basins? Are there any surface water alternatives?

P11-339 Another alternative which was never considered or mentioned is the ability of Coso to extend the depth of its existing production wells seeking additional sources from which Geofluids could be extracted. If Coso really intends to increase it power output, contrary to its stated objectives as was discussed earlier, drilling deeper may solve that problem. Was Coso asked whether deeper geothermal reservoirs may exist? Have there been any efforts made to explore for new or supplemental geothermal reservoirs within Coso's leased areas? Where are the studies or reports which define the extent of the geothermal reservoirs available to Coso? What would the cost be to seek additional resources through deeper production wells? (See DiPippo Report.)

P11-340 **Page 5-6:** Section 5.2.4 regards the length of the proposed CUP. This alleged alternative was again mentioned and rejected because a limited timeframe project would allegedly not "prove economical and practical" when compared to the price of the Project construction. The conclusion is suspect given the proposed mitigation measure to stop pumping in 1.2 years. No details, evaluation or studies are provided on which to assess this conclusion. By approving a 30-year project, the County is taking a very dangerous gamble with the environment. Once the CUP is issued, Coso will have vested rights to pump the water and transport it, subject only to the willingness and ability of the County to enforce its mitigation plan. The County should know by now that Coso is not a particularly trustworthy company. How many times has the County had to fight or even litigate with Coso over its royalty and tax revenues? How frequently has

P11-340 Coso tried to stop or reduce payments to the County? Once Coso has its CUP, is there any doubt that it will make any argument and pursue all legal options to avoid pumping restrictions or reductions?

P11-341 **Page 5-6:** Shortening the length of the CUP should not be rejected as an alternative. The Hydrology Model presented in the DEIR states that if Coso pumps water at a rate of 4,839 AFY, it will have to stop all pumping after only 1.2 years. What justification is there to give Coso a 30-year CUP, when one of the conditions will presumably be to stop pumping in 1.2 years?

P11-342 **Page 5-7:** Section 5.3 purports to analyze the No Project alternative. The conclusion that the No Project alternative would result in a shortened lifespan of Coso is not established. The reduction in energy production coupled with the conversion of Coso's water-cooling towers (WCTs) to an air-cooled condenser (ACC) system could actually prolong the operation of Coso indefinitely, admittedly at the cost of new equipment costs and reduced energy production. What other changes to Coso's Electrical Plant and method of operations could be found if pumping were not allowed? It is fairly obvious that Coso would simply not go away without the water-pumping project. It would simply mean that Coso would be forced to spend some of it profits to find other solutions. Why haven't all of these solutions been identified and discussed?

P11-343 What would really happen if Coso were not allowed to import water from the Rose Valley Basin? Coso will finally manage its geothermal reservoir in a prudent and environmentally friendly way. Without repeating the observations and questions above, it is much more likely that Coso will (a) utilize its own geothermal reservoir model to match its geothermal fluid production to a concept of "safe yield" to extend the life of the plant, which may reduce short-term production output, but materially extend the life of Coso reaching the goal of sustainability, (b) look seriously at converting its WCTs to an air-cooled system, and pursue other measures suggested by Mr. DiPippo to achieve sustainability. (See DiPippo Report)

P11-344 The sentence about the loss of royalty revenues and property tax revenues should be deleted. While perhaps true, this is not a proper subject for consideration in the EIR.

P11-345 **Page 5-7:** The presentation of the information in addressing Section 5.4.1, Alternative 1, is on its face misleading and distorts the conclusions from the Hydrology Model. The DEIR doesn't even bother to copy Figure C4-2 when discussing this alternative. Figure C4-2 clearly shows that Coso must entirely stop pumping within 1.2 years, not the 30 years being proposed for pumping, if the aquifer has a specific yield of 10%. Pumping must stop after 3 years if the aquifer has a specific yield of 30%. As more fully discussed herein, even the specific yield assumption of 10% is suspect, as the Hydrology Model was actually calibrated using just a 3% specific yield, causing all of the impacts to be skewed and probably vastly wrong and overstated. Why was Figure C4-2 not included in the discussion?

P11-346 Alternative 1 confuses the data between pumping at 4,839 AFY <u>for 30 years</u> and alternate rates which may allow Coso to pump either 180 AFY, 320 AFY or 480 AFY, for 30 years. The

P11-346 DEIR must compare the actual Project to Alternative 1, and not the Project assuming pumping will end in 1.2 years. On its face, the DEIR does not comply with CEQA, unless the Project were redefined as a CUP for 1.2 years.

P11-347 **Page 5-9:** The second 5.4.2 alternative, known as Alternative 2, would apparently allow for higher pumping rates than stated at Alternative 1, but for a much shorter duration. Under Alternative 2, impacts from extraction rates of 750, 1,500 and 3,000 AFY were presented. Figure 5.4-2 shows that the 10% maximum allowable drawdown would be reached even if pumping stops as early as 1.75 years after pumping commencement at 3,000 AFY, but as long 6 years using the 750 AFY pumping rate. However, no information is presented to confirm that the Hydrology Model was calibrated to show these pumping rates. (See Zdon Memorandum 9-2-08.) In all three cases, once pumping ceased at the time the maximum environmental impacts were achieved, Little Lake would continue to feel the adverse impacts from water losses for more than 100 years after pumping cessation. As with Alternative 1, the DEIR fails to properly compare these alternate pumping rates to the entire Project (4,839 AFY for 30 years). It is beyond argument that either Alternative 1 or 2 is environmentally superior to the Project.

P11-348 It is obvious that Coso cannot conceivably pump 4,839 AFY for 30 years without doing enormous environmental harm. The Hydrology Model, even in its flawed condition, would not allow such proposed pumping. Moreover, even if the 10% maximum reduction at Little Lake were guaranteed, the continuing damage to water supplies for over 100 years after the cessation of pumping constitutes yet another compelling reason to both (a) reject the entire Project without any further discussion, or (b) consider the more appropriate alternatives of either (i) reducing the initial allowed pumping to only 120 AFY, or (ii) mandating the termination of pumping after 1.2 years, by limiting the duration of the CUP to 1.2 years.

P11-349 **Page 5-11:** Section 5.5 purports to discuss environmentally superior alternatives, but its rationale is sorely lacking. Clearly, the No Project alternative is environmentally superior. The Rose Valley Basin is protected, as are all of the environmental components which are affected by the Project. It is argumentative to suggest that the No Project alternative would allow the continued decline of the geothermal reservoir and the decrease in productivity. As discussed above, neither of these conclusions are necessarily sure. It ultimately depends upon how Coso decides to expend its capital, reconfigure its operations and make good decisions for the management of the reservoir and the environment. The assumed loss of 200 MW of power is pure conjecture and does not have to occur at all. Why couldn't any lost power be replaced with other environmentally friendly projects such as solar, wind, hydroelectric, nuclear, etc.?

P11-350 Mr. DiPippo concludes that each of the suggested alternatives related to (a) the reduction of Geofluids production to prolong the life of the geothermal reservoir, (b) changing the water-cooling towers to an air-cooled system, (c) drilling deeper to reach and exploit a new geothermal reservoir below the current reservoir, (d) rotating the use of the production wells and generators, and (e) the importation of wastewater are all technically feasible and merit further investigation and research. (See DiPippo Report.)

Appendix B:

P11-351 **Sheet G5:** This sheet purports to show the acreage involved in the Project. As presented, the total acres involved in the Project are 56. The DEIR indicates that the Project area will comprise approximately 59.5 acres (see page 3.4-1). Please account for the discrepancy.

P11-352 **Sheet P17:** What is the purpose of the pond at the terminus of the pipeline? What liquids will flow into the pond? What will the possible components of the fluids be? Will the pond be covered or open to the atmosphere? Please describe the dimensions of the pond.

P11-353 Please answer the following questions, some of which may pertain to other sections of the DEIR: What type of materials will be used in the water pipeline? Does the pipeline itself have any impacts upon the soils in which it is located? Upon abandonment of the pipeline, what negative impacts will arise when the pipeline ultimately cracks or fails? What is the time estimate for soil subsidence following the decommissioning of the pipelines?

Appendix C:

P11-354 The Hydrology Model as presented in the DEIR is flawed and unsupportable. It must be re-run and this DEIR must be revised and re-circulated for public comment. (See Zdon Memorandum 9-2-08.)

P11-355 Appendix C contains the pump test results and hydrologic data concerning the Project. It must be first noted that the actual test was conducted by Coso itself, the applicant. Coso collected and distributed test data. It is peculiar that the applicant would be responsible for the single most important test of the entire Project. Would not independence, neutrality, and fairness have dictated that the test would be conducted entirely by independent personnel to avoid any possibility of bias, tampering or manipulation?

P11-356 The following will provide specific comments to the information contained in Appendix C and all of its subparts. Many of the comments will also pertain to the same or similar results noted in Section 3.2 of the DEIR. To the extent applicable, all comments made in connection with Appendix C should also be made in reference to the same information, language or statements made in the Executive Summary, DEIR, and Section 3.2 in particular. Likewise, all comments set forth above are equally applicable to the same or similar statements made in Appendix C and must be addressed.

Appendix C-1:

P11-357 Appendix C-1 merely describes the testing protocols, and references the raw test data of the 14-day pumping test. No evaluations or conclusions were reached in this section of Appendix C. Which individuals performed the work? What are their qualifications and professional

P11-357 degrees? Why wasn't the Hydrology Model signed by any individual or company? (See Zdon Memorandum 9-2-08.)

P11-358 **Page C1-3:** During the course of the pumping test, an independent consultant only visited the site at the beginning of the test on November 19th, 9 days later on November 28th, and at the end of the 14-day test on December 3, 2007. Does this provide the public with any comfort that the test was independently performed and evaluated? Who was this person and what professional degrees did he or she hold? Did a certified hydrogeologist prepare or review the Hydrology Model? If so, who was it, and what are her or his qualifications?

P11-359 **Page C1-3:** At Section C1-2 identify the persons at Geologica who supervised the pumping test and provide their qualifications. Are they certified hydrogeologists?

P11-360 **Page C1-3:** At Section C1-3, why was the flow rate at the Davis Spring measured? The DEIR says that the pumping project is not expected to affect this spring. Was the Davis Spring included in the Hydrology Model? Was the spring flow rate used to help calibrate the Hydrology Model?

P11-361 Since the Davis Spring was measured during the 2007 pumping test, doesn't this indicate the view of Geologica that the spring could be impacted? At a minimum, the Davis Spring and all other known springs should be included in the Hydrology Model. The Hydrology Model should also reflect any probable impacts to these springs from pumping. (See Zdon Memorandum 9-2-08) See all of my earlier comments on this issue.)

P11-362 **Page C1-10:** The aquifer specific yield could not be estimated using graphical methods. The uncertainty was to be addressed during the sensitivity analysis, but the DEIR does not provide any analysis. Why not? Wasn't the Hydrology Model calibrated at 3%? Why then was the specific yield component of the Hydrology Model changed to estimate impacts from the pumping throughout Rose Valley and Little Lake? (See Zdon Memorandum 9-2-08.) If the Hydrology Model depends upon the specific yield factor, should additional tests be performed before drawing any conclusions? How long of a pumping test would have to be conducted to obtain more specific yield estimates? Were any of the specific yield estimates of 10%, 20% or 30% used to calibrate the Hydrology Model? While the conclusion is that pumping did not cause the disturbance because of the relative elevation of the Davis Spring, there were nonetheless variations. Can this test conclusively determine that the pumping will not impact the Davis Spring?

P11-363 It is rather interesting that the 14-day pumping test is compared with the 24-hour pumping test in 2004. The groundwater flow model developed by Brown and Caldwell in 2006 (B&C Model) was compared. One significant conclusion drawn from the Pumping Test is that the B&C Model "may underestimate groundwater table drawdown developed at a distance from the Hay Ranch pumping wells." The significance is that the 14-day pumping test seems to have demonstrated a higher likelihood of underground water table drawdown than was earlier

P11-363 estimated by the B&C Model. The pumping test involved a water well pumping water for a relatively short 14-day period. What happens when both Hay Ranch wells are pumped? Would not even a much longer term pumping test, perhaps using both of the Hay Ranch wells, be more significant and provide even a greater support for the ultimate model and conclusions? Given the rather significant differences between the pumping test results and the B&C Model, why is there such a rush to approve the Project before a truly representative test can be performed and modeling prepared?

Appendix C-2:

P11-364 **Page C2-1:** We understand that the Hydrology Model uses a common, publicly available computer application from the United States Geologic Service (USGS) known as "MODFLOW". The DEIR provides conclusions from the Hydrology Model based upon variables selected and inputted into the model software. The variables and inputs used by the consultant are wrong. (See Zdon Memorandum 9-2-08.) This leads to the well-known adage "Garbage In—Garbage Out." The Hydrology Model, as presented, cannot be used to support the conclusions in the DEIR.

P11-365 **Page C2-3:** The DEIR indicates that the groundwater table surfaces at, and discharges from, springs beneath Little Lake. It is these springs that sustain the Lake. Where are each of these springs located? What are the physical properties which allow the springs to operate?

P11-366 **Page C2-3:** The DEIR indicates that water discharges across something called the "Little Lake Weir." The DEIR should describe the physical structure and its function.

P11-367 **Page C2-5:** For unknown reasons, the springs at Rose, Tunawee Canyon, Little Lake Fault, and the Little Lake Canyon Springs were not measured for discharge rates, and they are not proposed to be monitored. Moreover, Little Lake Canyon Spring and Little Lake Canyon Spring have not been identified in figure C2-1. Please add the locations and the pertinent details of the Little Lake Canyon Spring. Aren't all of the springs in the Rose Valley susceptible to harm by reduction of the underground water table? How much of a factor does the pressure of the underground water have in allowing the natural springs to function? If underground water tables fall, aren't the springs jeopardized? Does the mere height of springs above other portions of the groundwater table automatically cause them to be not hydrologically connected? (See Zdon Memorandum 9-2-08.)

P11-368 **Page C2-5:** The DEIR states as a certainty that the Davis Siphon well and the Portuguese Bench springs "are not directly hydrologically connected to the alluvial aquifer." Doesn't the Hydrology Model actually show a connection? Shouldn't the springs be separately discussed and analyzed with respect to the connection to the main aquifer? (See Zdon Memorandum 9-2-08.) See my earlier comments.

P11-369 **Page C2-5:** The DEIR states that the Coso Spring, entering into the Upper Pond at Little Lake, will likely be influenced by changes in the groundwater conditions in Rose Valley. If so, why wasn't the Coso Spring included within the Hydrology Model? What will the impacts be? On what evidence are the conclusions based?

P11-370 **Page C2-5:** Could earlier pumping of the Hay Ranch wells for agricultural purposes have impacted the Rose Spring? (See Zdon Memorandum 9-2-08)

P11-371 **Page C2-6:** The Siphon well located between Little Lake and the Upper Pond has an elevation below Little Lake, but higher than Coso Spring. The language in the parentheses at the seventh line should be corrected. It is located approximately 100-150 yards north of the Upper Pond.

P11-372 **Page C2-6:** Little Lake Ranch has the ability to raise or lower the water level in Little Lake, depending upon the adequacy of water flow from the natural springs. The use of the word "manipulate" to describe the ability of Little Lake Ranch to adjust the Lake levels is argumentative, and intends to imply or suggest a deceptive or deceitful purpose for the regular maintenance activities of Little Lake Ranch. Please use a more neutral word such as "manage." I doubt Geologica would approve of the word "manipulate" to describe the selection of assumptions and the predictions of the Hydrology Model, although such word might better reflect how the Hydrology Model was prepared rather than the management of water resources at Little Lake.

P11-373 **Page C2-8:** The Hydrology Model apparently uses a factor of 10% of the total precipitation falling on the Sierra Nevadas at elevations in excess of 4,500 feet which were used to establish predicted recharge rates. However, at least two other reports mentioned used recharge rates of only 6% to 8%. Please explain the basis on which the 10% figure was used in the Hydrology Model. Would the calibration for the Hydrology Model still correlate to a 6% or 8% recharge rate, rather than 10%? (See Zdon Memorandum 9-2-08.)

P11-374 **Page C2-9:** Not all of the groundwater discharge points on the Little Lake property have been noted and should be. There are additional discharges from the Upper Pond to the Lower Pond, and from Upper Pond bypassing Lower Pond. There is a discharge from the Lower Pond south that goes to the next pond in succession, which we call Teal Pond. The discharge point somewhere between the Lower Pond and Teal Pond likely constitutes the southernmost boundary of the Rose Valley Basin and has been described in the DEIR as the Little Lake Gap. The approximate location of the Little Lake Gap should be noted. What are the discharge rates from the Upper Pond and Lower Pond? Depending upon where the Little Lake Gap is located, there may be additional discharges from Teal Pond, as well as a succession of habitat ponds south of Teal Pond, leading to food plots, lava ponds located approximately ¼ mile east of Highway 395, and at the far south end of the Little Lake Ranch property a pond we call the Chukar Pond. Were any of these additional discharge points used to describe and create the Hydrology Model? If not, please explain why not and whether they should be included.

P11-375 **Page C2-9:** Please explain the reason that the Model grid ends at the south end of Little Lake. What is the reason for not including both the ponds and Coso Spring? All of these areas are north of the Little Lake Gap and are part of the Rose Valley Basin. Shouldn't the Hydrology Model incorporate these features?

P11-376 **Page C2-10:** The DEIR suggests that around 3,000 AFY infiltrates into the ground and continues as groundwater underflow to the Indian Wells Valley. This underflow rate seems in contradiction to other statements of the amount of underflow to Indian Wells Valley. What number was used for the Hydrology Model? Should there be a clarification between the observed or calculated underflow and the amount used in the Hydrology Model?

P11-377 **Page C2-10:** There are new references to the amount of water used in Rose Valley measured in terms of cubic feet per day (CFD) or gallons per minute (GPM). Most of the discussion relating to the Hydrology Model speaks in terms of acre-feet per year (AFY). The changing measures of flow or amounts of water are confusing. The DEIR should adopt and use a consistent measure or add the equations used to determine how many gallons per minute are equivalent to cubic feet per day, and then how many of either are equivalent to an acre-foot of water per year. As presented, it is extremely difficult to determine the relative amount of water being discussed at the various locations throughout Rose Valley.

P11-378 **Page C2-10:** Estimates of the water extraction from existing wells are stated. Little Lake Ranch consumes some of its water produced by its wells for residential, irrigation, habitat preservation and domestic uses. In addition, Little Lake provides water to the Cinder Block facility. (See comments above.) Should this consumption be factored into the model? This consumptive use should at least be mentioned.

P11-379 **Page C2-12:** The approximate boundaries of those portions of the Rose Valley which were included in the Hydrology Model are described and further depicted on Figure C2-2. Both Tunawee Canyon Spring and the Davis Spring are excluded. Yet, the Hydrology Model ends apparently mere feet away from the Davis Spring and predicts significant drawdowns at this boundary. Shouldn't the Hydrology Model include at least Davis Spring and perhaps Tunawee Canyon Spring? (See Zdon Memorandum 9-2-08.) The elevation lines on Figure C2-1 are not extended to either immediately north of, or at Little Lake north of the southern end of, Little Lake. Why not? Also excluded from the Hydrology Model is the Little Lake Hotel well, the Coso Spring, Little Lake Ranch Siphon well, and all of the water features in and around the Upper Pond and Lower Pond. Are these southerly water features part of the Rose Valley Basin? Where is the presumed location of the Little Lake Gap? Why doesn't the Hydrology Model include all relevant areas? Is it possible to show on Figure C2-1 the approximate location of the Coso Plant? Confirm that it is outside the boundaries of the Rose Valley Basin aquifer.

P11-380 **Figure C2-12:** There are some stated anomalies about the actual level of the underground water at areas in the more southerly portion of the Rose Valley. We have been

P11-380 verbally advised that the Cinder Mine operating in and around the Red Hill Cinder Cone has no water to access and that previous attempts to drill water wells have been unsuccessful, regardless of depth. Is it possible that there is a geologic reason for this area to contain underground rock features that are not porous? Does the presence of the cinder cone suggest reasons why relative water elevations in the immediate are may be skewed? Should this issue be further studied and included in the DEIR?

P11-381 **Page C2-13:** The thickness of the aquifer, including the various Model layers, is apparently depicted only in the figures referenced in the B&C Report as Figures 8, 9 and 10. These graphical depictions have not been incorporated into the DEIR. Each of these 3 figures should be included if the data contained therein was used to form the basis of the Hydrology Model. Apparently, the Hydrology Model used a total aquifer thickness extending as much as 3,500 feet below the ground surface water. According to our hydrologist, this vastly overstates the usable area of the aquifer from which water can be drawn and would accordingly tend to overstate the amount of water available in storage. Please explain the rationale for using this aquifer thickness. (See Zdon Memorandum 9-2-08.) Explain why the estimates used in the Hydrology Model conflict with the estimates from the Danskin Report.

P11-382 **Page C2-14:** The amount of evaporation and evapotranspiration were only assumed within the graphical boundaries of the Hydrology Model and, therefore, exclude a substantial area of wetlands and ponds south of Little Lake. It would also exclude the habitat surrounding Portuguese Bench and Tunawee Canyon Springs. As such, the evapotranspiration calculations used in the Hydrology Model are understated. This should be corrected.

P11-383 **Page C2-14:** Groundwater outflow to the Indian Wells Valley at Little Lake is discussed. However, the Hydrology Model stops at the south end of the Lake and excludes all land south of the Lake to the Little Lake Gap. Shouldn't the Hydrology Model be adjusted to take into account the water flows and discharges south of Little Lake?

P11-384 **Page C2-15:** At Section C2-3.4, there is an indication that the layer 1 specific yield was initially specified as 10%. Did this change? Was the Hydrology Model able to be calibrated at a 10% specific yield? If not, what was the ultimate specific yield used as determined from the calibration process? Why were the impacts then later measured by bearing the specific yield factors and not using the impacts from the calibrated Hydrology Model? (See Zdon Memorandum 9-2-08.)

P11-385 **Page C2-15:** The predicted drawdown at Coso Ranch north well is compared to the actual results from the pumping test. Figure C2-14 shows a much greater drawdown than predicted. According to the DEIR, some of this variation could have been caused by some unmetered water well pumping in the area of the Coso Ranch north well. Nonetheless, the actual drawdown seems to be considerably greater than the predicted drawdown. Would the unmetered well pumping account for the differential? Does it appear that that Hydrology Model understates the amount of actual drawdown?

P11-386 **Page C2-16:** According to Section C2-3.5.3, the Hydrology Model was calibrated to reflect a 3% specific yield. If the Hydrology Model was calibrated at this specific yield factor of 3%, how and why were the ultimate impacts from the Hydrology Model adjusted in the DEIR, assuming specific yields of 10% (3 times the calibrated specific yield), 20% (nearly 6.5 times the calibrated specific yield), and 30% (10 times the calibrated specific yield)? See comments above and in Zdon Memorandum 9-2-08.

P11-387 **Page C2-17:** Several data gaps and limitations on the resulting model were noted. Of particular concern is the lack of recent seasonal groundwater elevation data north of Rose Valley and adjacent to southern Haiwee Reservoir. There are further fluctuation discrepancies which need further investigation. Data is further lacking with respect to transmissivity or storativity data outside the Hay Ranch (Page C2-18). There is also a lack of recent seasonal flow measurements or water level measurements on the Little Lake Ranch property (Page C2-18). Given the magnitude of the proposed Project and the likely impacts upon Little Lake, should not these data gaps be filled before any approval of the Project is allowed? If accurate data cannot be provided as part of the EIR, should not the testing period be extended until the data can be gathered? (See Zdon Memorandum 9-2-08.)

P11-388 **Page C2-18:** Section C2-4 indicates that that Hydrology Model was calibrated based upon the 2007 pumping test to produce an estimated specific yield of 3%. What is the scientific basis for suggesting that the actual specific yield of the Rose Valley Basin is higher, by multiples of 3 times, 6.5 times, or 10 times? Was the Hydrology Model ever recalibrated to assume higher specific yields? If not, why not? Using the calibrated specific yield of 3%, what would be the conclusions drawn from the Hydrology Model for pumping 4,839 AFY for 30 years, for pumping 3,000 AFY for 30 years, for pumping 750 AFY for 30 years, for pumping 480 AFY for 30 years, and for pumping 120 AFY for 30 years? Why wasn't this data presented in the DEIR? (See Zdon Memorandum 9-2-08.) Using a specific yield of 3% in accordance with the calibrated Hydrology Model, what is the maximum amount of water that could be safely pumped for 30 years without exceeding a 10% loss at Little Lake? Using a specific yield of 3%, how much water could be pumped by Coso without causing any depletion of water in the Rose Valley Basin?

P11-389 **Page C2-19:** Was any attempt made to more precisely determine the types and composition of the soils in Rose Valley to determine an estimate of the specific yield in accordance with the Johnson, 1967 Report as set forth in Table C2-5? If so, describe such efforts and the results.

P11-390 **Page C2-20:** Were the mitigation measures adopted using a specific yield of 3% in accordance with the calibrated Hydrology Model, or were they based upon the higher specific yields of 10%, 20% or 30%? Please explain and justify the approach.

P11-391 **Page C2-20:** Section C2-4.2 contains an interesting observation when simulated pumping occurred at the Hay Ranch wells at the full development rate of 4,839 AFY in addition to pumping of 900 AFY per count for the proposed LADWP pumping Project. Unfortunately, the LADWP well went dry before the simulation could be completed. Only by disbursing the pumping through 3 wells and reducing the total pumping by LADWP to 770 AFY could the simulation be completed. To a layman, this does not bode well for the simulation or the impacts throughout Rose Valley if the Project were approved at full pumping level. Please explain the significance of this problem, and what effects this may portend.

P11-392 **Page C2-20:** Are all of the facts and conclusions set forth in the DEIR based solely upon the projected Project pumping rate, excluding the cumulative pumping from the proposed LADWP Project to pump an additional 900 AFY? Are the only conclusions from the combined Coso Project and the proposed LADWP Project listed in the cumulative impact section of the DEIR? Please provide additional graphs and conclusions assuming a combined pumping rate of both the Coso Project and the LADWP Project.

P11-393 **Page C2-20:** At Section C2-5, why is the expression of mitigation measures so obscure? Why doesn't this section simply say that the Hydrology Model would not permit pumping at a rate higher than 480 AFY, assuming a specific yield of 30%? Why doesn't the mitigation simply say that the Hydrology Model for a pumping rate of 4,839 AFY would compel the complete cessation of pumping after only 1.2 years, rather than 30 years?

P11-394 **Page C2-20:** Section C2-5.1 comments upon the suggestion that water supply to Little Lake could be augmented by pumping one of its existing wells from the groundwater or pumping from a new well to offset water losses caused by the Coso Project. The question was also raised concerning similar pumping performed at Little Lake in the past.

P11-395 Review the LLR History-Neuman report. Dr. Neuman is a medical doctor and a well-respected amateur biologist who has extensively studied Little Lake. He has been a member of Little Lake for approximately 40 years. As a result of seismic activity in the area in 1971, and in particular an earthquake, an earthquake fault developed within the Lake. This fault nearly emptied Little Lake. In order to restore the lake to its pre-existing condition, the members paid to have a well drilled on the property. The water well started pumping immediately. In 1976, Dr. Neuman, with the help of other members, located the source of springs feeding Little Lake which had been overgrown and clogged. Dr. Neuman and other members were able to manually dig out the springs and were able to restore full spring production. Over time, the earthquake fault filled in through natural processes and ultimately water losses through the fissure ceased. At this time, the natural springs were able to supply all of the water needs to Little Lake and further pumping of the wells ceased. (See LLR History-Neuman.) At no time since has Little Lake used any of its water wells to maintain or supplement the natural waters flowing at Little Lake. (See also, LLR History-Pearson.)

P11-396 The whole idea of this augmentation concept has been previously discussed by personnel of Coso and Little Lake Ranch. While no expert analysis has been performed to date, other than what is set forth in the DEIR, the concept seems unsupportable and contrary to basic reason. If Coso's pumping is causing a significant decline in underground water levels by virtue of its pumping 9 miles away, would the problem only be exacerbated by many multiples in the event a water well sited just north of the Lake were used? Indeed, would not the expected drawdown from the well be so significant so as to reduce the level of the lake? Would this not have a direct likely impact upon the ability of the natural springs from which Little Lake is fed to operate? Would this not result in a never-ending process of ever deeper wells with ever greater energy costs in perpetuity? Since the impacts from Coso will last decades and perhaps even hundreds of years after all pumping ceases, what protections will Little Lake ever have that the pumping augmentation process will be continued by Coso or its successors? The entire idea seems specious at best. Why should Little Lake be forced to undertake a man-made solution to its water needs when it is man causing the problem in the first place? Is it not much saner to prevent the first man, Coso, from causing the impact to begin with to a natural resource?

P11-397 **Page C2-21:** In connection with the proposed augmentation proposal, the DEIR indicates that a simulation was run for the proposal. Where are the results of the simulation? Was a chart or graph prepared to show what the impact from this proposal would be? How long would the augmentation proposal have to be continued to avoid a loss of water at Little Lake? Following full cessation of all pumping by Coso, how long would it take before the augmentation pumping could terminate? Why has none of this information been provided by the DEIR?

P11-398 **Figure C2-2:** Attached is a better identification of the locations and use of the water wells at Little Lake (Little Lake Well Locations). This figure should be corrected to reflect the actual locations. Moreover, as noted herein, the Hydrology Model, triggers and mitigation measures do not take into account the various elevations and individual characteristics of all these wells. There is not a consistent use of terminology to make sure the results and trigger points are referring to the correct well locations.

P11-399 **Figure C2-15:** The presented map, including the predicted drawdown of the groundwater table at Little Lake, is measured at the Little Lake Ranch well. At this level, a 5-foot drawdown is set forth. After this well which proceeds south, the land drops sharply towards Little Lake. Farther south is the Little Lake Ranch House well, and even farther south is the Little Lake North Dock Well at the north end of Little Lake. Why has no contour line been reflected for the North Dock Well, which of course is the well closest to Little Lake itself? Shouldn't the predicted drawdown be reflected at the North Dock Well to more accurately show the predicted drawdown which would have the most effect on Little Lake? Similarly, why does Table C2-1 exclude the well closest to Little Lake?

Appendix C-3:

P11-400 Please include a page separator and title page for Appendix C-3. The chemical compositions of the waters in and around Rose Valley are difficult to read, simply due to the small size. It also appears that all of the chemical compositions of the waters in Rose Valley are very old. Some of the dates are also not correct, such as those involving the Rose Valley Ranch. If changes to the quality of water are to be monitored and measured, there should be a new baseline sampling of the water throughout Rose Valley. This data needs to be presented for further comment by the public. Why is there missing data? Given the questions raised on the impacts of the Project on water quality, shouldn't new tests be performed to measure changes in water qualify from a current baseline of water quality?

Appendix C-4

P11-401 **Page C4-1:** The statement at the end of Section C4.1 that the monitoring and mitigation plan is <u>not</u> designed to mitigate naturally occurring changes in the hydrological system is troubling and contrary to common sense. The Rose Valley Basin is stated to be in a steady-state. Any pumping will cause an overdraft. Indeed, the proposed pumping at 4,839 AFY will completely eliminate on an average annual basis, all recharge. The pumping will be cumulative to any natural variations. Thus, the amount of drawdown caused by the pumping will further reduce underground water levels reduced by natural events, such as a relative lack of precipitation, snowmelt and recharge. Mitigation must take into account these natural variations so that pumping will cease or be severely curtailed when there is a normal cycle of drier years or drought. Just as LADWP is not allowed to pump as much water in drier years, so must the rate of pumping by Coso be automatically reduced in times of drought. What are the baseline levels of the Rose Valley Basin on which the Hydrology Model was based? Is it all averages? Did the Hydrology Model predict what would happen in drier years as compared to wetter years? This data and simulation should be presented. Moreover, there should be no room for debate or an analysis of causation in the implementation of mitigation. (See Zdon Memorandum 9-2-08)

P11-402 **Page C4-2:** The summary of hydrologic issues beginning at Section C4.2.1 merely states that the evaluation of the hydrological system within Rose Valley suggests that the project "may lower the water table elevation and groundwater flow rates in the Valley". (Page C4-2) The clever use of words completely ignores the actual prediction from the Hydrology Model. The summary should state that the Hydrology Model predicts anywhere from 5 to 12 <u>feet</u> of drawdown at Little Lake, when only a total of approximately 5 <u>inches</u> of drawdown is considered below significant.

P11-403 **Page C4-2:** The DEIR should not continue to use the deceptive word "manipulated" to describe the ability of Little Lake to manage its water resources. All references to the manipulation of water sources should be changed. The groundwater level and flow reductions as a direct result of the Project will occur regardless of what Little Lake Ranch does. See my comments above.

P11-404 **Page C4-2:** The DEIR should not characterize the November pumping test as "long term". In comparison, note that the DEIR states that the pumping test had no discernable effect on wells 5 to 7 miles south, which was not surprising "given the limited duration of the pumping."

P11-405 **Page C4-4:** The second paragraph more correctly states that the principal impacts of the Project will be the drawdown of the groundwater table. Since it is a rather established fact that the Project will draw down underground water levels, the DEIR should not use the word "may" to describe the impacts. The fact that the water will be transported outside of the Rose Valley Groundwater Basin is finally conceded. This fact should be clearly stated in the DEIR and not buried in an appendix.

P11-406 **Page C4-4:** The discussion about specific yields is misleading. This paragraph should be clarified to report the actual findings from the calibrated Hydrology Model. (See my earlier comments and Zdon Memorandum 9-2-08.)

P11-407 **Page C4-4:** According to the Model, the predicted drawdown at Little Lake at the proposed pumping rate of 4,839 AFY for 30 years is anywhere from 3 feet to 11 feet. As reported in other areas, this would likely cause a complete destruction of Little Lake, its ponds, habitat and wetlands. The following Section C4.2.3 at page C4-5 then no longer uses the drawdown in terms of feet, but instead indicates that a substantial reduction at Little Lake would occur if a "greater than 10% reduction in water falling" at Little Lake occurred. Why the difference in terminology? If one section of the report is going to speak in the terms of feet of drawdown, should not all sections of the report use the same terminology and reference points? A 10% reduction in water table area would amount to about 4 inches. The Hydrology Model predicts that the Project, at full pumping levels for 30 years, will result in a 3 feet drawdown at its most optimistic standard, almost a tenfold increase over the minimum, but it could cause a drawdown of 11 feet or more!! This should be stated. There is no mention of the elevation from which the predicted drawdowns will be measured. Why not?

P11-408 **Page C4-4:** The written report of the impacts from pumping on page C4-4 is a complete variance with the presented graph at Figure C4-2. The words say that if Coso pumps 4,839 AFY for 30 years, the drawdown at Little Lake will be between 3 to 11 feet. Just 2 pages later, the DEIR presents Figure C4-2 which a casual reader might assume reflects the effect at Little Lake assuming pumping at 4,839 AFY for 30 years. While the title of Figure C4-2 indicates the early termination after 1.2 years, the language immediately below the title suggests that the graph actually reflects what the drawdown at Little Lake will be for pumping at the full 4,839 AFY for 30 years. Given the language of the effects at page C4-4, why isn't the graph presented for the actual predicted drawdowns at Little Lake, rather than the manipulated graph contained at Figure C4-2? Why does Figure C4-2 not include a chart reflecting the effects at Little Lake assuming a specific yield of 3%?

P11-409 **Page C4-5:** See my earlier comments regarding Davis spring, Tunawee Canyon spring, and Rose spring. Were any water composition tests performed to verify that the springs are not also fed and helped to operate by the larger Rose Valley aquifer? If these springs serve to also recharge the aquifer, why haven't they been included in the Hydrology Model?

P11-410 **Page C4-5:** How much drawdown in the underground water levels will be deemed significant for impacts at all of the other water wells and owners throughout Rose Valley? The depletion of water in Rose Valley must be considered significant. It is not mitigation to simply force Coso to pay for deepened wells as the drawdown continues unabated. We are talking not only about economic impacts by such owners having to deepen their wells, install greater capacity pumps, and use more energy to pump the water. Rather, the environmental impact is the reduction of water supplies in Rose Valley. Yet, there is no mitigation for the loss of water in Rose Valley. Once it is lost and transported to Coso, it is gone. Should the County charge Coso an environmental impact fee? The Hydrology Model reflects that it could take hundreds of years after pumping stops for nature to restore the aquifer. Isn't this in and of itself a significant impact, for which no mitigation is offered?

P11-411 **Page C4-5:** Section C4.2.4 should contain a graph showing the full impacts of the Project at a pumping rate of 4,839 AFY for 30 years. The impacts of the proposed Project must also be presented throughout the DEIR. Tell the public what will truly happen if Coso is allowed to pump at the full pumping rate for 30 years. What will happen to Rose Valley? What will happen to the vegetation and wildlife which depend upon water resources? What will happen to the springs? What will happen to air pollution? In each and every section of the DEIR, the actual impacts of the proposed Project at full pumping rates for the complete duration of the Project are required. The DEIR cannot avoid this discussion merely by proposing the mitigation to stop pumping in 1.2 years. This violates CEQA.

P11-412 **Page C4-5:** Why does Appendix C of the DEIR launch into a discussion of the impacts to vegetation and wildlife at Section C4.2.3? The assertion, without any information or evidence that the Project would have no impacts on vegetation, is entirely argumentative and misplaced. What is the scientific or logical basis for concluding that a reduction of available water will not reduce the ability of the land naturally, or a landowner, to care for its environment? Regardless of the ability of Little Lake Ranch to manage its water resources, it cannot manage what it doesn't have. Review the pictorial history as presented in the LLR History-Neuman. You will see the steady improvement of habitat at Little Lake over the last 50 years.

P11-413 The Project will deplete water resources. That is a fact proven by the Hydrology Model. Doesn't the loss of water invariably lead to habitat loss? Doesn't habitat loss lead invariably to loss of wildlife? In a desert, isn't any loss of water supplies significant? When the water is gone, how is the vegetation to survive? Without vegetation and water, where will the wildlife go to survive? Is Little Lake a critical feature for migratory fowl? Where will all of the birds and animals relying upon Little Lake and its wetlands go when they no longer exist? Perhaps, the

P11-413 DEIR should focus on these real questions, rather than presenting specious arguments about whether Little Lake Ranch can improve the environment and habitat through the management of what limited water resources it has.

P11-414 Little Lake Ranch does not trust the mitigation measures. What happens if it takes longer than predicted for the monitoring wells to be impacted? Will Coso be allowed to continue pumping, even though a huge cone of depression is being created at the Hay Ranch? Because this cone of depression will slowly work its way southward, and the impacts may not even be felt for decades after the cessation of pumping, don't the mitigation measures offer Coso an opportunity to keep pumping because of delayed impacts at the monitoring wells? Once the cone of depression reaches the monitoring wells and Little Lake, it may be far too late. The impacts by way of the reduction in water supplies will continue to grow for another 30 years. (See Zdon Memorandum 9-2-08.) Rose Valley will not recover for more than 100 years after pumping stops. What is to prevent this from occurring?

P11-415 **Page C4-5:** The DEIR indicates that the maximum drawdown at the Little Lake north dock well should be limited to 0.3 feet. However, Table C4-1 refers to the Little Lake Ranch North well which is approximately 1 to 1-1/2 miles distant and north of the North Dock well. Which well is being monitored and what is the allowable drawdown? Does a 0.4-foot drawdown at the north well correspond to a 0.3-foot drawdown at the dock well? How do these drawdown triggers operate to prevent a more than 10% reduction? If the maximum allowable drawdown reduction at the North Dock well is 0.3 feet, why would the trigger be set at the maximum allowable drawdown realizing that the cone of depression will increase with time after pumping stops? Should the triggers at Little Lake allow for no drawdown to avoid the larger impacts as pumping continues?

P11-416 **Page C4-5:** Little Lake Ranch is also subject to several agreements regarding the maintenance, management and preservation of the habitat enhanced as part of the Habitat Project. Just as Coso is concerned about its ability to perform its energy delivery contracts, Little Lake is also concerned about its ability to perform. There is an enormous difference, however. Coso entered into its contracts before it had a right to import water. Little Lake entered into its contract to maintain the habitat at a time when there was not even a suggestion or a known possibility that water throughout Rose Valley would be arbitrarily reduced. Little Lake entered into its contracts in good faith reliance that it could depend upon historical water flows. Coso entered into its contracts without any assurance of imported water.

P11-417 **Page C4-6:** Why is Coso in charge of the monitoring and evaluation program? Virtually all of the triggers and mitigation measures are related to Little Lake. While certainly Little Lake Ranch appreciates the concerns, and the concerns are well-founded, the Project will degrade water resources throughout Rose Valley. The triggers and pumping reductions should occur not only for the benefit of Little Lake, but all of the residents, landowners and businesses of Rose Valley. Indeed, all of the residents of Inyo County should be concerned about this Project. If the mitigation measures are truly designed to protect Little Lake, why isn't Little Lake

P11-417 Ranch itself part of the process to assure that no significant impacts will ever occur? Why does Coso, the likely cause of environmental harm, get to perform the tests and evaluate the tests? Is there any reason to assume that Coso will discharge this responsibility in good faith?

P11-418 **Page C4-7:** The drawdown triggers are confusing and suspect, as reflected in Table C4-1. The Hydrology Model in general clearly says that maximum predicted drawdowns may not occur for as long as 30 years after pumping stops entirely. The level of significant impact allowed at Little Lake is stated to be a 10% reduction in the discharge of groundwater equal to a .3-foot decrease (a little less than 4 inches) at the North Dock Well, but this well is not even mentioned. Nonetheless, the Project would apparently allow the drawdown of the underground water table at the Little Lake Ranch North well by .4 feet. The problem, of course, is by the time this drawdown trigger is reached, the Hydrology Model predicts a continuing and massive increase of the drawdown over the next 30 years. Even after 30 years have elapsed, which would only worsen the drawdown, the Hydrology Model then predicts that Little Lake will not recover its previous water flow for as long as 100 years or longer.

P11-419 **Page C4-7:** Table C4-1 should actually be deleted in its entirety. The fine print at footnote (2) presents the data assuming that pumping entirely stops after just 1.2 years, and assumes a specific yield of 10%. What value is Table C4-1? This does not present an analysis of triggers, but only a prediction from the Hydrology Model of what will occur. Table C4-1 becomes relevant only if the CUP issued to Coso were expressly limited to a duration of 1.2 years. Table C4-1 really provides no guidance or an acceptable maximum drawdown. A completely separate table should be created showing all wells to be monitored. Moreover, the drawdown must be considered in light of the full projected pumping of 4,839 AFY for 30 years, and not a presumption will stop after only 1.2 years. Since the amount of drawdown will increase for as long as 30 years after pumping ceases, the maximum drawdown triggers must be set much lower at each of the monitoring points to avoid excessive drawdown, even after pumping stops.

P11-420 **Page C4-7:** Why aren't all of the wells at Little Lake listed at Table C4-1? What should the maximum allowable drawdowns be for each of the 3 Little Lake wells? Shouldn't the maximum allowable drawdown be changed to prevent the continuing reduction after pumping is stopped? Doesn't the Hydrology Model state that underground water levels will continue and accelerate even after pumping stops? Shouldn't the trigger be set much tougher so that the cumulative impacts from pumping will never exceed the 10% maximum drawdown?

P11-421 **Page C4-7, Table C4-1:** As written, the trigger levels are based upon the stated maximum drawdown levels. However, the table does not establish the current levels from which the drawdowns are set. What are the separate elevations being considered as a baseline start-up level? If the triggers are set at too low an elevation below the ground level, they will never be reached, regardless of how much Coso pumps. What is the process to determine the levels from which drawdowns will be measured? Identify the data on which these baseline levels are set. Is it based upon the levels during the summer or in the winter? What is the natural variation of

levels? Shouldn't the initial level be based upon the relative highest level, rather than the lowest
P11-421 level, so that the allowable triggers will be effective? The average levels must not be used, as that would still ignore the cumulative impacts from pumping.

Page C4-8: The Hydrology Model shows that there will be underground water level drawdown. How does merely deepening wells mitigate the loss of water in the aquifer? The DEIR should state the amount of water that is deemed to be not significant. Isn't any water lost
P11-422 to the aquifer significant? The DEIR should state that the Project will deplete the Rose Valley Basin. This by itself is significant and cannot be mitigated simply by the lowering of wells and installation of larger pumps.

Page C4-8, Hydrology-2: Not just some, but all wells and springs may be affected by groundwater drawdown. The HMMP should expressly require the monitoring of all wells and springs. The report of well depths and drawdowns should be made monthly, and not just semi-annually. The well owners should be contacted immediately, and not have to wait for 6 months.
P11-423 Reduction or cessation of pumping must be automatic, if an applicable trigger point is reached. There should be no room for argument in mitigation. If any well or spring loses depth or flow beyond a stated trigger, then the pumping must be reduced or stopped. The HMMP cannot allow the County or Coso to question whether the impact was caused or not caused by the Project.

Page C4-8: Mitigation measure Hydrology-3 indicates that the monitoring locations, parameters, and schedules are presented in Tables C4-1 and C4-2. Table C4-1 only refers to the Little Lake Ranch North well. However, the written material indicates that a trigger would be adopted at the Little Lake North Dock well. Table C4-2 at pages C4-16 to C4-18 again refers to the Little Lake Ranch North well, and contains mention of the trigger. However, Table C4-2 states that the Little Lake North Dock well will simply be monitored, but no triggers are
P11-424 provided. Likewise, there is apparently no monitoring at the Little Lake Ranch well or the Little Lake House well. At the public meeting on August 20, 2008, it was suggested by representatives of Geologica, that all wells would be monitored and that triggers would be set as to each well. When is this information going to be clarified and corrected? How is Little Lake Ranch supposed to provide comments to the DEIR without all of the information provided?

Page C4-8, Hydrology-3: How is the monitoring of wells handled? Who will do it? Will data be available daily, or will monitoring only occur manually once a month? Why is there a 20-day delay between the date data is collected before it is delivered? All data should be delivered to not only the County, but Little Lake and all of the landowners having wells in Rose Valley. Why is there an automatic reduction of monitoring to quarterly after 2 years? Won't the
P11-425 effects of pumping continue for decades? Won't even greater impacts be observed later in time, rather than upon the commencement of pumping? Should an independent water master be hired and funded by Coso? Should the water master be approved by the County, Coso and all affected Rose Valley owners? When is the Water Department given discretion to apparently change trigger levels? Once approved, the trigger levels should not be subject to modification.

P11-426 **Page C4-9:** Hydrology-4 adds an undefined concept that a trigger of a 0.3-foot drawdown may be exceeded if new data indicates a larger decrease of head would not result in a greater than 10% decrease in groundwater flow, or "substantially deplete the water availability to the springs and wetlands." Please define what a substantial depletion of water to the springs and wetlands means. How is this to be measured? What is the objective evidence on which this standard will be based? Once a trigger is reached, how long will it take to recalibrate the Model? Who will perform the analysis? What happens to pumping during the course of the recalibration of the Hydrology Model? Pumping should stop immediately. Will Little Lake Ranch have the right to participate in this process? Coso should not be allowed to continue pumping once a trigger is reached. Why is Coso given any right to continue pumping once a trigger level is reached?

P11-427 **Page C4-9, Hydrology-4:** Explain the logic for allowing Coso to pump at the full pumping rate of 4,839 AFY for 30 years, when the Hydrology Model states that such pumping has to stop in only 1.2 years to avoid significant impacts? Why are changes to the pumping rate or duration only subject to approval by the Inyo County Water Department (ICWD)? Won't any such change fundamentally affect the basis on which the DEIR has been prepared? How can ICWD ensure that Coso will not challenge the decision and voluntarily comply with the HMMP?

P11-428 **Page C4-9:** Mitigation measure Hydrology – 4 indicates that Coso will be allowed to pump at the full proposed pumping rate unless certain triggers are reached or exceeded. This mitigation measure does not, however, state what happens to the pumping when this point is reached other than to require a recalibration of the Hydrology Model and the establishment of new pumping rates. There must be a firm and unambiguous cessation of all pumping in the event the triggers are reached. The mitigation measure should expressly state that all pumping must immediately cease, without reason or excuse, if any trigger level is reached or exceeded. Otherwise, there will be endless litigation and claims while the experts do battle over the model and causation.

P11-429 **Page C4-10:** Section C4.2.5 provides erroneous goals of the HMMP. The HMMP is not designed to actually provide a system for "mitigating for groundwater drawdown in existing wells." The loss of water cannot be mitigated. The loss of water is a loss of water. There is no sufficient natural recharge to support any pumping. Coso will deplete the Rose Valley Basin. Merely providing a mechanism to allow landowners to deepen their wells and pump water from deeper portions of the aquifer is not truly mitigation. It simply provides some economic help to minimize the economic harm from the Project. It does not reduce the environmental impacts caused by the pumping. This should be restated.

P11-430 **Page C4-10:** Why is there reference that the HMMP is further designed to indicate "potential impacts to wetlands"? The DEIR refused to study the biology of the Rose Valley and Little Lake. This appears to be an implicit admission that the Project will affect the wetlands and riparian habitat. This should be explained and clarified.

P11-431 **Page C4-10:** There are old sayings about letting the fox guard the chicken coop. The Hydraulic Monitoring and Mitigation Program (HMMP) at Section C4.3.1 states that the monitoring and mitigation will be performed by Coso and that Coso will report the results. Why is Coso performing the monitoring and mitigation of the HMMP? Does Coso get to set the standards and then determine whether it complies? Why shouldn't Coso fund an independent monitor? What if Coso does not? What if Coso delays or makes "honest" mistakes in data collection or interpretation? What if Coso does not really understand what its obligations are and chooses to file declaratory relief action for guidance, all the while continuing its pumping? What if Coso manipulates its data (much in the same way as the DEIR suggests that Little Lake can manipulate its water resources, for good or bad)?

P11-432 Why is the County evaluating the changes "relative to natural conditions such as rainfall and snowfall"? Any and all water table reductions or water supply availability to Little Lake must be conclusively presumed to be caused by the pumping. As soon as "natural factors" are introduced, the County will never be able to curtail pumping once the CUP is granted. This is not to say that there are not natural variations in water table levels or surface flow. Little Lake Ranch obviously concedes there are. The problem is that Coso's pumping will add to and make worse periods of drought. Even if the water table or water supplies are naturally reduced, then there is even more reason to stop all pumping. Coso is exporting water, not using it reasonably within the Rose Valley Basin. Coso's pumping should be expressly and without question subordinate to the legal rights and needs of all of the overlying owners.

P11-433 **Page C4-10:** Section C4.3.1 further provides that the data will be provided to Little Lake Ranch. Because Coso clearly is impacting Little Lake, Little Lake Ranch should not be forced to bear any expense in this process. Only a qualified hydrologist will be able to interpret and understand the dynamics of the system. Coso should bear, as part of the mitigation measures, the reasonable costs of a hydrologist selected by Little Lake, the maximum annual cost of which could be agreed plus an automatic CPI adjustment for the length of the CUP.

P11-434 **Page C4-11:** Phase 1 of the monitoring system set-up will allegedly help to "establish prevailing conditions prior to generating impacts and to establish the monthly baseline levels from which to compare the trigger level drawdown values." How long will monitoring last before pumping begins? At the public meeting on August 20, 2008, it was suggested that as short as 6 months of pre-pumping monitoring would occur. Explain how this limited amount of monitoring will establish proper baseline levels. What other data will be used to set baseline levels? Where will the baseline levels be set? How will they be determined? This is an enormously complex and controversial process, as the setting of the baseline levels could allow Coso to pump forever, regardless of the amount of drawdown in the Rose Valley Basin. They could also be set so high, to forbid any pumping from the inception. Without knowing the manner in which the baseline levels will be set, the DEIR cannot possibly comply with CEQA. The comments made at the August 20th public meeting are also not repeated or confirmed in the DEIR. This by itself is misleading.

P11-435 **Page C4-11:** More stringent safeguards need to be incorporated into the CUP, in addition to Inyo County Code, Chapters 18.77.045 and 18.77.055. As written, the CUP could only be challenged if the proponent can prove that the Project is causing an unreasonable effect on the overall economy or environment of Inyo County. This is much too high of a burden given the localized impacts from the Project. Is the County willing to sacrifice Rose Valley to sustain the "overall economy or environment" of the County?

P11-436 **Page C4-11:** Section C4.3.3 identifies the various monitoring phases of the proposed mitigation measures. The monitoring system does not even commence until construction of the Project commences. Question: What is the purpose of the delay? Why should not Coso begin monitoring as soon as the CUP is issued and approved by Coso? Indeed, shouldn't the commencement of actual pumping be delayed for at least one year after monitoring commences? Could not Coso commence construction upon issuance of the CUP, but only defer pumping commencement for one year after monitoring begins?

P11-437 **Page C4-12:** Better explain how the water flow measurements over the so-called Little Lake Weir will be constructed and operated. How will the measurement device be constructed to accurately measure water flow during these management activities? Please better define the location of the so-called "North Culvert." Will surface water monitoring occur at the North Culvert? Will the construction, placement and operation of the monitoring equipment require permits from CDFG and the California Regional Water Quality Control Board? (See Zdon Memorandum 9-2-08.)

P11-438 **Page C4-12:** Subsection "d" indicates that the water levels at Little Lake North Dock Well will be monitored. However, such well is not identified on Figure C4-3. This should be added. Moreover, there is no trigger set for Little Lake Ranch North Dock well. Indeed, the triggers described in Table C4-1 set a .4 feet trigger for the Little Lake Ranch North Well. Now, we really have confusion in the DEIR. Is a .4 feet trigger appropriate for either or both wells? They are separated by over a mile in distance and considerable changes in elevation, both at ground level and distance to the underground water table. Which well is to be monitored? Was the Hydrology Model run with both wells or only one? How are we supposed to comment on the accuracy of the Hydrology Model, when we do not know which well is correct, and what the suggested triggers for action are? This should be clarified, and the public should be given a new opportunity to comment when the correct information is available.

P11-439 **Page C4-12:** Subsection "f" indicates that the monitoring network will include the wells at Fossil Falls, Little Lake Hotel, and the Little Lake north dock wells. No triggers or drawdown information is provided for these wells. Are they to be monitored? What equipment will be used? How frequently will monitoring occur? Will any triggers be stated? When will this information be provided to the public for comment?

P11-440 **Page C4-14:** As stated above, monitoring the Rose Valley Basin for only 6 months before pumping begins is woefully inadequate. Not only should a full 12 months be required, P11-440 but even longer monitoring would be more appropriate. The mechanism to determine the background water levels is critical if the HMMP is to have any meaningful chance of success. Under no event should this step be left to Coso. Its self-interest in manipulating the data and setting the water levels is evident. Setting the water levels cannot be relegated to future environmental studies. This violates CEQA. Explain the rationale for referring statistical methods to those similar to RCRA and CERCLA sites. These both relate to the contamination of water or other pollution issues. What relevance do these statistical methods have to determine the statistical baseline measures for underground water levels?

P11-441 **Page C4-14:** Under Task 1.2, Subsection A., there is an incomplete sentence presumably dealing with the installation of a device to measure hydrologic head. No other information is provided, such as the type of device or where it will be located. Please clarify and explain the rationale for this item. How long will these devices be in place before pumping begins? How long will monitoring occur before commencement of pumping? Why does it seem to be limited to 6 months before pumping? This will not even allow a single water year consisting of summer, fall, winter and spring to occur before pumping commences. Given natural fluctuations over the course of a typical year, isn't a longer test required? How does this data compare to normal fluctuations over the years during periods of wetter years, compared to the number of drier years?

P11-442 **Page C4-15:** The threshold for the 2 existing Hay Ranch wells should include maximum daily pumping rates. The action if threshold is exceeded should eliminate discontinued pumping, as the amount of daily or yearly output by itself would not cause cessation of pumping.

P11-443 Regarding the 6 new observation wells, the original starting elevations are not noted. What will they be? How does the absence of starting elevations affect the triggers? To be meaningful, isn't the original elevation point crucial? The actions to reduce and stop pumping must be automatic. If the drawdown deviations or the maximum triggers are reached, all pumping should stop. Pumping should only be allowed to resume following the recalibration of the Hydrology Model, subject to the approval of an independent water master, the costs of which are borne by Coso. Does each of the 6 observation wells have the same triggers? Table C4-1 seems to imply that there is only a single observation well, rather than 6. Shouldn't there be different triggers at least for those 3 wells tracking the north well, compared to the 3 wells tracking the south well? Why are there no triggers associated with the 2 Hay Ranch wells themselves?

P11-444 **Page C4-15, Table C4-2:** This seems to provide a useful tool for the development of monitoring standards. However, it may be better to establish several similar tables, each corresponding to a fixed number of years before and after the commencement of pumping. To determine background baseline, monitoring should be commenced immediately and continue for at least one year prior to the onset of pumping. The methods to select the baseline elevations must be described. Without the beginning elevations and a description of how they were determined, there is no was to ascertain whether the drawdown levels and triggers are

P11-444 meaningful, or will do anything to protect Rose Valley and Little Lake. Since the entire HMMP assumes that the Hydrology Model will be recalibrated after approximately 1 year, the next table should only address the nature of monitoring, frequency, trigger points and response actions during the first 1 year. Then, a further table should be established addressing the time period after 1 year and perhaps continuing for anywhere from 3 to 5 years. This would greatly simplify the reader's review, analysis and comments on the monitoring program. In all cases, the actions in response to the exceedance of a trigger point must be absolute and non-discretionary. Moreover, there should be no discretion or leniency for Coso to argue that the trigger point was exceeded due to some cause other than pumping.

P11-445 The adequacy of the mitigation measures are further flawed, because the Hydrology Model is based upon average annual conditions. The Hydrology Model should be run to reflect impacts from pumping during a cycle of wetter years as well as a cycle of drier years. In drier years, the pumping from the Project will accelerate or worsen the impacts from the drought cycle. To avoid even a 10% loss at Little Lake, the mitigation measures must assume a worst case scenario of a prolonged drought while pumping occurs. (See Zdon Memorandum 9-2-08.)

P11-446 The triggers are also misplaced and inadequate. The cessation of pumping at triggers which are set at the maximum allowable water level drop is not adequate. The Hydrology Model predicts that water levels will continue to drop even after pumping stops. Thus, the triggers have to be set to take into account the continuation and worsening of water losses following the cessation of pumping.

P11-447 **Page C4-16:** At least 10 wells are indicated to be monitored. Monthly monitoring alone is not adequate. Why are groundwater elevations not measured at least weekly, if not daily? Of the 10 wells listed, not all have trigger points as set forth in Table C4-1 and, in particular, the Fossil Falls well and the new well between Coso Junction and the Cinder Road, Red Hill well. There is also a discrepancy between the names used for the Cinder Road, Red Hill well. Table C4-2 refers to it as Cinder Road, Red Hill well, while apparently Table C4-1 refers to it as the Red Hill Cinder Road well. Is this the same well? Does it exist? The DEIR should consistently refer to the same well using the same terminology. What are the triggers for the missing wells? What are the beginning elevations from which the drawdown will be measured?

P11-448 **Page C4-16:** The "Threshold Requiring Action" for the new Hay Ranch observation wells is inaccurate. Reference is made to Table C4-1. See all of my comments earlier regarding Table C4-1.

P11-449 **Page C4-16:** The reduction of monitoring to only quarterly after 2 years is too short. Impacts for pumping will continue for over a 100 years, even after pumping stops. Continuous monitoring should be required. The reference to the "wetlands" at Little Lake should probably be deleted under the section called "Action if Threshold Exceeded." The DEIR does not address any of the wetlands or habitat at Little Lake. Unless the DEIR establishes baselines for the wetlands, habitat and wildlife, it is improper to talk about a trigger to protect these resources. Again, Little

P11-449 Lake Ranch believes that the DEIR is in error and that the habitat and wetlands must be addressed, analyzed and protected.

P11-450 **Page C4-17:** The Little Lake Hotel Well and North Dock Well are mentioned, but no trigger points are provided. Why not? Longer-term baseline monitoring, daily or weekly monitoring during pumping, and the continuation of monitoring for the duration of pumping, should be required.

P11-451 **Page C4-18:** Table C4-2 indicates that there will be monitoring of Little Lake itself. For the first time, and nowhere else found in the DEIR, is it suggested that a 1-foot or more change in the lake level will be a threshold requiring action. A 1-foot loss of water in Little Lake is much more than a 10% loss. There are no statements about what happens in the event of this water loss. Is this table accurate or in error?

P11-452 **Page C4-18:** Please identify exactly where the Little Lake North Culvert weir is located. Is it beyond the boundaries of the Hydrology Model? If so, why is it being monitored? Describe the type of equipment used to monitor the discharge rate. The DEIR does not consistently refer to this discharge point and the discrepancies should be corrected. Why are there no triggers required? What is the frequency of monitoring? What is the purpose of the monitoring at this point?

P11-453 Table C4-2 indicates that Little Lake Ranch Pond P1 (Upper Pond) will be monitored, but the parameters monitored and the frequency of monitoring are confusing. Under the parameters, it talks about the Siphon well discharge and the monitoring is only done by visual inspection. What is being monitored? Is it the Upper Pond known as Pond P1, or the Siphon well? What possible information can be gleaned from visual inspection? What measurements will be made? What monitoring equipment will be used? Where will it be located? Are there any triggers, and if not, why not?

P11-454 **Page C4-18:** It is unclear what is meant by a request for the reporting of any major operational changes. Depending upon circumstances and the availability of water in Little Lake, Little Lake Ranch does manage its water sources. The level of the Lake can be raised or lowered depending upon the circumstances and the need for water to replenish ponds and conduct irrigation south of the lake, which happens frequently. These activities are considered by Little Lake Ranch to be normal, but it is unclear whether the DEIR might suggest that these are major operational changes. Please clarify.

P11-455 **Page C4-18:** Groundwater quality is proposed to be monitored. Yet, there is virtually no discussion of the impacts on water quality from the pumping in the DEIR. This has been mentioned earlier. New water samples should be taken of all wells throughout Rose Valley to determine current water quality. Why is the trigger set at 2,000 MG/L for TDS? The TDS information for Little Lake is specified in a series of separate samples. It is not clear where these

P11-455 samples were taken. TDS levels vary considerably. What is the impact of increasing TDS levels? What is the baseline data for current water quality?

P11-456 **Page C4-19:** The threshold requiring action in connection with well yield seems too high. A loss of 25% or more in yield from the described wells would be severe. Shouldn't this trigger be set much lower, such as the 10% significant impact standard used throughout the DEIR?

P11-457 **Page C4-19:** There is far too much leniency given to Coso. Cessation of pumping should be automatic. Pumping should not be allowed to resume until the Hydrology Model has been recalibrated. Pumping should not be resumed until an independent water master approves any changes in the Hydrology Model. All information should also be provided to Little Lake Ranch and any other person who requests notice of the study. All residents of Rose Valley and landowners should be allowed to provide input into this process.

P11-458 **Page C4-19:** Little Lake Ranch has no confidence that Coso will actually report or properly evaluate situations where trigger levels are exceeded nor do we believe that Coso will voluntarily reduce pumping if maximum acceptable drawdown trigger levels are reached or exceeded. See all comments above about the problems with the monitoring by Coso.

P11-459 **Page C4-19:** The required termination of pumping by Coso after 1.2 years seems to only require this if the drawdown values in "<u>all</u> monitoring levels occur." This is too high of a standard. If the results of pumping seem to be consistent with the Hydrology Model in a majority of the monitoring wells, then pumping should cease. Coso cannot be allowed to argue some standard of reasonableness or causation. Why is Coso in charge of recalibrating the Model? Shouldn't an independent hydrologist perform the work?

P11-460 **Page C4-20:** See all comments above about the problems with the monitoring by Coso. Consider what has happened to Coso Hot Springs. The US Navy is in charge of the monitoring, but it receives enormous financial benefits from Coso's operations. Despite overwhelming evidence to the contrary, the US Navy has continued to deny that the geothermal operations have caused any impacts to Coso Hot Springs. The monitoring reports clearly provide a direct causal connection between geothermal operations and Coso Hot Springs. Nonetheless, the US Navy and Coso have taken no actions to reverse the problem or to limit production in direct violation of the 1979 MOA. The same thing should not happen to Little Lake.

P11-461 **Page C4-20:** Delete all references that the background levels for each well shall account for natural variation, or to separate effects of pumping from natural effects. This again leaves open the door for dispute. If Coso is going to pump, its pumping should be expressly subordinate to natural variation. Indeed, its pumping will worsen any drawdown and water table reductions.

P11-462 **Page C4-21:** The timing to recalibrate the Hydrology Model is mentioned throughout Appendix C and the DEIR. In some cases, the dates on which the Hydrology Model is to be recalibrated are contradictory. It seems that the more appropriate time to recalibrate the Hydrology Model should occur approximately 1 year after pumping commences. The only reason to advance the date on which this may occur is because the pumping has caused 2 or more of the triggers to be reached throughout the Rose Valley. To protect Rose Valley and Little Lake, the DEIR should specify that the recalibrated Hydrology Model be completed no later than 15 months (a little over 1.2 years) after pumping commences. If the Hydrology Model has not been recalibrated by this time, then all pumping should automatically cease until the Hydrology Model is recalibrated and its results are known and made available for public input. Similarly, the Hydrology Model has to be recalibrated because of the exceedance of triggers, pumping again should immediately cease until the Hydrology Model is recalibrated and the public has the opportunity to provide input as to its results.

P11-463 **Page C4-21:** The only stated trigger at Little Lake is described in Table C4-1 as a 0.4-foot drawdown at the Little Lake Ranch North well. This seems to be in error. As noted previously, once a drawdown of 0.4 feet is hit at the Little Lake Ranch north well, while Coso is still pumping, a much larger cone of depression will continue to increase the drawdown, even after pumping stops. Thus, the maximum allowable drawdown must be much less than 0.4 feet at the Little Lake Ranch north well. (See Zdon Memorandum 9-2-08.) Moreover, this is a meaningless trigger unless we know what the beginning elevation is.

P11-464 **Page C4-21:** The section on the "redefinition of pumping rates and duration" is unclear. There is at least a suggestion that pumping should stop after 1 to 1.2 years, but this is never stated as an absolute requirement in the DEIR. Why not? Will pumping absolutely stop after 1.2 years? If so, shouldn't the Project be redefined as a pumping project allowing pumping at 4,839 AFY for only 1.2 years? If that is accurate, shouldn't Coso then have to reapply for a new CUP, subject to another Environmental Impact Report based upon the environmental studies and recalibrated Hydrology Model conducted during the first year of pumping? Isn't this the only way to ensure the safety and protection of the Rose Valley Basin?

P11-465 **Page C4-21:** If the maximum drawdown is .3 feet at the northern end of Little Lake (presumably, the North Dock Well), why is the trigger set at .4 feet for the Little Lake Ranch North well (see Table C4-1)? See comments above about the proper trigger and beginning elevations.

P11-466 **Page C4-22:** The DEIR does state that drawdown could continue to decline for as long as 30 years after pumping ceases. However, neither the DEIR nor Appendix C contains a sufficient description of the residual impacts, including the inability of the Rose Valley Basin to fully recover the water lost through the pumping Project for more than 100 years after pumping ceases. While a few of the graphs depict this extraordinarily long time for the Rose Valley Basin to recover, why is this impact not stated clearly in the DEIR? More analysis is required.

P11-467 **Page C4-22:** Why isn't the entire process to recalibrate the Hydrology Model and establish new trigger levels subject to complete environmental review? Shouldn't pumping absolutely stop after 1.2 years? Should all of the new evidence and recalibrated Hydrology Model be subject to full public scrutiny and allow for new public hearings?

P11-468 **Page C4-22:** See all of my comments above regarding the suggested water augmentation plan.

P11-469 **Page C4-22:** Water quality, as opposed to quantity, is mentioned here and at a few other places in Appendix C. The underground aquifer supplies 100% of all water used and consumed within Rose Valley for all purposes. Any degradation of the water quality could dramatically affect the residents of Rose Valley. See my comments above about water quality issues.

P11-470 **Page C4-23:** While there is no objection to the accumulation of data with respect to trends in precipitation data, recharge, seismic events, and major storms, none of these events should be permissible when addressing the rate or duration of pumping. Natural variations in recharge, surface flow, and underground water table levels will occur. Nonetheless, if trigger points are reached, pumping must stop regardless of the cause.

APPENDIX D

P11-471 Appendix D purports to provide the baseline documentation for wildlife which may be impacted by the Project. While recognizing that there are number of special status plants, as well as endangered or threatened wildlife in and around the Project, all of the information provided in Appendix D is expressly limited to the geographic footprint of the Project consisting of approximately 59 acres in total. Virtually no information is provided with respect to the larger confines of the Rose Valley or the much richer habitat and wildlife refuge of Little Lake, Portuguese Bench and Rose Spring. Despite some conclusion to the contrary that these areas are not likely to be impacted, the serious threats to water supplies in and around Rose Valley, the natural springs and seeps and Little Lake are ignored.

P11-472 The stated reason for not assessing the vegetation and wildlife around Rose Valley, and in Little Lake in particular is suspect. No scientific evidence is presented which would permit the conclusion that a 10% loss of the surface water at Little Lake would have less than significant impacts on the habitat and wildlife. Several requests have been made to ascertain the status of the habitat in and around the actual Project site. To date, all of these requests have gone ignored. Absent a baseline study of vegetation and wildlife, how will anybody ever determine whether the Project will have an impact?

P11-473 It is noted that the survey performed by EREMICO Biological Services dated May 1, 2008, included a survey at Rose Spring. Rose Spring is now dry. Was this condition caused by agricultural pumping? Why was Rose Spring singled out for a special survey while Portuguese Bench, Little Lake and the rest of Rose Valley were excluded?

APPENDIX E

P11-474 Appendix E consists of the Programmatic Memorandum of Agreement (MOA) among the US Navy, the California State Historic Preservation Office (SHPO) and the Advisory Counsel on Historic Preservation (Advisory Counsel), executed in December 1979. The proposed scope of the leasing program to develop geothermal reservoirs is recited and it was assumed that approximately a 3-1/2 square mile area within the Coso known geothermal reservoir area (Coso KGRA) would be involved. It should be noted, however, that the MOA is expressly limited to lands controlled by the US Navy and not any portion of the Coso KGRA managed by BLM. Thus, the MOA is irrelevant and not binding on the Paiute Indian Tribes, at least insofar as the Project will also affect and benefit the BLM portion of Coso. The relationship of the Project between the US Navy portion and BLM has not been addressed at all. Indeed, virtually no reference to the BLM power generation activities are made a part of or considered in the DEIR. Why has BLM been excluded? Will any of the water injection activities benefit or affect the BLM power generation facilities? What is the relationship between the Project and BLM?

P11-475 **App. E, page A.4-8**: At page A.4-8, it is noted that the geothermal production operations would generate waste products consisting of non-condensable gases, fluid remaining after flashing to provide steam, and the condensate. How these waste products would be managed at the time was not capable of evaluation.

P11-476 **App. E, Page A.4-9**: The productive life of the geothermal field was not specified. There is a note however that the geothermal reservoir, if "properly managed, can continue to produce energy indefinitely". It is this observation which is most critical concerning the current Project and Coso's plans. Has indeed the geothermal reservoir been properly managed? Should Coso's proposal to import water to rectify decades of mismanagement be allowed? Should not Coso, having made its decisions, knowing that it existed in a high desert environment where water is not readily available, be left to accept the consequences of its decision?

P11-477 **App. E, Page A4-11**: Section 6.a. the commander in charge of the Naval Weapons Center, specifically agreed to locate, identify and evaluate all historic and cultural properties that may be impacted from any Project-related undertaking. There is no indication in the DEIR that this has occurred. The US Navy is not a co-sponsor of the County of the DEIR and no independent environmental analysis has been yet performed of the Project under NEPA.

P11-478 Coso Hot Springs is already listed in the National Register of Historic Places. The impacts to Coso Hot Springs by the geothermal activities have been documented. How can there be any assurance that the further continuation of geothermal activities at Coso will not exacerbate the problem? Why has not the commander fulfilled his obligation to date under the MOA?

P11-479 **App. E, Page A4-12:** The Coso Hot Springs was identified and monitoring of its condition was required. More importantly, the MOA goes on to state: "In the event a perceptible change to the surface activity of the hot springs were to occur over a period of time as a result of the Geothermal Development Program the Navy will cease those actions on the part of the Navy and/or its agents which can reasonably be presumed to be causing this effect and will make every reasonable effort to determine what actions could be taken to mitigate this change." Has this Happened since 1987? Has any portion of Coso been limited in light of the obvious evidence? The MOA requires a reduction in production activities until the Coso Hot Springs is stabilized. What agreements have been reached with the Paiute Indian Tribes, SHPO or the Advisory Counsel to reverse the effects to the Coso Hot Springs? Have the Paiute Indian Tribes imposed various objections to the continued operation of Coso? Absent an agreement, the commander is not supposed to proceed.

P11-480 **App. E, Page A4-14:** The MOA required annual review of the MOA including assessment of program operations. Has this occurred? Where are the annual reports, other than the 2 most recent monitoring reports?

APPENDIX F

P11-481 Appendix F purports to describe the Habitat Restoration and Improvement Plan conducted by Little Lake, but only includes the plan approved October 14, 2000, as current through April 20, 2001, and the Draft Initial Study and Mitigated Negative Declaration. The Environmental Impact Report which superseded the LLR MMD and the Habitat Update should be included. (See Little Lake FEIR and Habitat Plan Update.)

CONCLUSION

P11-482 The DEIR is incomplete and inadequate. It is based upon a fundamentally flawed Hydrology Model that cannot be fixed merely by answers to the questions posed. The DEIR is incapable of being cured by a simple amendment. The County must re-run the Hydrology Model to address all of the foregoing comments and questions. The DEIR must be revised and completely rewritten consistent with the new Hydrology Model. Then, the DEIR should again be subject to public examination and comment.

Very truly yours,

ARNOLD, BLEUEL, LAROCHELLE,
MATHEWS & ZIRBEL, LLP

Gary D Arnold

Gary D. Arnold

GDA:

Little Lake\Coso\Letters\Gretz Ltr 09-DEIR

cc: Little Lake Ranch, Inc.

REFERENCES:

1980 EIS: Environmental Impact Statement published in September, 1980 for the "Proposed Leasing within the Coso Known Geothermal reservoir Area"

1985 EA: Environmental Assessment of the Proposed California Energy Company Plan of Exploration, Federal Lease Ca-11402, Coso KGRA, Dated December 5, 1985.

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Bauer Thesis: Master's Thesis entitled "The Hydrogeology of Rose Valley, Little Lake Ranch, Inyo County, California", by Charles M. Bauer, April 2002.

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Coso 10-K 12-31-04: SEC Annual Report, Form 10-K, for Caithness Coso Funding Corp, for fiscal year ending December 31, 2004.

Curry Report 2004: Analysis of Causes of Hydrologic Changes at Coso Hot Springs by Robert R. Curry, PhD, March 2004, Revised April 1, 2004.

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Danskin Report: Evaluation of the Hydrologic System and Selected Water-Management Alternatives in the Owens Valley, California, prepared by Wesley Danskin for USGS, 1998.

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Fournier Recharge Study: Report entitled "The Recharge Area for the Coso, California, Geothermal System", by Robert O. Fournier and J.M. Thompson, 1980.

GAO Report 2004: Report prepared by the US General Accounting Office in 2004 called "Information on the Navy's Geothermal Program"

GT Model 6-30-04: Revised Hydrogeologic Conceptual Model for the Rose Valley Prepared by Geotrans, Inc., Dated June 30, 2004

Geologica 2005: Coso Hot Springs Monitoring Report 2004-2005 prepared by Geologica, Inc.

Geologica 2006: Coso Hot Springs Monitoring Report 2005-2006, prepared by Geologica, Inc.

Geothermal PEIS: Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States prepared by Bureau of Land Management and the United States Forest Service.

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Habitat Plan: Upper Little Lake Ranch, Inc. Habitat Restoration and Enhancement Project, dated October 14, 2000 (Current through April 20, 2001)

Habitat Plan Update: Upper Little Lake Ranch Habitat Restoration and Enhancement Project, dated November 30, 2000

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Harris E-Mail 9-2-08: E-Mail from Charles Harris to Gary Arnold, dated September 2, 2008.

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ICPD Cost Memo: Draft memo apparently received by the ICPD on December 20, 2007, and contained in the Inyo County Planning Department files.

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LLR MND: Draft Initial Study and Mitigated Negative Declaration prepared in conjunction with the Upper Little Lake Ranch Habitat Restoration and Enhancement Project, dated April 4, 2002.

LLR History-Neuman: A pictorial and narrative history of Little Lake Ranch, including its creation, predecessors and significant events.

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Larsen E-mail 9-26-07: E-mail from Janice Larsen to Laurie McClenahan Hietter of MHA on September 26, 2007.

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Scoping – NAHC: Letter from the Native American Heritage Commission dated October 22, 2007.

Scoping – OVC: Letter from Carla Scheidlinger, president of Owens Valley Committee, dated November 2, 2007.

Scoping – Geologica: Memorandum from Geologica dated October 29, 2007 discussing the proposed pumping tests.

Scoping – Prather: Letter from Mike Prather, former chairman of the Owens Valley Committee received by County on October 30, 2007.

Scoping – Tribal Council: Letter from Bishop Tribal Counsel dated November 6, 2007.

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Stanislaus v. County of Stanislaus: The judicial decision rendered by the California Court of Appeal entitled *"Stanislaus Natural Heritage Project v. County of Stanislaus"* (1996) 49 Cal.App. 4th 727.

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Wicks – Deformation: Steady-State Deformation of the Coso Range, East-Central California, Inferred from Satellite Radar Interferometry, by Charles W. Wicks 2001.

Zdon Memorandum 9-2-08: Memorandum from Andrew Zdon, P.G., C.E.G., C.Hg., associated with Golden State Environmental, Inc.

EXHIBIT A

- Implement a Visual Resource Protection Program. The purpose of the program is to establish the criteria and methodologies to manage visual resource protection measures throughout the life of a project (from design, construction, and operation of the project through reclamation). The program would be implemented as a part of the project design criteria and mitigation measures for the project through the Record of Decision. The objectives of the program would be to prevent adverse visual impacts whenever possible, reduce the severity and extent of the adverse impacts that cannot be prevented, and rehabilitate adverse effects.

- The applicant shall include and identify a VRM specialist with demonstrated qualified credentials (e.g., licensed landscape architect) as a part of the planning team for evaluating visual resource issues and opportunities for siting options of project facilities.

- VRM treatments are to be fully integrated into the overall site development program and construction documents, including but not limited to, re-vegetation plans, supplemental watering plans, vegetation thinning/feathering plans, contour grading plans that quantify and provide means for measuring compliance with VRM objectives and mitigation commitments.

- The contrast rating procedures described within BLM Handbook H-8431-1, Visual Resource Contrast Rating are to be followed for proposed activities within VRM Class I, II, and III areas.

- For proposed projects within VRM Class I, II, and III, develop suitable geo reference terrain data covering the project area and the full context of viewshed adequate for designing and evaluating visual impacts of the proposed activities using cadd, 3-D GIS modeling, and visualization software.

- Perform evaluation using electronic 3-dimensional modeling and design capability and visual simulation tools. All evaluations shall also be field verified. Proposals determined to be out of compliance will need to be mitigated until demonstrated to be in compliance.Appendix D. Best Management Practices Mitigation Measures *Draft PEIS for Geothermal Leasing in the Western US* D-47 May 2008 Mitigation plans demonstrating VRM class objective compliance need to quantify mitigation activities and be field measurable during construction and post-project completion.

- A VRM mitigation monitoring and compliance checking strategy shall be included in the mitigation plan with activities monitored and maintained through life of the project.

- VRM best management practices may need to extend beyond the project boundary lending to additional modification to the landscape in order to fully integrate the facilities visually into the viewshed and meet VRM objectives. These modifications may require EA/EIS level analysis along with the other resource considerations and project activities. Early identification of VRM measures will help facilitate impact disclosure.

- BLM/ USFS landscape architects shall be consulted before construction begins to coordinate on VRM mitigation strategy that may include treatments to occur early in construction such as project edge treatments by thinning and feathering vegetation, enhanced contour grading, salvaging landscape materials from within construction areas, etc. Proponents will coordinate in advance to have BLM/ USFS landscape architects on site during construction to work with implementing BMPs.

- Site projects outside of the viewsheds of publicly accessible vantage points, or if this cannot be avoided, as far away as possible; Site projects to take advantage of both topography and vegetation as screening devices to restrict views of projects from visually sensitive areas;

- Site facilities away from and not adjacent to prominent landscape features (e.g., knobs and water features); Avoid placing facilities on ridgelines, summits, or other locations such that they will be silhouetted against the sky from important viewing locations;

- Collocate facilities to the extent possible to use existing and shared rights-of-way, existing and shared access and maintenance roads, and other infrastructure to reduce visual they do not bisect ridge tops or run down the center of valley bottoms.

- Site linear features (aboveground pipelines, rights-of-way, and roads) to follow natural land contours rather than straight lines (particularly up slopes) when possible. Fall-line cuts should be avoided.

- Site facilities, especially linear facilities, to take advantage of natural topographic breaks (i.e., pronounced changes in slope) to avoid siting facilities on steep side slopes.

- Where possible, site linear features such as rights-of-ways and roads to follow the edges of clearings (where they will be less conspicuous) rather than passing through the centers of clearings.

- Site facilities to take advantage of existing clearings to reduce vegetation clearing and ground disturbance, where possible.

- Site linear features (e.g., trails, roads, rivers) to cross other linear features at right angles whenever possible to minimize viewing area and duration.

- Site and design structures and roads to minimize and balance cuts and fills and to preserve existing rocks, vegetation, and drainage patterns to the maximum extent possible.

- Use appropriately colored materials for structures or appropriate stains and coatings to blend with the project's backdrop.

- Use non-reflective or low-reflectivity materials, coatings, or paints whenever possible.

- Paint grouped structures the same color to reduce visual complexity and color contrast.

- Design and install efficient facility lighting so that the minimum amount of lighting required for safety and security is provided but not exceeded and so that upward light scattering (light pollution) is minimized. This may include, for example, installing shrouds to minimize light from straying off-site, properly directing light to only illuminate necessary areas, and installing motion sensors to only illuminate areas when necessary.

- Site construction staging areas and laydown areas outside of the viewsheds of publicly accessible vantage points and visually sensitive areas, where possible, including siting in swales, around bends, and behind ridges and vegetative screens.

- Discuss visual impact mitigation objectives and activities with equipment operators prior to commencement of construction activities.

- Mulch slash from vegetation removal and spread it to cover fresh soil disturbances or, if not possible, bury or compost slash.

- If slash piles are necessary, stage them out of sight of sensitive viewing areas.

- Avoid installing gravel and pavement where possible to reduce color and texture contrasts with existing landscape.

- Use excess fill to fill uphill-side swales resulting from road construction in order to reduce unnatural-appearing slope interruption and to reduce fill piles.

- Avoid downslope wasting of excess fill material.

- Round road-cut slopes, vary cut and fill pitch to reduce contrasts in form and line, and vary slope to preserve specimen trees and nonhazardous rock outcroppings.

- Leave planting pockets on slopes where feasible.

- Combine methods of re-establishing native vegetation through seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas and staging of construction enabling direct transplanting.

- Re-vegetate with native vegetation establishing a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape.

- Provide benches in rock cuts to accent natural strata.

- Use split-face rock blasting to minimize unnatural form and texture resulting from blasting.

- Segregate topsoil from cut and fill activities and spread it on freshly disturbed areas to reduce color contrast and to aid rapid re-vegetation.

- If topsoil piles are necessary, stage them out of sight of sensitive viewing areas.

- Where feasible, remove excess cut and fill from the site to minimize ground disturbance and impacts from fill piles.

- Bury utility cables where feasible.

- Minimize signage and paint or coat reverse sides of signs and mounts to reduce color contrast with existing landscape.

- Prohibit trash burning; store trash in containers to be hauled off-site for disposal.

- Undertake interim restoration during the operating life of the project as soon as possible after disturbances. During road maintenance activities, avoid blading existing forbs and grasses in ditches and along roads.

- Randomly scarify cut slopes to reduce texture contrast with existing landscape and to aid in re-vegetation.

- Cover disturbed areas with stockpiled topsoil or mulch, and re-vegetate with a mix of native species selected for visual compatibility with existing vegetation.

- Restore rocks, brush, and natural debris whenever possible to approximate preexisting visual conditions.

- The BLM will consider the visual resource values of the public lands involved in proposed projects, consistent with BLM Visual Resource Management (VRM) policies and guidance.

- The public shall be involved and informed about the visual site design elements of the proposed geothermal energy facilities. Possible approaches include conducting public forums for disseminating information, offering organized tours of operating geothermal developments, and using computer simulation and visualization techniques in public presentations.

- The BLM will work with the applicant to incorporate visual design considerations into the planning and design of the project to minimize potential visual impacts of the proposal and to meet the VRM objectives of the area. Power plants would be sited using terrain to obstruct visual impacts to the extent possible. Design elements would also include non-reflective paints, and prohibition of commercial messages on structures.

- Other site design elements shall be integrated with the surrounding landscape. Elements to address include minimizing the profile of the ancillary structures, burial of cables, prohibition of commercial symbols, and lighting. Regarding lighting, efforts shall be made to minimize the need for and amount of lighting on ancillary structures. Where practical, wells should be co-located to reduce road, pad and utility surface area and tank batteries centralized.

- Minimize the number of structures required;

- Construct low-profile structures whenever possible to reduce structure visibility.

- Select and design materials and surface treatments to repeat or blend with landscape elements.

- Control litter and noxious weeds and remove them regularly during construction and operation.

- Implement dust abatement measures to minimize the impacts of vehicular and pedestrian traffic, construction and operation, and wind on exposed surface soils.

- Operators shall reduce visual impacts during construction by minimizing areas of surface disturbance, controlling erosion, using dust suppression techniques, and restoring exposed soils as closely as possible to their original contour and vegetation.

- Nighttime lighting will be limited to areas necessary for the safe operation of the project and, where applicable, will include motion sensors to reduce nighttime lighting when not necessary.

EXHIBIT B

Cal Trans Sewage Treatment Plant
Coso Junction, California

California City
21000 Hacienda Blvd.
Attn: Ron Wallace
California City, CA 93505

California City WWTF
Attn: Dan Allen
10835 Nelson Drive
California City, CA 93505
(760) 373-1069

Desert Lake Community Service District
Sewage Treatment Plant

Independence WWTF
Attn: Gene Coufal
APPR 1 Mile NE of Independence
Independence, California 93526
(760) 873-0266

Erskine Creek WWTF
Attn: Shirley Keeling
5500 Lake Isabella Blvd.
Lake Isabella, CA 93240

Furnace Creek WWTF
Route 190 Park Headquarters
Death Valley, CA 92326

Inyokern CSD
Attn: Mary Lenz
Post Office Box 1418
1429 Broadway
Inyokern, CA 93527
(760) 377-5840

Inyokern WWTF
Attn: Ken Silliman
N.E. of Inyokern
Inyokern, California 93537
(760) 377-4708

Lone Pine WWTF
Attn: Vic Jackson
601 Locust Road
Long Pine, California 93545
(760) 876-4110

Lone Pine CSD
Attn: Bill Fogarty
215 Lubken Road
Long Pine, California 93545
(760) 876-4110

National Park Service
Attn: Dan Moran
Route 190 Post Office Box 579
Death Valley, CA 92328
(760) 786-2331

Ridgecrest Wastewater Treatment Facility
Attn: Dennis Sizemore
Knox Road - China Lake
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Ridgecrest, City of
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P11 Gary D. Arnold
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P11-1 Please refer to Master Response N6 for a discussion of previous actions related to the previously permitted power plant. Analysis of the intentions of Coso are outside the scope of this EIR.

P11-2 Please refer to Master Response N6 for a discussion of previous actions related to the previously permitted power plant. Analysis of the intentions of Coso are outside the scope of this EIR.

P11-3 Please refer to Master Response C2 for a discussion of the adequacy and accuracy of the Hydrology Model.

P11-4 a.-k. Please refer to Master Response C2 for a discussion of the Hydrology Model.

P11-5 Please refer to Master Response A3. All preparers were qualified.

P11-6 Please refer to Master Response A3 for a discussion of the preparers' qualifications. The hydrologic model was originally developed by Brown and Caldwell. It was adapted and modified by Dan Matthews. He also prepared the groundwater analysis in the EIR in consultation with Dr. Galen Kenoyer and Inyo County Water Department staff. Senior review was conducted by Dr. Galen Kenoyer, although his name was inadvertently left off of the List of Preparers in Chapter 6 of the Draft EIR. Dr. Kenoyer and Mr. Matthews professionally peer reviewed each others' work for this project. Mr. Matthews and Dr. Kenoyer are qualified hydrologists through training and experience.

P11-7 a. Please refer to Master Response A3 for a discussion of preparers' qualifications. Mr. Matthews is a Washington State Registered Geologist, a Washington State Registered Hydrogeologist, and a California Registered Geologist. Mr. Matthews has nearly 25 years of experience providing hydrogeologic services on a wide range of projects. He has directed hydrogeologic characterization studies of a number of sites in Washington and California. He has used groundwater flow models to evaluate ground water development potential, to delineate well head protection areas, to design construction dewatering systems, and to optimally locate extraction wells for contaminant plume capture and treatment. Mr. Matthews has a Master's Degree in Hydrology and Water Resources from the University of Arizona and completed modeling coursework with Shlomo Neuman. A registration as a hydrogeologist in California is not required to perform the modeling or the CEQA analysis presented in the Draft EIR.

b. The hydrology analysis was peer-reviewed by Dr. Galen Kenoyer, who is a Senior Hydrogeologist with MHA|RMT. Dr. Kenoyer is a California Registered Professional Geologist. Dr. Kenoyer received his PhD in Hydrogeology from University of Wisconsin under the renowned modeling expert Mary Anderson. A registration as a hydrogeologist in California is not required to perform the modeling or the CEQA analysis presented in the Draft EIR.

c. The hydrology analysis was prepared by fully and exceptionally well-qualified hydrogeologists. The commenter is incorrect in stating that no specialized professional participated in the analysis of the Hydrology Model.

P11-8 The commenter's opinion of Andy Zdon is noted. The comment is noted regarding a request for peer review of the Hydrology Model. Peer review at the request of a commenter is not required by CEQA and is unnecessary. The model has been made available upon request. The model was made available to Little Lake Ranch and to the LADWP.

P11-9 a. Please refer to Master Response C4.4 for a discussion of the determination of significance criteria. The 10% decline is not the decline in the overall aquifer, but the allowable reduction in flow into Little Lake. This amount is within natural variation, which the habitat has historically tolerated. A full discussion of the justification for the significance criteria is presented in Master Response C4.4.

b. The commenter's opinion regarding water loss in Rose Valley is noted.

c. Please refer to Master Responses C4.4 and E2 for the significance threshold of 10%. The 10% significant threshold for loss of water at Little Lake falls within the natural variation that occurs at Little Lake. There appears to be some flexibility in the management of the wetland at Little Lake, although it is noted that any loss of water can impact the water table and wetland levels. Little Lake currently exports some of their water (approximately 6 ac-ft/yr) to a nearby pumice mine for non-wetland and consumptive uses. This exportation constitutes a loss of water, while they are still able to maintain the wetlands.

d. According to the analysis and hydrologic model, this amount of drawdown would not impact the springs or cause the springs or lake to desiccate.

e. The commenter's opinion regarding thresholds of significance is noted.

P11-10a. Please refer to Master Response L2 for a discussion of alternatives considered.

b-g. All alternatives, labeled "a" through "g" are addressed in Master Response L2. Refer to the applicant's comment letter (comment letter A1) for additional support information regarding the economic and technical feasibility analysis.

h. All of the alternatives have been evaluated in Master Response L2 and were determined to be infeasible. Please refer to Master Response L1 and L5 for a discussion of CEQA requirements and the consideration of economic feasibility. CEQA does not require an applicant to consider a project that is economically infeasible.

P11-11 No comment with this label.

P11-12 Please refer to Master Response L2 for a discussion of alternatives considered. See Response P9-1 through P9-13 for responses to the DiPippo memo. Please refer to Master Response N6 for a discussion of out-of-scope comments regarding previous decisions made by Coso, such as equipment.

P11-13a. The comment is noted. All comments have been responded to completely, in a good-faith effort. All conclusions are supported with factual data.

b. The response to comments resulted in only minimal edits to the Draft EIR, for purposes of clarification and updating. No significant new information has been provided after the close of the comment period. A new hydrology model is not required. Please refer to Master Response C2 for a discussion of the adequacy and accuracy of the Hydrology Model. The model does not need to be rerun. The Draft EIR is adequate under CEQA. Please refer to Master Response A7.2. The Draft EIR does not require recirculation under CEQA.

P11-14 The comment regarding the Executive Summary is noted.

P11-15 The comment is noted. Master Responses have been prepared to deal with the high level of repetition in the comments.

P11-16 Please refer to Master Response B1. The project purpose and need is stated on Page 2-1 of the Draft EIR, under Section 2.1.2: Purpose and Need. The project objective is stated on page ES-1 of the Executive Summary. The following revisions have been made to clarify the project objectives:

Page ES-1

ES.1.1 PROJECT DESCRIPTION

Overview

The Coso Operating Company, LLC (COC) is seeking a 30-year Conditional Use Permit (CUP No. 2007-03) from the Inyo County Planning Commission (County) for the Coso Hay Ranch Water Extraction and Delivery System project.

The proposed project includes extracting groundwater from two existing wells on the Coso Hay Ranch, LLC property (Hay Ranch) in Rose Valley, and delivering the water to the injection distribution system at the Coso geothermal field in the northwest area of the China Lake Naval Air Weapons Station (CLNAWS).

The project elements are described in Table ES.1-1 and shown in Figure ES.1-2. The project would occupy approximately ~~59.5~~ 60.5 acres, as shown in Table ES.1-2. The project location is shown in Figure ES.1-1.

Project Objective

The proposed project's objectives are ~~is needed~~ to provide supplemental injection water to the Coso geothermal field in order to minimize the annual decline in reservoir productivity due to evaporation of geothermal fluids from power plant cooling towers.

P11-17 Figure ES 1-1 on page ES-2 of the Draft EIR has been revised to include the BLM power plants. Please see the revised figure in Section 6.5: Revisions to Figures below.

P11-18a. According to the applicant, the wells are capable of sustaining the proposed pumping rate. The mechanics of the wells are irrelevant to the environmental analysis in this Draft EIR as they do not result in any additional impacts.

b. Please refer to Master Response G2. The project would not preclude the use of the property in the future for agriculture. The parcel is privately owned and it is up to the discretion of the property owner whether to farm the property.

c. The injection system currently exists and injects fluids at various locations. The fluid would be supplied to the injection system at one connection, as specified on page 2-14 of the Draft EIR. Water is to enter the injection system at this location. No new piping is required in the injection system.

P11-19a. The cause of reservoir decline is summarized on page 2-1 of the Draft EIR, which is loss of fluid through the cooling towers. Coso has not depleted the geothermal reservoir through inefficient or antiquated equipment. Previous decisions by Coso regarding equipment choice are beyond the scope of this environmental analysis.

b. Please refer to Master Response C5.1. Coso has not overexploited the geothermal reservoir.

c. Power requirements for the wells and pump station are listed on page 2-10 of the Draft EIR.

P11-20a. Please refer to Master Response A2 for a discussion of NEPA compliance. The Hay Ranch EIR has been incorporated by reference into the EA. The EA will be distributed for a 30-day public review with an unsigned FONSI and ROD.

b. The Draft EIR states on page 1-3 that the BLM and Navy will each use the EA to determine independently whether to prepare an Environmental Impact Statement or a FONSI. The Navy may also determine that the project is categorically exempt because the action is to grant Coso a right-of-way. Edits have been made to the Draft EIR, page 3.5-5.

c. The BLM conducted Native American consultation as part of the Section 106 process. The County distributed scoping and notification letters to the tribes as part of the CEQA process. It is not necessary to describe this detail in the Executive Summary.

P11-21 Comment letters regarding the scope of the Draft EIR were excluded erroneously from but were considered in the preparation of the Draft EIR. They are included in the Final EIR.

P11-22a. Please refer to Master Response C3.3. and page 3.2-41 of the Draft EIR. The level of detail requested to explain these impacts is inappropriate for an Executive Summary.

b-d. Please refer to Master Response C3.3 and pages 3.2-41 of the Draft EIR. Rose Spring and springs at Portuguese Bench would not be impacted by groundwater pumping. The level of detail requested to explain these impacts is inappropriate for an Executive Summary.

e. Please refer to Master Response C3.3 for an explanation of why these springs do not need to be represented in the Hydrology Model.

P11-23 The change was made as requested for the purposes of clarification. The revisions to the Draft EIR incorporated into the Final EIR are not significant new information that would require recirculation of the EIR. The following revisions were made to the EIR for the purpose of clarification:

Page ES-7

Little Lake Ranch is a private property that includes wetlands and open water habitat~~currently undergoing habitat restoration efforts~~, which is continually maintained, and is used for recreational hunting.

P11-24a. The use of the term “perched” groundwater in the Executive Summary was a typographic error. The following revisions were made to the Draft EIR. The revisions to the Draft EIR incorporated into the Final EIR are not significant new information that would require recirculation of the EIR:

Page ES-7

Little Lake Ranch is a private property that includes wetlands and open water habitat~~currently undergoing habitat restoration efforts~~, which is continually maintained, and is used for recreational hunting. The property is located nine miles south of Hay Ranch. The lake, surface waters, and springs at Little Lake Ranch are sourced completely by ~~perched~~ groundwater. The proposed project has the potential to draw down the groundwater table and therefore impact the surface waters at Little Lake. A substantial reduction in the amount of water available at Little Lake is defined as greater than 10% reduction in water available to the surface features at Little Lake.

b-d. There is no perched groundwater. The error has been corrected as indicated above.

P11-25a. The standard of no less than 10% loss of water at Little Lake as a result of the proposed project is the threshold by which significance under CEQA was determined. Impacts that caused more than 10% loss of water at Little Lake would be significant.

b-c. Previous decisions by Inyo County on other projects are irrelevant to the objective environmental analysis of the proposed project. CEQA requires that a project be evaluated for significant impacts and any significant impacts identified be mitigated. Policy decisions by Inyo County are beyond the scope of this EIR.

P11-26 Please refer to Master Response C4.4 for a discussion of the determination of significance criteria. The 10% decline is not the decline in the overall aquifer, but the allowable reduction in flow into Little Lake. This amount is within natural variation for which the habitat has historically tolerated. A full discussion of the justification for the significance criteria is presented in Master Response C4.4, and impacts to wetlands are discussed in Master Response E2. The mitigation monitoring and assessment of significant impacts is designed such that if trigger levels are reached in wells remedial pumping actions must be taken, including cessation of pumping. Coso would be required to take remedial actions if the trigger levels in monitoring wells were reached. The applicant would not be required to reduce or cease pumping to account for the effect of a drought if the drought lowers groundwater levels to the established trigger levels. The Inyo County Water Department would recalculate the pumping rate to ensure a no greater than 10% reduction in groundwater flow based on the new reduced background level. This would likely result in reduced pumping because the maximum 10% reduction would be calculated based on the reduced availability of groundwater

P11-27a. Please refer to Master Response C5.2. There is some connection between the Coso Hot Springs and the geothermal reservoir; however, it is not one-to-one.

b-d. Please refer to Master Response C5.2 and refer to pages 3.2-51 to 3.2-55 of the Draft EIR for an explanation of the potential impacts to the Hot Springs. Reducing pressure in the geothermal field could reduce the steam phase, which could reduce the temperature of the hot springs. The level of detail requested to explain these impacts is inappropriate for an Executive Summary.

e. The reports used for analysis of impacts to the Coso Hot Springs are listed on page 3.2-2 of the Draft EIR.

f. The rhetorical question by the commenter regarding stopping of withdrawal of geofluids is noted. The existing operation of the power plants at Coso is beyond the scope of analysis of this EIR.

P11-28 The comment on background information on hydrothermal systems is noted.

P11-29 Please refer to Master Response G2 for a discussion of agricultural uses at Hay Ranch. The project could be used as agricultural land in the future since the project would only remove about 5 out of 300 ac of land. Steps to restore agricultural production on the Hay Ranch parcel are irrelevant to this EIR. Hay Ranch could be used for agricultural purposes in the future at the owner’s discretion. The existing state of the property is the baseline condition for the analysis of the proposed project. It is beyond the scope of the EIR to address the effects of the baseline conditions.

P11-30 Refer to the analysis of impacts to aesthetics on pages 3.9-7 to 3.9-8 of the Draft EIR for further explanation as to why visual impacts would be less than significant. The analysis addresses construction and operation phases, which include the evaluation of permanent above ground structures. The level of detail requested to explain these impacts is inappropriate for an Executive Summary.

P11-31a. Refer to page 3.4-41 of the Draft EIR. Most vegetation in Rose Valley is drought tolerant and does not rely on groundwater. The commenter is incorrect in stating that withdrawal of groundwater would deplete the natural moisture available to all surface vegetation. The groundwater table is over 100 to 200 ft below the ground surface in most areas of the Rose Valley. Vegetation does not rely on moisture from the groundwater table.

b. Please refer to Master Response J1 for a discussion of fugitive dust generation in Rose Valley. Effects of the generation of fugitive dust due to loss of soil moisture from groundwater pumping are discussed in the Draft EIR beginning on page 3.13-7. The majority of Rose Valley contains drought-resistant plants that do not rely on the water table for water, as the water table can be over 240 ft bgs in certain areas of Rose Valley. Areas with drought-resistant plants would be largely unaffected by the proposed project and no impacts with regard to increased fugitive dust generation would occur.

P11-32a. Please refer to Master Responses C4.4 and E2 for the significance threshold of 10%. Mitigation is proposed to minimize effects to wetlands. The 10% significant threshold for loss of water at Little Lake falls within the natural variation that occurs at Little Lake. While it is noted that any loss of water can impact the water table and wetland levels, there appears to be some flexibility in the management of the wetland at Little Lake. Little Lake currently exports some of their water (approximately 6 ac-ft/yr) to a nearby pumice mine for non-wetland and consumptive uses. This exportation constitutes a loss of water, while they are still able to maintain the wetlands. This amount of drawdown would not impact the springs or cause the springs or lake to desiccate, according to the analysis and Hydrology Model.

b. The project would cause a reduction in the groundwater aquifer of between 2 and 3% with implementation of mitigation. Some loss of water from the aquifer is not necessarily a significant impact. Groundwater users would experience less than significant effects. Impacts to habitat from a small loss would be less than significant with implementation of mitigation, despite some loss of water from the aquifer.

c-d. Little Lake would never experience greater than 10% loss of water, which was determined to be less than significant. Water levels would take considerable time to rebound; however, at no point would water inflow to Little Lake decrease by more than 10% as a result of the proposed project, during or after pumping has ceased. Little Lake would not be significantly impacted.

e. The commenter is incorrect in stating that impacts to wildlife and biology at Little Lake are not analyzed in the Draft EIR. They are discussed on pages 3.4-40 through 3.4-44 of the Draft EIR. The level of detail requested to explain these impacts is inappropriate for an Executive Summary.

P11-33a. Please refer to Master Response C6.1 for a discussion of contamination of Rose Valley drinking water. The project would not contaminate drinking water. The effects of existing conditions of underflow between Coso and Rose Valley are beyond the scope of this EIR because the project would not impact them.

b. Please refer to Master Response C6.1. Most water in the Rose Valley is not potable.

c. The injection of fresh water into the geothermal reservoir would not contaminate the fresh water from the Rose Valley. Existing operations at Coso were previously permitted and are the baseline for this study. The proposed project would not result in generation of any impacts at the plant that are already permitted and previously produced.

d-f. Operations at the Coso plant are beyond the scope of this EIR. Please refer to Master Response N3. Previous documentation for the power plants addresses all impacts and all impacts could be mitigated. The proposed project would not generate power in excess of what was previously permitted and previously produced.

P11-34 Please refer to Master Response J1 for a discussion of fugitive dust. The commenter is incorrect in stating that the Draft EIR deals only with construction dust. Refer to page 3.13-7 through 3.13-8 of the Draft EIR under the heading “Operations and Maintenance” for the discussion of post-construction dust generation and indirect impacts to dust generation from groundwater drawdown. The majority of Rose Valley contains drought-resistant plants that do not rely on the water table for water, as the water table can be over 240 ft bgs in certain areas of Rose Valley. Areas with drought-resistant plants would be largely unaffected by the proposed project and no impacts with regard to increased fugitive dust generation would occur.

P11-35a. Please refer to Master Response L2 for a discussion of alternatives considered. Please refer to Master Response L1 for a discussion of CEQA requirements for evaluation of alternatives. The alternatives were considered and evaluated in accordance with CEQA.

b. The commenter is incorrect in stating that the Draft EIR does not accurately and consistently describe the basic project objective. See page 5-1 of the Draft EIR, Section 5.1.2: Project Objective. The objective is clearly stated at the beginning of Chapter 5: Alternatives.

c. The objectives are clearly stated and the alternatives can be compared against the project objectives. Refer to Chapter 5: Alternatives. The level of detail requested to explain these impacts is inappropriate for an Executive Summary.

P11-36a. Several additional alternatives were considered but rejected. These alternatives are described on pages 5-1 through 5-7 of the Draft EIR.

b. Charts and figures are presented as they are referenced throughout the Draft EIR. It would be impractical and confusing to group figures referenced in several different sections in one location. All predictions pertaining to the proposed project and the project with mitigation are presented in Section 3.2. CEQA requires analysis of cumulative impacts, which is presented in Chapter 4: Cumulative Analysis. CEQA also requires analysis of alternatives, which is presented in Chapter 5: Alternatives.

Headings are used for clarification. The hydrology analysis and predictions in Chapter 4 and Chapter 5 are found under the heading *Hydrology and Water Quality*.

c. The comment has misquoted the Draft EIR language. The Draft does not say “largely the same as the proposed project,” as was quoted by the commenter. The correct quote from page 5-7 of the Draft EIR is, “largely the same in nature as the proposed project, but would take longer to occur.” The comparison is clearly stated.

d. The County would issue a 30-year CUP. Mitigation from the Draft EIR would be incorporated into the CUP. Pumping would need to be evaluated and possibly reduced or ceased once trigger levels in the groundwater monitoring wells are reached.

The Draft EIR clearly states that the pumping 4,839 ac-ft/yr for 30 years has greater impact than pumping 120 ac-ft/yr for 30 years. The Draft EIR states that pumping 120 ac-ft/yr for 30 years has similar projected effects at Little Lake as pumping 4,839 ac-ft/yr until trigger levels are reached, in terms of the maximum drawdown that develops; both would produce no more than 0.3 ft of drawdown at the north end of Little Lake. The predicted maximum drawdown develops within 15 years of the start of pumping and drawdown recovers to below the significance threshold before the end of the 30 year CUP for the mitigated project. The predicted maximum drawdown takes, in contrast, over 30 years to develop for the alternative of pumping 30 years at 120 ac-ft/yr.

e. The quantity of water stored in the aquifer is based on porosity, thickness of sediments, and area of the aquifer; these are inputs to the 3-dimensional groundwater flow model that are described in detail in Appendix C2 of the Draft EIR.

f. The project would cause a reduction in the groundwater aquifer of between 2 and 3% with implementation of mitigation. Some loss of water from the aquifer is not necessarily a significant impact. Groundwater users would experience less than significant effects. Impacts to habitat from a small loss would be less than significant with implementation of mitigation, despite some loss of water from the aquifer.

g. The proposed mitigated alternative with full project pumping at a reduced duration and alternatives with lower pumping rates would reduce groundwater inflow to Little Lake by at most 10%, as stated in the Draft EIR. The average reduction in groundwater inflow to Little Lake over the life of the project would be fewer than 70 ac-ft/yr. Bauer (2002) measured discharge rates (outflow) from the Little Lake outfall weir that ranged from 0 ac-ft/yr in the summer to 1,300 ac-ft/yr during wet periods. Consequently the reduction in inflow is small relative to the groundwater inflow/outflow rate of the lake.

h. Each of the alternatives would reduce the inflow to the lake by no more than 10%. The largest effects would persist for approximately 10 to 15 years, and then reduce substantially as the aquifer recovers from pumping.

i. The Rose Valley Basin would recover from the effects of pumping. There is no significant drawdown to the aquifer and in all scenarios the aquifer recovers where reduction of inflow to Little Lake is no more than 10%. The commenter is incorrect in stating that these effects are not clearly discussed. They are clearly discussed in Section 3.2: Hydrology and Water Quality. The level of detail requested to explain these impacts is inappropriate for an Executive Summary.

P11-37a. Please refer to Master Response L4. The life of a geothermal project depends on the productive capacity of the resource, the life of the power plant, and the economics of the cost power generation relative to the price of power. The statement that the life of the power plant would be shortened without supplemental injection water is accurate.

b. The comment is noted; however, the statement in the Draft EIR is accurate and has therefore not been deleted from the Final EIR.

c-d. Please refer to Master Response L2 for a discussion of air-cooled towers. Evaluation of an air-cooled system was performed as part of the alternatives analysis and was found to be infeasible.

e. Please refer to Master Response L2 for a discussion of binary plants. Evaluation of a binary plant was performed as part of the alternatives analysis and was found to be infeasible.

P11-38a. Please refer to Master Response C5.2 for a discussion of the connection between the Coso Hot Springs and the geothermal reservoir. The Draft EIR states that there is a connection between the hot springs and the geothermal field; however, it is not one-to-one.

b-c. Please refer to Master Response F2. The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR.

P11-39a. Please refer to Master Response L5 for a discussion of economic feasibility of alternatives. The minimum economic rate does not matter as long as impacts of the proposed project can be reduced to less than significant levels.

b. Please refer to Master Responses L1 and L5 for a discussion of the consideration of economics when determining feasibility of alternatives. The economics were independently addressed by the County's consultants.

c. Coso's rate of return on the project is not relevant to the environmental analysis and is therefore not considered nor does it need to be considered under CEQA. Please refer to Master Response N7 for further discussion.

d. Please refer to Master Response A6 for graphs showing the decline in production with and without the proposed project. The total production is projected to be less than 3700 kph (at 760 btu/lb or 52% steam) after almost 30 years without augmented injection. The total production is projected to be 6900 kph (at 600 but/lb or 34% steam) with augmentation, which translates to about 25MW or 22% more power generation at 30 years, keeping in mind that with and without injection, production decreases from existing conditions.

e-f. The amount that Coso earns on each kilowatt/megawatt of electricity and its debt service is not relevant to the environmental analysis of this EIR.

g. The statement that 500 gpm is economic applies to a water source in the immediate proximity of the power plants, which would not require the expensive infrastructure and piping associated with the proposed project. No such water source exists.

h. The comment is noted. The use of different labels is not incorrect, even if it is inconvenient. Edits have been made, as shown in Chapter 3: Errata, showing the amount in ac-ft/yr as well as gpm.

i-j. The rate would vary depending upon its source. A fixed rate is unknown at this time.

k. The comment is not relevant to the environmental analysis of the proposed project.

P11-40 a. The proposed project is for 30 years of pumping. There is a strict monitoring program that would be mandated, that would ensure less than significant impacts. The likely duration of pumping may be substantially less than 30 years with implementation of mitigation, depending on monitoring results.

b. Reduced pumping would still result in drawdown of the groundwater tables. See pages 5-9 and 5-10 of the Draft EIR.

c. The comparison of the effects of long-term pumping versus short term pumping using the numerical Hydrology Model is based on physical principals that are the same regardless of the duration of pumping. The reviewer is correct in stating that the accuracy of the model, or any hydrogeologic model, is affected by the accuracy of recharge estimates. The project includes a mitigation monitoring program to further refine the model using adaptive management principals.

d. The results of the numerical model, described in detail in the Draft EIR, confirm that the magnitude of the drawdown of the water table in the vicinity of Little Lake would reach a similar maximum value of 0.3 ft of drawdown, with both shorter-term pumping (e.g., 1.2 years) at full rates (4,760-ac-ft/yr) and long-term pumping at lower rates (120 ac-ft/yr). The commenter is incorrect in stating that the charts and graphs presented do not confirm this assertion.

P11-41a. The commenter's opinion is noted. Please refer to Master Response L3 for a discussion of the comparison of alternatives.

b. The alternatives are fully evaluated in Chapter 5: Alternatives. Refer to pages 5-7 through 5-9 of the Draft EIR for the evaluation.

c. The Draft EIR clearly states that the pumping 4,839 ac-ft/year for 30 years has greater impact than pumping 120 ac-ft/yr for 30 years. The Draft EIR states that pumping 120 ac-ft/yr for 30 years has similar projected effects at Little Lake as pumping 4,839 ac-ft/yr until trigger levels are reached in terms of the maximum drawdown that develops; both would produce no more than 0.3 ft of drawdown at the north end of Little Lake. The predicted maximum drawdown develops within 15 years of the start of pumping and drawdown recovers before the end of the 30-year CUP for the mitigated project. In contrast, the predicted maximum drawdown takes over 30 years to develop for the alternative of pumping 30 years at 120 ac-ft/yr.

d. Please refer to Master Response L3 for a discussion of the comparison of alternatives. The Draft EIR clearly states that the pumping 4,839 ac-ft/yr for 30 years has greater impact than pumping 120 ac-ft/year for 30 years. The proposed project would be implemented with mitigation. The alternatives incorporate the mitigation. A comparison to the project with mitigation is allowable as the proposed project could only be implemented with mitigation.

P11-42 The comment regarding Coso's previous actions and speculation on the company's intentions is noted. The commenter's opinion is noted. Please refer to Master Response N6 for discussion of out-of-scope comments/past intentions and past actions of Coso. The past operation of the Coso plant is irrelevant to the analysis of the proposed project as it is the baseline condition for this EIR. The geothermal power plants have had separate environmental review and all impacts were found to be mitigable.

P11-43 The comment regarding Coso's previous actions and speculation on the company's intentions is noted. The resource at Coso is not threatened. Good reservoir and project management of geothermal energy development projects requires optimizing the use of the resource in an economically reasonable way. Inefficient energy conversion systems (e.g. air cooling, binary at Coso reservoir temperatures) waste resource and limit the project as inappropriate reservoir management. The primary tool currently used in the geothermal industry for extending the life of a geothermal resource is injection. Coso is currently reinjecting all available fluids and managing the injection so as to maximize the returns of injection in the form of stabilized reservoir pressure. The proposed project would contribute positively to the life of the plants.

P11-44 a. If the project is approved, Inyo County would issue the CUP. The CUP would contain conditions based on the analysis in the Final EIR. Please refer to Master Response M2 for a discussion of how a violation of the CUP is determined. The CUP conditions are legally binding and violations can be challenged and have consequences. CEQA analysis assumes that mitigation is implemented. There would be a significant effect if mitigation is not implemented; however, there is a separate process for handling violations. The comment regarding Coso's past decisions and intentions is noted. The comment is irrelevant to the analysis presented in the Draft EIR. Please refer to Master Response N6.

b. Please refer to Master Responses C4.3 and M1 through M4 for a discussion of mitigation and monitoring. Coso must implement mitigation measures identified in the EIR if the EIR and the project are approved. There are ramifications outside of CEQA for addressing violations if Coso fails to implement requirements. The chance that Coso would adhere to mitigation measures is irrelevant to the EIR analysis. Inyo County has jurisdiction over the CUP and is responsible for overseeing the monitoring program, approving technical staff proposed to conduct the monitoring, and evaluating the quality and objectivity of the monitoring program. Inyo County may also enforce the conditions of the CUP by, if necessary, revoking the permit. Comments regarding whether or not Coso would implement required mitigation do not pertain to the environmental impacts of the proposed project.

c. The County's decisions regarding other, separate, projects by LADWP are irrelevant to this EIR.

d. The Draft EIR was distributed to all libraries and the County Clerk, and noticing was provided as required under CEQA. Approval or rejection of the project and Final EIR will be conducted at a public hearing. The appropriate noticing according to CEQA will apply.

e. See Appendix C4, which describes the required baseline studies and monitoring reports for the project.

f. The requirement for baseline studies remains at 6 months. Please refer to Master Response C4.1.

g. Coso would bear the cost for any impacts to private wells. The mitigation measure has been revised to clarify that pumping or increased electrical costs would also be borne by Coso. The edits to the Draft EIR are shown below, and do not constitute significant new information that would require recirculation of the EIR.

Page 3.2-39

Hydrology-2: Mitigation for effects to groundwater wells in Rose Valley shall depend upon the specific characteristics of each well, and the use of the well. The applicant shall use monitoring data and the numerical groundwater flow model described in Appendix C2 to

> track groundwater levels throughout the valley. The applicant shall work with the County Water Department to identify wells that may be affected by groundwater drawdown as the project progresses. The evaluation of wells depths and uses in the Rose Valley as compared with groundwater drawdown shall be made semi-annually and reported to the Inyo County Water Department. The owner of any wells that may potentially be impacted within the six months after an evaluation shall be contacted by the applicant to assess the need for additional pumping equipment on the well or deepening of the well. The applicant shall be responsible for the cost of equipping or deepening wells that are impacted by groundwater drawdown as a result of the proposed project. <u>The applicant would also bear the costs of any additional energy costs required to pump the wells.</u> The applicant shall also evaluate any wells that are brought to the attention of the applicant by the user to evaluate if groundwater drawdown from the proposed project is impacting the well. If it is determined by the County or by the applicant (using well monitoring data and modeling) that the well in question is being impacted by the proposed project, the applicant shall fund the necessary adjustments to the well to secure the previous uses of the well. Disputes as to the cause of well water drawdown or appropriate corrective measures shall be resolved by the County.

h. The comment is noted. CEQA requires a comparison of impacts against the baseline condition. It is not feasible to mitigate for wells that do not currently exist.

i. The commenter’s opinion is noted, and is included in the project record.

j. Other factors could impact wells besides Coso’s pumping. The mitigation described on page 3.2-29 of the Draft EIR allows for a process for determining the cause of the impact. Coso should not be responsible for mitigating for conditions unrelated to their project.

k. The commenter’s opinion regarding arbitration is noted. The County is responsible for permits and land use decisions in the County. The County would therefore make any decisions regarding disputes according to County policy. Inyo County is extremely experienced and organized to evaluate pumping impacts and appropriate mitigation. The LADWP does extensive pumping in the Owens Valley in Inyo County, and the Inyo County Water Department is tasked with overseeing that pumping to avoid environmental affects. Inyo County has extensive experience regulating groundwater pumping, is organized to do so, and has a history of aggressively protecting the environment of the County.

P11-45a. Refer to Appendix C4 of the Draft EIR for a discussion of implementation of mitigation measure Hydrology-3 and details of the monitoring plan that allow for detection of important changes and trends in water levels. The allowable changes are included in Table 3.2-7 on page 3.2-48 of the Draft EIR.

b. All monitoring points are clearly defined in Appendix C4 and on Table 3.2-7, on page 3.2-40 of the Draft EIR.

c. The comment is noted. Page 3.2-47 of the Draft EIR states that, “After three years, if water levels are decreasing more slowly than predicted, the applicant can petition the County to reduce the measurement frequency to quarterly.”

P11-46a-b. Please refer to Master Responses C4.4 and E2 for a discussion of the 10% significance threshold. Please refer to Master Responses C4.4 and E2 for the significance threshold of 10%. Mitigation is proposed to minimize effects to wetlands. The 10% significant threshold for loss of water at Little Lake falls within the natural variation that occurs at Little Lake. There appears to be some flexibility in the management of the wetland at Little Lake, although it is noted that any loss of water can impact the water table and wetland levels. Little Lake currently exports some of their water (approximately 6 ac-ft/yr) to a nearby pumice mine for non-wetland and consumptive uses. This exportation constitutes a loss of water, while they are still able to maintain the wetlands. This amount of drawdown would not impact the springs or cause the springs or lake to desiccate according to the analysis and Hydrology Model. A 10% change was determined to be the threshold. A 5% change would have less impacts but a 10% change would still have less than significant impacts.

c. Some loss of water from the aquifer is not necessarily a significant impact. Groundwater users would experience less than significant effects. Impacts to habitat from a small loss would be less than significant with implementation of mitigation, despite some loss of water from the aquifer.

d. Existing landowners would not experience significant impacts with implementation of mitigation.

e. The mitigation to compensate landowners is to deepen wells or reequip wells such that users experience no change in the amount of water available to them.

f. Please refer to Master Response C7 for a discussion of water rights. Water rights issues, since they are legal and not environmental, are beyond the requirements for analysis under CEQA.

g. Please refer to Master Response C7 for a discussion of water rights. Water rights issues are beyond the jurisdiction of Inyo County, are not relevant to the environmental impact from the proposed project, and are therefore not appropriate for analysis under CEQA.

h. The comment is noted. The comment regarding unrelated actions by the LADWP is irrelevant to the EIR.

i. Some loss of water from the aquifer is not necessarily a significant impact. Groundwater users would experience less than significant effects. Impacts to habitat from a small loss would be less than significant with implementation of mitigation, despite some loss of water from the aquifer. The CUP process has been established by the County to allow for situations of water transfer.

j. The County can permit transfer of water outside of one water basin into another through the CUP process. The EIR addresses the impacts of this action and it has been determined that the transfer, with mitigation, would have less than significant impacts on the environment.

P11-47 Comments regarding decisions by other agencies are noted, and are irrelevant to the analysis in the Draft EIR because they do not involve environemental impacts.

P11-48a. The groundwater would stay on the property. It would simply be moved from a more southerly location to be pumped into Little Lake where it would reinfiltrate into the aquifer. It is redistributing the water from depth to the surface, which is more sensitive to water level changes. Please refer to Master Response C4.6 for further explanation of the augmentation option.

b. Please refer to Master Response C4.6.

P11-49a. The injection of cooler water into the hot geothermal reservoir over 2 km southwest of the major surface manifestations and 1 to 3 km below the surface provides sufficient hot reservoir rock between the Coso Hot Springs and injection so the water would be heated by the hot reservoir rock as discussed above. The cooler temperature of the water relative to current waste brine injection would not be a factor.

b-c. Comment noted. See response to comment P11-27 1-f above.

d. The biggest change in the geothermal reservoir since production began is the decrease in reservoir pressure related to the negative net withdrawal. The increase in injection related to this project would reduce the negative net withdrawal and therefore related changes.

P11-50a. The project, with mitigation, would minimize effects to all groundwater users to less than significant levels. Water quality of groundwater would not be impacted. Please refer to Master Response C6.1.

b. The amount removed from storage is relatively minor, and would not result in significant changes in water quality. The aquifer mineralogy that controls the quality of the groundwater would not change as a result of this project.

c. This comment appears to protest the injection of clean water into the subsurface, which would improve, not degrade, the overall quality of water in the subsurface.

d. No mitigation is required because the subsurface water would not be degraded in this process.

e. No mitigation is required because the water that would be used would improve the quality of the subsurface water at the point of injection. There would no loss of drinking water to users in the Rose Valley.

P11-51 Subsidence requires the presence of suitable soft, compressible clay-rich sediments which are not present in notable accumulations in either the Rose Valley or Coso Basins. The potential for subsidence is discussed in Section 3.2. The available evidence indicates that there is minimal potential for subsidence.

P11-52a. Coso is located in a tectonically active area with active deformation generating regional seismicity. It is one of the most active regions in Southern California with most significant events (>4 magnitude) located outside the geothermal field and in response to regional tectonic stresses (Lees 2001).

b. Please refer to Master Response N2. EGS is not a part of the proposed project.

c. Microseismicity at Coso is considered to be associated with injection and fluid flow and related fracturing (Feng and Lees 1997). It currently occurs.

d. More than 20,000 microearthquakes were recorded at Coso between 1991 and 1995. No related surface disturbance or environmental impact was recorded.

P11-53a. Volcanic eruptions are related to the movement of liquid rock (magma) to the Earth's surface. Seismic data suggests that the magmatic heat source is below approximately 5.5 to 6 km, whereas the proposed injection into the Coso reservoir would occur in the upper 2-2.5 km (Lees 2002; Wicks et al. 2001). It is unlikely that any change in the reservoir would induce magmatic or volcanic eruptions.

b. The reservoir response to injection of cool water into hot geothermal reservoirs is controlled by the physical processes of heat transfer, fluid flow and phase changes in the context of the specific reservoir characteristics of pressure, temperature, liquid saturation, porosity, permeability and distribution of production and injection wells. Injected water is heated until it reaches the saturation temperature at the reservoir pressure when it begins to vaporize, expanding away from the injection plume and pressurizing the reservoir (Pruess 2008). Liquid saturation begins to increase as vapor pressure rises if injection continues. The effect of this pressurization and increased liquid saturation on the hot springs depends on the connection between the reservoir and the hot springs.

As discussed above, to the extent that the changes observed in the hot springs are related to depressurization of the reservoir and conversion of portions of the field from liquid to vapor-dominated, these processes would be mitigated by the injection-related repressurization and increased saturation. Any change in the hot springs related to changes in the reservoir is most likely to be stabilized or the rate of change reduced rather than reversed because the proposed injection would reduce the rate of change (depressurization) rather than reverse the changes in the reservoir (Draft EIR Figure 5.2.2).

c. The response of the Coso reservoir to injection was simulated and the results are presented in graphs shown in Master Response A6. This simulation was performed by Coso using industry standard reservoir simulation software known as TETRAD. Changes in the Coso Hot Springs are reported in the Coso Hot Springs Monitoring Reports (2002-2008).

P11-54a. See the last full paragraph on page 3.4-26 of the Draft EIR and the third full paragraph on page 3.4-27 of the Draft EIR for discussion of impacts to wildlife movement due to construction of the proposed project. See the seventh full paragraph on page 3.4-27 and the third full paragraph of page 3.4-28 of the Draft EIR for discussion of impacts to wildlife movement due to operation and maintenance of the proposed project.

b. Please refer to Master Response B2 for a discussion of the injection system. No new injection system is proposed.

c. No new injection systems are proposed in the EIR or the CUP application.

d. See page ES-21 of the Draft EIR. The Draft EIR addresses off-site, indirect impacts to Little Lake. The project does not include any construction at LittleLake that could impact desert tortoise, MGS, etc. Please refer to Master Response E2.

e. Please refer to Master Response E2.

P11-55 Please refer to Master Response E1. See the discussion under Potential Impact 3.4-2 beginning on page 3.4-37 of the Draft EIR. Mitigation measures Biology-5 and -6 would reduce impacts to the MGS.

P11-56a-b. See page 3.4-41 of the Draft EIR. Most of the valley is comprised of drought tolerant species and do not depend on groundwater. The groundwater table provides no moisture for these plants. The groundwater table is as much as 140 to 240 ft bgs through much of the Rose Valley.

c. Please refer to Master Responses E2 and E3.

d. The commenter is incorrect. The impacts are addressed for the full 30 years of pumping. Impacts would be significant. Mitigation described in Section 3.2:

Hydrology and Water Quality would minimize effects. Please refer to Master Response A4.

P11-57a-e. Please refer to Master Responses G1, G2, and G3.

P11-58a. See pages 3.9-7 through 3.8-8 of the Draft EIR for a discussion of the permanent erection and operation of structures on the Hay Ranch property. Impacts would be less than significant.

b-c. Please refer to Master Response H2.

d. Please refer to Master Response E2. A 10% decrease in water flow into Little Lake would be less than significant on habitat and vegetation. The underground water table would decrease by less than 3% with implementation of mitigation.

P11-59 a. Please refer to Master Response E2.

b. The comment is noted. The comment is unclear, but appears to be entirely unrelated to environmental impacts resulting from the project.

P11-60a. The comment is noted.

b. Please refer to Master Response L2 and the letter supplied by the applicant (comment letter A1).

P11-61 The comment is noted regarding hydrogen sulfides.

P11-62a. The commenter’s opinion is noted.

b-d. Please refer to Master Response C7 regarding water rights.

P11-63 a-b. Please refer to Master Response N3 regarding comments that do not pertain to the environmental effects of the proposed project, such as comments regarding the operation of the power plants. Please refer to Master Response I for a discussion of toxic gasses.

P11-64a. See Section 3.13 in the Draft EIR.

b-c. Please refer to Master Response J1.

P11-65 The comment is noted.

P11-66a-b. Please refer to Master Response B1 for a discussion of the project objective. CEQA does not outline requirements for a project overview, or for the contents of an introduction to an EIR (CEQA Guidelines Article 9).

P11-67 The power plants have been added on all related graphics in the Final EIR. These revisions are not significant new information that would require recirculation of the EIR.

P11-68a. Please refer to Master Response A6 for discussion of new baseline studies and a list of example baseline studies that were used in this Draft EIR.

b. Please refer to Master Response A6 for discussion of new baseline studies and a list of example baseline studies that were used in this Draft EIR.

P11-69 See the fourth full paragraph on page 1-3 of the Draft EIR for a discussion of previous analysis of the possibility of use of groundwater from the Rose Valley for power plant cooling.

P11-70a-e. Please refer to Master Responses A3 and N3.

P11-71a-d. Please refer to Master Response A3.

P11-72 a-c. Please refer to Master Response A1 for a discussion of the life expectancy of the power plants.

d. The previous actions and intentions of Coso do not pertain to potential impacts of the proposed project. See the fourth full paragraph on page 1-3 of the Draft EIR for a discussion of previous analysis of the possibility of use of groundwater from the Rose Valley for power plant cooling. Original permits did not allow importation of water from the Rose Valley; this would be the purpose of CUP 2007-003.

e. Please refer to Master Response C5.1 for discussion of exploitation of the geothermal resource.

f. Please refer to Master Response L2 for discussion of why lowering production as an alternative to the proposed project is infeasible. Lowering production fails to meet the basic purpose of the project.

g. See pages 1-1 and 2-1 of the Draft EIR for the purpose and need (justification) for the project.

h. Please refer to Master Response N3 for discussion of comments that are outside the scope of this EIR.

i. Please refer to Master Response A1 for discussion of the life expectancy of the power plant.

j. Please refer to Master Response A1 for discussion of the life expectancy of the power plant.

P11-73 a. Please refer to Master Response A1 for discussion of the life expectancy of the power plant.

b. The comment is noted.

c-d. The comment is noted. The comment is irrelevant to the environmental analysis of the proposed project.

P11-74a. Please refer to Master Response N9 regarding out-of-scope comments on royalties paid by Coso.

b. The comment is noted. The comment is irrelevant to the environmental analysis in the EIR.

c. The location of users that receive the electrical power generated at Coso is out of scope of this EIR.

d. Please refer to Section 3.11 beginning on page 3.11-1 of the Draft EIR for a discussion of public services supplied to Coso. The cost of public services supplied to Coso is out of scope of this EIR.

e. Mitigation has been incorporated into the project and would be implemented to ensure less than significant impacts to the environment.

f. Please refer to Master Response N7 regarding out-of-scope comments related to Coso's financials. Mitigation has been incorporated into the project and would be implemented to ensure less than significant impacts to the environment.

P11-75 a-b. Please refer to Master Response A2 for discussion of the BLM's EA.

P11-76 a,c. Please refer to Master Response A2 for discussion of the BLM's EA.

b. The BLM's responsiveness to letters from the commenter does not pertain to environmental effects of the proposed project.

P11-77 See the discussion of the NOP for this EIR beginning in the fourth full paragraph on page 1-5 of the Draft EIR. The commenter's background information is incorrect. The Draft EIR is correct. No changes were made to the EIR.

P11-78 Listed comment letters have been included in the EIR. Two letters were omitted from the Draft EIR due to administrative error, and have been incorporated into the Final EIR, Chapter 3: Errata. These letters were considered in preparation of the Draft EIR.

P11-79 Listed comment letters have been included in the EIR. Two letters were omitted from the Draft EIR due to administrative error, and have been incorporated into the Final EIR, Chapter 3: Errata, and addressed as appropriate. These letters were considered in preparation of the Draft EIR.

P11-80 The process described in Section 1.2.6: Final EIR on page 1-6 of the Draft EIR is adequate. Both the Planning Commission and the Board of Supervisors are part of Inyo County. Inyo County is serving as the CEQA lead agency of the EIR, as described in CEQA Guidelines §15090(a). An appeal to the Board of Supervisors would be part of the lead agency process of independent judgment and analysis.

P11-81 See response to comment P11-80.

P11-82 See the complete listing of mitigation measures in one location on pages ES-14 through ES-30 of the Draft EIR. See the HMMP in Appendix C4 of the Draft EIR. The MMRP is part of the Final EIR.

P11-83 Please refer to Master Response B1 for discussion of the project objectives. The commenter is incorrect in stating that the objectives are inadequate under CEQA.

P11-84 a-f. Please refer to Master Response N8 for a discussion of out-of-scope comments related to equipment at the existing power plants.

g-h. The project would stabilize the decline of total project generation by stabilizing the decline in steam supplies to the plants. The generation from specific units is not relevant.

P11-85a. The County has been working in coordination with the Navy and the BLM, and has had access to resource data.

b. See the discussion of the geothermal reservoir beginning in the second full paragraph of page 3.2-24 of the Draft EIR.

c. Please refer to Master Response B1 for discussion of the objectives/purpose and need/justification for the project.

d. Please refer to Master Response L2 for discussion of alternatives that were considered during the environmental review process.

P11-86 a. The Coso Reservoir Model was used to test the geothermal reservoir's potential response to adding 3,000 gpm of additional injection. A base-case forecast with no field improvements was used to compare with a forecast with 3,000 gpm of additional injection. Production would not increase over existing levels. Production would decrease and then stabilize (graphic provided by Coso, January 2008). Please refer to Master Response A6.

b. The proportion of liquid relative to steam depends on the enthalpy of the total fluids. Under current conditions, it is approximately 52%. As enthalpy increases, the percent steam increases and as enthalpy decreases the percent steam declines (see Figure 1).

d-f. This data is proprietary information, belonging to Coso.

g. The natural “real-time” recharge of the reservoir is limited. The inflow of water into the Coso geothermal reservoir on the time scale of the current extraction for geothermal power generation is negligible (see response to A1-19, above).

h. Any efficient production of the Coso geothermal reservoir would exceed the natural recharge. Please refer to Master Response C5.2.

P11-87 The comment and commenter’s opinion are noted.

P11-88 a. The purpose of injection is to increase the liquid saturation and repressurize the reservoir.

b. Injection is occurring now on a continuous basis, and is proposed to continue.

c. The injection distribution system includes piping, pumps and some storage facilities to transfer and distribute the waste (fluid remaining after boiling and steam separation) brine, cooling tower blowdown, and discharged condensate to injection wells throughout the field.

d. Water would be injected through the existing system.

e. The energy necessary to extract and transport water is identified on page 2-10 of the Draft EIR.

f. The predicted result of the injection is that the reservoir pressure and liquid saturation would stabilize or locally increase and production decline would decrease, the enthalpy of produced fluids would also decrease. Please refer to Master Response A6.

g. Please refer to Master Response N2 regarding EGS.

P11-89 a-d. Please refer to Master Response N2 regarding EGS.

P11-90 a. Please refer to Master Response N6 and N8 for discussion of comments that are outside the scope of the EIR.

b. Please refer to Master Response L2 for discussion of alternatives/air cooled towers.

c. Please refer to Master Response N8 for a discussion of out-of-scope comments regarding the existing equipment at the Coso plants.

d. The comment is noted. All environmental impacts of the proposed project would be less than significant with mitigation.

e. Please refer to Master Response N6 for a discussion of out-of-scope comments regarding past actions of Coso.

f. Please refer to Master Response N7 for discussion of economics.

g. See Chapter 3.2 of the Draft EIR for a discussion of the steam versus liquids produced in the reservoir.

h. Please refer to Master Response L2 for a discussion of alternatives considered. See Chapter 5: Alternatives in the Draft EIR for a discussion of Alternatives.

i. Comment noted. All environmental impacts of the proposed project would be less than significant with mitigation.

P11-91 The comment is noted.

P11-92a. Please refer to Master Response A6.

b-d. The annual decline in total production between now and 2020 is projected to be approximately 3.6% per year without additional injection from the project and approximately 2.3% per year with the project (see figure in Master Response A6). These projections are based on the results of numerical simulation of the Coso reservoir by Coso with and without augmented injection using the numerical simulation program TETRAD. Output of the modeling results were provided to the County and MHA | RMT by Coso and are summarized in the figure in Master Response A6.

The total production is projected to be less than 3700 kph (at 760 btu/lb or 52% steam) after almost 30 years without augmented injection. The total production is projected to be 6900 kph (at 600 but/lb or 34% steam) with augmentation, which translates to about 25MW or 22% more power generation at 30 years, keeping in mind total production would always decline, the project just reduces the rate of decline.

e. This comment is not relevant to the analysis of the proposed project in this EIR.

f-g. The rate of injection was 2,000 to 12,000 kph, although this is irrelevant to the analysis of the proposed project in this EIR. Please refer to Master Response A6 for a graph showing the decline.

P11-93 a-b Please refer to Master Response N7 for discussion of economics of the project.

c. No changes were made to the EIR. The sentence is adequate.

d-g. Please refer to Master Response N7 for discussion of economics of the project.

P11-94 a-e. Please refer to Master Response A1 for discussion of Life Expectancy of the power plants.

P11-95 Please refer to Master Response A1 for discussion of Life Expectancy of the power plants.

P11-96 a. The comment is noted. All environmental impacts of the proposed project would be less than significant with mitigation.

b. Inyo County is considering whether to allow the import of water in order to sustain existing geothermal resources.

c. Please refer to Master Response A1 for discussion of life expectancy of the power plants.

d-e. See the Draft EIR regarding impacts of the proposed project.

f. Please refer to Master Response N6 for discussion of comments that are outside the scope of this EIR.

P11-97 a-e. Please refer to Master Response A1 for discussion of Life Expectancy of the power plants.

P11-98 a. Please refer to Master Response A1 for discussion of permits associated with the existing power plants.

b. See Table 1.1-1 on page 1-4 of the Draft EIR for a list of previous environmental documentation. Refer to these documents for previous analysis of the capacity of the geothermal reservoir. The analysis of the existing plants is beyond the scope of this EIR. Please refer to Master Response N3.

P11-99 See the discussion of the project location beginning in the first full paragraph on page 2-2 of the Draft EIR. The Draft EIR states that the location is *centered* at the Hay Ranch property, adjacent to and east of US 395. See Section 2.3.2: Description of Project Elements beginning on page 2-3 of the Draft EIR for descriptions of the locations of the various components of the proposed project. Figure 2.3-1 on page 2-5 of the Draft EIR illustrates the extent of the proposed project.

P11-100 a-c. A reference to a 4.75-ac well pad was not found on the specified page. No "leveling" would be required as the Hay Ranch production wells are already existing features.

P11-101 Replacement wells would be located in the same location as abandoned wells, and would be consistent with all applicable regulations.

P11-102 a. Megawatts (MW) is a measure of power and no duration of time is needed for the value. One watt equals one joule of energy *per second*.

b. See the second full paragraph on page 2-10 of the Draft EIR for a description of the location of land that would be sold by Coso to SCE for use for the proposed project. See Appendix B of the Draft EIR for a map of the location of the substation.

c. See the first full paragraph on page 2-10 of the Draft EIR for a description of the new electric power substation that would be built on the piece of land to be sold to SCE by Coso. The sale would occur to facilitate SCE's construction of the new electric power substation on the land.

d. Impacts from this transaction would be related to the permanent loss of land for other uses, such as agriculture. These impacts would be less than significant. See the discussion of permanent removal of land due to construction of the substation beginning in the second full paragraph on page 3.8-5 of the Draft EIR.

e. All environmental impacts of the proposed project would be less than significant with mitigation. Construction of the substation is part of the proposed project and is therefore addressed in Chapter 3 of the Draft EIR. It is not a separate project to be addressed in Chapter 4: Cumulative Impacts. Growth-inducing impacts are addressed on Page 4-12 of the Draft EIR.

P11-103 a. The comment is noted. Please refer to Master Response H3 for discussion of the use of BLM aesthetic VQO program designations.

b. See the discussion under Potential Impact 3.4-1 beginning on page 3.4-26 of the Draft EIR for a discussion of potential impacts to wildlife migration due to pipeline placement.

P11-104 a. Please refer to Master Response A2 for discussion of NEPA analysis completed by the BLM and Navy for the portion of the proposed pipeline that would be located on BLM or Navy land.

b. Please refer to the analysis in Chapter 3 of the Draft EIR under the heading *Tanks* for each environmental parameter for discussion of the potential environmental impacts of the tanks.

c. See page 2-17 for the list of approvals and permits required for the proposed project.

P11-105 a-c. Please refer to Master Response B2 regarding the injection system. No new injection system is proposed as part of this project.

P11-106 a-c. A cost analysis is not required under CEQA. Please refer to Master Response L5 regarding the economic feasibility of alternatives. See comment letter A1 for further cost analysis information provided by Coso.

P11-107 The comment is noted. Permits would be obtained as required for monitoring systems. The applicant is not proposing to install any new monitoring systems on the Little Lake property. Permits would be required if the optional water diversion plan at Little Lake is determined to be feasible, as indicated on page 3.2-50 of the Draft EIR.

P11-108 Project components only include buildable elements, not the baseline or existing environment.

P11-109 a-c. Please refer to Master Response A1 regarding the life expectancy of the power plants.

d. The comment is noted. The comment is not clear and can not be answered.

e. Please refer to Master Response L2 for a discussion of alternatives, including reduced production.

f. Please refer to Master Response C6.1 for a discussion of contamination of drinking water.

g. The impacts of the existing power plant operation are beyond the scope of this EIR. Please refer to Master Response N3.

h. Please refer to Master Response L2 for a discussion of alternatives considered.

i. All environmental impacts of the proposed project would be less than significant with mitigation. The County will make this decision when deciding to grant or deny the CUP.

j. See the fourth full paragraph on page 1-3 of the Draft EIR for a discussion of previous analysis of the possibility of use of groundwater from the Rose Valley for power plant cooling. Original permits did not allow importation of water from the Rose Valley; this is the purpose of CUP 2007-003.

k. See the fourth full paragraph on page 1-3 of the Draft EIR for a discussion of previous analysis of the possibility of use of groundwater from the Rose Valley for power plant cooling. The analysis was not completed previously; therefore, it is being completed now.

l. Please refer to Master Response N6 for discussion of comments that are out of scope of this EIR, such as Coso's past intentions and actions.

m. Please refer to Master Response N9 for a discussion of out-of-scope comments related to royalties and taxes. All environmental impacts of the proposed project would be less than significant with mitigation.

P11-110 Please refer to Master Response N2 regarding EGS.

P11-111 a. The thesis research was conducted under the supervision of graduate student advisor, and is subject to review of a graduate committee, typically composed of Professors, Associate Professors, and Assistant Professors with a PhD in a related field. Graduate-level research is typically viewed as high quality work, held to a high standard. The results of the research will be checked by re-measurement of appropriate hydrologic parameters such as water levels, during the monitoring period associated with this project.

b. Hydrologic monitoring would be conducted over a multi-year period by qualified personnel, as stated in the Draft EIR monitoring plan, and in the response to P11-111a.

c. Bauer's study took place over a period of 1 year, during which there were significant variations in the weather.

P11-112 a. The changes were made as requested for the purpose of clarification. See Chapter 3: Errata of this Final EIR.

b. It is inaccurate to state that only multi-year monitoring can provide meaningful hydrologic data. The 1-year period of study conducted by Bauer provided valuable data that showed seasonal variations and trends. These data would be supplemented by a multi-year data collection program, as part of the monitoring program that is defined in the Draft EIR.

c-d. The changes were made as requested for the purpose of clarification. See Chapter 3: Errata of this Final EIR.

P11-113 In context, the word *defensible* suggests that the long-term pumping test was performed and analyzed in order to formulate a more accurate forecast of long-term aquifer behavior. No revisions were made to the EIR to change this language.

P11-114 a. Figure 3.2-1 on page 3.2-4 of the Draft EIR is titled "Study Area Physiographic Features". The Deep Rose property is not a physiographic feature. The Hay Ranch property is marked on the map because it would be the location of the proposed project. No changes to Figure 3.2-4 of the Draft EIR were made to include the Deep Rose property. The location of the Deep Rose project is included on Figure 4.2-1.

b. Figure 3.2-1 on page 3.2-4 of the Draft EIR contains the Little Lake Hotel Well and Little Lake Fault Spring locations. No changes to Figure 3.2-1 of the Draft EIR were made.

c-d. Significant wells, springs, seeps, and other features that are relevant to environmental impact analysis for the proposed project have been included in Figure 3.2-1 on page 3.2-4 of the Draft EIR.

P11-115 a-c. Please refer to Master Response C3. The springs are described in the Draft EIR relative to prominent geographic features for ease of locating them. Comparisons of water levels in the springs are referenced to the nearest water table elevations in the valley – this is an appropriate comparison, to demonstrate how the springs are connected (or their lack of connection) to the water table in the valley. Springs are shown on figures in Section 3.2: Hydrology and Water Quality. These figures include scales such that the reader can measure distances (e.g., Figure 3.2-6).

P11-116 The comment is noted. The commenter is incorrect. The description of Little Lake as written on page 3.2-6 of the Draft EIR is accurate. The description does not conflict with any information mentioned by the commenter.

P11-117 The comment is noted.

P11-118 a. Little Lake is a manmade, privately-held reservoir. The commenter describes in comment P11-117 efforts to create the reservoir at Little Lake. Little Lake is not a ranch because there is no grazing. These are factual statements and demonstrate no bias by Inyo County.

b. The comment is noted. The commenter describes in comment P11-117 efforts to create the reservoir at Little Lake.

c. Please refer to Master Response N6.

P11-119 Please refer to Master Response N6.

P11-120 This document was requested from Little Lake Ranch. Little Lake Ranch did not provide a copy of the document to Inyo County.

P11-121 See previous responses to comments on the Draft EIR's characterization of the pumping tests and observation.

P11-122 a. See the first full paragraph on page 3.2-18 of the Draft EIR for a description of how the acreage of vegetation was estimated.

b. See the discussion of wetland and riparian habitat beginning on the fifth full paragraph on page 3.4-41 of the Draft EIR.

P11-123 a. The cinder mine operation's use of water from Little Lake is considered part of the baseline physical condition of the area, which is considered in the Hydrology Model.

b. The total groundwater flow rate toward the Little Lake Ranch property would exceed 3,700 ac-ft/yr under all development alternatives, far greater than the 6.3 ac-ft/yr used for the Cinder Block facility. The yield from the well used to supply the Cinder Block facility is unlikely to be impacted unless the pump is set less than 0.3 ft below the static water table. The Applicant would be required to fund necessary mitigation to the well in the event that the well yield is impacted, such as setting the pump deeper as described on page C4-8 in the HMMP in the Draft EIR.

P11-124 Please refer to Master Response C2. The model does have several conservative assumptions in it that make it appropriate to use the term conservative.

P11-125 a. This is subsurface flow.

b. Coso injects waste brine, cooling tower blowdown and condensate into the reservoir.

c. Injected Coso brine is similar to the reservoir brine except that it has lost some steam and gas during boiling. The approximate chemistry is as follows:

Injection water Coso Well 68-20 (Park et al., 2006)	
Temp (°C)	105
pH	7

$B(OH)_3$	10 mM
Ca^{2+}	1 mM
Cl^-	200 mM
HCO_3	2.8 mM
Na^+	200 mM
SiO_2	11 mM

d. No. Injected fluids contain concentrations of metals and salts that occur naturally in geothermal systems including Coso and that are concentrated by steam during boiling.

e. Theoretical studies (e.g. Pruess 2008) of injection behavior and field studies of reservoir response to injection (e.g. Rose et al. 2002, Adams et al. 1999) suggest that injected fluids heat on contact with hot reservoir rocks and move rapidly towards areas of lower pressure depending on local permeability structures. Microseismicity studies of the Coso field suggest that injection fluid travel outward and downward from injection wells (Fung and Lees 1997).

f. The chemistry of Coso injectate is similar to the chemistry of geothermal fluids in the reservoir albeit concentrated by steam and gas loss during boiling. The process of power generation does not add contaminants to the brine. These comments are irrelevant to the analysis of the impacts of the proposed project.

P11-126 a. The higher levels of total dissolved solids (TDS) in Little Lake waters are related to evaporation in the lake (page 3.2-23 of the Draft EIR).

b. There is no evidence of degradation of water quality based on a review of the available data on the chemistry of Little Lake waters. Significant changes are most likely related to differences in evaporation rates resulting from changes in the size of the lake.

c. Injection occurs at Coso within the geothermal reservoir at depths of 1-2.5 km (Fung and Lees 1997).

d. No surface discharge occurs at Coso.

e. See response P11-126c.

f. It is possible that some of the geothermal fluids from the Coso geothermal system have naturally leaked into Rose Valley. For example, the LEGO well, G-36 and the geothermal test hole, 18-28GTH, are located within the valley northeast of Little Lake and completed at significant depths below ground surface. It is possible that a small quantity of this water is included in the Rose Valley underflow which flows into Little Lake. Stable isotopes and chemistry of the Little Lake and surrounding waters suggest that this geothermal component, if present, is small (page 3.2-22 to 3.2-23 of the Draft EIR).

g-h. The effect of the pumping of Hay Ranch wells on the water quality in Little Lake are likely to be minimal relative to the effects of evaporation (> 50% based on some isotopic results, Draft EIR Figure 3.2-7). The water quality at Hay Ranch is not "cleaner and fresher" than the groundwater in the vicinity of Little Lake. Water quality effects of the project in Rose Valley and Hay Ranch are dependent on the amount of water extracted and the effect on the water levels in the vicinity. The water quality to the south may improve if the pumping reduces southward flow from Hay Ranch, which has relatively low water quality. More saline water as observed in the LEGO well may alternately be drawn towards the area of drawdown close to the center of the Valley. The evaporation rate would additionally decrease at Little Lake if the surface area of the lake is reduced, possibly improving water quality at Little Lake. Please refer to Master Response C6.1.

P11-127 The discussion states the evidence supporting the source of waters at Little Lake. Evaporation occurs at Little Lake; however, the chemistry of the water suggests that the source of the constituents can not be from concentration through evaporation.

Little Lake can only evaporate at the lake. It is not physically possible for the lake to evaporate in other areas of Rose Valley. Analysis of the baseline condition (i.e., current evaporation of Little Lake) is beyond the scope of analysis required under CEQA.

P11-128 a. Please refer to Master Response A6.

b-c. The amount of injection at Coso has decreased primarily as a result of increasing enthalpy of produced fluids and decreasing total production. The amount of waste brine produced from flashing decreases as enthalpy increase. Decline in waste brine has produced decline in injection because waste brine makes up the bulk of injectate.

d. Coso already injects 100% of waste brine. The only way to increase the injection is to augment injection from outside the geothermal system.

P11-129 a-b. Stable isotopic evidence suggests that there does not appear to be any significant real-time natural recharge of the geothermal system. Based on ^{18}O and deuterium analysis, the source of the water in the Coso geothermal system is the Sierra and/or the Coso Range (see answers to comments A1 through A19).

c. Stable isotopic data has been available for the Coso geothermal system since 1980 (Fournier and Thompson 1980).

d-f. Please refer to Master Response N6.

P11-130 a. Fournier and Thompson (1980) suggest that the source of the water in the Coso geothermal system is rain and snowfall from the Sierra Nevada on the basis of stable isotopic compositions of fluids from Coso Hot Springs and early exploration wells, albeit they do not rule out additional sources such as the nearby Coso Range. They note that the flow of source water through the aquifer host rocks is slow and the system is probably sealed, preventing localized and direct inflow. Others (e.g. McKibben and Williams 1990) suggest that the source of water is the nearby Coso Range and others (Christensen et al. 2006) indicate the source is ambiguous. None suggest that there is recharge on the time scale and mass scale of the current mass extraction (see answers to comments A1 through A19).

b. The exact quantity is not known and is irrelevant to the environmental analysis of the proposed project.

c. The response of the Coso geothermal system to production has been pressure decline and the development of steam zones (ITSI 2007), suggesting that the system is operating with a negative net withdrawal of fluids. The response to pressure drop is not influx of cold or cooler water from the edges of the system (such as in parts of Cerro Prieto), but a drying of the system. It is apparently at an insufficient rate to maintain the reservoir pressures and liquid saturation during production of the reservoir, although it is possible that there is some natural leakage. Please refer to Master Response L2.

d. The geothermal reservoir consists of stored heat and fluid. Stored heat is probably unaffected as recent studies (e.g. Christensen et al. 2006; Fong and Lees 1997) suggest that the Coso geothermal system is heating up in some areas as a result of recent increases in magmatism beneath the field. The decline in steam production would also be reduced if production is reduced and the negative net withdrawal is reduced.

e. Geothermal power generation for a given power plant is related to power plant and reservoir production efficiency and is summarized by a term known as the steam rate (lbs/hour of steam /MW of power generation). The steam rate for a plant is established by the efficiency power plant and well field engineering design and the natural conditions such as resource enthalpy, noncondensible gas content, spatial distribution of wells. Coso has recently performed several power plant modifications to improve power plant and wellfield efficiency. Power generation would be reduced in accordance with the steam rate as steam flow declines, given a specific steam rate.

P11-131 The comment is noted.

P11-132 a. Reservoir pressure will eventually decline if more fluid is extracted than enters the hydrothermal system through injection or recharge. The rate at which this occurs depends on the porosity, permeability, liquid saturation (fluid stored) and heat stored of the reservoir.

b The geothermal reservoir at Coso has not been destroyed. The Coso geothermal reservoir remains one of the hottest in the United States.

c. Please refer to Master Response N6.

P11-133 The comment is noted.

P11-134 The comment is noted. This only addresses water authorization for one of three power plants.

P11-135 a-b. Please refer to Master Response A1 for discussion of the lifetime of the power plants, and the length of the power plant permits. Please refer to Master Response B4 for discussion of the length of the CUP. Please refer to Master Response A1 for a discussion of the plants' existing permits.

P11-136 a. All of the produced steam passes through the power plant and is condensed.

b. Approximately 70-80% of the steam is evaporated in the cooling tower, depending on the weather.

c. 100% of the remaining 20-30%.

d. The effect of injection into a portion of a geothermal reservoir is discussed above.

e. Enhanced injection is projected to reduce total and steam production declines (see graph in Master Response A6). As discussed above, power generation is directly proportional to steam production so as steam production is stabilized, MW production will also.

P11-137 a-b. Please refer to Master Responses C5.1 and C5.2. Coso Hot Springs represent the surface manifestations of the Coso geothermal system. There have been surface manifestations at Coso for over 300,000 years (Adams et al. 2000). Geological evidence suggests that the surface manifestations have changed in character and location during their history. They have ranged from moderate to high temperature hot springs (formed when hot water issues at ground surface) to fumaroles and mud pots (formed when steam issues at ground surface. The Navy GPO has been monitoring various characteristics of Coso Hot Springs since before production of the Coso geothermal reservoir (Geologica 2002-2008). These monitoring reports suggest that since production began: 1) in South Pool, the temperature has risen then fallen slightly and the water level has fallen, 2) the input of steam to many features has increased, and 3) some features have enlarged (Fault Line fumaroles) and some have decreased (Devils Kitchen).

c. Please refer to Master Response C5.2.

P11-138 Please refer to Master Response C5.2.

P11-139 The comment is noted.

P11-140 The comment is noted.

P11-141 The comment is noted.

P11-142 See the first full paragraph on page 3.2-30 of the Draft EIR for a discussion of the CWA. The CWA protects the waters in the Rose Valley Basin. Please refer to Master Response C6.1 for discussion of impacts to drinking water.

P11-143 See the third full paragraph on page 3.2-31 of the Draft EIR for a statement that notes that water would be transferred from the Rose Valley Groundwater Basin to the Coso Groundwater Basin. Figure ES 1-2 on page ES-3 of the Draft EIR shows that water would be pumped from the Rose Valley Basin and transferred out of the basin for use at the Coso geothermal field. The transfer is the reason why a CUP is needed and this EIR was prepared.

P11-144 The Inyo County General Plan Existing Settings are not goals or policies of Inyo County. They are settings and describe the existing conditions. The Regulatory Settings described for each environmental parameter do not need to contain the settings outlined in the Inyo County General Plan.

P11-145 Section 8.5.2 of the Inyo County General plan is a description of the Existing Setting. It is not a goal or policy of Inyo County. Inyo County General Plan 8.5.4 Policy WR-1.1 is not relevant to the proposed project. The proposed project is not a development proposal (e.g., a housing project) and would not encourage future growth or development (e.g., commercial development and demand for more public services).

P11-146 Inyo County General Plan 8.5.4 Policy WR-1.1 is not relevant to the proposed project. The proposed project is not a development proposal (e.g., a housing project) and would not encourage future growth or development (e.g., commercial development and demand for more public services).

P11-147 Implementation Measure 17.0 from Table 8-4 of the Inyo General Plan outlines ways in which to implement Conservation and Open Space Element goals and policies.

The commenter is incorrect in stating that the Drat EIR does not address the items from Table 8-4 of the Inyo County General Plan. Each item listed in the comment is addressed.

- o Sensitive Species: See Section 3.4 Biological Resources of the Draft EIR
- o Groundwater withdrawal: Mitigation measure Hydrology-1 and the HMMP ensure existing groundwater wells and well users are not significantly impacted
- o Water quality: See pages 3.2-57 and 3.2-58 of the Draft EIR for a discussion of why the project would not impact water quality. Also see Master Response C6.
- o Water treatment: The project would not require wastewater treatment. See pages 3.11-5 and 3.11-6.
- o Groundwater level impacts: Implementation of the HMMP and mitigation would prevent the reduction in ground and/or surface water levels that would make access or use of such waters uneconomical for developmetn planned in accordance with the General Plan.
- o Discharge of contaminants: The project would not discharge contaminants into surface or groundwater resources. See Section 3.2 Hydrology and Water Quality of the Draft EIR.
- o Land subsidence: The project would not result in land subsidence. See pages 3.3-12-15 of the Draft EIR for the discussion of why the project would not result in land subsidence.

Please refer to Master Response C6.1 for a discussion of contamination of Rose Valley drinking water and Clean Water Act.

P11-148 The comment is noted.

P11-149 See mitigation measures Hydrology-1 and -2 on page 3.2-39 of the Draft EIR, mitigation measure Hydrology-3 beginning on page 3.2-47 of the Draft EIR, mitigation measure Hydrology-4 beginning on page 3.2-49 of the Draft EIR for mitigation that would prevent the drying of Little Lake. Please refer to Master Response C5.2 for a discussion of impacts to Coso Hot Springs.

P11-150 Please refer to Master Response L2 for discussion of the use of air cooled towers as an alternative to the proposed project. Please refer to Master Response N6 for a discussion of out-of-scope comments regarding previous equipment choices.

P11-151 a-b. Please refer to Master Response G2 for discussion of future agricultural use of property throughout Rose Valley.

P11-152 The comment is noted. However, the comparison of this project to the project described in the 1980 EIS is misleading. The mitigated Hay Ranch project would not cause a general decline of groundwater levels by 60 to 100 ft, as described in the 1980 report for a theoretical geothermal project. The water table maximum acceptable drawdowns described in the Draft EIR are far less, ranging from 13 ft at Hay Ranch to 0.3 ft or less in the southern end of the valley. The comparison to the 1980 EIS is not appropriate or relevant. The project would not irreversibly degrade groundwater. Please refer to Master Response C6.1.

P11-153 The comment citing the 1980 EIS is noted.

P11-154 There have been ongoing consultations throughout previous environmental review for geothermal operation as required by the 1980 EIS. Requirements for the proposed project are outlined in the Draft EIR. The Draft EIR was distributed to federal, State, and local agencies for review. Comments received are presented in this Final EIR.

P11-155 The comment is noted.

P11-156 a. The full impacts from pumping at full-project pumping rates and duration are described in detail on pages 3.2-32 through 3.2-39 of the Draft EIR.

b. The impacts from the proposed project vary from point to point in the valley and also vary over time. The results cannot readily be distilled down to a simple brief statement. To do so would be incomplete and misleading.

c. The Draft EIR clearly presents the predicted impacts in detail on pages 3.2-32 through 3.2-39.

d. The commenter is asking for the findings of the model to be discussed before discussing the impacts, in direct contradiction to comment (a) above. The findings of the model are the impacts: therefore the commenter is asking for the impacts to be discussed before the impacts are discussed.

P11-157 a. Sources of water to Indian Wells Valley are estimated at a total of 36,415 ac-ft/yr (Williams 2004).

b. It appears to be (Williams 2004). It is not a feasible source of water as an alternative. Please refer to Master Response L2.

c-d. See Section 5.2.3 of the Draft EIR and Master Response L2 for a discussion of alternative sources of injection water.

P11-158 Please refer to Master Response A4.

P11-159 Please refer to Master Response C2 for discussion of the accuracy and adequacy of the Hydrology Model.

P11-160 Figure 3.2-14 was updated to show drawdown contours for pumping 4,839 ac-ft/yr for 30 years with specific yield at 10%. The amount of drawdown from pumping under these conditions would have significant impact on Little Lake but is mitigated by reducing pumping duration or pumping rate, as stated in the Draft EIR.

P11-161 Please refer to Master Response C2.

P11-162 The maximum drawdown in wells in the Rose Valley at 4,839 ac-ft/yr for 30 years is considered a significant impact; therefore, mitigation has been outlined to reduce impacts to less than significant levels. See mitigation measures Hydrology-1 and -2 on page 3.2-39 of the Draft EIR, mitigation measure Hydrology-3 beginning on page 3.2-47 of the Draft EIR, mitigation measure Hydrology-4 beginning on page 3.2-49 of the Draft EIR for mitigation that would prevent significant drawdown. Impacts to biological resources, aesthetics, air quality, water quality, and other environmental parameters are discussed in their respective sections of the Draft EIR.

P11-163 a. Table 3.2-5 on page 3.2-36 of the Draft EIR and Figure 3.2-14 on page 3.2-35 of the Draft EIR are referenced in text. The table is a clear outline of predicted maximum drawdown. The figure is a clear representation of drawdown, and is meant to show geographically and spatially the levels of groundwater drawdown in relation to the project location and other locations in the Rose Valley.

b. Approval of the project is at the discretion of the Inyo County Planning Commission. All impacts can be mitigated to less than significant levels.

c. The model supports 120 to 480 ac-ft/yr of pumping for 30 years to avoid a significant impact, or a greater amount can be pumped for a shorter period of time.

d. Please refer to Master Response C2.7.

e. The commenter is incorrect. The results of the analysis are plainly stated and highlighted in the Draft EIR.

P11-164 a-e. Please refer to Master Response C2.7.

P11-165 a. Mitigation ensures no greater than a 10% reduction in water at Little Lake and less than 2 to 3% in the aquifer in Rose Valley.

b. All environmental impacts of the proposed project would be less than significant with mitigation; therefore, impacts to groundwater users in the Rose Valley would be less than significant. Refer to Section 3.2: Hydrology and Water Quality.

c. See Figure 3.2-17 on page 3.2-44 of the Draft EIR.

d.-e. Please refer to Master Response C4.4.

P11-166 a. See mitigation measure Hydrology-2 on page 3.2-39 of the Draft EIR.

b. The measure has been revised to state that Coso would be responsible for any increase in electrical cost for pumping wells impacted by the project.

c. Cumulative impacts are not expected.

d. The Draft EIR was distributed to all libraries and to the County Planning Department and notices were published in the County newspaper (the Inyo Register).

e-g. The Draft EIR addresses the impacts. The Draft EIR was subject to a 45-day public review, according to CEQA requirements.

h. Disputes would be resolved by the County.

P11-167 a. Coso would be required to implement measures. Violations to the conditions of approval and the CUP would be dealt with through enforcement of the CUP by Inyo County. Please refer to Master Response M2.

b-c. Please refer to Master Response C4.3

d. The commenter's opinion is noted.

e. Coso would be required to implement measures. Violations to the conditions of approval and the CUP would be dealt with through enforcement of the CUP by Inyo County. Please refer to Master Response M2.

P11-168 a-b. Please refer to Master Response L2.

P11-169 a. The text of the Executive Summary was clarified to note that "Even with mitigation, the project may result in a minimal lowering of the groundwater table beneath Little Lake. Groundwater table drawdown of up to 0.3 feet could develop within 10 years after start of pumping and persist for as much as 10 to 20 years; thereafter groundwater levels would slowly recover to pre-pumping levels over a period of 100 years or more. At no time would the groundwater flow available to Little Lake be reduced by more than 10%." The revisions to the Draft EIR incorporated into the Final EIR are not significant new information that would require recirculation of the EIR.

Page ES-7 to ES-8

HYDROLOGY AND WATER QUALITY

The project as proposed could have significant impacts to groundwater users in the Rose Valley, as well as surface waters that are dependent upon groundwater. The project will be required to monitor groundwater levels in a network of wells, that will provide an early warning system, and allow for mitigation in the form of a shortened duration of pumping, to avoid significant impacts. The duration of pumping will likely be shortened significantly below thirty years, to as little as 1.2 years, based on model results, to avoid significant impacts.

Impacts to groundwater wells would be mitigated. The applicant would be responsible for lowering pumps or deepening wells in Rose Valley that are impacted by groundwater withdrawal from Hay Ranch.

Springs at Portuguese Bench and Rose Spring would not be impacted by the proposed project because these springs are located at higher elevations and, most likely, their source of water is predominantly Sierran recharge. Impacts to springs (not associated with Little Lake) would not occur.

Page ES-9

The project could indirectly impact wetlands in the Rose Valley, particularly at Little Lake. Hydrology mitigation requires the monitoring and cessation or reduction of pumping prior to significant groundwater drawdown near Little Lake, defined as no greater than 10% decrease in groundwater inflow available to Little Lake. Even with mitigation, the project may result in a minimal lowering of the groundwater table beneath Little Lake. Groundwater table drawdown of ~~by~~ up to ~~less than~~ 0.3 feet. could develop within 10 years after start of pumping and persist for 10 to 20 ~~as much as 50~~ years; thereafter groundwater levels would slowly recover to pre-pumping levels over a period of 100 years or more. At no time would the groundwater flow available to Little Lake be reduced by more than 10%. ~~However w~~ Wetland vegetation would be unlikely to ~~not~~ change to a different community type because the change in water level would be minor and largely within the natural seasonal variation already experienced at the lake. Wetland restoration efforts have been designed to considerable variation in water availability on the Little Lake Ranch property. Changes related to the proposed project would fall within the range that has been previously experienced.

Impacts to wetland vegetation would be less than significant.

b. Please refer to Master Response C3.

c. Please refer to Master Response C3.2 for discussion of impacts of previous agricultural pumping at Hay Ranch to Rose Spring.

P11-170 Please see the discussion beginning in the last full paragraph on page 3.2-39 of the Draft EIR. This paragraph explains that impacts of the project would be less if it was terminated early or pumping rates were reduced. The Draft EIR does not designate a “safe” pumping rate. Please refer to Master Response C2.7 for discussion of the potential duration of the proposed project.

P11-171 a. Please refer to Master Response C3.3.

b. Please refer to Master Response C3.2.

P11-172 a. No. Please refer to Master Response C3.

b. Please refer to Master Response C3.3.

P11-173 a. Bauer (2002) showed that the groundwater level at the north end of Little Lake was consistently three feet higher than Little Lake throughout the year of measurement. This relationship was maintained even when the level of Little Lake declined by a foot. There are no additional groundwater data points adjacent to Little Lake to compare results.

b. Please refer to Master Response C3.

c. No claims are made that the groundwater level at the North Dock Well has always been 3 ft higher than the average elevation of the lake. It was consistently 3 ft higher than the lake during the year of measurement, however. This relationship would be monitored during the pre-startup monitoring that is specified in the monitoring plan, and would be continued during the operation of the project, in order to provide substantial additional data to document the relationship between groundwater and lake levels.

P11-174 The commenter is correct that the Draft EIR states that the drawdown predicted for the Little Lake North **Dock** well ranges from 3 to 8 ft if the project were to continue pumping for 30 years at the full development rate. Figure 3.2-15 depicts the drawdown for the Little Lake **Ranch** North well, which is predicted to range from 4 to 12 ft assuming pumping for 30 years at the full development rate. The Little Lake Ranch North well is nearly 1 mi closer to the Hay Ranch wells and is expected to experience greater drawdown impacts, as noted elsewhere in the Draft EIR.

P11-175 a-e. Please refer to Master Response C3 for a discussion of springs. Water loss at the surface of Little Lake would not be greater than 10%.

P11-176 Figure 3.2-16 has been corrected to show axis labels. See Chapter 3: Errata of this Final EIR for the corrected figure.

P11-177 a. The commenter has mischaracterized the results. The figure shows a peak drawdown of 0.3 ft (fewer than 4 in) lasting for approximately 10 years with lower drawdown levels before and after that peak period.

b. Drawdown levels at Little Lake would result in a less than significant impact throughout the modeled time period for the mitigated project. Some loss of water is not a significant impact. Please refer to Master Response C4.4.

c. Drawdown levels at Little Lake would result in a less than significant impact throughout the modeled time period, for the mitigated project. A substantial amount of groundwater was apparently pumped for years at Hay Ranch in the past for irrigation without destroying Little Lake.

d. The Draft EIR states that greater drawdown levels would develop in Rose Valley north of Little Lake. These are described in detail in the Maximum Acceptable Drawdown values that are presented in Table 3.2-7 of the Draft EIR. No groundwater users would be significantly impacted with implementation of mitigation, however.

P11-178 Please refer to Master Response N10.

P11-179 Please refer to Master Response N10.

P11-180 Please refer to Master Response N10.

P11-181 Please refer to Master Response N10.

P11-182 Please refer to Master Response N10.

P11-183 a. Please refer to Master Response N10.

b. The Hydrology Model would be recalibrated and the potential impacts reassessed if the observed aquifer response is different than predicted by the Hydrology Model. Inyo County Water Department will review the results of the revised model and determine whether changes to the pumping schedule including reducing or terminating pumping are called for, to prevent significant impacts from occurring. See Appendix C4 of the Draft EIR.

c. There are several monitoring points that almost certainly would have significant draw downs in less than 1 year. As specified in the Draft EIR, the model would be re-calibrated in less than one year to the new data, and adjustments to the trigger levels would be made if necessary, based on the re-calibrated model results. Using the adjusted trigger levels, limits on the duration and magnitude of pumping would be made as needed to prevent significant impacts. This program is designed to be protective of Little Lake, and water users throughout Rose Valley.

d. The main factor potentially causing impacts to develop later would be higher than assumed specific yield.

e. No. Please refer to Master Responses C.

P11-184 a. The Brown and Caldwell model used different input parameters.

b. The differences are explained in Appendix C2 of the Draft EIR.

c. Section 3.2 and Appendix C2 of the Draft EIR provide a detailed explanation of the assumptions.

d. The comment is noted.

e. See Section 3.2, Potential Impact 3.2-2, of the Draft EIR.

f. A detailed explanation of differences in boundary conditions and model parameters between the current model and the Brown and Caldwell model is presented in Section 3.2 and Appendix C2 of the Draft EIR.

P11-185 Please refer to Master Response N10.

P11-186 Geologica, who developed the model, is not aware of any attempt by Team Engineering to communicate with Geologica prior to August 2008 (after the date of release of the Draft EIR). No attempt was made to communicate with MHA|RMT.

P11-187 Please refer to Master Responses C4.4 and E4.

P11-188 The commenter is incorrect. See the last full paragraph on page 3.4-42 of the Draft EIR for discussion of impacts to biology of Little Lake resulting from pumping at the rate of 4,839 ac-ft/yr for 30 years.

P11-189 a. Please refer to Master Responses C2.7 and E3 for discussion of significance and duration of impacts.

b. Please refer to Master Response E2 for discussion of impacts to vegetation due to a 10% drawdown.

c. The project would not result in no or drastically reduced habitat with implementation of mitigation. Wildlife species would not be impacted.

d. Please refer to Master Response E5 for discussion of impacts to migratory birds. Migratory birds would not be impacted with implementation of mitigation.

e. See mitigation measures Hydrology-1 and -2 on page 3.2-39 of the Draft EIR, mitigation measure Hydrology-3 beginning on page 3.2-47 of the Draft EIR, mitigation measure Hydrology-4 beginning on page 3.2-49 of the Draft EIR for mitigation that would prevent the drying of Little Lake.

f-i. Please refer to Master Responses E2, E4, and E5.

P11-190 a-b. Please refer to Master Response N5 for a discussion of out of scope comments related to past actions taken by Inyo County on unrelated projects.

P11-191 Please refer to Master Response M2 for a discussion of CUP violations. Mitigation and conditions on the CUP must be implemented. Violations of legal requirements are beyond the scope of the EIR as required by CEQA. See page 3.2-31 of the Draft EIR.

P11-192 a. Please refer to Master Response E4.

b. Mitigation incorporates the delayed response at Little Lake. The maximum drawdown that would ever be experienced by Little Lake with implementation of mitigation is 0.3 ft.

P11-193 Please refer to Master Response C2.7 and Master Response E3.

P11-194 a-b. Please refer to Master Response M1.

P11-195 Table 3.2-7 on page 3.2-48 of the Draft EIR arranges the wells with the northernmost well on the left end of the table and the southernmost well on the right end of the table. No revisions were made to Table 3.2-7 on page 3.2-48 of the Draft EIR. See all responses regarding mitigation measure Hydrology-3.

P11-196 a. The mitigation measure incorporates an HMMP, which includes several performance standards and outlines methods of monitoring and mitigating for impacts. Please refer to Master Response M3 for a discussion of the mitigation plan and how adaptive management has been incorporated into the plan. Furthermore, Inyo County is extremely experienced and organized to evaluate pumping impacts and appropriate mitigation. The City of Los Angeles does extensive pumping in the Owens Valley in Inyo County, and the Inyo County Water Department is tasked with overseeing that pumping to avoid environmental affects. Inyo County has extensive experience regulating groundwater pumping, is organized to do so, and has a history of aggressively protecting the environment of the County.

b. Little Lake Ranch can offer input to Inyo County Water Department at any time in the process.

c. Inyo County Water Department would review and determine if and when pumping reductions and/or cessation of pumping is required if hydrologic triggers have been exceeded. Pumping cessation or reduction would be mandatory if the County determined that the proposed project caused trigger levels to be reached and that groundwater (and surface water) resources in the valley could be significantly impacted, as defined by the model and model recalibration.

P11-197 a-d. Please refer to Master Response C4.6. As stated in this section of the report, this option would only be effective and implementable if it was agreed upon with Little Lake Ranch and the applicant. Little Lake Ranch may at some point view this as an option that they would support.

e. The public has the right to comment on the entire Draft EIR, including the mitigation measures. The Draft EIR was distributed for the mandatory 45-day review period per CEQA expressly to receive comments from the public. All mitigation measures are identified in the Draft EIR.

f. Please refer to Master Responses C2.7 and E3.

g. Please refer to Master Response C4.6. As stated in this section of the report, this option would only be effective and implementable if it was agreed upon with Little Lake Ranch and the applicant. Little Lake Ranch may at some point view this as an option that they would support.

h. The applicant would fund the diversion for the duration that it would be necessary. One of the requirements is that the diversion would only be needed for a reasonable timeframe. See top of page 3.2-50 of the Draft EIR.

P11-198 a. Background information was requested from Little Lake Ranch. Little Lake Ranch did not provide a copy of the documents cited in the comment to the Inyo County. Gary D. Arnold, Esq. was contacted regarding the Draft EIR, as noted on page 6-3 of the Draft EIR.

b-d. Violation of conditions of approval and the CUP is beyond the scope of EIR analysis under CEQA. Please refer to Master Response M2.

P11-199 Please refer to Master Response M3.

P11-200 Please refer to Master Response M3.

P11-201 Please refer to Master Response A4.

P11-202 Please refer to Master Response A4.

P11-203 Please refer to Master Response A4.

P11-204 a. The “steam cap” of a geothermal reservoir is a zone at the top of the reservoir in which the main fractures are filled with steam and in which the temperature and pressures are controlled by the thermodynamic properties of saturated steam. Steam caps are formed when geothermal fluid extraction causes the reservoir pressure to drop below the saturation pressure and reservoir fluids boil.

b. Injected water will not completely offset Coso’s water losses.

c. It would not restore the pressure; injection would reduce the decline.

d. One of the objectives is to minimize decline.

e. No, the Draft EIR does not suggest that the project would increase production.

f. All of the injection water would be injected into the reservoir. Injection is typically a dynamic process in geothermal reservoirs as it is moved within the field in order to maximize the benefit (pressure support and injection derived steam) and minimize the cost (cooling) when injectate moves too quickly into the production area to be thoroughly heated by rock. Coso maximizes the benefit of injection and minimizes the risk of cool water breakthrough by 1) monitoring and evaluating the effects of injection, and 2) moving injection fluids to injection wells which would provide the most benefit and least breakthrough from injection. Injection monitoring by Coso includes tracer testing, production monitoring (enthalpy and flow rates), and geochemical monitoring of produced fluids for evidence of injection returns. Coso installed a water transfer system in order to move injection water around the field in 2000 (Coso pers. comm. 2008).

g. In some individual wells which currently produce excess steam (more steam than the steam that could be derived from boiling brine at the reservoir temperature) from steam zones, total steam production could decline as the steam zones are saturated. The decline in excess steam is observed in the simulated results of the effect of injection as a slight decline in total enthalpy. Any steam decline would be balanced by reduced decline, stabilization, or even slight increase in total production (see graph in Master Response A6).

h-i. Measuring geothermal fluids by volume would be dependent on temperature because steam is condensable and the density of steam and hot water varies with temperature. This is why geothermal fluids are typically measured by mass which is independent of the conditions of measurement.

j. Current injection is at approximately 4,000,000 lbs/hour (see graph in Master Response A6). Assuming that the average injection temperature is approximately 180 degrees F, then 13,360 ac-ft/yr is injected. The project proposes to inject an additional 4,839 ac-ft/yr.

k. The temperatures of current injection at Coso range from waste brine at just above boiling to cooling tower blow down which is approximately ambient temperature. Temperatures in the Coso Valley basin range from the highest reservoir temperatures near 640 °F to less than 95 °F in shallow observation wells (OB-2; Geologica 2003).

l. Please refer to Master Response C5.2. The cooler the water injected into the Coso geothermal reservoir, the greater contact (either longer time or greater water rock ratio) with hot rock required to heat the water. It is unlikely that the end result differs, given the amount of heat in the Coso system. Thetemperature of water from the proposed project is not significantly different than cooling tower blowdown currently being injected at Coso.

m. Please refer to Master Response C5.2. The difference in water temperature between current injection and proposed injection is unlikely to generate a different effect.

n. Please refer to Master Response N3. Analysis of the existing operations at Coso is beyond the scope of the environmental analysis of this EIR.

o. Please refer to Master Response C5.2. If the changes in Coso Hot Springs observed in the Coso Monitoring program are related to the development of steam zones and these steam zones are related to the production of fluids as discussed in numerous comments and responses above, then the reduction in production may reduce the rate of change in the Coso Hot Springs. However, the changes in the Coso Hot Springs have not been directly related to the development of steam zones within the reservoir and therefore this relationship and the related effects are not certain.

P11-205 a. There is no corresponding change in production or injection that correlates with the stabilization of South Pool temperatures and drop in water levels in 1993 and the drop in temperatures and water levels in 2002, although the initial rise in temperature (and water levels) in the South Pool manifestation correlates with the onset of production.

b. No.

c. The temperatures and water levels in South Pool have changed as the commenter indicates and above (Geologica 2002-2008).

d. See Master Responses C5.1 and C5.2

P11-206 The comment is noted.

P11-207 a. Coso Hot Springs monitoring data presented by Geologica in the annual Coso Hot Spring Monitoring reports suggest that the fluctuations in water levels and temperatures recorded at South Pool are greater than the seasonal fluctuations.

b. These monitoring reports do not compare changes in characteristics of various surface manifestations with changes in the exploitation of the Coso geothermal field and do not conclude that the changes are related to the Coso geothermal field.

c. The purpose of the Coso Hot Spring Monitoring Program Annual Reports is to report the results of the monitoring program including changes in the monitored characteristics. It is not the purpose of these reports to compare changes observed in the monitored characteristics to the Coso geothermal operations.

d. These reports are made available to the public.

e. Please refer to Master Response F2. This comment does not relate to the environmental analysis for this project.

P11-208 a-b. Coso has presented the results of the Coso reservoir model (see graph in Master Response A6) and indicated that the software used is the standard program for geothermal reservoir simulation known as TETRAD.

c. The Coso geothermal reservoir model is proprietary.

P11-209 a-b. Please refer to Master Response F2.

P11-210 See the first full paragraph on page 3.2-31 of the Draft EIR for discussion of a SWPPP. The proposed project would require an SWPPP. A description of the SWPPP requirements can be found at http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/draft/draftconst_att_h_swppp.pdf.

P11-211 a-b. The lowering of the water table is unlikely to affect the water/rock ratio in the remaining saturated portion of the water-bearing zones. The amount of unsaturated rock would not affect the water chemistry. These conditions can be represented by comparing a bowl filled with sand and water to the brim with a bowl filled with sand to the brim and half full of water. The sand above the water level doesn't contact the water and is therefore not relevant.

c. Please refer to Master Response C6.3.

d. Please refer to Master Responses C6.2&3. The major effect on water quality of Little Lake is evaporation. The direct correlation between the degree of evaporation indicated by the shift in stable isotopes and the TDS concentration of Little Lake water suggests that evaporation in the Lake is the controlling factor on water quality. This relationship was not observed in other water from Rose Valley.

e. The TDS of Rose Valley water ranges from less than 350 mg/L in springs along the Sierran front to 800-1000 mg/L in the northern portion of the valley to over 1,000 - 1,500 mg/Lin the vicinity of Little Lake (higher levels in highly evaporated Lake water samples) and a few thousand mg/L in wells thought to be influenced by geothermal fluids (e.g., LEGO) up to 5,000 to 10,000 mg/L in the Coso geothermal field (Draft EIR Figure 3.2-6). Although the water in Rose Valley is more dilute (lower TDS), Rose Valley waters exceed at least one primary and several secondary drinking water standards established by the EPA (Draft EIR Table 3.2-4). Steam condensate probably exceeds the water quality of Rose Valley waters as it is typically low in TDS and sodium chloride.

f. The transport of Rose Valley water would not affect its quality. Please refer to Master Response C6.1.

g. Yes, the transported water would be unavailable in Rose Valley.

h. Please refer to Master Responses C6.2 and C6.3. The project would not significantly affect the evaporation or evapotranspiration rates at Little Lake. The primary factor affecting the evaporation or evapotranspiration rates is the surface area of Little Lake, which is (and would be under the proposed project) primarily controlled by a weir at the south end of the Lake. The evaporation or evapotranspiration rates will decrease if there is a slight reduction in the water level of Little Lake as a result of the project and the surface area decreases.

i. It is possible that if the amount of water flowing south through Rose Valley is reduced, and the flow of relatively high TDS waters from the northern part of the Valley are reduced relative to the inflow from the Sierras, then the water quality in the southern part of the valley may improve. Monitoring includes TDS in order to provide an independent (of water level, the other major monitoring parameter) assessment of change in water sources.

P11-212 a. Little Lake area groundwater water levels have historically fluctuated seasonally by at least a foot, based on measurements made over the course of a year by Bauer (2002). The maximum drawdown of groundwater in the vicinity of Little Lake is expected to be no more than 0.3 ft due to Hay Ranch pumping. The expected decline in lake level would be related to the decline in groundwater level, which won't be any greater than is already experienced seasonally at the lake. This variability in lake level would not result in significant loss of habitat or biological resources. The requirement that at least 90% of the groundwater inflow to the lake must be maintained is not expected to change the water quality any more than the resulting change in water quality during seasonal variations that currently occur in the lake level.

b. Please refer to Master Response C6.3.

P11-213 The comment is noted.

P11-214 a-c. Please refer to Master Response D2.

d-h. Please refer to Master Response N3.

P11-215 Please refer to Master Response N3.

P11-216 Please refer to Master Response D1.

P11-217 The commenter's opinion is noted. Please refer to Master Response D1.

P11-218 Please refer to Master Response D2.

P11-219 a-b. Please refer to Master Response B2.

P11-220 Please refer to Master Response D2. Past actions and impacts of the existing plant are beyond the scope of analysis of this EIR. Please refer to Master Response N3.

P11-221 Past actions and impacts of the existing plant are beyond the scope of analysis of this EIR. Please refer to Master Responses N3 and N6, and D2.

P11-222 a. The 0.27% is a typographical error and has been deleted from the EIR. With mitigation, the total aquifer volume reduction would be fewer than 3%. The revisions to the Draft EIR incorporated into the Final EIR are not significant new information that would require recirculation of the EIR.

Page 3.3-13

> Ground subsidence or collapse could occur from withdrawal of fluid from unconsolidated sediments, poorly consolidated rock, or clay-rich basins. The well driller's logs (California Department of Water Resources 1971; California Department of Water Resources 1974) show that the soils in the project area are stable alluvial materials as expected from alluvial fan deposits and stream deposits. The Rose Valley basin is not filled with compressible clay, which would be more prone to subsidence. ~~The total amount of water pumped during operation of the proposed project would be approximately 0.27 percent of the total aquifer volume.~~ Subsidence, however, is related to resulting drawdown and not the change in aquifer volume. The drawdown in the immediate vicinity of the pumped wells could be sufficient to cause subsidence if the soils consisted of compressible clays or poorly-consolidated sediments; however, the sediments are well consolidated and not clay-rich. Subsidence in the Rose Valley is generally not expected due to the coarse-grained and highly consolidated nature of the deposits. Impacts would be less than significant.

b. The Draft EIR evaluates the potential impact of groundwater withdrawal relative to the amount of groundwater recharge, and all water flow into or out of the valley. These factors all enter into the computations of the groundwater model, which then calculates the amount of drawdown in groundwater levels in the valley, for its given dimensions and porosity. The drawdown of water levels is the key factor, not the absolute storage in the basin, and that is derived by the model, and reported in the Draft EIR.

c. Please refer to Master Response L2.

P11-223 a. See page 3.3-13 of the Draft EIR. The first paragraph states that with Implementation of the mitigation in Section 3.2: Hydrology and Water Quality, surface waters would not be significantly impacted and wind blown soil erosion would not increase.

The following edits have been made to clarify that the project as proposed could Impact Little Lake surface waters, but mitigation reduces that impact. The revisions to the Draft EIR incorporated into the Final EIR are not significant new information that would require recirculation of the EIR.

Page 3.3-14

> Groundwater pumping ~~would not~~ <u>could</u> result in significant reductions in surface water levels in Rose Valley, as described in Section 3.2 Hydrology and Water Quality. Concern has been expressed that reductions in surface waters would increase soil erosion in the valley. <u>However,</u> ~~M~~<u>m</u>itigation has been included in Section 3.2 Hydrology and Water Quality to monitor groundwater drawdown, with contingency plans to prevent surface water impacts (primarily at Little Lake) from groundwater drawdown. With implementation of the mitigation in Section 3.2 Hydrology and Water Quality, surface waters would not be significantly impacted and wind blown soil erosion would not increase.

b-e. Please refer to Master Response J1. See response P11-223a for edits to page 3.3-14 of the Draft EIR.

P11-224 a. Please refer to Master Response C5.1.

b. Please refer to Master Responses C5.1 and A6.

c. The Alternatives Section of the Draft EIR evaluates alternatives to achieve the project objective of decreasing the decline in power generation at Coso. See Master Response L1 and L2.

d. The comment is noted.

e. Please refer to Master Response N6.

P11-225 The comment is noted.

P11-226 The comment is noted. The age of Little Lake is not a factor in the Hydrology Model or impact assessment.

P11-227 The comment is noted. The proposed project includes mitigation to minimize impacts to Little Lake.

P11-228 Please refer to Master Responses E2 and E5.

P11-229 a. See the Regulatory Setting sections in each environmental parameter for the Inyo County General Plan goals and policies that are relevant to the proposed project.

b. Please refer to Master Responses E2 and E4.

c. See the discussion of surveys and studies performed in the project area beginning in the last paragraph on page 3.4-1 of the Draft EIR. Figure 3.4-1 on page 3.4-13 of the Draft EIR and Figure 3.4-2 on page 3.4-14 of the Draft EIR are maps of special status species in the project area. Figure 3.4-3 on page 3.4-17 of the Draft EIR shows the water dependent habitat around Little Lake. See mitigation measures Biology-2 through Biology-9 for mitigation that would protect sensitive species. Additional surveys for desert tortoise are required.

d. Implementation Measure 3.0 in the Inyo County General Plan Table 8-5 requires wetland delineation for project sites with the potential to contain wetland resources. The project site, the Hay Ranch property, does not contain wetland resources. Wetland delineation is not required for the Hay Ranch property. This Implementation Measure does not apply to the proposed project. Please refer to Master Response E2 potential impacts to wetlands as a result of the proposed project. See confirmation letter from the Army Corps of Engineers stating that the project would not require a Section 404 permit.

e. See the discussion of mitigation for potentially significant impacts to the Mohave ground squirrel in the last paragraph on page 3.4-29 of the Draft EIR. See the discussion of mitigation for potentially significant impacts to the desert tortoise beginning in the first full paragraph on page 3.4-31 of the Draft EIR.

f. Implementation Measure 8.0 in the Inyo County General Plan Table 8-5 applies to land management agencies. Coso is not a land management agency. This Implementation Measure does not apply to the proposed project.

g. Implementation Measure 12.0 in the Inyo County General Plan Table 8-5 requires that a survey (i.e., review) of prevention measures, abatement measures, and post-project monitoring of noxious weeds as a component of land management or land development projects. Neither a pre-project physical survey of noxious weeds nor the adoption of preservation or management plans is required by Implementation Measure 12.0 of the Inyo County General Plan Table 8-5.

P11-230 See the discussion under Potential Impact 3.4-4 beginning on page 3.4-40 of the Draft EIR.

P11-231 Please refer to Master Response E2 and E5 and K1 and K2. See mitigation measures Hydrology-1 and -2 on page 3.2-39 of the Draft EIR, mitigation measure Hydrology-3 beginning on page 3.2-47 of the Draft EIR, mitigation measure Hydrology-4 beginning on page 3.2-49 of the Draft EIR for mitigation that would prevent the drying of Little Lake, and would prevent impacts to migratory birds.

P11-232 Please refer to Master Response E2 and E5.

P11-233 Please refer to Master Response E2.

P11-234 a. Please refer to Master Response E2 potential impacts to vegetation as a result of groundwater drawdown.

b. The commenter misquoted the Groenveld article. The correct quote is: "Although periodic lowering of the regional water tables due to ground-water pumping has probably played the most important role in driving large-scale changes from grass-dominated cover to shrub cover, the effect of approximately twenty to thirty years of active fire suppression has also had an effect." Please refer to Master Response E2 for discussion of potential impacts to vegetation as a result of groundwater drawdown.

c. The quotation provided by the commenter pertains to the export of water from the Owens Valley. Please refer to Master Response E3 for discussion of duration of impacts to vegetation in the Rose Valley.

d. Please refer to Master Response C2.7 for a discussion of the impact analysis findings. The effects of pumping would be averaged over many years because of the physical configuration of the Rose Valley groundwater basin and the way drawdown effects propagate out from a pumping center. The effects of drought years and years of above average rainfall are likewise averaged out by the length of time required for infiltration or natural discharge from the basin. The use of averages in the Draft EIR is the appropriate way to address long-term response in the reservoir. The model is accurate for the analysis proposed. Mitigation requires continued calibration of the model as more data is obtained once the aquifer is stressed. Mitigation identifies trigger points to detect significant impacts, which accounts for delayed response down-valley.

P11-235 a-h. Please refer to Master Response E1.

P11-236 a-c. Please refer to Master Response E1.

P11-237 See the discussion of mitigation measures Biology-2 through -7 beginning on page 3.4-31 of the Draft EIR. These mitigation measures are designed to prevent take of the Desert Tortoise as a result of the proposed project. A take permit from CDFG is also likely, but would be determined by the CDFG.

P11-238 Type E vegetation is comprised of areas where water is provided to Los Angeles-owned lands for alfalfa production, pasture, recreation uses, wildlife habitats, livestock, and enhancement/mitigation projects. Figure 3.7-1 on page 3.7-2 of the Draft EIR shows land owned by the City of Los Angeles. This classification is not applicable to Little Lake Ranch's habitat enhancement efforts, because the land is not owned by the City of Los Angeles and water is not provided to the lands. Type D is the most accurate classification.

P11-239 Please refer to Master Response C3.3.

P11-240 Please refer to Master Response C3.2.

P11-241 a. Please refer to Master Response E4.

b. Please refer to Master Response E2.

c. Please refer to Master Response L2.

P11-242 a. Please refer to Master Response E4.

b. Please refer to Master Response L2.

P11-243 The comment is noted.

P11-244 Please refer to Master Responses C5.1 and C5.2.

P11-245 Please refer to Master Responses C5.1 and C5.2.

P11-246 a-f. Please refer to Master Responses G1, G2, and G3. Inyo County does not contain any Farmland of Statewide Importance, as stated on page 3.8-2 of the Draft EIR.

e. The commenter is incorrect. Please refer to Master Response G2.

P11-247 a-b. Please refer to Master Responses G1 and G2.

c. See mitigation measure Hydrology-2. The text has been revised to clarify that the applicant would be responsible for any increase cost of electricity for pumping that is required because of the proposed project.

d. Please refer to Master Responses G1 and G2.

P11-248 a-f. Please refer to Master Response G1, G2, and G3.

P11-249 Please refer to Master Response G1 for discussion of the designation of the Hay Ranch property as prime agricultural land.

P11-250 See page 3.9-1 of the Draft EIR. This is already stated in the Draft EIR.

P11-251 Please refer to Master Responses H1, H2, and H3.

P11-252 The existing impacts associated with the dilapidated structures on the Hay Ranch property is part of the baseline condition and do not require mitigation, under CEQA. CEQA requires analysis of impacts against the baseline condition.

P11-253 Please refer to Master Response H2.

P11-254 Please refer to Master Response H2.

P11-255 a. The Draft EIR states on page 3.9-2 that there would be potentially significant impacts without mitigation. Mitigation must be implemented if the project is approved.

b. Please refer to Master Responses H1, E2, E5, and C4.4.

P11-256 Please refer to Master Response I.

P11-257 Please refer to Master Response C6.1.

P11-258 Please refer to Master Response N3.

P11-259 Please refer to Master Response N3.

P11-260 Please refer to Master Response N3.

P11-261 Please refer to Master Response N3.

P11-262 Please refer to Master Response N3. The proposed project would not increase the waste beyond that allowed for by previous environmental documentation and is currently being produced. See page 3.11-7 of the Draft EIR.

P11-263 Please refer to Master Response G3 for discussion of previous water use at Hay Ranch for agricultural production.

P11-264 a-i. Please refer to Master Response G3 for discussion of previous water use at Hay Ranch for agricultural production.

j. Please refer to Master Response C3.2 for discussion of impacts of previous pumping to Rose Spring.

P11-265 Comments noted, and are included in the project record. See all previous responses to comments regarding loss of water from evaporation.

P11-266 It is unlikely because of either spatial separation or limited transmissivity for there to be a significant change in the leakage of the Coso geothermal fluids into the surrounding groundwater or groundwater basins as a result of this injection because: a) there is no groundwater at Coso and injection would occur primarily below the known groundwater in Rose Valley, b) although leakage of geothermal fluids into Rose Valley has been postulated, the rates and amounts appear to be slow and low, and c) the injected fluids have similar water quality to the reservoir into which they would be placed (and from which they came) and the addition of Rose Valley water would actually improve the injection water quality by diluting the total dissolved solids.

Since before the production of the Coso Geothermal Reservoir, there has been no shallow groundwater overlying the Coso geothermal field (Adams et al. 2000). Shallow groundwater overlying the Coso Geothermal System disappeared after the last pluvial or wet season approximately 10,000 years ago and before the onset of the most recent episode of magmatic activity at Coso which drives the modern hydrothermal system. The proposed injection into the geothermal reservoir is also significantly deeper than local groundwater in Rose Valley. The upper level of groundwater at Rose Valley ranges from 3,160 to over 3,400 ft amsl. The deepest wells are at approximately -2500 ft amsl in the northern part of the valley. The base of the aquifer may extend as deep as 0 ft amsl (assuming the maximum depth of permeable sediments (page C2-2.2 of the Draft EIR) at approximately 3,500 ft bgs) in the northern part of the Valley rising to about 3,000 feet amsl in the vicinity of Little Lake. Injection into the Coso Geothermal reservoir would occur between approximately 700 to -4,200 ft amsl. These results suggest that injection would mostly enter the Coso geothermal reservoir below the elevation of the deepest parts of the Rose Valley basin and well below the level of the deepest groundwater wells because microseismic studies suggest that injection water usually moves vertically initially (Feng and Lees 1997).

Some of the deeper wells in Rose Valley drilled for geothermal exploration purposes such as the LEGO well currently contain some geothermal fluids (based on analysis of geochemical samples collected over the last several years (see Section 3.2.1 of the Draft EIR). Migration of both geothermal fluids and Sierran water beneath Rose Valley has been proposed to explain the variety of waters in the Rose Valley and Indian Valley basins (Gule, 2002; Guler and Thyne 2003) and in the Coso geothermal system (Fourier and Thompson 1980; Christensen et al.

2007). The flow rates of these fluids are not known except that migration of fluids deep beneath Rose Valley is considered to be slow and of small volume (Fournier and Thompson 1980; Williams 2004). Because the total production of fluids at Coso is projected to continue to decline, the overall reservoir pressure is probably not projected to increase and therefore, there is no drive to increase outflow of the system.

The fluids that are currently injected at Coso are the same fluids that were produced, but slightly concentrated by steam loss. The injection to date (since 1987) does not appear to have affected groundwater quality in Rose Valley. The addition of Rose Valley water to the injected fluid would dilute the TDS of the injection fluids thereby improving the water quality of the total injectate.

P11-267 The proposed project would not increase production of hazardous materials beyond what was originally allowed in environmental reviews listed in Table 1.1-1 on page 1-4 of the Draft EIR or what is currently being produced. The project would not result in an increase in power production. Please see responses to other comments regarding generation of waste.

P11-268 Please refer to Master Response N3.

P11-269 Please refer to Master Response J1.

P11-270 Please refer to Master Response I.

P11-271 Please refer to Master Response I. No additional odors are expected.

P11-272 Please refer to Master Response K1.

P11-273 Please refer to Master Response K1.

P11-274 a. Please refer to Master Response D1 for discussion of subsidence.

b-c. Please refer to Master Response K1.

P11-275 a-b. Please refer to Master Response K1.

P11-276 a-b Please see all responses to the commenter's previous comments regarding public services and utilities. Please refer to Master Response K1.

P11-277 Please refer to Master Response K2 and page 4-5 of the Draft EIR. The analysis mentions that other buildings may be built along US 395 but they would be screened and the proposed project is screened. The proposed project would not have a significant contribution to a cumulatively significant impact to visual resources. Edits have been made to the text for clarification, as shown below. The revisions to the Draft EIR incorporated into the Final EIR are not significant new information that would require recirculation of the EIR.

Page 4-5

Aesthetics

The proposed project would have less than significant impacts on aesthetics. The possible LADWP leakage recovery project at Haiwee Reservoir would capture approximately 900 acre-feet per year of water that is currently leaking into the Rose Valley. Removal of this groundwater, in addition to removal of groundwater in the proposed project, could cumulatively impact aesthetics by resulting in a loss of wetlands, wildlife and vegetation at Little Lake. <u>Structures associated with the LADWP reservoir project would be located 2 miles north of the Hay Ranch property. Given the minimal impacts to visual resources on the Hay Ranch property due to</u>

visual screening and the distance of the structures from the highway and the distance between the projects, cumulative impacts would not be significant. Other related projects may lead to more buildings along US Highway 395 near the project's vicinity, but these buildings would likely be landscaped and built to blend with the existing environment and would not be considered cumulatively significant.

P11-278 a. Please refer to Master Responses K1 and K2. The total groundwater storage capacity of the aquifer has not been evaluated; it is the impact on groundwater levels and flow through the valley that is important, and that was the focus of the evaluation.

b. Any project that withdraws groundwater from the Rose Valley aquifer has the potential to lower groundwater levels.

c. The cost of possible retrofits to existing wells cannot be estimated at this time; however, the Applicant would be required to fund this work, as described on page C4-8 of the HMMP.

d. The cost of potential increased electrical costs cannot be estimated at this time; the County would evaluate the need for compensation due to increased electrical costs at the time claims of damages are made.

e. Increased groundwater production costs could potentially inhibit agricultural production, although the increased costs would likely be minimal because the drawdown is relatively small. However, this is a moot point as any significant groundwater development for agricultural purposes or any other use would require a water right and potentially an environmental impact review because no significant groundwater use is occurring in Rose Valley now.

P11-279 The project as proposed would have a significant impact on groundwater. Mitigation reduces the amount of groundwater that can be removed from the aquifer. Based on the rate of soil pore drainage presented in Table 3.2-6 (3,071 ac-ft/yr) this would amount to a reduction in groundwater storage in the Rose Valley aquifer of approximately 3,700 ac-ft with the mitigated project, with recovery beginning immediately on cessation of pumping. This figure is 0.5% of the 820,000 ac-ft storage capacity cited in this comment.

P11-280 Please refer to Master Response K1.

P11-281 a. The proposed project would not increase production beyond what was originally allowed in environmental reviews listed in Table 1.1-1 on page 1-4 of the Draft EIR or that is currently being produced (at the time of the issuance of the NOP for this EIR).

b. Please refer to Master Response K1.

P11-282 Please refer to Master Responses K1 and K2.

P11-283 The potential Deep Rose geothermal project's reservoir is reportedly greater than 15,000 ft bgs under Rose Valley and below the basement of the aquifer. Therefore it does not appear to be connected to the Rose Valley aquifer. It is over 3.1 mi west of the Coso Hot Springs and the Coso geothermal system separated by an zone with no evidence of recent volcanism, a different pattern of seismicity and different geology. There is no evidence to connect Coso Hot Springs and the Deep Rose project. Furthermore, the Deep Rose project is an exploration project over a limited area. It is entirely speculative whether the exploration will lead to development of a geothermal plant, and development could only occur after extensive environmental study following permit applications. There is no likelihood that the exploration would affect the Coso Hot Springs.

Edits have been made the Draft EIR, as shown below. The revisions to the Draft EIR incorporated into the Final EIR are not significant new information that would require recirculation of the EIR.

Page 4-5 and 4-6

Cultural Resources

Rose Valley and surrounding regions are known to be rich in cultural resources. The proposed project would have less than significant effects to cultural resources with implementation of project mitigation measures. The Haiwee Reservoir leakage recovery, Little Lake habitat restoration, and Caltrans US Highway 395 Coso Junction Rest Area improvements would not be expected to disturb any previously undisturbed grounds and would not affect the Coso Hot Springs as these projects would not be in the same groundwater basin.

The Gill Station Coso Road improvements project proposed by Inyo County would disturb artifacts and sites of historical and archeological importance. Mitigation would be implemented and would avoid significant cumulative impacts. Crystal Geyser and Deep Rose Geothermal project could aggregate the amount of resources disturbed due to future ground disturbance; however, with implementation of mitigation, the impacts would not be cumulatively significant.

<u>Development of Deep Rose is speculative at this time; however, the potential Deep Rose geothermal project's reservoir is reportedly greater than 15,000 feet below the surface of Rose Valley and below the basement of the aquifer. It does not appear to be connected to the Rose Valley aquifer. It is over 3.1 miles west of the Coso Hot Springs and the Coso Geothermal system separated by an zone with no evidence of recent volcanism, a different pattern of seismicity and different geology. There is no evidence to connect Coso Hot Springs and the Deep Rose project.</u>

P11-284 Please refer to Master Response K1 and K2.

P11-285 a. Each subsequent project environmental analysis would consider direct, indirect, and cumulative impact of other projects.

b. The Deep Rose is not included in the Hydrology and Water Quality section of Chapter 3 because it is not part of the baseline physical condition. The only project for which Deep Rose has applied for a permit is a limited exploration project, which has little probability of impacting the environment. The exploration project is in planning stages, and does not contribute to the baseline physical condition of the project area. The project is addressed in the Cumulative Impacts chapter. Please refer to Master Response K2.

c. Inyo County is aware that Deep Rose owns private property with a well from which it can extract water. See Master Response K1.

d. Water would likely be needed during certain phases of the Deep Rose project if exploration progresses. Please refer to Master Response K1.

e-f. Please refer to Master Response K2. Edits have been made to the hydrology section to include a discussion of the Deep Rose project.

P11-286 a-b. Please refer to Master Response K2.

P11-287 a. Please see responses to commenter's previous comments on water quality.

b. The commenter is incorrect in stating that the Draft EIR does not address water quality. See page 3.2-57 of the Draft EIR, Potential Impact 3.2-6: The potential to cause a violation of water quality requirements or otherwise degrade existing water quality in the area or impact drinking water and drinking water supplies.

P11-288 Mitigation measures outlined in Section 3.2: Hydrology and Water Quality would ensure that Little Lake would not dry up or experience greater than 10% reduction in flow. There would be no impacts to recreation.

P11-289 a. The comment is noted.

b. Please refer to Master Responses C5.1 and N6.

c. These questions are not relevant to the environmental analysis in the Draft EIR.

P11-290 Please refer to Master Response L5.

P11-291 Please refer to Master Response C5.1.
Please refer to Master Response N6.

P11-292 Please refer to Master Response N3.

P11-293 Please refer to Master Response L2.

P11-294 The comment is noted.

P11-295 Please refer to Master Response L2.

P11-296 Please refer to Master Response L2.

P11-297 a, c. Please refer to Master Response B1.

b. Please refer to Master Response N10.

P11-298 Please refer to Master response B1.

P11-299 a. Please refer to Master Response B1.

b. The objectives of the projected are stated in terms relative to the length of the CUP.

c-d. Please refer to Master Response L2.

e. Reduction of production would reduce the annual decline of the reservoir; however, it would not meet the stated project objective of sustaining the production capacity of the existing power plant units. The cumulative impacts of long-term production of power, although considered, need not bebe compared to the cumulative impacts of short-term production of power.

P11-300 a-b. Please refer to Master Response L2 for discussion of alternatives brought forth for analysis and alternatives considered but rejected.

P11-301 Please refer to Master Response N6 regarding previous equipment decisions by Coso.

P11-302 Please refer to Master Response N10 for a discussion of interim information generated during the EIR preparation process.

P11-303 a-d. Please refer to Master response N9.

P11-304 Modifications to the power plants, and their feasibility, are considered on pages 5-4 and 5-5 of the Draft EIR. The past intentions and actions of Coso do not pertain to potential effects of the proposed project Please refer to Master Response N6. The impacts of theoretical oil wells and manufacturing plants do not pertain to potential effects of the proposed project. Capital costs are included in the Draft EIR discussion because the alternatives analysis contains an economic component. Please refer to Master response L5.

P11-305 a. The changing of geothermal technologies for the intentional reduction of electrical generation does not have to be considered, as they do not meet the basic project objective of maximizing utilization of the generating capacity of the existing plants. Please refer to Master Response L2.

b. The intentions and past actions of Coso do not pertain to potential effects of the proposed project. Please refer to Master Response N6.

c. The purpose of the proposed project is to meet existing power agreements.

d. Please refer to Master Response N6 for a discussion of out-of-scope comments pertaining to past actions of Coso.

P11-306 Comment noted, and is included in the project record. Please refer to Master Response L5 for discussion of economic feasibility and alternatives. Please refer to Master Response N7 for a discussion of Coso's financial status and relevance to the environmental analysis.

P11-307 Please refer to Master Response N7.

P11-308 Please refer to Master Response C5.5 and N5. See the fourth full paragraph on page 1-3 of the Draft EIR for a discussion of previous analysis of the possibility of use of groundwater from the Rose Valley for power plant cooling.

P11-309 Please refer to Master Responses C5.5 and N5. See the fourth full paragraph on page 1-3 of the Draft EIR for a discussion of previous analysis of the possibility of use of groundwater from the Rose Valley for power plant cooling.

P11-310 See Chapter 5: Alternatives in the Draft EIR.

P11-311 a. Please refer to Master Response L1. The project would not increase power generation beyond current production levels. The modifications that were sought out were to minimize the decline, hence increasing the amount of power generated than would be generated without the project. Edits have been made as shown below to clarify that production would not increase over existing levels. The goal is to stop the decline. The revisions to the Draft EIR incorporated into the Final EIR are not significant new information that would require recirculation of the EIR.

Page 5-2

5.2.2 ~~INCREASE~~ MAINTAIN POWER GENERATION THROUGH POWER PLANT ENHANCEMENTS

Introduction

One alternative considered was the potential for ~~increasing~~ minimizing the annual decline in power generation output through power plant enhancements. This alternative has the potential to achieve the project objective of ~~increased~~ minimizing the decline in power generation. The feasibility of improved power generation was investigated by comparing possible increased output from various potential plant efficiency improvements to the cost of the improvements for improved power generation and to the cost from projected decrease in steam production declines related to the project.

b-d. Please refer to Master Response B1 regarding objectives. The proposed project would not increase production beyond existing levels. Please refer to Master Response A6.

P11-312 a. See the applicant's comment letter (comment letter A1).

b. The changes in net output in megawatts (MW) were calculated for the Draft EIR (Figure 5.2.1), not by Coso. They were based on simulated production rates provided by Coso. The Coso reservoir model is proprietary.

c. Enthalpy is the energy of a substance that can be converted to work.

d. Steam has more enthalpy than water at a given temperature and pressure. As the proportion of steam in the total geothermal production from the wells at Coso rises, then the total enthalpy rises.

e-f. The enthalpy change observed at Coso is related to the reservoir response to production induced pressure drawdown. Because Coso has a large amount of stored heat (temperatures above 320°C and rising in some areas (Christensen et al. 2007) due to recent magmatic input, when the pressure drops below the saturation pressure for liquid water, the reservoir fluids boil, generating steam.

P11-313 a. Please refer to Master Response A1.

b. Global Power Solutions is the firm for which Gary McKay works. Gary McKay isone of the Draft EIR preparers. Edits to remove the reference to Global Power Solution are shown below.

Page 5-2 to 5-3

The analysis was based on production rates and enthalpies forecast through 2035 for the Coso geothermal projects, with and without additional injection. The approximate additional output associated with the additional flow rates and associated different enthalpy during the period was calculated ~~(Global Power Solutions 2008)~~ based on these forecasts. This amount of additional output relative to the total project price of $13.4 million produces an average of nearly 18 MW (see Figure 5.2-1 below) of additional output, or a cost of less than 750/kW. All other possible power generation improvements were then compared to this value.

c. Gary McKay at Global Power Solutions completed an impartial environmental review of the proposed project.

P11-314 a. This analysis was performed as part of the Draft EIR. The MW produced were estimated based on industry standard steam rates.

b-e. Please refer to Master Responses N4 and N7.

P11-315 The reservoir model is proprietary. Please refer to Master Response A6.

P11-316 a. Figure 5.2-1 was not produced by Coso. It was based on the projected production and estimated steam rates (discussed above).

b. The results of the model were provided by Coso as noted by the commenter in the paragraph above.

c. Please refer to Master Response A6.

d-e. Please refer to Master Response N7.

P11-317 The variation in power generation output in MW between that projected with and without additional injection varies according to differences in the simulated (using the Coso Reservoir Model) total production and enthalpy. Because the enthalpy and total flow vary at different rates in both scenarios, the difference plotted in Draft EIR Figure 5.2-1 varies. For example, enthalpy with injection peaks about 1 year after injection begins, while without injection, it peaks about 8 years later, then declines.

P11-318 Please refer to Master Responses N4 and N8.

P11-319 Please refer to Master Response N1 for discussion of the BLM Geothermal Programmatic Leasing EIS and its relation to the proposed project.

P11-320 Please refer to Master Response A6.

P11-321 Please refer to Master Responses L2 and L5.

P11-322 a-d. Please refer to Master Response L2.

P11-323 a-c. Please refer to Master Response L2.

P11-324 Please refer to Master Response L2. Policies PSU-3 and PSU-3.1 of the Inyo County General Plan are contained in the Public Services and Utilities section of the Land Use Element of the Inyo County general plan. These policies pertain to the *domestic* water supply of Inyo County; they do not pertain to the proposed project, which does not involve domestic water use. See the listing of relevant policies of the Inyo County General Plan to the proposed project beginning in the first full paragraph on page 3.2-32 of the Draft EIR.

P11-325 The comment is noted.

P11-326 Please refer to Master Response L2.

P11-327 Please refer to Master Response L2.

P11-328 a-b. Please refer to Master Response L2.

P11-329 The comment is noted.

P11-330 Please refer to Master Response A6. The water saved by using air cooled system if re-injected would subsequently reduce or reverse the decline in production. However, the air cooled system itself can cause a drop in plant power generation in summer by over 50% (Kutscher and Costenaro 2002). Therefore there would still be a net loss in power generation relative to increasing injection as proposed in this project

P11-331 a. The commenter’s opinion is noted.

b. The Draft EIR team.

c. Coso provided the subject assessment which was reviewed for reasonableness by geothermal power generation experts on the Draft EIR team.

d. The public had a 45-day review of the Draft EIR in accordance with CEQA.

P11-332 The phrasing that the project alternatives are not “competitive” implies that the project alternatives are not reasonable in that they would not feasibly attain the basic project objectives and avoid or substantially lessen any significant effects of the project.

P11-333 a-g. Please refer to Master Response L2.

P11-334 a. Analysis of alternative sources of water is presented in the Draft EIR Section 5.2.3, Table 5.2.2, and is addressed in Master Response L2. The first two wells in this table represent wells in the Coso Basin. These wells have insufficient flow rates to be considered as an alternative water source.

b. There is some evidence that there are is deep basin groundwater flow through the Coso Basin (Guler 2002; Williams 2004) to Indian Wells Valley. However, groundwater wells are scarce and are of low productivity (OB-1 and OB-2, see Draft EIR Table 5.2.2), suggesting that it is unlikely that there are sufficiently productive aquifers to meet the project objectives.

c. Williams (2004) and Gruler (2002) have used hydrochemical means for evaluating deep interbasin groundwater flow in the region and suggest that there could be over 3000 ac-ft of recharge to Indian Wells valley through the Coso Basin (Williams 2004)

d,e. Regardless of the potential flow at some depth within the basin, the water must be accessible through a water well with a reasonable flow rate. The available information shows that the Hay Ranch wells are most appropriate to provide a reasonable flow rate. The pumping test data for OB1 and OB-2 are proprietary information owned by Coso.

f. We are not aware of a hydrogeologic or numerical simulation of the Coso basin. The Coso Wash sub-basin was partially included in the ITSI hydrogeological analysis of the Coso geothermal system. Modeling of the Coso basin was outside the scope of the Draft EIR

g-h. Please refer to Master Response L2.

P11-335 a-b. Please refer to Master Response L2.

c. Comment noted, and is included in the project record. There is no record of a *Save Round Mountain* Case in which Inyo County was the defendant; however, there is a record of *Save Round Valley* case in which Inyo County was the defendant.

P11-336 a. Please refer to Master Response L2.

b. According to Caithness Energy, the owner of Coso, the combined name plate rating of the BLM power plants is 90MW. The name plate rating of the Navy I power plant is 90 MW. The name plate rating of the Navy II power plant is 90 MW.

c. Please refer to Master Response L2.

P11-337 Please refer to Master Response L2.

P11-338 Please refer to Master Response L2.

P11-339 a. Please refer to Master Response L2.

b. Coso has drilled into a deep reservoir in the East Flank and in the Southwest (Dilley et al. 2006). Some wells are over 13,000 ft. Given the high temperatures at Coso, this is considered to be near the practical maximum depth for geothermal wells (approximately 12,500 ft). Drilling costs increase exponentially with depth (Bloomfield and Laney 2005).

c. There are some reports available in the public domain such as those referenced in the report. Much of the data on the Coso geothermal reservoir remains proprietary.

d. A well drilled to 15,000 ft costs about three times as much as a well drilled to 10,000 ft and the risk is higher. In some areas of Coso, the deep reservoir temperatures exceed both commercially available drilling capacity and the ability of the rocks to maintain permeability and therefore deeper drilling is not useful.

P11-340 a. Please refer to Master Response B4.

b. Please refer to Master Response M2.

c. Speculation regarding Coso's intention to violate CUP and approval conditions is beyond the scope of this EIR.

P11-341 Please refer to Master Responses B4 and C2.7.

P11-342 a. Please refer to Master Response L4 for discussion of the No Project Alternative.

b. Please refer to Master Response L2.

c-d. Please refer to Master Responses N6 and N7.

P11-343 Please refer to Master Response L2.

P11-344 Please refer to Master Response L5 for discussion of CEQA requirements and economic analysis.

P11-345 Section 5.4.1 discusses an **alternative** to the mitigated project. The mitigated project has been discussed in detail in Section 3.2 and Appendix C (including Figure C4-2), and is not the subject of this section.

Alternatives 1 and 2 would be subject to the same constraints as the mitigated project, and could not:

- Reduce groundwater flow to Little Lake by more than 10%
- Decrease groundwater levels at the northern end of Little Lake by more than 0.3 ft

This is presented clearly in Section 5.4.1 of the Draft EIR.

P11-346 Please refer to Master Response L3 for discussion of how environmentally superior alternatives were compared to each other.

P11-347 a. The Hydrology Model was properly calibrated to predict potential drawdown impacts from pumping at the rates and durations cited in the comment. Please refer to Master Response C2.5 for discussion of model calibration procedures.

b. Alternatives 1 and 2 clearly are superior to pumping 4,839 ac-ft/yr for 30 years because either alternative would result in less drawdown and less impact to Little Lake.

P11-348 The commenter's opinion regarding the preferred alternative is noted.

P11-349 Please refer to Master Response L4. See the discussion of rejecting the No Project Alternative as the environmentally superior alternative beginning in the last paragraph on page 5-11 of the Draft EIR.

P11-350 Please refer to Master Responses L2 and L5.

P11-351 The project plans shown on sheet G5 in Appendix B were drawn in 2004, as noted on sheet G5. The project plans have been changed since the circulation of the Draft EIR; as such, acreage has also changed. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts and only clarify and amplify the conclusions from the Draft EIR. Please refer to Table 2.3-2 in Comment P12-3 for the updated acreage of the proposed project.

P11-352 The pond is an already-existing pond associated with the well pad. Analyzing the effects of the existing environment is not required under CEQA.

P11-353 a. See the discussion of the pipeline beginning in the fourth full paragraph of page 2-11 of the Draft EIR.

b. See the discussion of impacts to soils from the pipeline during operation beginning in the seventh full paragraph on page 3.3-14 of the Draft EIR.

c. See the first full paragraph on page 3.3-15 of the Draft EIR for a discussion of impacts to soils from the pipeline decommissioning.

d. The pipeline would be abandoned in place. No soil subsidence would occur.

P11-354 Please refer to Master Response C2.

P11-355 Please refer to Master Response C4.

P11-356 Comment noted, and is included in the project record.

P11-357 a. The comment is noted.

b-c. Please refer to Master Response A3.

d. It is not required by CEQA nor standard practice to sign sections of an EIR.

P11-358 a. The comment is noted.

b-c. Please refer to Master Response A3.

P11-359 Please refer to Master Response A3 for discussion of the qualifications of the preparers of the Hydrology Model.

P11-360 a. The flow rate at Davis Spring was measured to evaluate whether the spring was influenced by the 14-day pumping test at Hay Ranch.

b-c. Davis Spring was not included in the Hydrology Model because of its remote distance from and elevation above the Hay Ranch pumping location. No impacts to the Davis Spring are expected due to pumping at Hay Ranch. Please refer to Master Response C3.3 for discussion of for Potential Impacts to Currently Flowing Springs.

P11-361 a-c. The 14-day pumping test confirmed that there was no impact to the Davis Spring. Please refer to Master Response C3.3.

P11-362 a. Please refer to Master Response C2.2 for discussion of the sensitivity analysis of the Hydrology Model.

b-f. Please refer to Master Response C2.2.

g-h. Please refer to Master Response C3.3

P11-363 a. The comment is noted.

b. See Appendix C2 of the Draft EIR for a full discussion of the groundwater model. Please refer to Master Response C2.2 for discussion of pumping test.

c. The HMMP describes monitoring that would be conducted to evaluate aquifer parameters in response to pumping both Hay Ranch wells. The HMMP also includes model recalibration requirements that are mandated within one year of the startup of the pumping, and additionally if the longer term pumping data show significantly different results from the model results. These measures would be taken to provide real-time feedback that would allow for the effects of pumping to be closely monitored, to be protective of the groundwater/surface water supplies in Rose Valley.

P11-364 Please refer to Master Response C2 for discussion of the general reliability of the Hydrology Model.

P11-365 a. The comment is noted.

b. The discharge of groundwater to Little Lake may occur as diffuse groundwater seepage through the pores between soil particles, over a broad area beneath Little Lake, rather than through springs. The location of any springs beneath Little Lake, if present, were not mapped for the Draft EIR.

c. The springs will flow (operate) when the elevation of the spring discharge point is lower than prevailing groundwater hydraulic head elevations, and, a flow path exists that connects the aquifer to the spring discharge points.

P11-366 A weir is a small dam that is used to raise the water level of a river or stream. Water can flow over the top of the weir at high water levels.

P11-367 a. The Little Lake Canyon springs have been added to Figure C2-1. The addition is not significant new information that would require recirculation of the EIR.

b. The Little Lake Canyon springs lie in an area mapped by the USGS as bedrock, and are therefore not part of the unconsolidated sediments that make up the Rose Valley aquifer. As such, drawdown in the Rose Valley aquifer is unlikely to have any impact on the Little Lake Canyon springs. Please refer to Master Response C.3 for discussion on springs.

c. The underground water near the springs must be at a higher hydraulic head pressure than the elevation of the spring discharge point for the springs to function.

d-e. Spring flow would not be affected by changes in groundwater elevation unless the springs are hydraulically connected to the aquifer from which Hay Ranch extracts groundwater. Please refer to Master Response C3 for discussion on springs.

P11-368 a. The 14-day pumping test confirmed that there was no impact to the Davis Spring. Please refer to Master Response C3.3 for discussion of Potential Impacts to Currently Flowing Springs.

b. See Section 3.2.1 on page 3.2-5 of the Draft EIR for a discussion of the springs in Rose Valley and their relationship to the groundwater system.

P11-369 a-c. Please refer to Master Response C3 for discussion on springs.

P11-370 Please refer to Master Response C3.2 for discussion of Rose Spring.

P11-371 Edits have been made to the text for clarification, as shown below. The addition is not significant new information that would require recirculation of the EIR.

Page C2-6

At the south end of Rose Valley, groundwater flow through the Little Lake Gap is constrained by bedrock on the west, an apparent subsurface bedrock rise below, and low or reduced permeability in the basalt lava flows to the east. The ground surface in the area slopes to the south, gently between the northern property line and Little Lake, then more steeply south of Little Lake. As a result of the combination of south-sloping ground surface and bedrock barriers to lateral or vertical groundwater flow, groundwater surfaces in this area to discharge via submerged springs into Little Lake and from the Coso Spring southeast of Little Lake (Figure C2-2). Groundwater discharging from the Coso Spring flows into the upper Little Lake pond (P-1). A siphon well located south of Little Lake (below the elevation of Little Lake, but higher than~~and~~ Coso Spring) brings additional groundwater to the surface where it is piped to the lower Little Lake pond (P-2). The intake for the siphon well is lower than the Little Lake weir but higher than the Coso Spring. The siphon well is believed to be screened between elevations of approximately 3,120 and 3,130 ft MSL. Coso Spring is located at an approximate elevation of 3,120 ft MSL.

P11-372 No changes were made. See previous responses to this comment.

P11-373 Please refer to Master Response C4.4 for discussion on significance criteria of the HMMP.

P11-374 a. These features are outside the southern extent of the model grid. No attempt was made to represent these features in the model, nor do they need to be.

b. The amount of discharge from the upper pond and lower pond are not known, and these features are outside the model boundaries.

c. The comment is noted.

d. None of these additional discharge points were used to describe and create the Hydrology Model (see response to (e) below).

e. Surface water flows on the Little Lake Ranch property that are not lost to evaporation or plant transpiration reinfiltrate into the ground and then flow towards Indian Wells Valley, as described in Section 3.2. Evaporation losses and reinfiltration rates from surface water features south of Little Lake have no impact on water levels in the lake because of the southerly groundwater flow direction. Consequently, it is unnecessary to describe the various surface water features on the southern portion of the property or the amount or variation in water transfers between these features to evaluate the amount of groundwater flow available to the ranch property after implementation of the proposed project.

P11-375 Please refer to Master Response C2.3 for discussion on Southern Extent of Model Domain.

P11-376 As stated in Table C2-4 on page C-11 of the Draft EIR, a value of 3,000 ac-ft/yr was used in the Hydrology Model for underflow to Indian Wells Valley through the Little Lake gap from Rose Valley.

P11-377 Acre-feet per year (ac-ft/yr) are used consistently throughout the Draft EIR. Edits have been made to Appendix C2, page C2-10 to reflect consistent units as shown below.

Page C2-10

Existing Extraction Wells

Currently, approximately 50 acre-ft/yr of groundwater production from wells occurs in Rose Valley. No significant agricultural irrigation has occurred in the valley since the Hay Ranch ceased alfalfa growing operations. As many as 30 domestic wells are believed to extract relatively small quantities of groundwater for domestic uses and small scale irrigation in the Dunmovin area. This pumpage is not represented in the groundwater flow model because it is believed to amount to less than 10 acre-ft/yr. The LADWP, Cal-Pumice, and Hay Ranch wells are not being pumped and are not known to have been used in the last five years. The Coso Ranch South well, southern Coso Junction Store well (Coso Junction #2), and the Cal Trans well at Coso Junction are regularly used for businesses in the area. The Coso Ranch North well and northern Coso Junction Store well (Coso Junction #1) are not being used at present. Cal-Pumice and the cinder mine near Red Hill reportedly takes 5 to 10 truckloads of water a day during the week from the Coso Ranch South well and Red Hill well, respectively, which was set in the model as a continuous withdrawal of ~~2005 cubic feet per day (cfd)~~ 16.8 acre-feet per yr, or roughly 10 gpm. The Coso Junction Store well supplies the general store and COC offices in Coso Junction and was also represented as a continuous withdrawal of 2005 cfd. Extraction from the Cal Trans well was assumed to be negligible. Wells on the Navy property in Rose Valley including the Lego well, well G-36, and well 18-28 are not being pumped. Water wells on the Little Lake Ranch property were discussed in the previous section.

P11-378 The fact that Little Lake Ranch provides water to the Cinder Block facility was not known at the time the model was developed. The consumptive use of 6.3 ac-ft per year of groundwater on the Little Lake Ranch property for drinking water supply and irrigation and/or sale to off-site users is unlikely to significantly impact water levels on the property. Any exportation of water would be factored into the model recalibration in the future. The existing groundwater exportation is part of the baseline condition. The baseline is the habitat and lake level with the exportation project. The fact that Little Lake Ranch is able to export groundwater suggests flexibility in the water use to maintain habitat at Little Lake Ranch. The significance threshold of 10 percent decrease in groundwater flow into Little Lake would be from the baseline condition, which includes the exportation project. The proposed project would not require that Little Lake stop providing water to the pumice mine.

P11-379 a-c. Please refer to Master Response C2 for discussion on southern extent of model domain and boundary conditions represented in the model.

d. The location of Little Lake Gap is shown Figure 3.2-2 of the Draft EIR.

e. Features that are significant in the hydrology of Rose Valley are included in the figures in this section of the Draft EIR.

f. The location of the power plant is shown on several other figures in the Draft EIR. It is not necessary to show and affects the scale of the map on Figure C2-1.

g. The Coso power plants are categorically outside the boundaries of the Rose Valley aquifer.

P11-380 The County is aware of the water level anomalies in the south end of the valley associated with the low permeability bedrock. This area is outside of the unconsolidated aquifer, and is not part of the model. It is not necessary to study this issue for the Draft EIR. It would be addressed with the monitoring program described in the HMMP.

P11-381 Appendix C2 has been revised to include figures depicting alluvial aquifer thickness and model layer bottom elevation. Please refer to Master Response C2.1 for discussion regarding aquifer thickness represented in the Hydrology Model. Figure revisions are shown in Chapter 3: Errata of this Final EIR.

P11-382 Evapotranspiration that occurs outside the model boundaries is considered in the water balance of the model, in that it affects the flow of water into or out of the model boundaries, as a boundary condition. See page C2-9 in the Draft EIR for a discussion on evaporation and evapotranspiration. Table C2-4 on page C2-11 in the Draft EIR shows a conceptual groundwater budget component matrix.

P11-383 Please refer to Master Response C2.3 for discussion on the southern extent of model domain.

P11-384 a-d. Please refer to Master Response C2.3 for discussion on model calibration procedures.

P11-385 a-b. Water levels in the Coso Ranch North well rose and fell nearly 0.8 ft in response to barometric pressure fluctuations during the November/December 2007 pumping test. These fluctuations dwarfed the drawdown caused by pumping the Hay Ranch well which was estimated to range from 0.1 ft to at most 0.3 ft. No clear drawdown response was observed in the Coso Junction Store #1 well which is located 10,900 ft south of the Hay Ranch wells, just 1,200 ft further south than Coso Ranch North well. The lack of apparent response in the Coso Junction Store #1 well supports the interpretation that the drawdown response in the Coso Ranch North well was low, and closer to 0.1 ft. For that reason, the Hydrologic Model appears to reasonably match the pumping test drawdown response in the two wells.

P11-386 Please refer to Master Response C2 for discussion regarding the specific yield.

P11-387 a-d. The data gaps identified in Section C2-3.5.5 on page C2-17 of the Draft EIR do not need to be filled prior to approving the proposed project. The existing data is sufficient to evaluate whether or not the proposed project can proceed, with implementation of mitigation measures as needed to address project related impacts.

P11-388 a-e. Please refer to Master Response C2 for discussion regarding the specific yield.

P11-389 A discussion of the estimation of specific yield based on soils described in lithologic logs available for Rose Valley is described in Section C2-4 on page C2-18 of the Draft EIR.

P11-390 Mitigation measures were developed based on a specific yield of 10%. The rationale for estimating specific yield values for long-term pumping is presented in Section C2-4 on page C2-18 of the Draft EIR. The 10% specific yield value is consistent with the value identified by Danskin (1998) based on calibration of the Owens Valley model to the actual response of the aquifer and the existing long-term pumping data.

P11-391 See Master Response C2 for discussion regarding hydraulic conductivity values at the north end of Rose Valley. Lower transmissivity values were identified at the north end of Rose Valley on the LADWP property than elsewhere in the valley. This aquifer characteristic will make it difficult to implement the Haiwee Reservoir Seepage Recovery project with the two existing extraction wells as proposed by the LADWP, as stated in the Draft EIR. However, the fact that lower transmissivity values were identified in the northern end of the valley by the hydrologic analysis conducted for the EIR has no bearing on the quality of the simulation or potential for impacts south of Hay Ranch.

P11-392 a. All of conclusion set forth in Draft EIR were based solely upon the projected pumping rate, except for in the cumulative impacts section (Section 4.3 on page 4-4 of the Draft EIR), where the cumulative impacts of the South Haiwee Reservoir Recovery Project on the Hay Ranch Project are considered.

b. The only conclusions from the combined Coso project and the proposed LADWP project is listed in cumulative impacts section (Section 4.3 on page 4-4 of the Draft EIR).

c. The timing, or even the likelihood, of this project occurring is uncertain. The text in Section 4.3 presents the results of the simulation of additional pumping of groundwater by the South Haiwee Reservoir Recovery Project. It is not judged to be necessary at this time to present graphs and figures of the cumulative effects of this potential project, which has not been permitted. Please refer to Master Response K2.

P11-393 The comment is noted. Edits have been made to the text for clarification, as shown below. The addition is not significant new information that would require recirculation of the EIR.

Page C2-20

Potential measures to mitigate possible impacts to groundwater resources of Rose Valley caused by implementation of the full development project rate of 4,839 acre-ft/yr extraction from the Hay Ranch wells were evaluated using the numerical groundwater flow model. The mitigation measures evaluated consisted of:

- Re~~ducing~~stricting Hay Ranch pumping rates ~~below~~from surpassing the full project development rate of 4,839 acre-feet per year, assuming a specific yield of 30%;
- Reducing Hay Ranch pumping duration from the full project duration of 30 years; and,
- Augmenting the water supply to Little Lake by extracting groundwater on the Little Lake Ranch property and pumping that water into the lake.

Techniques for evaluating potential groundwater table drawdown and changes to groundwater flow rates used in the evaluation of potential mitigation measures are the same as those described in Section C2-4 and are not discussed further here.

P11-394 The comment is noted.

P11-395 The comment is noted. This comment states that the water level in Little Lake was restored to “its pre-existing condition” by pumping water from a well on the property into the lake after an earthquake opened a fissure in the bottom of the lake. Elsewhere in the September 3, 2008 letter from Mr. Arnold it is stated that this was the Little Lake North Dock well which is located immediately north of Little Lake. The comment on the bottom of page 89 of the letter appears to suggest that the well was utilized for at least 5 years between 1971 and 1976 after which Little Lake members dug out the springs feeding Little Lake which had become clogged. The comment suggests that groundwater diversion successfully kept the reservoir full during a period when the springs were not supplying sufficient water because they had become overgrown and clogged and a fissure in the bottom of the reservoir was allowing water to escape. This anecdotal history indicates that augmenting lake levels by pumping a well on the property for extended periods is in fact feasible. The comment does not mention any adverse impacts to Coso Spring or the other hydrologic features on the property.

P11-396 Little Lake Ranch’s counsel has stated that Little Lake Ranch has previously pumped a well north of Little Lake to restore water levels in the lake. Counsel has also stated that Little Lake Ranch has pumped a well on the property north of the lake and sold surplus groundwater to the nearby pumice mine without causing irreparable harm to Little Lake or its springs. Therefore, the concept of augmentation is neither unsupportable nor contrary to basic reason.

The Draft EIR stated that augmentation would have less impact if pumping occurred south of Little Lake.

Little Lake it is most sensitive to changes in the groundwater table elevation because it is positioned right at the groundwater table. Most of the groundwater passing through the Little Lake Gap passes beneath the Lake. Because of vertical anisotropy, a well positioned with the screen open at the bottom of the aquifer would reduce impacts to features at the top of the water table.

As stated in the Draft EIR, the impact would be minimal if the augmentation well was positioned south of Little Lake downgradient of where the springs feed the lake.

The system would assume a new steady-state configuration because there is no net change in the groundwater budget (water won't be removed from the Little Lake Ranch property, it would just be moved around).

The comment is a philosophical question, but it seems that a man-made solution to a man-made effect to a man-made lake is appropriate. The last comment is out of scope of this EIR.

P11-397 a. Discussion of the results of the simulation are discussed in Appendix C2, Section C2-5.1 on page C2-20 of the Draft EIR.

b. There were no charts or graphs prepared to show the impact from this proposal.

c. The simulation results depend on the scenario evaluated. Augmentation for pumping the Hay Ranch wells at the full project rate for 30 years requires groundwater diversion longer than pumping at lesser rates or for shorter durations. However, because the mitigated pumping alternative (pumping at 4,839 ac-ft/yr until trigger levels are reached) is not predicted to significantly impact Little Lake, augmentation should be unnecessary.

d. Augmentation of pumping would not be necessary with the mitigated alternative.

e. This information is conceptually presented in Section 3.2 beginning on page 3.2-1 of the Draft EIR, with more details presented in Section C2-5.1 of Appendix C2 on page C2-20 of the Draft EIR.

P11-398 a. As stated in Appendix C4, page C4-12, a survey of the locations and elevations of Little Lake surface water features consistent with the bench mark used for other monitoring wells referenced in the HMMP would be performed at the start of the baseline monitoring period.

b. The only confusion identified by Mr. Arnold was whether the "Cinder Road Red Hill well" and "Red Hill well on Cinder Road" refer to the same well (they do); and, whether the "Little Lake Ranch North Dock well" and the "Little Lake Ranch North well" are the same well (they are not). These features are clearly and consistently labeled on figures presented in the Draft EIR. The following changes have been made to clarify the table on page C4-7 of the Draft EIR.

Page C4-7

Table C4-1: Drawdown Trigger Levels (in feet)

Project Elapsed Time, years	Dunmovin Area well	Pumice Mine well	Hay Ranch Observation well	Coso Ranch North well	Coso Junction #1 well	Navy G-36 well	Navy Lego well	Cinder Road, Red Hill ~~Cinder Road~~ well	Navy 18-28 well	Little Lake Ranch North well
	Distance from Hay Ranch South Well (feet)									
	9,000	***6,100***	***1,300***	***9,700***	***10,900***	***26,000***	***27,300***	***32,000***	***38,000***	***42,600***
0.25	<0.2	0.5	3.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
0.5	0.3	1.3	4.7	0.4	0.3	<0.2	<0.2	<0.2	<0.2	<0.2
0.75	0.7	3.3	8.1	0.9	0.7	<0.2	<0.2	0.2	<0.2	<0.2
1	1.1	5.3	11.5	1.4	1.2	<0.2	<0.2	0.2	<0.2	<0.2
1.2	1.5	6.9	13.2	1.8	1.5	0.2	0.2	0.3	<0.2	<0.2
1.25	1.6	7.1	11.8	1.9	1.6	0.2	0.2	0.3	<0.2	<0.2
1.5	1.9	7	7.9	2.1	1.8	0.2	0.2	0.3	<0.2	<0.2
1.75	2.1	6.5	6.9	2.3	2	0.3	0.3	0.3	<0.2	<0.2
2	2.3	6	6.2	2.4	2.1	0.3	0.3	0.4	<0.2	<0.2
3	2.7	4.8	4.8	2.5	2.2	0.5	0.4	0.4	<0.2	0.2
4	2.8	4.1	4	2.5	2.2	0.6	0.6	0.5	0.2	0.3
5	2.7	3.6	3.5	2.4	2.2	0.7	0.7	0.6	0.3	0.3
Maximum Acceptable Drawdown (in feet)	2.8	7.2	13	2.5	2.3	1.1	1.1	0.7	1	0.4
Time to Max drawdown (years since pumping began)	4	1.3	1.2	3	3.5	14.5	15	12	22	13

NOTES

1) For any wells where predicted drawdown is less than or equal to 0.25 feet, actions related to these trigger points shall not be enforced, unless the drawdown seen in these wells is greater than 0.25 feet. Drawdown values of <0.25 feet are difficult to accurately detect.

2) Based on current groundwater flow model results, these maximum drawdown values listed above result from pumping the Hay Ranch production wells at design rates for 1.2 years, with specific yield values of 10%. These maximum acceptable drawdowns can occur several years after pumping at Hay Ranch ceases.

P11-399 a-b. The map was drawn with a 5 ft contour interval; there isn't a 5 ft contour running through the North Dock Well.

c. Table C2-1 in the Draft EIR does not list the North Dock Well because it was not made available to Geologica/Inyo County during the pumping test, it has not been surveyed, and consequently, a groundwater elevation cannot be calculated.

P11-400 a. Appendix C3 is a compilation of existing data. Not all analyses available were complete.

b. There is a wide range of data available on water quality in Rose Valley. Given the evidence that the impacts to water quality are unlikely to be significant, the available data is sufficient.

P11-401 a. The comment is noted.

b-c. Groundwater elevations are based on observations made in November 2007. Mountain front recharge, groundwater inflow from the north, and groundwater discharge to the south are all based on averages. Please refer to Master Response A6 for discussion of baseline studies.

d-e. The Hydrology Model does not predict what would happen in drier years as compared to wetter years. This data was not analyzed or simulated.

f. Hay Ranch is located 9 mi north of Little Lake and a number of wells would be monitored between Hay Ranch and Little Lake, the Rose Valley Hydrologic Monitoring Team, however it is constituted, would have ample time to review groundwater drawdown trends throughout Rose Valley and conclusively decide whether a wave of drawdown is developing that would adversely impact Little Lake and thus require reducing or ceasing pumping at Hay Ranch. Thedecision to shut down the Hay Ranch wells would not be based solely on water level changes at Little Lake.

P11-402 See the first full paragraph on page 3.2-43 of the Draft EIR for discussion of potential drawdown at Little Lake North Dock well and impacts to Little Lake under full project pumping at a rate of 4,839 ac-ft/yr for 30 years.

P11-403 The comment is noted. The definition of the word *manipulate* is: handle, manage, or use, especially with skill, in some process of treatment or performance. The Draft EIR contains an accurate depiction of the activities at Little Lake. Little Lake is not a natural body of water; it is manipulated to retain its current state.

P11-404 The Draft EIR has been revised to refer to the November/December pumping test as a “14-day pumping test” rather than a “long-term” test. See Chapter 3: Errata of this Final EIR. It should be noted that pumping tests commonly run for shorter time periods, and the 14-day pumping test that was conducted here is relatively long compared to typical tests. It is when this time is compared to the length of time that pumping would be conducted for the Hay Ranch proposed project, that the length of time for the pumping test is relatively short, in comparison.

P11-405 a. The comment is noted.

b. See the third full paragraph on page 3.2-31 of the Draft EIR for a statement that notes that water would be transferred from the Rose Valley groundwater basin to the Coso groundwater basin. Figure ES 1-2 on page ES-3 of the Draft EIR shows that water would be pumped from the Rose Valley Basin and transferred out of the basin for use at the Coso geothermal field.

P11-406 Please refer to Master Response C2 for a discussion regarding the specific yield.

P11-407 The comment is noted. The Draft EIR states that the projected drawdown of 3 to 11 ft after 30 years of pumping at the full project rate would cause unacceptable impacts.

The text cited in Section C4.2.3 on page C4-5 of the Draft EIR reads “[…]greater than 10% reduction in water flowing into surface water features[…]”, not “[…]greater than 10% reduction in water falling into surface water features[…]”, as stated in the comment. No new terminology was intended. Changes to groundwater elevation (drawdown) and changes in groundwater flow are both relevant to the discussion of impacts to Little Lake.

The reader is confusing the unacceptable drawdown at full pumping rates for 30 years (3 ft to 11 ft) with the drawdown of the mitigated project (0.3 ft). This is stated repeatedly in the text (for examples, see pages C4-4, C4-5, C4-6, and C4-7 in the Draft EIR).

Please refer to Master Response C2 for discussion regarding elevations from predicted draw downs.

P11-408 a. The text on page C4-4 of the Draft EIR cited by the commenter clearly describes the predicted effects of pumping at the full project rate of 4,839 ac-ft/yr for 30 years. The figure (C4-2) and discussion on page C4-6 of the Draft EIR describe the predicted impacts of the proposed mitigated project which involves pumping at the full project rate for a lesser duration of as little as 1.2 years and represents our best estimate of potential impacts. Figure C4-2 has in its title that the figure is of the Early Pumping Termination (1.2 years) Simulation Results.

b. See Figure 3.2-16. The figure presented on page C4-6 of the Draft EIR (Figure C4-2) is most appropriate for evaluating the potential effects of the mitigated project.

c. The basis for specifying specific yield is discussed in Master Response C2.2 on specific yield. No predictive simulations were conducted with the 3% specific yield value because it underestimates long-term yield of the aquifer.

P11-409 a. See responses to previous comments regarding Davis Spring, Tunawee Canyon Spring, and Rose Spring.

b. Please refer to Master Response C3 for discussion regarding springs.

P11-410 a. See Table 3.2-7 on page 3.2-48 of the Draft EIR for drawdown trigger levels for other wells.

b. The comment is noted. Please refer to Master Response C4.4 for discussion of significance criteria for impacts to hydrology.

c. The comment is noted.

d. Please refer to Master Response C2.7.

e-f. The comment is noted.

g. Please refer to Master Response C2.7.

P11-411 a. Figure 3.2-16 on page 3.2-44 of the Draft EIR shows the impacts of the proposed project pumping at a rate of 4,839 ac-ft/yr for 30 years.

b. See Master Response A4 for discussion of how impacts were addressed in the Draft EIR (30-year duration).

P11-412 a. Section C4.2.3 in the Draft EIR discusses impacts to vegetation because the baseline physical conditions of Little Lake, including vegetation, are relevant to determining significance criteria. Please refer to Master Response C4.4 for discussion of significance criteria for more discussion of the determination of significance criteria.

b. Please refer to Master Response E2. The commenter is incorrect in stating that alkali cordgrass is listed as “very rare and endangered” by the CNPS. The 1B CNPS list includes rare and threatened species. Spartina gracilis is on List 4: Plants of limited distribution. The CNPS website states that “The plants in this category (List 4) are of limited distribution or infrequent throughout a broader area in

California, and their vulnerability or susceptibility to threat appears relatively low at this time. ***While we cannot call these plants "rare"*** from astatewide perspective, they are uncommon enough that their status should be monitored regularly. Should the degree of endangerment or rarity of a List 4 plant change, we will transfer it to a more appropriate list."

c. The comment is noted.

P11-413 a. Please refer to Master Response E2 for a discussion of impacts to vegetation, and indirect impacts to wildlife from loss of vegetation.

b. Please refer to Master Responses C4.4 and E4 for discussion of significance criteria/water loss in desert.

c. Please refer to Master Response E2 for a discussion of impacts to vegetation.

d. Please refer to Master Response E2 for a discussion of indirect impacts to wildlife/wildlife habitat.

e. Please refer to Master Response E5 for a discussion of impacts to migratory birds.

f. The comment is noted.

P11-414 The comment is noted. The Hydrology Model would be revised if it takes longer for the drawdowns to occur than predicted. Coso would not be allowed to continue pumping if a "huge cone of depression" is being created at Hay Ranch, because there are trigger levels and maximum allowable drawdown values at Hay Ranch, and a number of other intermediate points between Hay Ranch and Little Lake, that would be monitored to detect unacceptable amounts of drawdown and to take appropriate action to stop it from propagating. The pumping would not continue unless the Inyo County Water Department determines that continued pumping would not impact Little Lake. The trigger levels are set to prevent exceedance of the maximum allowable groundwater drawdown, at any point in the future.

The proposed mitigation measures are designed to prevent significant impacts from pumping from occurring at any time during the project, during pumping or after pumping ceases.

P11-415 Please refer to Master Response C4 for discussion of Mitigation and Monitoring. Please refer to Master Response C4 and the response to comment P4-7 for discussion of mitigation and monitoring. The trigger levels in wells located upgradient of Little Lake serve as an early warning system to prevent the drawdown of more than 0.3 feet at Little Lake.

P11-416 The comment is noted.

P11-417 a. Please refer to Master Response C4.

b. The comment is noted. See Table 3.2-7 on page 3.2-48 of the Draft EIR for drawdown trigger levels for other wells.

c. The public, including Little Lake Ranch has been invited to take part in the environmental review with the opportunity to submit comments regarding the process.

d. Coso is not in charge of the design and evaluation of the environmental review tests for the proposed project. Coso has provided funds for the county to hire a county-approved and qualified environmental assessor. Please refer to Master Response C4.

e. Please refer to Master Response C4.

P11-418 Please refer to Master Response C4 for a discussion of mitigation and monitoring. Trigger levels have been set, that are lower than the Maximum Acceptable Drawdown values that would have to be exceeded at earlier points in time, in order for a Maximum Acceptable Drawdown value to be exceeded. Actions such as cessation of pumping would be required, to prevent the Maximum Acceptable Drawdown values from being exceeded.

P11-419 a-c. Please refer to Master Response C4 for discussion of Mitigation and Monitoring. The trigger levels identified in Table C4-1 are designed to do what the commenter says the “maximum drawdown triggers” should do. They are in essence an early warning system, to prevent the Maximum Acceptable Drawdown values from being exceeded. The trigger levels are based on model results, for a duration of pumping currently estimated to be 1.2 years. However, if the actual aquifer response to pumping is different than simulated and the trigger levels are reached earlier or later, the duration of pumping would be shorter or longer than 1.2 years so as to prevent significant impacts from occurring.

P11-420 a-c. See response to comment P11-419, and please refer to Master Response C4 for a discussion of mitigation and monitoring.

P11-421 a-d. Please refer to Master Response C4 for a discussion of mitigation and monitoring.

P11-422 a-d. Please refer to Master Response C4 for a discussion of mitigation and monitoring

P11-423 a-g. Please refer to Master Response C4.2 and C4.5 for a discussion of mitigation and monitoring. The evaluation of Rose Valley water wells (not monitoring wells) depths and water level reporting frequency is to be semi-annual, as stated on page C4-8; this is reasonable given the relatively small amounts of drawdowns expected and the length of time it takes for water levels to respond to pumping. The County would evaluate water levels in identified monitoring points, as specified in Table C4-2, and take appropriate action if trigger levels are exceeded, including model re-calibration and reduction or cessation of pumping if warranted. The County must be allowed some degree of flexibility in evaluating exceedance of trigger levels; for example, if a trigger level were exceeded in a monitoring point because there was substantial increase in pumping of a nearby well, not associated with the Hay Ranch project, the County must have the flexibility to evaluate the significance of that single monitoring point.

P11-424 a. The text does not state that a trigger level would be adopted for the Little Lake North Dock Well. It is not even mentioned on the page referenced, page C4-8.

b. As shown in Table C4-2, the Little Lake North Dock Well would be monitored for water levels to improve the understanding of the relationship between Little Lake and the underlying groundwater, but would not be used as a monitoring point for trigger level. Please refer to Master Response C4 fordiscussion of monitoring points and trigger levels.

c. A number of wells have been selected to provide a representative network of monitoring points over Rose Valley. There is no need for all wells, and it is not appropriate for many wells, to be monitored and used for trigger levels in Rose Valley. The Draft EIR is clear, in Table C4-1, which wells would be used for monitoring of trigger levels.

P11-425 a-l. The comment is noted. Please refer to Master Response C4 for discussion Mitigation and Monitoring.

P11-426 a-c. The phrase "or substantially deplete the water availability to the springs and wetlands" has been deleted from pages C4-9, 3.2-49, and ES-16 because it is redundant with the specified groundwater drawdown trigger levels established to protect Little Lake. This change is not significant new information that would require recirculation of the EIR.

d. As stated on page C4-17, the model would be recalibrated within 1 month of a trigger level exceedance.

e. The work would be performed by a qualified expert approved by the County.

f-h. As stated on page C4-17, pumping would cease until the model is recalibrated and would only restart if it can be demonstrated to the County that pumping can continue without impacting Little Lake.

P11-427 a. Please refer to Master Response B4 for discussion of the length of the CUP (30 years).

b. Inyo County is responsible for issuing and ensuring that all of the conditions of the CUP are being upheld. It is at the county's discretion to alter the pumping rate or duration. Please refer to Master Response A5.

c. The Draft EIR has been prepared under the knowledge that the County has the ability to revoke or alter the CUP if terms are not upheld.

d. Please refer to Master Response M1.

P11-428 The comment is noted. Please refer to Master Response M1.

P11-429 The comment is noted. Mitigation is meant to make an impact less than significant. The HMMP mitigates impacts to less than significant. No revisions to the Draft EIR were made to change the wording on page C4-10.

P11-430 Please refer to Master Response E2 for discussion of impacts to wetlands.

P11-431 Please refer to Master Response C4.

P11-432 Please refer to Master Response C4.5.

P11-433 On page 3.2-39 of the Draft EIR, mitigation measure Hydrology-1 states, "The project applicant shall finalize and implement the Draft Hydrological Monitoring and Mitigation Program (HMMP) included in Appendix C4 of this EIR." The applicant would be implementing the HMMP, and therefore would be financially responsible.

P11-434 a-g. Please refer to Master Response C4.

h. Comments on the Draft EIR made at the public meeting on August 20th, 2008 were not incorporated into the Draft EIR because the Draft EIR was written before the meeting in order to allow the public to comment on the Draft EIR. Comments from this meeting have been incorporated into the Final EIR, and are responded to in this chapter.

P11-435 Please refer to Master Response B4 for discussion of the CUP and integration of Inyo Code into the CUP terms.

P11-436 a-c. Please refer to Master Response C4 for a discussion of mitigation and monitoring.

P11-437 a. A variety of off-the-shelf hydrologic equipment devices can be used to measure flow over a weir. Exact equipment requirements would be developed at the start of the baseline monitoring period.

b. The location of the North Culvert is shown on Figure 3.2-2 on page 3.2-7 of the Draft EIR.

c. Permits from the water district would not be required as the mitigation and monitoring do not produce any wastewater discharge.

P11-438 a. The Little Lake North Dock well has been added to Figure C4-3. There is no trigger set for the North Dock well. Please refer to Master Response C4 for a discussion of mitigation and monitoring.

b. Little Lake North Dock well and Little Lake Ranch North Well would both be monitored, as stated in Table C4-2. However, the Little Lake Ranch North Well would be monitored for trigger levels as discussed in Table C4-1 and Table C4-2.

c. The groundwater model does not require either well to be “run”. Model-predicted groundwater levels at the locations of these wells are used to interpret the results meaningfully.

d. Page C4-12, Section (d), is clear that the Little Lake North Dock Well would be monitored. However, the Little Lake North Dock Well would not be used as a monitoring well for trigger levels, because it is likely to be influenced by lake level changes caused by management. It is not included in the trigger level wells presented in Table C4-1. Table C4-2 is clear in specifying that Little Lake Ranch North well, and not Little Lake North **Dock** well, would be monitored for threshold exceedances and potential actions if the threshold is exceeded.

P11-439 See Table C4-2 beginning on page C4-15 of the Draft EIR. Little Lake Hotel well and Little Lake North Dock well would be monitored using dedicated pressure transducer collecting hourly water level readings initially. As stated in Table C4-2, no trigger levels would be established for these wells. The monitoring data would be used to complete the hydrogeologic characterization of the Little Lake Ranch property and for Hydrology Model recalibration. The Fossil Falls Campground well would initially be monitored using an electronic water level sounder on a monthly basis. Trigger levels would not be established for the Fossil Falls Campground well; the data collected would be used for Hydrology Model recalibration.

P11-440 a. Please refer to Master Response C4.1. In accordance with a comment from the BLM and the CDFG, existing monitoring data for Rose Valley would be incorporated into the assessment of background conditions.

b. The establishment of baseline levels prior to startup is warranted, in that it constitutes a refinement of the existing hydrologic data, not a significant data gap for which there is little existing information.

c. These are well-established standard statistical methods that are used in a variety of disciplines for evaluating background conditions, the significance of trends, and evaluating whether time-varying data of any kind exceed specified criteria. The use of these methods are commonly used and widely accepted in, for example, evaluating groundwater chemical trends in the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act.

P11-441 a. The sentences in this section are complete. Details of the design of this device are provided in the reference that is cited. A detailed description of the device is not necessary to be included for this report; it is provided in the reference.

b-c. As explained in section Task 1.2 under subsection a. on page C4-14 of the Draft EIR, measurements would be made for a period of 6 months prior to startup of pumping system at Hay Ranch.

d-e. See response to comment P11-440a and Master Response C4.1.

f. The comparison is unknown.

P11-442 The text in Table C4-2 has been revised to note that the maximum combined daily pumping rate from the two wells would be limited to an annualized rate of 4,839 ac-ft/yr (equal to 13.25 ac-ft per day). Extraction would be discontinued for a calendar year when the reading on the flow totalizing recorder indicates that 4,839 ac-ft of groundwater has been extracted.

Page C4-15

Table C4-2: Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Groundwater Level, Extraction			
Total Groundwater Extracted	Daily	Pumpage not to exceed 4,839 acre-ft per year <u>(13.25 acre-ft per day)</u>	Reduce or discontinue pumping.

P11-443 a. It is impossible to know or measure the starting elevation (background water levels) for the new monitoring wells before they are installed. See page C4-14 of the Draft EIR regarding reference elevation for drawdown calculation.

b. The background water levels would be defined during the pre-startup period. See response to comment P11-443a.

c-d. The comment is noted. Please refer to Master Response M1.

e. The comment is noted.

f. The trigger levels for the six new monitoring wells would depend on well screen depth below ground surface and location relative to the Hay Ranch production wells. These trigger levels would be set using the model.

g. The trigger levels for the six new monitoring wells on the Hay Ranch property would be set using the model after the wells are drilled and their respective locations and screen intervals are known exactly.

h. The comment is noted.

i. The wells at Hay Ranch are subject to “well losses” (drawdown caused by pumping in the well itself) that causes them to not be indicative of the water level in the aquifer, outside the well. This precludes their use for trigger levels.

P11-444 a. The comment is noted. Table C4-2 would be updated after recalibration of the model and at later times during the CUP to reflect changes to the monitoring frequency and locations needed to monitor project impacts. Rather than generating multiple tables now, the applicant would generate a new monitoring table for review, approval, or modification by Inyo County Water Department when the applicant has sufficient monitoring data to make an argument for reducing the monitoring frequency.

b. Starting levels have been defined based on historical water level measurements at the monitoring points. The background levels would be refined based on 1 year of data collection, prior to startup. See page C4-14 of the Draft EIR.

c. The comment is noted.

d. The comment is noted. Please refer to Master Response M1.

P11-445 See previous responses to this same comment.

P11-446 The "Maximum Acceptable Drawdown" values in Table C4-1 incorporate the maximum drawdown values that may develop during the entire 180-year model simulation period and thus are intended to be protective of conditions that may not develop until after pumping stops.

P11-447 a. The water levels in the wells listed in Table C4-2 on page C4-16 of the Draft EIR did not change significantly during the November/December 2007 pumping test. Water levels in wells distant from Hay Ranch would not change very quickly. However, more frequent water level measurements would be made if it is observed during the initial stage of monitoring that water levels change more rapidly than anticipated.

b. Tables C4-1 and C4-2 are referring to the same well which is located approximately 1 mi west of the Red Hill cinder cone. Table C4-1 has been revised to refer to the well as the Cinder Road, Red Hill well. Trigger levels are specified on Table C4-1 for all currently existing trigger level monitoring points. Please refer to Master Response C4-5 for discussion of elevations, trigger levels, and beginning (background) water levels.

c. Trigger levels were not established for all wells in Rose Valley, as discussed previously.

d. The basis for setting beginning elevations for calculating drawdown is discussed in Master Response C4.1.

P11-448 See response to comment P11-443g.

P11-449 a. Groundwater level changes tend to change slowly once an initial period of adjustment has occurred. The text in Section C4.3.1 has been revised to note that the applicant may request that Inyo County Water Department allow changes in monitoring frequency by presenting data to support reduction in monitoring frequency in regular periodic monitoring reports. Text revisions are shown in Chapter 3: Errata of this Final EIR.

b. Please refer to Master Response E2 for discussion of impacts to wetlands.

c. Please refer to Master Response C6 for discussion of water quality.

P11-450 The proposed 10% standard for well yield would be impractical to enforce; with the exception of the Hay Ranch wells which would be carefully regulated and monitored, typically, water pumping well yields fluctuate more than 10% as a result of changes in well screen condition, mineral encrustation, back pressure on the piping, pump condition, and other factors that have nothing to do with drawdown caused by pumping at Hay Ranch.

P11-451 a. The model should be re-calibrated within a period of approximately 1 month. That amount of time would not have the potential to cause a significant impact such that an arbitrary cessation of pumping is required before the model calibration is completed.

b. The comment is noted.

c. Residents of Rose Valley are always welcome to provide input to the process at any time.

P11-452 Please refer to Master Response C4.3 for discussion of responsibilities and decision making.

P11-453 Cessation or reduction of pumping could be required if exceedance of trigger levels by at least 0.25 ft occurs in two or more of the monitoring points at any point in time, and the recalibration of the model indicates that pumping cannot continue at the full rate without causing a change in available water to Little Lake.

The model re-calibration would be reviewed in detail by the County, and may include consultation with their hydrology consultant(s), as needed.

P11-454 Comment noted. The HMMP is intended to provide the County with management tools and quantitative criteria to prevent significant impacts to hydrologic features in Rose Valley.

P11-455 Please refer to Master Response C4.5 for discussion of elevations and trigger levels. Consideration of natural variation of water levels is essential, to distinguish that from impacts due to pumping.

P11-456 The Little Lake Hotel well is located south of Little Lake, outside the Hydrologic Model grid; consequently, there is no basis for setting a trigger level for the Hotel well. Trigger levels were not specified for the North Dock well because the well may respond to changes in Lake Level; as a result, a trigger level was specified for the Little Lake Ranch North well which is farther from the lake. Comments regarding baseline monitoring duration and frequency are addressed in Master Response C4.1.

P11-457 The level of Little Lake would be monitored, but as is clear in Table C4-2, there is no action required other than reporting, and potentially revising the model. Little Lake levels are managed by Little Lake Ranch by periodically adjusting the level of the weir at the outlet to the lake. The lake level would be monitored as described in Table C4-2, and the data may be used to update the model, if needed, as described in Table C4-2. The trigger level for action in Little Lake area would be based on a change in groundwater elevation, in order to minimize changes in lake level.

P11-458 a. The location of Little Lake North Culvert is shown on Figure 3.2-2 on page 3.2-7 of the Draft EIR. The North Culvert is located outside the current model boundaries. It is being monitored because it has relevance to evaluating the hydrologic budget of the lake.

b. This location is consistently referred to as the “North Culvert”. It is anticipated that a flow-measuring weir would be established at this location at the start of the baseline monitoring period; consequently, the text on page C4-12 and Table C4-2 of the Draft EIR reference monitoring the North Culvert weir.

c. Trigger levels have been defined for groundwater levels near Little Lake. Asnoted previously, flow through the North Culvert would be monitored for information purposes only.

d. The monitoring frequency as stated in Table C4-2 beginning on page C4-15 of the Draft EIR, is weekly for the first 2 months, and then monthly.

e. See response to items (a) and (c).

P11-459 a-g. As stated in Table C4-2 on page C4-18 of the Draft EIR for Monitor Location: Little Lake Ranch Pond P1, "Occurrence of siphon well discharge" is being monitored, "weekly, by visual inspection." When the siphon well discharges into the pond, it makes a small but visible water spout. Little Lake Ranch staff indicated that the siphon well has discharged uninterrupted for the "last few years". The Little Lake Ranch staff indicated that under no circumstances could the flow from the siphon be allowed to be interrupted or disturbed by adding flow meters, pressure gauges, or other monitoring equipment. Hence, the only feasible monitoring is to look at the discharge point, to visually determine whether the siphon well is still flowing; if the discharge stops, then some change to the hydrologic system has occurred.

P11-460 The phrase "major operational changes" as stated in C4-2 on page C4-18 of the Draft EIR under Parameters Monitored for Little Lake, means something that has a significant effect on the hydrologic system, such as raising or lower the level of the weir. It would be helpful to the hydrogeologist tasked with monitoring surface water features at Little Lake to understand what Little Lake Ranch staff does to manage its surface water to better understand how this may impact subsurface features and vice versa. This includes changing the level of Little Lake by raising or lowering the outfall weir, diverting water from one pond to another, diverting water from irrigation ditch to another, or pumping water from well, etc.

P11-461 See comment response P11-400b. The current TDS of these wells is close to 1,000 mg/L. This level of significance is appropriate because the water from these wells is intended for industrial use and for injection into an aquifer with 5,000 to 10,000 mg/L TDS.

Most of the water quality data from Little Lake was taken from a compilation by Gruler (2002).

P11-462 It is agreed that some defined times for model re-calibration should be incorporated, as it is specified in the text, and that this re-calibration should occur before 15 months of operation have been completed. Exceedance of two or more triggers at any point in time by at least 0.25 ft requires the model to be re-calibrated within 1 month, and evaluation of the potential impact to Little Lake. The County would then determine if cessation or reduction in pumping is needed. This process is specified in Table C4-2, on page C4-16 of the Draft EIR.

P11-463 a-b. Please refer to Master Response M1.

P11-464 a. Trigger levels that would determine whether pumping must be reevaluated are based on groundwater levels, not time. The model indicates that it would take 1.2 years to reach the trigger levels pumping at the maximum amount allowed. It would not be appropriate to limit the permit to a 1.2 year period for several reasons. Most importantly, the model is conservative. It may be that Coso would be able to pump for a number of years without reaching a trigger level or threatening to exceed the significance criteria at Little Lake. The model assumes a direct connection between the northern portion of the Rose Valley aquifer and the southern. It could develop that the connection is not direct and that more water could be removed from the north without affecting the south, which would require a major revision of the trigger levels. Finally, assuming Coso must cease pumping at 1.2 years, it may develop that the aquifer regenerates more quickly than assumed and that Coso could resume pumping after some period of time. This could entail periodic pumping for the full 30-year period. Therefore, it is appropriate and protective to approve a 30-year CUP, even if it currently appears that pumping would not be allowed for that length of time. Please refer to Master Responses C2.7 and B4.

b. Pumping would be evaluated and may require a reduction in pumping rate or stopping pumping according to mitigation measure Hydrology-4 or at the expiration of the CUP, whichever comes first.

c. Please refer to Master Response B4.

d. Please refer to Master Response A7 for discussion of CEQA Guidelines regarding recirculation of a Draft EIR.

P11-465 Little Lake Ranch North Well is closer to Hay Ranch, which is why the drawdown there would be higher than at Little Lake. Please refer to Master Response C2 for discussion of trigger levels.

P11-466 a-b. The Executive Summary has been clarified to describe long-term residual effects of pumping and to clearly specify that the pumping duration will likely be substantially reduced in order to minimize impacts to less than significant levels. The drawdown levels at Little Lake would be managed to less than significant values, and would always be less than the natural variability in the groundwater levels that currently exist. While some residual drawdown may occur for several decades, this value would be small compared to the natural variability.

P11-467 a. Please refer to Master Response A7 for discussion of CEQA Guidelines regarding recirculation of a Draft EIR.

b. Please refer to Master Responses C4 and M1 for discussion of mitigation monitoring/cessation of pumping.

P11-468 Please refer to all responses to comments regarding the proposed project.

P11-469 The comment is noted. Please refer to all responses to comments regarding water quality.

P11-470 The comment is noted. Please refer to Master Responses C4 and M1 for discussion of mitigation monitoring/trigger levels.

P11-471 See the discussion of additional research and surveys at Portuguese Bench and Little Lake beginning in the second full paragraph on page 3.4-4 of the Draft EIR. See the discussion of surveys at Rose Spring beginning in the fifth full paragraph on page 3.4-3 of the Draft EIR, and in Appendix D on page 3 of the EREMICO Biological Services Letter Report. See the discussion of surveys of Rose Valley beginning in the last full paragraph on page 3.4-15 of the Draft EIR.

P11-472 a. The comment is noted.

b. Please refer to Master Response C4.4.

c-d. Please refer to Master Response A6 for discussion of biological surveys to establish baseline physical conditions for biological resources.

P11-473 a. Please refer to Master Response C3.2 for discussion of Rose Spring and previous effects of agricultural pumping.

b. See the discussion of additional research and surveys at Portuguese Bench and Little Lake beginning in the second full paragraph on page 3.4-4 of the Draft EIR. See the discussion of surveys of Rose Valley beginning in the last full paragraph on page 3.4-15 of the Draft EIR.

P11-474 Please refer to Master Response F2 for discussion of the Navy MOA.

P11-475 The comment is noted.

P11-476 Please refer to Master Response A1 for discussion of the lifetime of the power plants.

P11-477 Please refer to Master Response F2 for discussion of the Navy MOA.

P11-478 Please refer to Master Response F2 for discussion of the Navy MOA. Please refer to Master Response C5 for discussion of impacts to Coso Hot Springs.

P11-479 See Master Response C5 and F2 for discussion of past impacts to Coso Hot Springs.

P11-480 Please refer to Master Response F2 for discussion of the Navy MOA.

P11-481 This document was requested from Little Lake Ranch. Little Lake Ranch refused to provide a copy of the document to Inyo County.

P11-482 The comment is noted.

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

September 4, 2008

Tanda Gretz, Senior Planner
Inyo County Planning Department
P.O. Drawer "L"
Independence, CA 93526

Re: Draft Environmental Impact Report (DEIR) for Conditional Use Permit # 2007-3/ Coso Operating Company, LLC (Coso Hay Ranch Water Extraction and Delivery System)

Dear Ms. Gretz:

Southern California Edison (SCE) appreciates the opportunity to provide comment on the DEIR for the Coso Hay Ranch Water Extraction and Delivery System project. SCE has been working closely with Coso Operating Company, LLC to plan electricity service for this project.

The project is described in the DEIR as a proposal to extract groundwater from two (2) existing wells on the Coso Hay Ranch, LLC in Rose Valley and deliver the water to the injection distribution system at the Coso geothermal field, in the northwest area of the China Lake Naval Air Weapons Station (CLNAWS).

The scope of the project, as currently described in the DEIR, includes an SCE 3-5 megawatt (MW) substation on the Hay Ranch property, including associated electrical equipment, such as transformers, switchgear, and motor control centers; a mechanical electrical equipment room (MEER), and an electrical subtransmission line. Our comments on the DEIR address updating the project description for the substation and subtransmission line portion of the project, correcting any DEIR content errors related to the discussion of the proposed electric facilities and/or potential impacts associated with the proposed facilities and requesting clarification of electric facilities discussion items and proposed project mitigation. Our comments are provided below under the following headings:

Project Description for Substation and Subtransmission Line

P12-1

1. The project description for the substation (provided on page ES-5 and Table ES 1-1 of the DEIR) has been amended and should now read as follows:

"The proposed Coso Substation would be an unmanned 115-12kV, 5MVA, SAS Automated Substation constructed on a plot approximately 260' X 240', on Hay Ranch

P12-1 property. The substation site would contain a 115kV low profile switchrack with four (4) bays, two (2) 5MVA transformers (one normally in service and one spare) with isolating disconnects, surge arresters and neutral CT's, a 12kV low profile switchrack consisting of three (3) positions with provisions to expand to four (4) additional positions and a prefabricated MEER".

Additional corrections to substation and subtransmission line information are as follows:

P12-2

2. Table 2.3-1, *Project Elements*, page 2-2, should include the following revisions for the "Substation Associated Features and Description":

   - A 5MVA substation, including 115kV transformers and 12kV switchracks along with isolating disconnects, surge arresters lighting and a prefabricated MEER
   - A tap line into the substation from the existing 115kV subtransmission line adjacent to the substation

P12-3

3. Table 2.3-2, *Project Facility Acreage*, page 2-3, should be amended to read Substation acreage is 1.5 acres.

P12-4

4. Page 2-10, third paragraph should read as follows:

   "Two (2) transformers at the substation would be required. The substation capacity will be 5MVA and will serve the project and an existing SCE customer load of less then 1MW that SCE currently serves from the Los Angeles Department of Water and Power Haley Substation. The substation capacity is based on standard equipment available".

P12-5

5. Page 2-10, fourth paragraph should read as follows:

   "The proposed Coso Substation would be an unmanned 115-12kV, 5MVA, SAS Automated Substation constructed on a plot approximately 260' X 240', on Hay Ranch property. The substation site would contain a 115kV low profile switchrack with four (4) bays, two (2) 5MVA transformers (one normally in service and one spare) with isolating disconnects, surge arresters and neutral CT's, a 12kV low profile switchrack consisting of three (3) positions with provisions to expand to four (4) additional positions and a prefabricated MEER".

P12-6

6. Page 2-14, Section 2.4, first sentence should read as follows:

   "The proposed substation would require approximately 12 months to construct. SCE has not yet determined the total number of workers nor the number of workers at any given time that will be required to construct the substation".

P12-7

7. Please revise the substation acreage information, which is used in various contexts on pages 3.79, 3.8-1, 3.8-5, 3.8-6, 3.8-7 3.8-8 and 3.9-3, to reflect a substation site of approximately 1.5 acres.

P12-8

8. Page 3.10-6, *Substation and Associated Facilities*, second paragraph, first sentence should read as follows:

P12-8 "The substation would have two (2) 5MVA transformers and the oils would be utilized/stored in compliance with Inyo County Environmental Health Services Department and Inyo County Building & Safety Department".

P12-9 9. Page 2, Section 4 refers to Haley Substation. It should read "Haiwee Substation".

P12-10 10. Page 1, Section 1 refers to Hay Ranch California. It should read "Hay Ranch property".

P12-11 11. Please revise the DEIR to define a "MEER" as a mechanical electrical equipment room and not as a building.

Clarification of Electric Facility Discussion and Potential Impacts

P12-12 12. Please confirm that the references to the determination of National Register of Historic Places eligibility of any discovered resources on the substation site (located on private land) should fall under the state determination of the California Register of Historical Resources or be categorized as a unique/important resource under CEQA, that Inyo County is the lead agency for purposes of the California Environmental Quality Act (CEQA) review, and there is no federal agency or State Historic Preservation Office (SHPO) consultation required under federal regulation 36 CFR 800.

Clarification of Proposed Mitigation

P12-13 13. The DEIR stipulates that archaeological survey and other methods with regard to analysis of the substation land be performed consistent with earlier work for the project. Please provide guidance on those methods or provide us a copy of the project technical archaeological survey, evaluation, mitigation documents or direct us to the repository where these documents can be obtained (for example, the Eastern Archaeological Information Center, UC Riverside).

P12-14 14. On page 3.4-27, it states the substation area not permanently covered with structure of hardscape is to be landscaped with native vegetation. Please clarify what party will be responsible for post-construction native landscaping.

P12-15 15. On page 3.79, it states the substation would be screened with compatible landscaping to minimize visibility and maintain rural quality. Please clarify screening requirements and standards.

P12-16 16. On page 3.9-6, it states construction equipment/machinery/stockpiled material may temporarily impact sensitive viewers and requires construction components to be screened with temporary cloth fencing (desert sand or similar neutral color), which is to be removed upon completion of construction. Please clarify what sensitive viewers are located in the project area, where they are located and current screening standards, especially for oversized equipment.

P12-17 17. On page 3.9-7, it states the MEER is to be painted desert almond color (to blend in and minimize glare) and surrounded by a chain link fence with a locked gate, and indicates the fence will not be visible from the highway. SCE is unsure that we can guarantee the fence will not be visible from the highway and needs clarification on the standards to meet for this mitigation.

P12-18 18. On page 3.4-30, *Mitigation Measures Biology-2 thru Biology-5* provide mitigation for the desert tortoise. Please clarify what party will be responsible for providing the following for substation construction: pre-construction surveys (Biology-2), tortoise fencing and project boundaries staking (Biology-3), providing a tortoise monitor (Biology-4), and tortoise and ground squirrel training (Biology-5).

P12-19 SCE respectfully requests a meeting with Inyo County prior to the public hearing for this project to clarify items 12-18 in this letter.

P12-20 Once again, SCE appreciates reviewing and responding to the DEIR for the Coso Hay Ranch Water Extraction and Delivery System project and hopes these comments will assist you in the preparation of the Final EIR for this project. We request a copy of the certified Final EIR for this project in both CD and hard copy format for our records when it becomes available. If you have any questions regarding this letter, please do not hesitate to contact me at (760) 709-1188.

Sincerely,

Deborah Hess

Deborah Hess
Region Manager
Southern California Edison Company

P12 **Deborah Hess**
Southern California Edison
Mammoth Service Center
PO Box 7329
Mammoth Lakes, California 93546

P12-1 Southern California Edison (SCE) has provided additional information regarding the project description. The changes were made as requested for the purpose of updating the EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. The following revisions were made to the EIR:

Page ES-5 (Table ES.1-1)

Substation	Hay Ranch Property	• A ~~3-5 megawatt (MW)~~ 5 megavolt-ampere (MVA) 115-12kV SAS Automated substation including electrical equipment such as ~~transformers switchgear, and motor control centers to power the pumps and supply power to auxiliary equipment and lighting~~ a 115kV low profile switchrack with four bays, two 5MVA transformers (one normally in service and one spare) with isolating disconnects, surge arrestors and neutral CTs, and a 12kV low profile switchrack consisting of three positions with provisions to expand to four additional positions. • A prefabricated mechanical and electrical equipment room (MEER) ~~building~~ • An electrical distribution line to supply power to the well down hole pumps and to the lift pump station

P12-2 SCE has provided additional information regarding the project description. The changes were made as requested for the purpose of updating the Draft EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. The following revisions were made to the EIR:

Page 2-2 (Table 2.3-1)

Substation	Hay Ranch Property	• A ~~3-5 megawatt (MW)~~ 5 megavolt-ampere (MVA) substation including electrical equipment such as ~~transformers, switchgear, and motor control centers to power the pumps and supply power to auxiliary equipment and lighting~~ 115kV transformers and 12kV switchbacks along with isolating disconnects, surge arrester, and lighting • A prefabricated mechanical-electrical ~~and electrical building~~ equipment room (MEER) • A tap line into the substation from the existing 115 kV subtransmission line adjacent to the substation • An electrical transmission line to supply power to the well down hole pumps and to the lift pump station

P12-3 SCE has provided additional information regarding the project description. The changes were made as requested for the purpose of updating the EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. The following revisions were made to the EIR:

Page 2-3.

The project would occupy approximately ~~59.5~~ 60.5 acres, as shown in Table 2.3-2.

Table 2.3-2: Project Facility Acreage		
Facility	**Acreage**	**Location**
Wells	Negligible	Hay Ranch property
Lift Pump Station	4.75 acres	Hay Ranch property
Pipeline (total)	53.5 acres	Hay Ranch property, BLM lands, CLNAWS
	4.5 acres	Hay Ranch property
	33.2 acres	BLM lands
	15.8 acres	CLNAWS
High Point Tank (1.5 million gallon)	0.75 acres	CLNAWS
Substation and 12.4 kV Subtransmission Line	~~0.5~~ 1.5 acres	Hay Ranch Property
	60.5 acres	**TOTAL**

P12-4 SCE has provided additional information regarding the project description. The changes were made as requested for the purpose of updating the EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. The following revisions were made to the EIR:

Page 2-10

~~A minimum of four transformers would be required for the electrical installation. The substation capacity would be sized between approximately 3 and 5 MW to serve the project and an existing SCE customer load of less than 1 MW that SCE currently serves from the Los Angeles Department of Water and Power (LADWP) Haley substation. The capacity of the substation would depend on standard equipment available, which would likely be a 5 MW transformer. The substation would likely be derated to maintain the 3 MW rating.~~ Two transformers would be required for the electrical installation. The substation capacity will be 5 MVA and will serve the project and an existing SCE customer load of less than 1 MW that SCE currently serves from the Los Angeles Department of Water and Power (LADWP) Haley Substation. The substation capacity would be based on the standard equipment available.

P12-5 SCE has provided additional information regarding the project description. The changes were made as requested for the purpose of updating the EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. The following revisions were made to the EIR:

Page 2-10

The proposed substation would be an unmanned, 115-12 kilovolt (kV), ~~28~~ 5 megavolt-ampere (MVA) substation automation system (SAS) constructed on a plot approximately ~~0.5 acres~~ 260 by 240 feet in size on the Hay Ranch property. It would contain:

- A 115-kV, low profile switchrack with four bays
- Two ~~14~~ 5-MVA transformers (one normally in service and one spare) with isolating disconnects, surge arrestors, and neutral current transformers (CTs)

- A 12-kV, low profile switchrack consisting of three positions with provision to expand to four additional positions
- A prefabricated metal mechanical-electrical equipment room (MEER) ~~building~~.

P12-6 SCE has provided additional information regarding the project description. The changes were made as requested for the purpose of updating the EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts. The following revisions were made to the EIR:

Page 2-14

The proposed project would take approximately 110 days to construct the water infrastructure and 12 months to construct the substation. Several areas of the project would be constructed concurrently. No more than 20 workers would be working in any single area or component at one time; however, as many as 40 workers may be working on the overall construction project at once. SCE has not yet determined the total number of workers nor the number of workers at any given time that would be required to construct the substation; however, it is expected to be around 40 workers.

Page 3.8-7

Construction would not indirectly impact future use of the Hay Ranch property as agricultural land or preclude the Hay Ranch property from being designated as Prime Farmland in the future. Construction is short-term (lasting about 110 days for the pumping infrastructure and 12 months for construction of the substation). Topsoil would be stockpiled and replaced and only small amounts of water would be needed. Since construction is temporary and would only occur on a small portion of the overall property, it would not directly or indirectly impact future use of the Hay Ranch property for agriculture or impede a designation as Prime Farmland.

P12-7 SCE has provided additional information regarding the project description. The changes were made as requested for the purpose of updating the EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The revisions are indicated as a global revision in Chapter 3: Errata of this Final EIR.

P12-8 SCE has provided additional information regarding the project description. The changes were made as requested for the purpose of updating the EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revisions were made to the EIR:

Page 3.10-6

The proposed substation would have ~~a minimum of four transformers~~ two 5-MVA transformers, ~~sized at a total of approximately 3-5 megawatts (MW)~~. The transformers would contain transformer oil. The oils would be utilized and stored in compliance with the requirements of the Inyo County Environmental Health Services Department and Inyo County Building and Safety Department. The substation would be surrounded by a locked 8-foot chain link and razor wire fencing, and a sign would be posted to keep out intruders. Signage would be placed at the facility for notification in case of emergency or other hazardous accidents related to the substation. The transformers could leak or spill if they are damaged during a seismic event, fire, or other unforeseen incident. The following mitigation measure would be implemented to reduce impacts to less than significant levels.

P12-9 Wording not found on page specified. All references to *Haley Substation* have been revised to *Haiwee Substation* in the Final EIR for the purpose of fixing the error in the Draft EIR. The revisions to the Draft EIR incorporated into the Final EIR do not result in any new significant impacts or alternatives that have not been analyzed previously. The following revisions were made to the Draft EIR:

Page 3.11-2

Southern California Edison (SCE) and LADWP are the primary electricity services provider for Inyo County. There are two power line corridors located to the east of the Hay Ranch parcel. There is a 115-kV transmission line owned by SCE located immediately to the east of the north and south wells (with a portion of the line crossing onto the Hay Ranch parcel as shown in Figure 2.3-2). To the east of this line is the 500-kV Gorge Rinaldi transmission line owned by LADWP and SCE (UltraSystems 2006). The project area currently is serviced by SCE's ~~Haley~~ Haiwee Substation and has a power need of less than 1 MWe.

Page 3.11-6

Project electrical demand is estimated to be approximately 2.5 MWe. Less then 1 MW of power would be supplied to the local area to residents currently served by the SCE ~~Haley~~Haiwee Substation. The proposed substation would provide the power and would increase the amount and reliability of energy available in the project area. Impact to electrical supply and demand from the proposed project would be less than significant.

Page 4-12

The proposed project would include pumping of groundwater from Rose Valley to injection wells at the Coso Geothermal Plant, approximately 9 miles away. The project would also include construction of water pumping, storage, and conveyance systems. None of the water produced, however, would be available for public consumption or supply that could indirectly induce growth. The project does include a 3-5 MW substation, of which 2.5 MW would go to supplying power for groundwater pumping. The remaining 0.5 MW of power would serve an existing SCE load, which is currently served from the LADWP ~~Haley~~Haiwee Substation.

P12-10 The wording described by the commenter is not found in document. No revisions were made to the Draft EIR with regards to the wording "Hay Ranch California".

P12-11 The change was made as requested for the purpose of clarification. The following revisions were made to the EIR:

Page 2-10

- A prefabricated metal mechanical-electrical equipment room (MEER) ~~building~~.

Page 3.9-5

Wells, Lift Pump Station, and Substation and Associated Facilities. Wells would only require the installation of pumps, which would not have a significant visual impact. Construction of the substation and associated buildings (a mechanical and electrical equipment ~~building~~room (MEER)) and the lift pump station would require trucks and heavy equipment. Construction work would involve ground disturbance that could be visible from US 395; however, visual impacts would be temporary. Construction would last approximately 110 days, with work on multiple areas occurring concurrently.

P12-12 The commenter is correct that the determination of eligibility of any discovered resources on the substation site would fall under the State determination of the California Historic Preservation Office and that there is no federal agency or SHPO consultation required.

The following change was made as requested for the purpose of clarification. The following revisions were made to the EIR:

Page 3.5-8

The BLM prepared an Environmental Assessment (EA) pursuant to NEPA for the proposed project. The BLM has entered into formal consultation pursuant the Section 106 with the SHPO and the ACHP regarding determinations and findings for the proposed Hay Ranch Water Delivery and Extraction System project. The BLM, CLNAWS, SHPO, and the ACHP have proposed to execute a Programmatic Agreement to resolve issues regarding effects of this project on historic properties. Interested Native American tribes and the County of Inyo have been invited to become concurring parties to this agreement. CLNAWS entered into a Memorandum of Agreement (MOA) with the SHPO, and the Advisory Council on Historic Preservation in 1979 regarding the management of Coso Hot Springs and any potential effects that may arise from geothermal energy production.

Determination of NRHP eligibility of any discovered resources on the substation site, which is located on private land, falls under the State determination of the California Register of Historical Resources or should be categorized as a unique or important resource under CEQA. No federal agency or SHPO consultation is required under Federal Regulation 36 CFR 800. Inyo County would be the lead agency for CEQA review.

P12-13 The BLM has the technical archaeological survey for the proposed project. Any requests to obtain a copy of the report can be directed to the BLM.

P12-14 Coso would be responsible for landscaping around the substation, unless otherwise specified in agreements between Coso and SCE.

P12-15 Screening would be designed to filter views from US 395. Page 2-10 of the Draft EIR describes the requirements. The requirements include preparation of the landscaping plan by a certified, licensed landscape architect.

P12-16 A discussion of sensitive viewer at the project site begins on page 3.9-3 of the Draft EIR under the heading Sensitive Viewers. Mitigation measure Aesthetics-1 meets the County's current equipment screening policy.

P12-17 The sixth full paragraph on page 3.9-7of the Draft EIR states that the chain link fence would not be visible from US 395. The fence would not be visible from US 395 because of its substantial distance from the highway; sensitive viewers on US 395 would not be able to distinguish the chain link fence.

P12-18 Coso would be financially responsible for ensuring that the all mitigation measures are followed and implemented, including mitigation measures Biology-2 through -5. It would be up to the County to ensure that the conditions of the CUP are being upheld by Coso and whether, the CUP would need to be revoked if conditions are not followed. Coso would perform the survey and mitigation work, unless otherwise specified in any agreements with SCE.

P12-19 The comment is noted.

P12-20 The comment is noted. A certified Final EIR will be provided to the commenter when available.

September 4, 2008

Inyo County Planning Department
P. O. Box L
Independence, CA 93526

Re: The DEIR for Conditional Use Permit (CUP 2007-003), Coso Operating Company (COC) project.

P13-1 My comments regarding the above referenced DEIR findings center on three main themes: zoning, water availability, and alternatives. Notwithstanding the apparent economic benefit to the County of this proposed project by continued and/or accelerated acquisition of taxes/revenues for the extant and proposed project, and one may sympathize with the County's needs/desires, the environmental report as currently presented in the DEIR needs further evaluation and explanation.

1. Zoning.

P13-2 The DEIR's explanation of why transporting/supplying water to a geothermal plant for cooling purposes so that the energy produced can then be sold is an agricultural or rural use/benefit, is completely off the mark to put it kindly. For the current proposal to be further considered, the land use designation/zoning must be changed to 'manufacturing' or 'commercial'.

2. Water availability.

P13-3 Several questions remain re: actual quantity of water in the "perched aquifer", i.e. whether the 10% downdraft proposed is the total over the entire 30 years, or yearly, and is a permanent loss of 10%/year non-damaging for this area, and can it be sustained?

P13-4 3. More alternatives should have been considered.

P13-5 Additionally, is it prudent to have the project proponent monitoring the project itself and deciding whether and when to continue or curtail operation?

P13-6 Kindly inform me of any meetings, etc. that may take place relative to this proposed project.

Thank you.

Anna O. Zacher

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Olancha, CA 93549

P13 **Anna O. Zacher**
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Olancha, California 93549

P13-1 The comment regarding the Draft EIR is noted.

P13-2 The commenter is incorrect in stating that the Draft EIR states that transporting of water as proposed is an agricultural or rural use. See page 3.7-1 of the Draft EIR for a discussion of the meaning of the land use designation at the Hay Ranch property. One allowable use is “managed production of resources.” The property does not require a land-use change.

P13-3 Please refer to Master Response C4.4 for a discussion of the 10% significance criteria. The 10% is the maximum amount ever allowed measured from the baseline condition (see Appendix C4 for further explanation). The 10% applies to the inflow of water available to Little Lake. The actual aquifer would experience less than 2 or 3% decrease in flows.

P13-4 Please refer to Master Response L2, and Chapter 5: Alternatives in the Draft EIR for a discussion of numerous alternatives that were considered but determined infeasible.

P13-5 Inyo County does not have the resources to implement the HMMP using County staff; however it would be responsible for overseeing the monitoring program, approving technical staff proposed to conduct the monitoring, and evaluating the quality and objectivity of the monitoring program. The HMMP is intended to serve as an enforceable guidance document for monitoring hydrologic impacts related to the project. Failure by Coso to comply with the permit could lead to revocation of the permit or other enforcement action.

P13-6 The comment is noted. The commenter has been added to mailing list.

DEEP ROSE

1240 S. CHINA LAKE BLVD
RIDGECREST, CA 93555

September 05, 2008

Pat Cecil, Planning Director
Inyo County Planning Department
P.O. Drawer L,
Independence, CA 93526

RE: COC HAY RANCH H20 EXTRACTION and DELIVERY SYSTEM CUP No. 2007-03 DRAFT EIR

Dear Mr. Cecil:

I want to thank you for this opportunity to provide comments regarding the COC Hay Ranch Water Extraction, Export, and Delivery System Draft EIR (DEIR). When the Lead Agency (Inyo County) makes decisions on this proposed project, as caretakers of the ground water resources I would respectively request the decision makers to factor in the following measures:

P14-1

1) Ensure paramount protection of *all* Inyo County citizens to include the protection of the environment and sustainable development of the economy
2) Maintain a groundwater table that will not cause excessive costs to other groundwater users (domestic, future development to include the Deep Rose Project and additional identified geothermal development within the Rose Valley Aquifer)
3) To consider the needs and practices of all water users within the State of California

P14-2

Management of the groundwater should be held in trust for the beneficial and reasonable use of all current/future users. Fortunately prior leadership from the Inyo County Supervisors had enough foresight to ensure the protection of its citizens when the "Geothermal Ordinance of the County of Inyo" was passed back in 1973. The intent was to provide for the general welfare and optimum use of the land. Additionally today, decisions may be made that may have significant effects on the environment when factoring in the impacts to a precious resource, water or lack thereof.

P14-3

Principals with the Deep Rose Project own private land adjacent to Hay Ranch for future water needs in support of proposed geothermal projects in the near future. This too must be factored in the decision making process and it appears that the cumulative impacts within Section 4 of the DEIR, is not addressing all reasonable and foreseeable projects which definitively now, should include the Maxx Management, Inc. and Terry Metcalf BLM geothermal leases. I have enclosed an August 29, 2008 letter (Attachment 1) from Mr. Sean E. Hagerty, Geothermal Program Lead, CA BLM Office stating that the BLM has already started the planning process for the preparation for an Environmental Impact Statement that will address the future geothermal leasing of approximately 22,100 acres, which is adjacent to Hay Ranch (Page 3 of Attachment 1); furthermore, he states that the need for water in support of the West Coso Geothermal Leasing Area will be substantial.

DEEP ROSE

P14-4 Additionally, Deep Rose LLC has retained the services of Dr. Carl Austin, the "father" of the existing geothermal project on China Lake NAWS. As the MHA Environmental Consultants stated many times on the eve of the Public Comment Meeting on August 20, 2008, Dr. Austin is the premier expert on the Coso Known Geothermal Resource Area. In short, based on Dr. Austin's extensive experience and expertise, he is proclaiming that the primary source of heat is west of the existing geothermal production area within the confines of China Lake NAWS, which is why Deep Rose LLC is moving toward the development of geothermal resources west of the existing production area within the Coso Known Geothermal Resource Area.

P14-5 I am urging Inyo County to have the foresight to at least allow for equal opportunity for any future potential sustainable economic development, which in the long run, will ensure a more sustainable tax base for Inyo County. I can assure you that any geothermal development under Deep Rose LLC, will be both water efficient and more environmentally friendly.

Thank you for your anticipated cooperation. If you have any questions regarding this, please contact me at 760-382-7576.

Very truly yours,

9/05/08

Terry Metcalf, Manager
Deep Rose, LLC

Cc: Inyo County Supervisors

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
California State Office
2800 Cottage Way, Suite W1834
Sacramento, CA 95825
www.blm.gov/ca

ATTACHMENT 1

3200 (920) P

August 29, 2008

Mr. Terry Metcalf, President
Deep Rose
73-4273 Hulikoa Drive
Kailua-Kona, Hawaii 96740

Dear Mr. Metcalf:

In response to your inquiry regarding groundwater in the Rose Valley area in Inyo County for geothermal development, I would say that groundwater will be an important resource for virtually any geothermal activities planned for or anticipated in the area.

As you are aware, you and Maxx Management, Inc. currently have three geothermal lease applications pending with the Bureau of Land Management (BLM). These applications, CACA-43993, CACA-43998, and CACA 44082, cover approximately 4500 acres of public lands to the northeast of Coso Junction. In addition, Deep Rose, LLC has expressed interest in nominating an additional 17,600 acres of public lands immediately to the east of the three pending geothermal applications. In total, you, Maxx Management Inc., and Deep Rose LLC have expressed an interest in approximately 22,100 acres of public land for geothermal leasing and subsequent exploration/development in this area. Towards this end, the BLM has started the planning process in preparation of an Environmental Impact Statement (EIS) to address geothermal leasing of the approximately 22,100 acres in which we are calling the West Coso Geothermal Leasing Area. The attached map identifies the boundary of this area, along with the three pending geothermal lease applications.

The need for water in exploring these lands for geothermal resources is vital to the success of the activities. Water will be needed for road and well pad construction for the initial exploration, and hopefully, confirmation drilling to identify the productive areas within the West Coso Geothermal Leasing Area. Following exploration and development drilling, any construction associated with a geothermal powerplant will require water for the preparation of the foundation, mixing of cement and aggregate for concrete, and initially filling of the cooling tower basin if a water draft cooling system is utilized. Even in the event that air cooling is utilized, water will still be needed for the construction of the facility.

The quantity of water required for geothermal exploration and utilization within the West Coso Geothermal Leasing Area, as well as the potential sources for this water, will be thoroughly addressed in the subsequent leasing EIS covering this area. Whether this water is obtained from the groundwater within Rose Valley, or some other source, it is clear that water will play a crucial role in the search for and utilization of any geothermal resources to be found within the approximate 4500 acres under application by you and Maxx Management, Inc., and any of the remaining 17,600 acres within the West Coso Geothermal Leasing Area.

Please feel free to contact me at (916) 978-4375 if you have any questions in regard to this information.

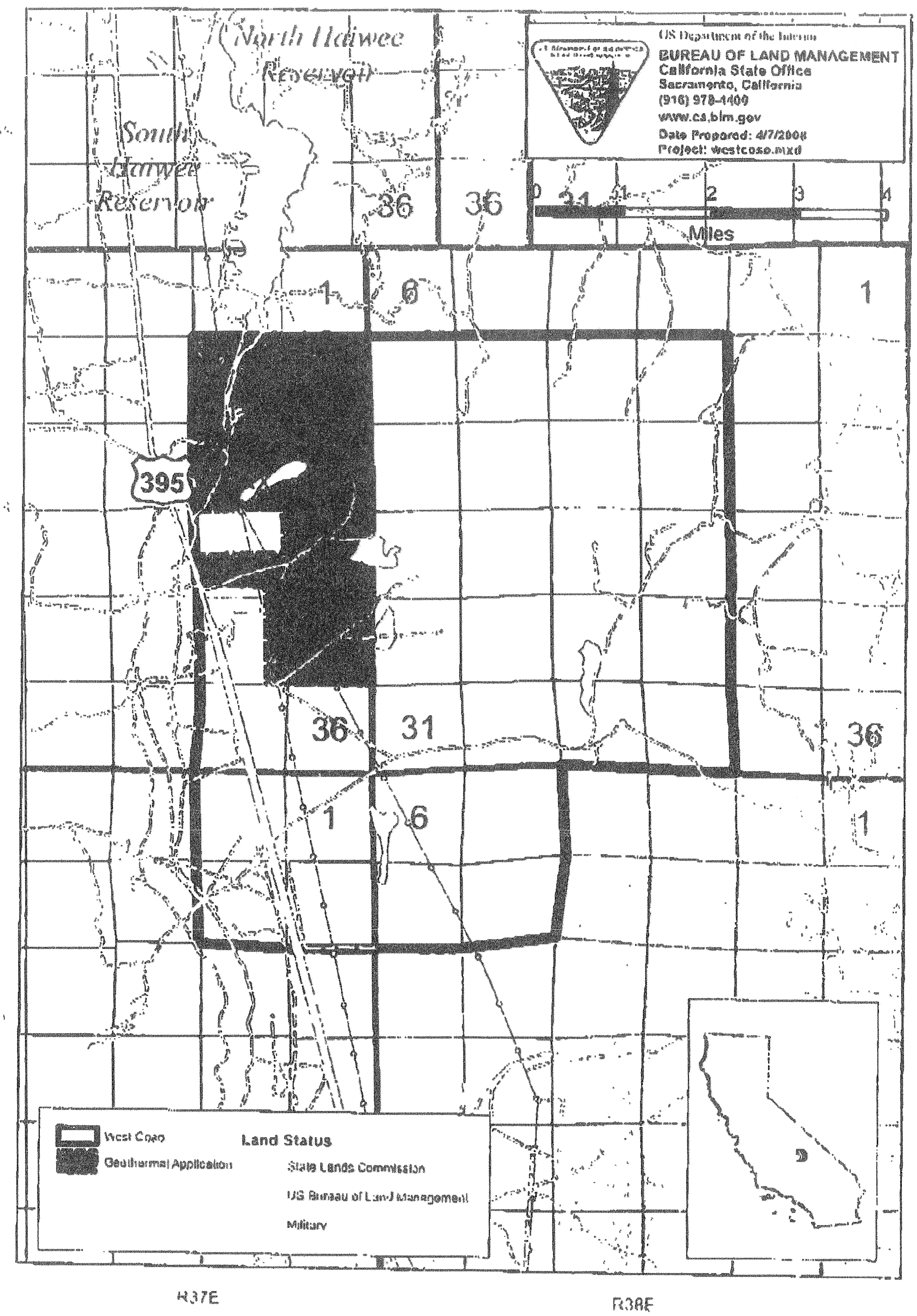
Sincerely,

Sean E. Hagerty

Sean E. Hagerty, Geothermal Program Lead
Division of Energy & Minerals

1 Attachment, as stated

West Coso Geothermal Leasing Area



Attachment 2

P14 **Terry Metcalf**
Deep Rose, LLC
1240 S. China Lake Blvd.
Ridgecrest, California 93555

P14-1 The comment regarding decisions regarding water resources is noted.

P14-2 The comment providing background information on Inyo County policy and previous decision-making is noted.

P14-3 Please refer to Master Response K1 for a discussion of the Deep Rose project and future water needs for geothermal activities. The only project currently permitted or applied for involves exploration by Deep Rose on a limited parcel. Development of a geothermal plant on that parcel is speculative, as it would not occur unless resources were located and could not occur until a permit were granted and CEQA analysis completed. Development of a geothermal plant on the area subject to lease negotiations with the BLM is even more speculative as an exploration permit has not been applied for or obtained from Inyo County. Therefore, cumulative impacts from these projects, other than the permitted exploration, are not included in this EIR. They could not be analyzed given their speculative nature and the lack of any project detail. Simulations could not be run because this amount of water usage and development of geothermal resources are speculative at this time.

Edits were made to the Draft EIR to include additional details regarding future leasing in the project region. Deep Rose would also require a permit to transfer water from the Rose Valley to the Coso Basin, which would require environmental review.

P14-4 The comment regarding the location of the geothermal resource in the project area is noted.

P14-5 The comment is noted regarding the water needs of potential future projects.

P15

Tanda Gretz

From: Thomas G Schneider [ts40smc@juno.com]
Sent: Friday, September 05, 2008 1:18 PM
To: Tanda Gretz
Subject: Comments concerning DEIR/CUP for Coso Hay Ranch water extraction project

Tanda Gretz
Inyo County Planning Department
Post Office Box L
168 N. Edwards Street
Independence, California 93526
(760) 878-0265

P15-1 In the DEIR, we see the pumps that Coso will be installing have the capacity to extract more water than Coso is asking for. The capacity of the pumps exceed stated 3000 gal/hour to be extracted by 30%. A statement to the effect that Coso will not pump 24 hours a day is included. This down time seems part of the calculation for the amount of water to be transported to their power plant. If Coso was to pump for a longer period, they could extract more water than they are asking for.

P15-2 My questions are as follows Is this shut down time voluntary? If not, how is this going to be enforced?
P15-3 How will the actual amount of water extracted at the Hay Ranch be monitored or metered? Will this be done at the pump or down stream? What is the transportation capacity of the entire system proposed?
P15-4 What is the maximum amount of water that could be pumped if Coso does not stop pumping? What
P15-5 will that impact to the aquifer if the maximum amount of water is pumped? Is there a maximum amount of water that will be allowed to be pumped per day? What protection is there to prevent excessive pumping? What will be done if excessive pumping at the Hay Ranch occurs? Why does the DEIR not include any protection against excessive pumping at the Hay Ranch before triggers are reached?

P15-6 The triggers that are suggested do not prevent any excessive pumping. They will only respond after it has
occurred. These questions need to be answered in the DEIR.

Tom Schneider

P15 Tom Schneider
ts40smc@juno.com

P15-1 Coso would be bound by the terms of the CUP. Even if they could pump more water, it would be in violation of the CUP and would not be allowed.

P15-2 The allowable pumping hours per day or rate would likely be specified in the CUP and the amount of water withdrawn would be tracked by Inyo County and Coso in fulfillment of the County's responsibility. The County would be responsible for ensuring compliance with the CUP. Additionally, Section 18.77.055 of the Inyo County Code allows any party to challenge the ongoing transfer of water by alleging that the permittee is in violation of its permit requirements. The wells include logs that measure the amount of water pumped. The CUP may include conditions that require periodic copies of those logs.

P15-3 The transportation capacity of the entire system is irrelevant to the environmental analysis in the EIR. The project would be required to comply with the conditions of the CUP, which would not allow more pumping than has been analyzed in the EIR.

P15-4 The maximum allowable amount of water that can be pumped is 4,000 gpm. See Section 3.2 for the evaluation of impacts associated with pumping at the maximum rate. Page 2-2 of the Draft EIR addresses the maximum and average pumping rates. Excessive pumping would be a violation of the CUP and would be prohibited by Inyo County. Violation of CUP terms could result in loss of the permit and the loss of permission to do any pumping. CEQA does not require the evaluation of impacts associated with violating conditions of approval or not implementing mitigation. The County will adopt an MMRP as part of any approval to ensure all mitigation is carried out. The CUP would likely include monitoring requirements to document the amount of water pumped. This is beyond the scope of the EIR.

P15-5 Excessive pumping would not be permitted in the CUP. See previous responses, above.

ARNOLD BLEUEL
LAROCHELLE MATHEWS &
ZIRBEL LLP
ATTORNEYS AT LAW

ATTORNEYS

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www.atozlaw.com

September 5, 2008

Tanda Gretz, Senior Planner
Inyo County Planning Department
P.O. Box L
Independence, CA 93526

Re: Rose Spring

Dear Tanda:

Enclosed please find a copy of an excerpt from a public report prepared in 1915. The report was entitled Springs of California by Gerald A. Waring on behalf of the United States Geological Survey. You will notice at page 339 that Rose Spring is reported as a watering place that is well known to prospectors in the Coso Range. In addition to the Rose Spring, the report includes two other springs which may be located within the Rose Valley including the Arab Spring and the Crystal Springs. They all produce water of a nearly constant yield.

P16-1 Insufficient data has been produced to date to know what caused the Rose Spring to go dry. The actual cause may be related to water pumping from the Hay Ranch to support agricultural operations as noted in our earlier comments. Please add this letter and the attached report to our earlier comments in connection with the Draft Environmental Impact Report on the Coso Project, CUP 2007-03.

Very truly yours,

ARNOLD, BLEUEL, LaROCHELLE,
MATHEWS & ZIRBEL, LLP

Gary D Arnold

Gary D. Arnold

GDA:tg
Enclosure
cc: Little Lake Ranch (via e-mail)
Team Engineering (via e-mail)

Little Lake\Coso\Letters\Gretz Ltr 10

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 338

SPRINGS OF CALIFORNIA

BY

GERALD A. WARING

WASHINGTON
GOVERNMENT PRINTING OFFICE
1915

SPRINGS NEAR SOUTHEAST SIDE OF OWENS LAKE (INYO 23).

A small amount of water of fair quality issues in a group of several springs along the southeast side of Owens Lake. They are used by prospectors, who often camp near by, and they have long been a watering place on the road between Keeler and Mohave. The water is apparently of surface origin, coming from the slopes of the Coso Range to the south and rising in the alluvium of the lake basin.

Similar springs issue a short distance toward the lake from the hotel at Keeler and yield a small amount of fair water.

ARAB SPRING (INYO 24).

In the Coso Range several springs of small but perennial flow furnish camping and watering places for prospectors and other travelers. Arab Spring is one of these on the road between Keeler and Coso mining camp. It is situated on the eastern side of the range about 18 miles southward from Keeler. It is also known as Lower Centennial Spring, Upper Centennial Spring being a similar spring in the same ravine a mile south and 400 feet higher.

CRYSTAL SPRINGS (INYO 27).

Crystal Springs, which are about 8 miles southeast of Arab Spring, also afford a watering place on the road to Coso, being 6 miles north of this camp. The yield is small but of very good quality.

ROSE SPRING (INYO 25).

Rose Spring forms a watering place that is well known to prospectors in the Coso Range. The water issues near the western base of the range, about 4 miles south of Haiwee post office.

The three watering places last described—Arab, Crystal, and Rose springs—are supplied by the precipitation on the adjacent mountains and are essentially surface springs, though they are of nearly constant yield.

SPRINGS NEAR HAIWEE (INYO 26).

Cold water issues from the coarse gravel slopes at the base of the Sierra, at a ranch that is 28 miles southward from Keeler and that was the Haiwee stage station in the fall of 1908. When the place was visited a flow of about 20 gallons a minute was collected by ditches along the side of a small cienaga or marshy area and was used for domestic supply and garden irrigation.

GRAPEVINE SPRINGS (KERN 18).

Grapevine Springs are situated near the road between Keeler and Mohave and about 50 miles south of Haiwee. They yield a small flow of water of excellent quality. There is also running water during

P16 **Gary D. Arnold**
Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP
300 Esplanade Drive, Suite 2100
Oxnard, California 93036

P16-1 Please refer to Master Response C3.3 for discussion of Rose Spring. Rose Spring is currently dry. The baseline condition for analysis in the EIR is defined as the existing conditions at the time of issuance of the NOP. The NOP was issued 92 years after the report supplied by the commenter was written. Conditions have changed since the preparation of the report and the current conditions are the baseline for this report.

P.O. Box 554
Ridgecrest, CA 93556-0554
6 September 2008

Inyo County Planning Department
168 N. Edwards Street
P.O. Drawer L
Independence, CA 93526

Re: Coso Project, Conditional Use Permit No. 2007-03

P17-1 I strongly object to this request! Rose Valley may look "uninhabited", but there are indeed people and businesses, and a whole lot of animals and plants (including Mojave Ground Squirrels and Tortoises) who live there which depend upon the ground water in that valley. A proposal to withdraw 4800 acre feet of water per year will greatly affect the ground water table and the springs (which used to be artesian) in the valley and especially Little Lake.

P17-2 Little Lake is spring-fed and has been there for many thousands of years, as evidenced by the many petroglyphs on the rocks there. Today it serves as a very important stop-over for migrating birds. The owners of the Lake keep it at the current level by pumping water from their wells whenever it drops down even a little bit, because the lake is VERY shallow. The proposed drop of 10% would be very significant!

P17-3 Your own ordinances, which were very wisely passed, say

*This project is **not** exempt from the requirements of Inyo County Ordinance No. 1004, which added Section 18.77 to the Inyo County Code, (Regulation of Water Transfer, Sale, or Transport from Inyo County) and Water Code Section 1810 et seq. Section 18.77.000 (H.) Groundwater Transfers, states: "A transfer or transport of groundwater from a groundwater basin located in whole or in part within Inyo County to an area outside of the groundwater basin…[has] the potential to adversely affect the economy and environment of Inyo County."*

*The project is also **not** exempt pursuant to the provisions of Inyo County Code Section 18.77.010 (B.) "Exemptions," because it does not involve purchase or acquisition of water by the Los Angeles Department of Water and Power, is not an emergency transfer of water, is not the transfer of water in the form of manufactured goods, and is not a transfer of water over which the County lacks jurisdiction to regulate.*

P17-4 *A groundwater model was run which showed that by the end of the 20-year operations period a drawdown of 72 feet at the North well and a 68-foot drawdown at the South well would occur. Groundwater discharge at Little Lake showed a decline of 1,132 acre-feet per year (afy) or a 2.4-foot water level decline, by the end of the 20-year pumping period.*

This will cause damage to plants just like the drawdown in the Owens Valley did! Dropping Little Lake by 2.4 ft. will make it a tiny puddle of it's former self. It just isn't that deep to begin with!

P17-5 If Coso wants more water, then they should be recycling more of the water they now have, or they can purchase water from LADWP, but they should NOT be allowed to pull ground water from Rose Valley, no matter what. We don't need another Owens Valley problem, and that's exactly why Inyo Co. has the above County ordinances! Stick to them!!!!

P17-6 Please put me on your mailing list for any further actions relating to this matter.

Thank you,

Janet Westbrook

P17 Janet Westbrook
PO Box 554
Ridgecrest, California 93556-0554

P17-1 Opposition to the project is noted.

P17-2 Please refer to Master Response C4.4 for the discussion of the 10% significance criteria. Little Lake is a reservoir that has been in existence for approximately 100 years. A 10% decrease in groundwater discharge to Little Lake equates to a drawdown of the groundwater level of approximately 0.3 ft at the northern end of Little Lake, and less at the southern end. The lake is approximately 5 ft deep. It is helpful to understand how a 0.3 ft decrease in groundwater level compares to natural variability in groundwater levels. For perspective, Figure 3.2-3 on page 3.2-10 of the Draft EIR presents Bauer's (2002) data that show that groundwater elevation near Little Lake varied by approximately 1.0 ft during the year of measurement. A drawdown of 0.3 ft in the groundwater level near Little Lake is substantially less than the historical range of groundwater level fluctuation near Little Lake over the course of a year (Bauer 2002).

P17-3 The comment citing the Inyo County Ordinance is noted. See page 3.2-21 of the Draft EIR, where these ordinances are discussed as relevant to the proposed project.

P17-4 The Draft EIR analysis acknowledges the project as proposed would have a significant impact. The mitigation would reduce impacts to less than significant levels. With mitigation, Little Lake would experience a 0.3 ft or less drop in groundwater levels. If the project is approved, mitigation would be enforced.

P17-5 Please refer to Master Response L2 for a discussion of alternative water sources considered, including purchase of water from the LADWP. None of these options were found to be feasible. Mitigation minimizes the impact to Rose Valley. With mitigation, the Rose Valley aquifer would lose less than 2 or 3% of its current volume.

P17-6 The comment is noted. Commenter has been added to the mailing list.

RECEIVED
SEP 19 2008
BY: [signature]

September 8, 2008

Inyo County Board of Supervisors
Courthouse
168. N. Edwards Street
Independence, CA 93526

Re: Coso Geothermal Project Proposal – Little Lake Pumping of Potable Water

Dear Honorable Board Members:

P18-1 Unless you act responsibly now, Inyo county could see an important environmental asset in ruin, specifically Little Lake and surrounding area. Any potential change to the pumping of water (at any level) within the boundaries of Inyo county require extreme caution and vigilance for environmental protection. Your job continues to be to protect the citizens and the environment in this county, as you well know, please don't disappoint us now.

P18-2 I oppose any fresh/potable/ground water pumping from Little Lake and its surrounding area by the Coso Geothermal company/project, this company has other alternatives which will not cause possible irrevocable damage to southern Inyo county. The Coso Geothermal initiating documents projected a 10 year life to this project which actual term is reaching 23 years. Don't let this critical moment for avoiding further adverse environmental change to our beautiful valley and to one of the few remaining lakes here.

P18-3 I appreciate your consideration of my comments directed to this proposal when you make your deliberation towards the final decision. I realize these comments may be too late for the public comment period for the draft environmental impact report but nonetheless I ask that these comments "weigh in" with the others.

Respectfully,

[signature]

Jennifer Duncan, Citizen
Property Owner in So. Inyo County
P.O. Box 43
Independence, CA 93526

P18 **Jennifer Duncan**
P.O. Box 43
Independence, California 93526

P18-1 The comment is noted. The project includes mitigation to protect environmental resources at Little Lake from significant impacts.

P18-2 The commenter's objection to the proposed project is noted. Please refer to Master Response L2 for the list of alternatives considered but determined infeasible in accordance with CEQA. The project includes mitigation to protect environmental resources in Rose Valley.

P18-3 The comment is noted.

PM1
PM2
PM3
PM4

ENVIRONMENT • ENERGY • ENGINEERING

Meeting Notes

Project	1178 Hay Ranch
Date, Time	August 20, 2008, 6-8 p.m.
Location	Statham Hall, Lone Pine, Inyo County, California
Attendees	Inyo County Planning Department, MHA|RMT, Geologica, and other members of the public
Subject	Public Meeting to accept comments on the Draft Environmental Impact Report (EIR)

Comments Received

General Comments

- PM1-1 The EIR does not contain an evaluation of all impacts for the proposed 30 years of pumping (i.e., air quality, biological resources, etc.). The document needs to address impacts for all parameters for the full 30 years and not just the mitigated 1 to 2 years. (Gary Arnold)
- PM1-2 Why is the conditional use permit (CUP) for 30 years if mitigation is for 1 to 2 years? (Gary Arnold)
- PM1-3 People in Rose Valley should not accept the water loss. (Gary Arnold)
- PM2-1 The project is about money. It is directly proportional to tax benefits. (Wilfred J. Nabahe)
- PM2-2 The 2005 Energy Act encouraged new geothermal development. The state of California must increase its capacity by 10 percent by 2011. This will allow Coso to offset royalty payments to the County by 50 percent with increased production.

  Federal Register May 2007. If Coso can expand their project by increasing production by 10 percent by 2011, Coso can then reduce their royalties by 10 percent for any increases beyond 5 years. (Wilfred J. Nabahe)

  An economic analysis should be prepared.
- PM2-3 The County failed to uphold County Ordinance and State Law. (Wilfred J. Nabahe)
- PM1-4 The County should have a new draft EIR made available. New issues could arise from the answers to the questions on the Draft EIR – the existing Draft EIR should not go forward. (Gary Arnold).
- PM2-4 A 30 day extension on the comment period should be provided (Wilfred J. Nabahe)
- PM2-5 The document does not meet CEQA requirements. (Wilfred J. Nabahe)
- PM1-5 The EIR is fundamentally flawed. (Gary Arnold)

RMT

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PM2-6
- Opportunity to provide comments is deficient. A court reporter should have been present. Another public meeting to accept comments should be required. (Wilfred J. Nabahe)

Alternatives

PM1-6
- The alternatives do not compare the effects from 30 years of pumping. Pumping alternatives are compared to reduced pumping and not full pumping. (Gary Arnold)

PM2-7
- Why not make the cooling towers more efficient to avoid the export of water from Rose Valley. Viable alternatives are insufficient – they do not include capturing water loss from the cooling towers. (Wilfred J. Nabahe)

PM1-7
- We proposed 10 different alternatives and none were considered in the EIR. There are 15 alternative water sources within 50 miles. Water purchases from Haiwee should have been considered. Pumping out of Owens Valley and Indian Wells Valley should have been considered. This project is about evaporation from the cooling towers. Switching to air cooling should have been considered in the alternatives. Coso thought these alternatives were too expensive. All alternatives were thought to be too expensive. What is feasible? Analyze economics. (Gary Arnold)

Hydrology and Water Resources

PM1-8
- The project would create greater overdraft in Rose Valley than recharge. (Gary Arnold)

PM1-9
- Clarify the specific yield on charts and tables. (Gary Arnold)

PM2-8
- Anti degradation policy by State Water Resources Control Board (SWRCB) – Rose Valley - should be addressed. Permanent loss of water is occurring on Navy lands. (Wilfred J. Nabahe)

PM1-10
- Baseline monitoring should occur for 12 months (winter and summer). (Gary Arnold)

PM1-11
- Triggers: Gave triggers for North Dock Well that were inconsistent. Table C4-1 and 3.2-7. One says North Well and the other says North Dock Well. These are two different wells. (Gary Arnold)

PM1-12
- What is the starting elevation for trigger points? What if it is a dry year or a wet year? (Gary Arnold)

PM2-9
- The document is deficient in hydrologic data. (Wilfred J. Nabahe)

PM2-10
- Shawn Haggerty said on October 12, 2000 that hydrologic monitoring can be manipulated until it fits. (Wilfred Nabahe)

PM1-13
- The idea of loss of 10% of water throughout the Rose Valley and at Little Lake is too great. That 10% is needed to maintain habitat.(Gary Arnold)

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Hydrologic Modeling

PM1-14
- Project aquifer is 700 feet thick. The calibrated model overstates the thickness at 3,000 feet. (Gary Arnold)

PM1-15
- If Danskin uses a specific yield of 10 percent, why does the document state the specific yield is 10 percent, 20 percent, and 30 percent? (Gary Arnold)

PM1-16
- The hydrologic model was calibrated at 3 percent specific yield. Why was 10 percent used? (Gary Arnold)

PM1-17
- The model overstates the water available. (Gary Arnold)

PM1-18
- Can the predictions of the model be verified? (Gary Arnold)

PM1-19
- Can Wes Danskin, USGS, be used as a third-party, peer-reviewer for the model? (Gary Arnold)

PM2-11
- Hydrologic modeling does not factor in cumulative effects of other projects. (Wilfred J. Nabahe)

PM2-12
- 300 feet of drawdown is too much. (Wilfred J. Nabahe)

PM3-1, PM3-2, PM3-3
- Groundwater model: the model does not consider the north end of the aquifer wells. The north end assumes hydrologic conditions 2 to 3 times smaller. Include a geologic cross-section. North and South head conditions should not be constant. (LADWP rep)

PM3-4
- Stick to the recharge assumed – 10 percent recharge from precipitation from the mountains. Danskin cites 6 percent. The EIR assumes more water than exists. Main comments by LADWP will be on the north end of the valley. (LADWP rep)

Coso Hot Springs

PM1-20
- The document suggests a benefit to Coso Hot Springs but does not give any proven direct connection. Fix this contradiction. (Gary Arnold)

PM2-13
- 1979 MOA does not protect Coso Hot Springs. Decision makers need to consider this. (Wilfred J. Nabahe)

PM2-14
- The Coso Hot Springs have been destroyed beyond repair. Everyone used them and cannot now. This needs to be addressed in the EIR. (Wilfred J. Nabahe)

PM2-15
- The data shows change in Coso Hot Springs since 1993. A change of 2X is not minor. The increase in temperature of over 200 degrees has destroyed the springs. (Wilfred J. Nabahe)

PM2-16
- Connectivity between the Coso Hot Springs and the reservoir – Geothermex (September 15, 2006) cannot say there is no connectivity and then say there are benefits. Sim of Hay Ranch August Project. (Wilfred J. Nabahe)

PM2-17
- Carl Austin said that a number of scenarios could occur that the EIR ignored. The document state that augmented fluids may cause increase in useability. However, it may also 1) cause fractures.

PM2-17 2) Fractures become blocked 3)Result in permanent cessation of hot spring activity. These should all be considered to eliminate risk for the next century or two. (Wilfred Nabahe)

- PM4-1 The contradiction in the Coso Hot Springs connection needs to be addressed and clarified. (Bill Helmer)

Agriculture

- PM2-18 The project would result in removal of 300 acres of agricultural land – 1973 Ordinance on geothermal development says that development must still protect agricultural lands and allow for other reasonable uses for the entire county. (Wilfred J. Nabahe)

Cumulative Impacts

- PM2-19 The decision on the cumulative impacts includes the Navy Geothermal Plant. The impacts of the geothermal plant should be addressed. (Wilfred J. Nabahe)
- PM2-20 Cumulative impacts should also consider other projects that could occur that would require water – such as other geothermal projects, solar projects, wind power projects. (Wilfred J. Nabahe)
- PM2-21 Deep Rose geothermal is mentioned but the cumulative analysis did not address the potential for future properties to be leased for geothermal development. (Wilfred J. Nabahe)

PM1 Gary D. Arnold
Arnold, Bleuel, LaRochelle, Mathews & Zirbel LLP
300 Esplanade Drive, Suite 2100
Oxnard, California 93036

PM1-1 Please refer to Master Response A4. The commenter is incorrect in stating that the project does not address the impacts of the project for the proposed 30 years of pumping.

PM1-2 Inyo County would issue the CUP if the project is approved. See Master Response B4. The CUP would contain conditions based on the analysis in the Final EIR. The duration of pumping would not be based on a specified timeframe, but on the trigger levels. The trigger levels may be reached before or after 1.2 years. The model is very conservative and so pumping may continue for many more than 1.2 years if there is available water, and may stop and restart if the aquifer were to recharge more quickly than modeled. Please refer to Master Response C2.7.

PM1-3 Some loss of water from the aquifer is not necessarily a significant impact. Groundwater users would experience less than significant effects.

PM1-4 Please refer to Master Response A7.2. No new information or significant impacts arose as a result of public comment. Recirculation of the Draft EIR is not required.

PM1-5 The commenter's opinion is noted.

PM1-6 Please refer to Master Response L3. The alternatives were compared to the proposed project and the Draft EIR clearly states that the alternatives would have fewer impacts than the project as proposed, without mitigation. Mitigation minimizes the impacts of the proposed project to less than significant levels.

PM1-7 Please refer to Master Response L2 for explanation as to why all alternatives proposed by the commenter are infeasible, pursuant to CEQA.

PM1-8 The comment is noted. The project may overdraft the groundwater aquifer in Rose Valley; however, some loss of water from the aquifer is not necessarily a significant impact. Groundwater and spring and surface water users would experience less than significant effects.

PM1-9 The comment is noted. Edits to graphs and charts have been made as noted throughout this Final EIR, and are shown in Chapter 3: Errata.

PM1-10 Please refer to Master Response C4.1.

PM1-11 The Draft EIR, Table C4-2 states that groundwater elevations in the Little Lake Hotel well and the Little Lake North Dock well would be monitored using dedicated pressure transducer collecting hourly water level readings initially. As stated in Table C4-2, no trigger levels would be established for these wells. The monitoring data would be used to complete the hydrogeologic characterization of the Little Lake Ranch property and for Hydrology Model recalibration.

Monitoring would be conducted and drawdown triggers have been established for the Little Lake Ranch North well, located at the north end of the ranch property, as listed in Table C4-1. The Draft EIR does not identify any other wells on the Little Lake Ranch property that would be monitored during the Hay Ranch project. The verbal comments from Geologica in the public meeting were intended to reflect the fact that trigger levels had been established for all wells listed in Table C4-1, not that trigger levels would be established for all wells on the Little Lake Ranch property. The text of the HMMP and Section 3.2 of the Draft EIR has been clarified to note that trigger levels are only specified for wells that are not routinely pumped and which are suitably located and constructed so as to provide early warning of impending drawdown impacts. It is not intended nor is it necessary to monitor or set trigger levels for every well in Rose Valley. The Little Lake North Dock well would be intensively monitored during the baseline study period and throughout project operation; however, a trigger level was not specified in Table C4-1 for this well because of concerns that groundwater levels in the well may be affected by water level changes in Little Lake related to management practices. The trigger level for the Little Lake Ranch North well located near the north end of the ranch property was conservatively specified as 0.3 ft with a maximum allowable drawdown of 0.4 ft. The low trigger level for the Little Lake Ranch North well is intended to prevent a water level change of greater than 0.3 ft beneath Little Lake, consistent with the groundwater flow model results.

PM1-12 See page C4-14 of the Draft EIR for a discussion of how the baseline condition from which trigger levels are measured would be established.

PM1-13 Please refer to Master Response C4.4 and E2 for a discussion of the trigger level. The commenter is incorrect in stating that a 10% loss of water would occur throughout the valley. The project, with mitigation, would result in a maximum of 10% decrease of water flowing into Little Lake. The rest of the valley would experience less than 2 to 3% reduction in the groundwater aquifer.

PM1-14 Please refer to Master Response C2.1 for an explanation of the aquifer thickness. The correct thickness for the most accurate results was used in the groundwater model.

PM1-15 Please refer to Master Response C2.2 for a discussion of specific yield. The correct values for specific yield were evaluated in the Draft EIR.

PM1-16 Please refer to Master Response C2.2 for a discussion of specific yield. The correct values for specific yield were evaluated in the Draft EIR.

PM1-17 Please refer to Master Response C2. The commenter is incorrect in stating that the model overestimates the amount of water available.

PM1-18 The predictions of the model would be verified through the monitoring and conditions of the HMMP. Adjustments would be made to the model as appropriate. This does not change the significance criteria for the proposed project.

PM1-19 The comment is noted regarding a request for peer review of the Hydrology Model. Peer review at the request of a commenter is not required by CEQA. The model can be made available upon request. The model was made available to Little Lake and to the LADWP and can be provided to anyone else upon a public request.

PM1-20 Please refer to Master Responses C5.1 and C5.2. The commenter is incorrect in stating that there is a contradiction. There is not a direct, one-to-one connection. No edits were made to the Draft EIR.

PM2 **Wilfred J. Nabahe**
Deep Rose, LLC
1240 S. China Lake Blvd.
Ridgecrest, California 93555

PM2-1 The comment is noted. The comment does not relate to the environmental analysis of the EIR.

PM2-2 The comments are noted. The references and claims cited by the commenter were not identified in the recent legislation. The comments do not relate to the environmental analysis of the EIR.

PM2-3 The comment is noted.

PM2-4 Please refer to Master Response A7 for a discussion of why the comment period was not extended.

PM2-5 The commenter's opinion regarding the document's adequacy under CEQA is noted.

PM2-6 Please refer to Master Response A7. A court recorder is not required for a public hearing or meeting under CEQA or Inyo County Code.

PM2-7 Please refer to Master Response L2. Alternatives, including modifications to the cooling towers were considered but were infeasible.

PM2-8 Existing operations at Coso are beyond the scope of this EIR, in terms of loss of water from the cooling towers. The proposed project would not expand production at the power plants beyond that which is permitted and was previously produced. See Master Response N3.

PM2-9 See Section 3.2: Hydrology and Water Quality of the Draft EIR for a discussion of data and background reports used. The Draft EIR used available information and a pumping test was also performed to collect additional data.

PM2-10 The comment regarding manipulation of data is noted.

PM2-11 The commenter is incorrect in stating that the Hydrology Model does not factor in effects of other projects. Potential effects from pumping of LADWP wells were modeled. To the extent that previous actions contribute to effects, the effect of those actions is part of the baseline and considered in the model.

Refer to pages 4-1 through 4-14 of the Draft EIR.

PM2-12 The commenter is incorrect in stating that the project would cause 300 ft of groundwater drawdown. The proposed project would not cause nearly that much drawdown, particularly with mitigation incorporated.

PM2-13 Please refer to Master Response F2. The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR. The measures in the MOA as established were agreed upon by the signatory parties and remain valid.

PM2-14 The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR. The measures in the MOA as established were agreed upon by the signatory parties and remain valid. The existing conditions at the hot springs are baseline for this EIR.

PM2-15 Please refer to Master Response C5 for a discussion of the impacts to the Coso Hot Springs.

PM2-16 The Draft EIR does not say that there is no connectivity. Please refer to Master Response C5.2.

PM2-17 Please refer to Master Responses C5 and D2 for a discussion of the potential for causing fractures. There has also been no correlation between seismic activity and changes in Coso Hot Springs for the parameters monitored. The introduction of cool water into hot rock produces fractures or microfractures, which in turn produce permeability; however, this process is currently occurring at Coso.

PM2-18 Please refer to Master Response G2. The project would not remove 300 ac of agricultural land. At most, 5 out of the 300 ac on the Hay Ranch parcel would be removed. Hay Ranch could be used for agricultural purposes in the future at the owner's discretion.

PM2-19 Please refer to Master Response N3 for a discussion of out-of-scope comments related to the impacts of the power plants. Impacts of the power plants are not relevant to the proposed project because the impacts of the plant are the baseline for this project (have already occurred) and are addressed in previous documents. Previous documentation for the power plants addresses all impacts and all impacts could be mitigated. The proposed project would not generate power or waste in excess of what was previously permitted and previously produced. The mitigation from previous documents is applicable to the ongoing generation of power from the plants (i.e., plant operation).

PM2-20 Please refer to Master Response K1 for additional discussion of geothermal leasing. Some text clarifications were made to address the larger area for leasing. There are currently no proposed wind or solar projects in the project area. CEQA does not require that the cumulative analysis address speculative projects with no project plans or applications.

PM2-21 Please refer to Master Response K1 for additional discussion of the Deep Rose project. Some text clarifications were made to address the larger area for leasing. Whether additional projects of any kind will occur in the Rose Valley area is speculative and not amenable to study.

PM3 **Saeed M. Jorat**
City of Los Angeles Department of Water and Power
111 North Hope Street Floor 15
Los Angeles, CA 90012-2607

PM3-1 Please refer to Master Response C2.4 for a discussion of the northern boundary condition used in the model.

PM3-2 A geologic cross-section was determined to be unnecessary, given the minimal impacts expected to the north end of the valley.

PM3-3 Please refer to Master Response C2.4 for a discussion of the southern boundary condition.

PM3-4 Please refer to Master Response C2.2 for a discussion of specific yield. The correct values for specific yield were evaluated in the Draft EIR.

PM4 **Bill Helmer**
Tribal Historic Preservation Officer
Big Pine Paiute Tribe of the Owens Valley
PO Box 700
Big Pine, California 93513

PM4-1 Please refer to Master Response C5.2 for discussion of connectivity of Coso Hot Springs to the geothermal reservoir. The commenter is incorrect in stating that there is a contradiction. There is not a direct, one-to-one connection. No edits were made to the Draft EIR.

BIG PINE PAIUTE TRIBE OF THE OWENS VALLEY

Big Pine Indian Reservation

RECEIVED
SEP 2008
INYO COUNTY PLANNING DEPT.

September 5th, 2008

Inyo County Planning Department
P.O. Drawer L,
Independence, CA 93526

RE: Conditional Use Permit No. 2007-3/Coso Operating Company LLC (Coso Hay Ranch Water Extraction, Export, and Delivery System)

Planning Department:

Please accept these comments regarding the Draft Environmental Impact Report (Draft EIR) for the Coso Hay Ranch Water Extraction, Export, and Delivery System Project. We also would like to thank you for promptly sending the Big Pine Paiute Tribe a hard copy of the Draft EIR and all notices relating to the Project.

T1-1 The Big Pine Paiute Tribe submitted scoping comments to the Inyo County Planning Department on October 16, 2007, but these comments are not found in the Draft EIR (see **Attachment 1**). Please include these comments in the Final EIR.

T1-2 **[EIR, p. 3.2-51] Potential Impact 3.2-3: The potential to cause a significant alteration in the temperature or water levels of the surface features at Coso Hot Springs through injection of additional water into the Coso geothermal reservoir.**

On page 3.2-51 it is stated: "Construction of the proposed project would have no impact on the Coso Hot Springs," yet there is no evidence to back up this statement. It is also stated:

> The proposed project involves injecting water into the system, which theoretically could counter the pressure differential and result in a decrease or stabilization of the steam-dominated portion of the reservoir and a decrease (or stabilization) in water level and temperature in the hot springs. These changes could make the hot springs closer to their pre-geothermal development condition (p. 3.2-51).

However, water has been injected back into the geothermal reservoir for the last twenty years, and this has not stopped the rise in temperature of Coso Hot Springs subsequent to the initiation of geothermal energy production. This rise in temperature has prevented the traditional use of Coso Hot Springs by many Native Americans for over two decades. The Draft EIR presents no evidence indicating that injection of water into the Coso Geothermal Reservoir will not continue the adverse effects on Coso Hot Springs as a result of geothermal energy production.

The monitoring program doesn't provide a "safeguard" for Coso Hot Springs, as stated in the EIR (p. 3.2-51), but it does provide evidence that the temperatures of Coso Hot Springs subsequent to

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T1-2 geothermal production have consistently stayed higher than the temperatures at the Springs before geothermal production.

T1-3 The Coso Hot Springs Analysis (*Technical Summary*) submitted by Innovative Technical Solutions in April, 2007 upon the request of the Navy stated the following conclusion:

"It is impossible to completely rule out time dependent changes observed at the Coso Hot Springs being due to natural variability associated with high Rayleigh number convection. However, the timing of the onset of geothermal fluid withdrawal and changes in hot spring activity at Coso suggest a correlation (p. 60)".

In light of the above conclusion, and the negative effects of geothermal production on Coso Hot Springs traditional use for the last twenty years, a preponderance of the evidence indicates that continued injection of water into the geothermal reservoir and continued geothermal production will continue to have an adverse significant effect on Coso Hot Springs.

T1-4 Because of these adverse effects, the Big Pine Paiute Tribe and other area tribes have requested a meeting with Naval Air Weapons Station, China Lake (NAWS), the Advisory Council on Historic Preservation (ACHP), and the California State Historic Preservation Officer (SHPO) per the MOA which concerns geothermal production and Coso Hot Springs: *and Programmatic Memorandum of Agreement between the Commander, Naval Weapons Center, California State Historic Preservation Officer and the Advisory Council on Historic Preservation (November, 1979).* **Attachment 2** is a copy of the letter sent to NAWS requesting this meeting.

T1-5 The Big Pine Paiute Tribe and other tribes will also discuss with the Navy another 1979 MOA concerning the effects of geothermal production on Coso Hot Springs: *Memorandum of Agreement between the Commander, Naval Weapons Center and the Coso Ad Hoc Committee, Owens Valley Paiute-Shoshone Band of Indians (July, 1979).* Although the Big Pine Paiute Tribe's scoping comments cited the July, 1979, MOA between NAWS and the Coso Ad Hoc Committee, Owens Valley Paiute-Shoshone Band of Indians, this was not included as a reference in the EIR. **Attachment 3** is a copy of the July, 1979 MOA which should be included in the Draft EIR in an Appendix for reference.

T1-6 A section in the Memorandum of Agreement (MOA) between NAWS, China Lake and the Coso Ad Hoc Committee and the Owens Valley Paiute-Shoshone Band of Indians (July, 1979) states:

> 11. That material or substantial alteration or permanent disturbance of the hot springs or the pond shall not be permitted. Both the Naval Weapons center and the Native Americans pledge their mutual cooperative efforts to expeditiously develop a preservation and management plan acceptable to both parties and to the California state Office of Historic Preservation and approvable by the Advisory Council on Historic Preservation (p. 2).

Since there has been permanent disturbance of Coso Hot Springs, this provision in the MOA will be discussed with the Navy.

A section in the Memorandum of Agreement between the Commander, Naval Weapons Center, California, State Historic Preservation Officer and the Advisory Council on Historic Preservation (November, 1979) states:

> In the event a perceptible change to the surface activity of the hot springs were to occur over a period of time as a result of the geothermal development program the Navy will cease those actions on the part of the Navy and or its agents which can reasonably be presumed to be causing this effect and will make every reasonable effort to determine what actions could be taken to mitigate this change. The Navy will request the comments of the Owens Valley Paiute-Shoshone Band of Indians, the California State Historic Preservation Officer and the Advisory Council on Historic Preservation (p. 10).

T1-7

Since a more than perceptible change has occurred at Coso Hot Springs as a result of geothermal development, this provision of the MOA will be discussed with the Navy, ACHP, and SHPO. The first meeting concerning the two MOAs and the involved parties is scheduled for some time in November, 2008. As stated in the Draft EIR (p. 3.5-16), the proposed project is part of the Coso Known Geothermal Resource Area (KGRA), and it is within the jurisdiction of both 1979 MOAs. The Draft EIR states: "The project is not expected to have a significant impact on Coso Hot Springs with implementation of the existing MOA. No additional mitigation for the proposed project is needed" (p. 3.5-16).

However, implementation of the November, 1979 MOA between NAWS, ACHP, and SHPO (with tribes as consulting parties) could potentially lead the Navy to "cease those actions on the part of the Navy and or its agents which can reasonably be presumed to be causing this effect and will make every reasonable effort to determine what actions could be taken to mitigate this change." Since this could be the case according to the provisions of the MOA, it is premature to state that "No additional mitigation for the proposed project is needed."

T1-8

Potential Impact 3.2-2: The potential to substantially reduce the amount of water available to surface water bodies at Little Lake Ranch and to other areas in the Rose Valley

As stated in the Draft EIR, the proposed project will pump 4,839 ac-ft/yr for 30 years (p. ES-8). The Draft EIR also states that groundwater inflow to Little Lake could possibly be negatively effected after 1.2 years of pumping at this rate. If this happens, pumping would be stopped or reduced. A recalibrated monitoring model after actual pumping data is obtained may also change the time at which Little Lake may be negatively effected by the project. However, this appears to be a very speculative and non-substantive form of mitigation. It seems that if the Project is not to be shut down after 1.2 years, the Draft EIR's own Hydrology Model must be proven wrong. The real conclusion of the Hydrology Model is that there will be significant adverse impacts on the Little Lake riparian area which can't be mitigated to a less than significant level. The destruction of rare riparian habitat in the desert is not acceptable.

T1-9

Native American Prayer Site. On page 3.5-15 the Draft EIR states: "There is a Native American prayer site located along Gill Station Coso Road approximately 1,600 feet from the terminus of the proposed project pipeline route into the injection system at the Coso geothermal

T1-9 field." It appears that the injection well is visible from the prayer site. If the pipeline is above ground in this area, then the added construction to the geothermal electric plant could have adverse effects on the use of the prayer site. A simulation of what the injection well and pipeline would look like from the prayer site (on both sides of the road) should be added to the Final EIR.

T1-10 In conclusion, the Big Pine Paiute Tribe of the Owens Valley recommends the "No Project" Alternative for the proposed project. The Draft EIR states on p. ES-12 that if the No Project Alternative is chosen, then "The Coso Hot Springs could return to a natural state sooner if the power plants and geothermal withdrawal were to cease." It is time for Coso Hot Springs to return to a natural state because the geothermal electric plant has severely adversely effected a sacred site on the National Register of Historic Places, Coso Hot Springs. Geothermal, solar, and wind alternative energy projects can occur elsewhere in order to meet California's energy needs. These needs can be met without destroying sacred sites.

Enough damage has been done already; now is not the time to compound the desecration of Coso Hot Springs with the destruction of rare riparian habitat at Little Lake. The Project will create adverse, significant impacts to Coso Hot Springs and Little Lake which can't be mitigated. Other alternative energy projects can be developed in Inyo County so that its tax revenues can be sustained. For Coso Hot Springs it is time to start healing again.

Sincerely,

Virgil Moose

Virgil Moose
Tribal Chairperson
Big Pine Paiute Tribe of the Owens Valley

cc: Reid Nelson, ACHP
Milford Wayne Donaldson, SHPO

ATTACHMENT 1

BIG PINE PAIUTE TRIBE OF THE OWENS VALLEY
Big Pine Indian Reservation

October 17, 2007

Jan Larsen, Senior Planner
Inyo County Planning Department
P.O. Drawer L,
Independence, CA 93526

RE: Conditional Use Permit No. 2007-03/Coso Operating Company LLC (Coso Hay Ranch Water Extraction, Export, and Delivery System)

Dear Ms. Larsen:

Please accept these scoping comments regarding the Environmental Impact Report for the above referenced "Hay Ranch Project."

V. Cultural Resources. The EIR should have a new, in-depth analysis of the potential effects of injecting cold water into the Coso geothermal reservoir on Coso Hot Springs. In May, 2007, upon the advice of the Big Pine Paiute Tribe, other area tribes, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP), BLM changed its initial APE (Area of Potential Effects) for the Project to include Coso Hot Springs. Coso Hot Springs is on the National Register of Historic Places and is a sacred site for area tribes as well as for other Native Americans.

The potential impacts of the proposed Project on Coso Hot Springs have never been adequately assessed. The study conducted by GeothermEX was not particularly in-depth, and was critiqued by Dr. Austin, a geologist familiar with the Coso geothermal reservoir (see **Attachment 1**). The brief GeothermEX study was also conducted before the study commissioned by Naval Air Weapons Station, China Lake's Geothermal Office, *Hydrologic Analysis of the Coso Geothermal System: Technical Summary N68711-05-P-0049, Innovative Technical Solutions, Inc., April 26, 2007.* This study may be very helpful as background data for the analysis of the water injection effects on Coso Hot Springs.

Since the Project's effects on Coso Hot Springs are presently not adequately analyzed, and it is unknown as to whether mitigation measures may reduce the Project's impacts to a Less Than Significant Level with Mitigation, the impact on Cultural Resources should be checked as a "Potentially Significant Impact."

The Native American Heritage Commission is not involved in any MOAs (Memorandum of Agreements) with China Lake Naval Air Weapons Station (CLNAWS). CLNAWS is a party to two MOAs regarding the effects of geothermal production within the Coso Geothermal Reservoir on Coso Hot Springs: *Memorandum of Agreement between the Commander, Naval Weapons Center and the Coso Ad Hoc Committee, Owens Valley Paiute-Shoshone Band of Indians (July, 1979), and Programmatic Memorandum of Agreement between the Commander, Naval Weapons Center, California State Historic Preservation Officer and the Advisory Council on Historic Preservation (November, 1979).* Both MOAs have provisions which require consultation with Native Americans and a discussion of mitigation measures if there are negative impacts on Coso Hot Springs which can be attributed to geothermal production in the Coso geothermal reservoir. Especially after the geothermal study stated above, a preponderance of the evidence suggests that geothermal production in the Coso Geothermal Reservoir has had negative impacts on Coso Hot Springs almost since the inception of geothermal production. The

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monitoring program substantiates the heating up of Coso Hot Springs so that it is unusable for many traditional Native American users of Coso Hot Springs.

In light of the negative effects which geothermal production has had on Coso Hot Springs for two decades, the Environmental Impact Report should also address whether the continuance of the geothermal production (as augmented by the injection of cold water from Hay Ranch) will have cumulative negative effects on Coso Hot Springs.

The monitoring program merely records the changes at Coso Hot Springs, which since geothermal production have been negative. The monitoring program is not mitigation. Geothermal production has already produced negative impacts on the traditional use of Coso Hot Springs by Native Americans, and mitigation measures have yet to be agreed upon by all the interested parties. Thus, there are no specifics as to what mitigation measures would reduce the Project's impacts to a Less Than Significant level.

VIII. Hydrology and Water Quality. The Project's proposed withdrawal of huge amounts of water from the Rose Valley aquifer have to adequately address potential impacts to wildlife, plants, springs, and wetlands in the region. The analysis in the previous Mitigated Negative Declaration for the Project was not adequate.

XVII. Mandatory Findings of Significance. The Project could potentially "eliminate important examples of the major periods of California history or prehistory," and thus has a potentially significant impact. Coso Hot Springs is one of the most important multi-tribal sacred sites in California, and the inception of geothermal production in the Coso Geothermal Reservoir has severely disrupted traditional practices for two decades. The proposed Project may prolong the life of geothermal production and continue to degrade traditional use of Coso Hot Springs. No mitigation measures to offset these negative effects have been proposed.

In addition, the Project's cumulative effects of prolonging the documented negative effects of geothermal production on Coso Hot Springs has to be assessed.

Since the Project is subject to both the California Environmental Policy Act (CEQA) as well as NEPA (National Environmental Policy Act), please coordinate the EIR with the revised Environmental Assessment by the Bureau of Land Management which will be necessary due to the new findings produced by the EIR.

Thank you for providing the Big Pine Paiute Tribe of the Owens Valley the opportunity to submit comments regarding the scope and content of the Environmental Impact Report for the Hay Ranch Project. Please keep us informed of all pertinent hearings, deadlines, and the availability of all relevant documents.

Sincerely,

Virgil Moose

Virgil Moose
Tribal Chairperson
Big Pine Paiute Tribe of the Owens Valley

ATTACHMENT 2

BIG PINE PAIUTE TRIBE OF THE OWENS VALLEY
Big Pine Indian Reservation

July 15, 2008

Captain Gary Peterson, U.S. Navy
Commanding Officer
Naval Air Weapons Station
1 Administration Circle
China Lake, CA 93555-6100

RE: Implementation of the two MOAs from 1979 regarding adverse effects to Coso Hot Springs as a result of geothermal development

The Big Pine Paiute Tribe of the Owens Valley is officially requesting a meeting with NAWS, China Lake, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding the implementation of the following two MOAs and the adverse effects to Coso Hot Springs as a result of geothermal development:

(1) Memorandum of Agreement between the Commander, Naval Weapons Center, and the Coso Ad Hoc Committee, Owens Valley Paiute-Shoshone Band of Indians (July, 1979)

(2) Programmatic Memorandum of Agreement between the Commander, Naval Weapons Center, California State Historic Preservation Officer and the Advisory Council on Historic Preservation (November, 1979).

The Big Pine Paiute Tribe is a party to the first MOA listed above, and is a consulting party to the second. We assume that other involved Tribes will be participants in such a meeting.

A Section in the *Memorandum of Agreement between NA WS, China Lake and the Coso Ad Hoc Committee* states:

> 11. That material or substantial alteration or permanent disturbance of the hot springs or the pond shall not be permitted. Both the Naval Weapons center and the Native Americans pledge their mutual cooperative efforts to expeditiously develop a preservation and management plan acceptable to both parties and to the California state Office of Historic Preservation and approvable by the Advisory Council on Historic Preservation (p. 2).

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In fact, "material or substantial alteration or permanent disturbance of the hot springs" has been permitted almost since the inception of the geothermal development. A study commissioned by the Navy (with no tribal input) came to the following conclusion: ". . .the timing of the onset of geothermal fluid withdrawal and changes in hot spring activity at Coso suggest a correlation" *Hydrologic Analysis of the Coso Geothermal System: Technical Summary,* prepared for the Navy's Geothermal Program Office by Innovative Technical Solutions, Inc. (p. 60).

A section in the *Memorandum of Agreement between the Commander, Naval Weapons Center, California State Historic Preservation Officer and the Advisory Council on Historic Preservation* states:

> In the event a perceptible change to the surface activity of the hot springs were to occur over a period of time as a result of the geothermal development program the Navy will cease those actions on the part of the Navy and/or its agents which can reasonably be presumed to be causing this effect and will make every reasonable effort to determine what actions could be taken to mitigate this change. The Navy will request the comments of the Owens Valley Paiute-Shoshone Band of Indians, the California State Historic Preservation Officer and the Advisory Council on Historic Preservation (p. 10).

There has been more than a perceptible change to hot springs for the last two decades. As the chart from the *Hydrologic Analysis of the Coso Geothermal System: Technical Summary, Figure 4 (p. 4),* indicates, the Hot Springs have become so hot after the geothermal development that they have become unusable in the manner traditionally used by Native Americans, especially Elders (see **Attachment 1**).

Besides NAWS and the involved Tribes, this meeting would also include representatives from California SHPO and the ACHP. If desirable by all parties, Stephen Haberfield of Indian Dispute Resolution Services, Inc., may be available as a mediator for this meeting.

Please contact me at your earliest convenience so we can discuss this matter.

Sincerely,

Virgil Moose

Virgil Moose
Tribal Chairperson
Big Pine Paiute Tribe of the Owens Valley

cc: Reid Nelson, ACHP
Milford Wayne Donaldson, SHPO

Attachment 1

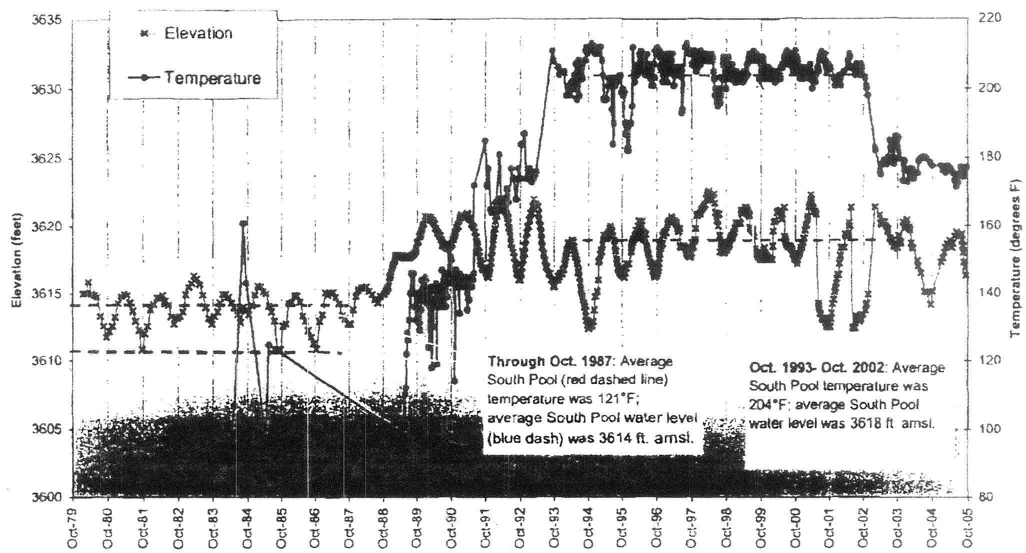


Figure 4. Changes in Coso Hot Springs South Pool temperature and water levels, 1979 – 2005. Note changes in water levels and temperatures before and after 1987. The average temperature difference between the periods 1979-1987 and 1993-2002 exceeds 80°F. The average water elevation difference in the South Pool during those periods is 4 ft. The changes appeared to have begun in 1988. Data from the Navy Geothermal Program Office.

ATTACHMENT 3

MEMORANDUM OF AGREEMENT

The Commander Naval Weapons Center acting for and on behalf of the U. S. Government and the Coso Ad Hoc Committee, Owens Valley Paiute-Shoshone Band of Indians, acting for and on behalf of the Indians represented by that group, as well as for certain Indian people in the Kern Valley Indian Community area, are desirous of entering into this agreement for the mutual benefit of both parties. The general subject of the agreement is access to and related matters concerning the area known as Coso Hot Springs, located within the Naval Weapons Center, China Lake, California.

The parties hereafter referred to as the Naval Weapons Center and the Native Americans respectively, hereby agree:

1. That the terms of this Memorandum of Agreement are based upon the primacy of the mission of the Naval Weapons Center and that any or all access provisions herein agreed to shall be premised on a not-to-interfere with that mission basis;

2. That both parties to this Memorandum of Agreement recognize the provisions of Public Law 95-341 "Native American Religious Freedom" and its mandate for an evaluation of existing laws and regulations. Therefore, the terms of this Memorandum of Agreement are subject to review at the request of either party following the Presidential submittal of the evaluation to the Congress;

3. That the requirements of the Historic Preservation Act of 1966 (Public Law 89-665) shall be scrupulously adhered to by both parties and that both parties agree to diligently pursue the formulation and acceptance of a preservation and management plan for the Coso Hot Springs National Register of Historic Places site;

4. That upon request a maximum of eight (8) scheduled weekend visits per year shall be reserved exclusively for members of the Owens Valley Paiute-Shoshone Band of Indians and/or the Kern Valley Indian Community. Such visits shall be limited to a maximum of twenty five (25) vehicles and one hundred (100) people on any given weekend. The duration of any one weekend visit shall be from sunrise Saturday to sunset Sunday. However, up to three (3) two-night visits may be scheduled on Federal holidays which fall on weekends;

MEMORANDUM OF AGREEMENT

5. That unscheduled visits shall be considered on a case-by-case basis by the Commander, Naval Weapons Center, upon receipt of a written request by the Chairperson of the Coso Ad Hoc Committee describing the need for the visit, or a Committee member in the Chairperson's absence. In instances which the Chairperson considers a bona fide emergency, the request may be made by telephone and shall be followed with written confirmation;

6. That Native American groups other than the Owens Valley Paiute-Shoshone Band of Indians and those from the Kern Valley Indian Community are not covered by this agreement. However, medicine men who may be visiting the aforesaid groups may accompany these groups. Requests from other Native American groups shall be considered on a case-by-case basis;

7. That the boundaries of the visit area shall be the immediate vicinity of the Prayer Site, Coso Hot Springs, the old resort of the same name, and a designated overnight camping area. These areas are specified on a map accompanying this Memorandum of Agreement;

8. That appropriate sanitary facilities shall be provided by the Naval Weapons Center and installed in the camping area;

9. That the visiting Native Americans shall carry out all trash and garbage and shall police up their own camping area. On-site rubbish receptacles shall not be provided by the Naval Weapons Center;

10. That the Naval Weapons Center shall provide an escort for all visits; the escort shall be a person acceptable to the Ad Hoc Committee. During any ceremony, upon request, the escort shall withdraw to a discrete distance and shall not intrude on traditional rites;

11. That material or substantial alteration or permanent disturbance of the hot springs or the pond shall not be permitted. Both the Naval Weapons Center and the Native Americans pledge their mutual cooperative efforts to expeditiously develop a preservation and management plan acceptable to both parties and to the California State Office of Historic Preservation and approvable by the Advisory Council on Historic Preservation;

12. The Naval Weapons Center will provide Assumption of Risk forms t the Coso Ad Hoc Committee to be signed by each adult individual desiring t enter the Naval Weapons Center under provisions of this agreement. A designated Indian visit leader will be responsible for assembling all executed Assumption of Risk forms from each adult visitor for presentatior to the Navy escort at time of entry. The Naval Weapons Center will maintain a permanent file of signed Assumption of Risk forms and repeat visitors will not be required to provide new forms for subsequent visits.

MEMORANDUM OF AGREEMENT

13. That in the event the mission of the Naval Weapons Center requires use of its ranges, any or all visits shall be subject to cancellation without prior notice and under the same conditions are subject to immediate termination. The Coso Ad Hoc Committee shall be responsible for assisting the Naval Weapons Center, when and if necessary, in the event immediate evacuation of visitors from the area is required to conduct the mission of the Naval Weapons Center;

14. That the Naval Weapons Center reserves the right to prohibit future access if the terms of this Memorandum of Agreement are deliberately or materially violated by visiting Native Americans; and that the standards of conduct established for Naval Weapons Center personnel, federal, state or local agencies, and contractors while on the NWC ranges will be observed by visiting Native Americans.

W. L. Harris
For the Naval Weapons Center
Rear Admiral, U.S. Navy

June 28, 1979
Date

For the Coso Ad Hoc Committee

For the Coso Ad Hoc Committee

For the Coso Ad Hoc Committee

Phyllis
For the Coso Ad Hoc Committee

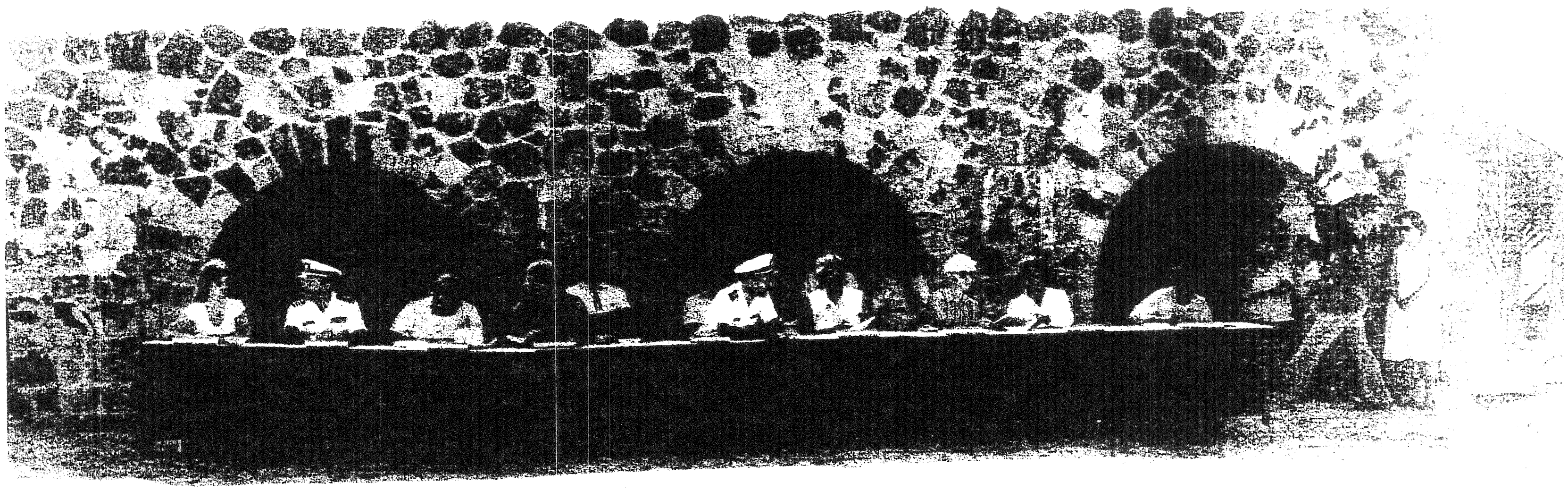
For the Coso Ad Hoc Committee

July 25, 1979 9:15 a.m.
Date

Approved as to Form on behalf of the Owens Valley Paiute-Shoshone Band of Indians

CALIFORNIA INDIAN LEGAL SERVICES

June 25, 1979
Date



A year of negotiations between the Naval Weapons Center, China Lake, Calif., and the Owens Valley Paiute-Shosone Indians for a program permitting use by local Indians of the Coso Hot Springs area on the Center's test ranges were concluded on July 28, 1979, at the Coso Hot Springs site with the signing of an agreement for Indian use of the area. Present at the signing as shown in the photo are, left to right, Patti Wermuth, Kern River Valley Indian Community; Lt. Cmdr. Perry S. Patterson, USN, Staff Judge Advocate, Naval Weapons Center; Phyllis Hunter, Coso Ad Hoc Committee; Neddeen Naylor, Chairperson, Coso Ad Hoc Committee; Capt. Jon R. Ives, CEC, USN, Naval Weapons Center Public Works Officer; Art Maillet, California Indian Legal Services; Tilly Barling, Natural Resources Officer, Naval Weapons Center; Ruth Brown, member, Native American Heritage Commission; and Hazel McLean, Coso Ad Hoc Committee.

T1 **Virgil Moose**
Big Pine Paiute Tribe of the Owens Valley
Big Pine Indian Reservation
PO Box 700
825 South Main Street
Big Pine, California 93513

T1-1 The comment letter containing scoping comments dated October 16, 2007 was excluded from the Draft EIR due to administrative error. The letter is included in the Final EIR. The letter was considered in the preparation of the Draft EIR.

T1-2, T1-3 Construction would not impact the Coso Hot Springs. Construction activities are located 2.5 mi or more from the Coso Hot Springs. See page 3.5-15 of the Draft EIR. Construction would not be seen, heard, or felt by a person located at the Coso Hot Springs.

Please refer to Master Response C5.2 for a discussion of cold water injection, connectivity between the geothermal reservoir and the Hot Springs, and restoration of the Hot Springs.

T1-4 The comment is noted. Please refer to Master Response F2 for discussion of the MOA and its previous implementation. The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR. The measures in the MOA as established were agreed upon by the signatory parties and remain valid.

T1-5 The comment is noted. The memorandum is included as an appendix to the Final EIR.

T1-6 The comment is noted. Please refer to Master Response F2 for discussion of the MOA and its previous implementation. The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR.

T1-7 The comment is noted. Please refer to Master Response F2 for discussion of the MOA and its previous implementation. The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR. The measures in the MOA as established were agreed upon by the signatory parties and remain valid. Any measures that are agreed upon under the 1979 MOA would be applicable to the proposed project through the conditions of the 1979 MOA. No additional mitigation is necessary outside of the MOA because mitigation would be determined through the MOA.

T1-8 The initial duration of pumping is not based on a specified timeframe, but on the trigger levels. Those may be reached before or after 1.2 years. Please refer to Master Response B4. The time elapsed before reaching the trigger levels determines the duration of pumping. Please refer to Master Response M3 regarding adaptive management techniques that allow for further refinement of the Hydrology Model to better predict timeframes to reach the trigger thresholds. Please refer to Master Response C2.7 for a discussion of the hydrologic impacts.

Because of current uncertainty in several key aquifer parameters in the model, hydrologic data collected during a planned baseline monitoring period and during the initial operating period of the project would be used to recalibrate the Hydrology Model to confirm and/or modify the hydrologic impact predictions described in the Draft EIR. The model recalibration would occur no more than 1 year after start of pumping at Hay Ranch. The model recalibration effort and/or termination or reduction of pumping may be requested by the County earlier if hydrologic monitoring indicates that specified hydrologic trigger levels are, or likely would be, exceeded earlier than the expected 1.2-year mitigated pumping alternative.

Impacts to wetlands and riparian habitat would be less than significant with implementation of the HMMP. Please refer to Master Response E2 for further discussion of impacts to wetlands and riparian habitat at Little Lake.

T1-9 Please refer to Master Response F1. A 500-ft section of pipeline would be installed above ground just north of the CLNAWS boundary. This location is 2.6 mi from the prayer site and would not be visible at the prayer site due to distance, its low profile, and topography. The appearance of the land as viewed from the prayer site would be exactly the same as the existing condition after construction. No visual simulation is required. See Appendix B, Sheet P-12 of the Draft EIR for the location of the above-ground section of pipeline.

T1-10 Objection to the project is noted.

RECEIVED
SEP 2008
INYO CO.
PLANNING DEPT.

5 September 2008

Inyo County Planning Department
P.O. Drawer L
Independence, Ca. 93526

Re: Conditional Use Permit No. 2007-3/Coso Operating Company LLC (Coso Hay Ranch Water Extraction, Export and Delivery System)

Dear Planning Department:

On behalf of the Timbisha Shoshone Tribe of Death Valley, California, I am submitting comment on the Draft Environmental Impact Report for the Coso Hay Ranch Water Extraction, Export, and Delivery System project.

T2-1 Living in the desert we are accustomed to what we can and can't do with the water resources we have today. It is always the Timbisha Shoshone Tribe's intent to protect the waters and surrounding ecosystems of the Coso area. There are no safeguards for Coso in this proposal. The area has been damaged already and by Inyo County's permission to proceed via a use permit is irresponsible and reckless [for such a tragedy to a sacred site]. As native people we take our duties seriously to protect the lands, water, animals and people. Wetlands need to be protected. Water has already been taken to Los Angeles and you live with what is left, do not take for granted that Coso will always be there.

T2-2 "Several known cultural resource sites are located within…" the Draft EIR says that the project construction has the potential to disturb or cause an adverse change to known and unknown resources, including the potential to disturb human remains. Does this matter to Inyo County planning department? Has enough mitigation taken place? We do not think so.

T2-3 As for the "Potential Impact 3.2-3: The potential to cause a significant alternation in the temperature or water levels of the surface features at Coso Hot Springs through injection of additional water into the Coso geothermal reservoir", the draft EIR shows no evidence that injecting water into the Coso Geothermal Reservoir will not continue the adverse effects on Coso Hot Springs. We believe there will be further damage to the site, a site that is listed on the National Register of Historic Places. We agree that the geothermal system is highly complex. The hot springs are not flowing anymore, it's use is not natural anymore. We believe the injection of water into the geothermal reservoir will have an adverse effect on Coso Hot Springs.

T2-4 The Timbisha Shoshone Tribe recommends the "No Project" alternative. We want the Coso Hot Springs to return to a natural state and your draft EIR says it "will

Timbisha Shoshone Tribe
785 N. Main Street, Suite Q • Bishop, CA 93514 • PH: (760) 873-9003 • FAX: (760) 873-9004
Post Office Box 206 • Death Valley, California • 92328-0206 • PH: (760) 786-2374 • FAX: (760) 786-2376

T2-4 sooner if the power plants and geothermal withdrawal were to cease."

T2-5 Our elders speak of Coso Hot Springs and surrounding areas with reverence and we want our youth to have those same feelings. Please protect Coso Hot Springs from any further damage. Water is a commodity that we need to protect.

Sincerely,
Madeline Esteves

For Joe Kennedy,
Tribal Chairperson
Timbisha Shoshone Tribe

T2 **Joe Kennedy**
Timbisha Shoshone Tribe
785 N. Main Street, Suite Q
Bishop, California 93514

T2-1 The comments are noted. Mitigation has been included in the proposed project to minimize impacts to groundwater resources and wetlands.

T2-2 The commenter's opinion regarding mitigation is noted. The project has the potential to impact known or unknown resources; however, mitigation has been included to reduce or avoid all impacts to cultural resources. If the project is approved, the mitigation must be implemented.

T2-3 Please refer to Master Responses C5.1 and C5.2 for a discussion of impacts to Coso Hot Springs. No claim is made that enhanced injection would "restore" the hot springs. The surface manifestations at Coso have been evolving for 300,000 years (Adams et al. 2000) and it is not clear to what state they could or would evolve if production ceased at Coso. However, some of the geochemical monitoring data reported as part of the Coso Hot Springs Monitoring Program (see reference above) suggests at least some changes are related to an increase in the flow of steam to the surface manifestations. If the Coso Hot Springs and the exploited portion of the geothermal reservoir are related, then the increase in steam flow may be related to the growth in steam zone in the reservoir and stabilizing the growth of steam zones at Coso may stabilize or reduce further changes in Coso Hot Springs.

T2-4 The commenter's opposition to the project is noted.

T2-5 The comment is noted.

Lone Pine Paiute-Shoshone Reservation
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Web Site: www.lppsr.org

September 05, 2008

Pat Cecil, Senior Planner
168 North Edwards Street
P.O. Drawer L
Independence, CA 93526

RE: DRAFT EIR CUP (2007-003) COC HAY RANCH H2O EXTRACTION SYSTEM

Dear Mr. Cecil:

On behalf of the Lone Pine Paiute-Shoshone Reservation (LPPSR), I want to thank you for this opportunity to provide comments regarding China Lake NAWS and Coso Operating Company's geothermal production/development (Project) and COC's Hay Ranch Water Extraction, ***still*** Exportation, and Delivery System Draft EIR (DEIR). The following are comments related to the DEIR:

T3-1

1. LPPSR has many times in the past asserted that the Project has already negatively affected the following: 1) the alteration of a prehistoric archeological site (Coso Hot Springs National Register of Historic Places), 2) the adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object, 3) the cause of recent physical change that adversely affected unique Shoshone-Paiute religious/spiritual values, and 4) the negative adverse effects of historical usage of Coso Hot Springs (due to the extreme high temperatures). I have enclosed (Attachment 1) a letter sent by LPPSR to the BLM on August 25, 2006 which identifies many issues including again, the assertion that CHS is interconnected to the Project, references studies ("Analysis of Causes of Hydrologic Changes at Coso Hot Springs")and a letter from Dr. Robert Curry (Attachment 2) to Dr. Ellen Hardebeck, which should be factored into the decision making by the Lead Agency, and LPPSR's assertion that the times of "monitoring" CHS are over, issues should be covering mitigation of the desecration of CHS.

T3-2

2. The 1979 MOA with the United States Navy and the Ad Hoc Committee has never been upheld since significant alteration to Coso Hot Springs National Register of Historic Places (CHS) has already occurred; Furthermore, any reference within the DEIR to the MOA being sufficient for monitoring purposes is in and of itself deficient. How does one monitor CHS for negative effects when CHS is already destroyed, as referenced within the DEIR (high temperatures are deadly if CHS is used in its historical context). The 1979 MOA between the United States Navy and the Coso Ad Hoc Committee and the Owens Valley Paiute-Shoshone Band of Indians states:

T3-2

> "That material or substantial alteration or permanent disturbance of the hot springs or the pond shall not be permitted. Both the Naval Weapons center and the Native Americans pledge their mutual cooperative efforts to expeditiously develop a preservation and management plan acceptable to both parties and to the California state Office of Historic Preservation and approvable by the Advisory Council on Historic Preservation (p. 2)."

Permanent disturbance of CHS has already occurred as indicated by even your data acquisition & the United States Navy's.

T3-3 3. The 1979 MOA between the United States Navy (China Lake), SHPO, and the Advisory Council on Historic Preservation Office to ensure the protection of CHS has not been upheld, again, CHS is irreparably damaged from the onset of the Project. Again, please refer to the DEIR and the date from the United States Navy showing the significant increase of temperatures since the onset of geothermal production. The significant alteration of CHS should be analyzed within Section 4: Cumulative, Growth-Inducing, and Significant Unavoidable Impacts of the DEIR.

T3-4 4. On page 3.2-51 it is stated: "Construction of the proposed project would have no impact on the Coso Hot Springs," yet there is no evidence to back up this statement. It is also stated:

> The proposed project involves injecting water into the system, which theoretically could counter the pressure differential and result in a decrease or stabilization of the steam-dominated portion of the reservoir and a decrease (or stabilization) in water level and temperature in the hot springs. These changes could make the hot springs closer to their pre-geothermal development condition (p. 3.2-51).

Again, the DEIR asserts there is an interconnection

T3-5 5. The signing of the current Programmatic Agreement between the BLM, United States Navy, and SHPO for monitoring of the effects of the water exportation project is going to "protect" CHS. Again, how is it possible to monitor for negative effects when CHS is already non-usable due to the fact that immersion through the form of a mud bath would result in death (due to high temperatures)?

T3-6 6. Any assumption within the DEIR that the injection of water may positively affect CHS, which is declaring that there is an interconnection between the project & CHS may absolutely be incorrect. For reference, I've attached (Attachment 3) a letter from Dr. Carl Austin to the BPPT THPO who in short, states that may be serious negative consequences and to include a potential for a **permanent** cessation of spring activity if the project moves forward. As the MHA Consultants stated repeatedly during the public meeting August 20, 2008, Dr. Austin is the premier expert on geothermal development within the Coso Known Geothermal Resource Area.

T3-7 7. In a June 26, 2006 letter from BLM (Attachment 4) to LPPSR, they too state that there is an interconnection between CHS and the production area.

T3-8 8. LPPSR asks that the Lead Agency follow through on prior leadership decision by the Inyo County Supervisors in the development of both the 1973 "Geothermal Ordinance of the County of

T3-8 Inyo" and the anti-water exportation ordinance. All we ask is for current leadership to uphold Inyo County laws for the long term protection of a precious finite resource, water.

T3-9 9. The bottom line is that the Project has relied on the least water efficient power plant technology, Dry Steam which is why the Project is running out of water. This technology was first used in Larderallo Italy in 1904. Any future expansion and/or production by the Project should be utilizing either Flash Steam or Binary-Cycle Power Plant technology (closed loop system) which is a more efficient use water. The alternatives discussed to make the existing Project more efficient is not adequate since as it states for the project description, the real issues is a decline of reservoir productivity due to evaporation from the cooling towers. Just because it may cost more to make the towers more efficient, doesn't excuse the proponent from doing a comprehensive analysis of the true cost.

T3-10 In closing, LPPSR believes the real "Project Objective" in accordance to the recently passed Energy Policy Act of 2005 and the May 02, 2007 Final Rule (USDOI BLM) 43 CFR Parts 3000, 3200, and 3280 Geothermal Resource Leasing and Geothermal Resources Unit Agreement is increasing the Projects production by more than 10 percent over the average monthly production during the previous 5 years and/or trends within that same time frame (Under Section 224(d) of the Energy Policy Act). Again, within the Energy Policy Act Section 224(c) and (d) the incentive is to afford power producers (COC) an opportunity to make more money in the form of a four year, 50% reduction in royalties from what normally would be due. This is provided however, that COC's expansion is in full commercial operation by August 08, 2011. This new "project" of water extraction and hydro-fracturing by COC would qualify for future reductions in royalty payments to Inyo County. Therefore, what is significantly lacking in the DEIR, is the comprehensive socio-economic impacts the offsets of royalty payments reduced by 50% to Inyo County will have.

Sincerely,

Sanford K. Nabahe

Sanford K. Nabahe
Administrator/Member
Lone Pine Paiute-Shoshone Reservation

Cc: Inyo County Supervisors

Lone Pine Paiute-Shoshone Reservation
P.O. Box 747 • 975 Teya Road
Lone Pine, CA 93545
(760) 876-1034 FAX (760) 876-8302
Web Site: www.lppsr.org

August 25, 2006

VIA ELECTRONIC & U. S. MAIL

Hector A. Villalobos
Field Manager
Ridgecrest Field Office, USDOI BLM
300 South Richmond Road
Ridgecrest, CA 93555

RE: Hay Ranch Water Extraction and Delivery System Project:
NEPA Tracking No.: CA-650-2005-100;
BLM Case File No.: CACA 046289 (2800); &
Response to 8120 CA-650.22(P) (06/26/06 Ltr)

Dear Mr. Villalobos,

On behalf of the Lone Pine Paiute-Shoshone Reservation (LPPSR), I wanted to thank you in affording me an opportunity to formally respond to both the June 26, 2006 letter from you, the Hay Ranch Extraction and Delivery System Project Final Draft EA (EA) and the Coso Operating Company LLC (COC) letter dated July 25, 2006 from Richard E. Arruda (Enclosed). First, many issued related to this project will be discussed followed by specific issues and/or concerns directed related to the EA since it is the duty of BLM to consider the cumulative impacts throughout the Coso KGRA, especially considering the adverse impacts to Coso Hot Springs, National Register of Historical Places (Coso) and the focal point of what is important both religiously and spiritually to the indigenous people of this area. As per the California Desert Conservation Area Plan Management Principles, we too believe that, "in the face of unknowns, erring on the side of conservation in order not to risk today what we cannot replace tomorrow." This principle is consistent with federal trust doctrine to protect the interest of LPPSR to the fullest extent possible. The Tribe further believes that both the DOI and US Navy have failed in their trust obligation to protect Coso (see Enclosed Resolution # 03-03-02-01) since now it has been desecrated and would be deadly if used traditionally today.

Some of LPPSR's general concerns on the cumulative impacts throughout the Coso KGRA are:

1. That despite the National Historic Preservation Act, NEPA, FLMPA, American Indian Religious Freedom Act, the CLNAWS, BLM, SHPO, ACHP MOA, etc, Coso is no longer usable for religious/spiritual healing

2. The whole basis of the Coso Geothermal Project rested on the shoulder of Dr. Carl F. Austin, former Head of the Navy's Geothermal Program Office and manager of the Coso geothermal project for over 27 years who is now being retained by the Deep Rose Project

    a. Collaborated with Dr. Mel Erskine (also from the Navy Coso Geothermal Project)
    b. Worked with Carl Halsey, Field Manager for the Navy for the entirety of the Coso Geothermal Project

    All of these individuals will work on the Deep Rose Project utilizing the proprietary information of Dr. Austin, in short the belief that, "A portion of the heat from this mid-crustal magma is driven east and up dip, to be captured by the fracture network of the Coso Antiform where it supplies the fluids and steam of the Navy Coso Geothermal Project by topographically driven groundwater flow from the Kern Plateau to the fractured reservoir at Coso (Austin 2005)." This quote comes from Dr. Carl Austin in the EA/Initial Study Deep Rose Geothermal Exploration Project Inyo County, California December 2005 Section 3.1.1.

The exploration in Deep Rose is a result of the work of individuals who were formally retained under the Navy's Geothermal Project. For a visual perspective, see the Deep Rose A Unique Geothermal Development Opportunity pamphlet (Enclosed). When these same individuals worked for the Navy Geothermal Project they "concluded" that there is no connection from the Project to Coso. The US Navy and now COC still conclude there is no connection from the Project to Coso (see COC Ltr). When these same individuals retire from the Navy Geothermal Project and work for Deep Rose, LLC, their "conclusion" is that there is a connection from the Project to Coso and are willing to spend millions of dollars to prove it.

3. There was a study completed in 2004 as a result of a Geothermal Deep Test Well being proposed in 2002, which brought the Tribe to the table on the continued desecration to Coso. Dr. Robert R. Curry is the same individual who conducted the study with the limited resources the Tribe's were able to pull together, holds a PhD in both Geology and Geophysics. Dr. Curry has over 40 years of experience in Eastern California, serves on the Lahontan Regional WQCB, maintains active research programs as a faculty member of UC Santa Cruz, and formally sat on the US Senate Public Works Committee and other national energy policy bodies. In a letter dated March 18, 2002 to Ellen Hardebeck, Control Officer for GBUAPCD (Lead Agency for Test Well EA), in short he briefly states that:

   a. Geothermal exploration and development induce seismicity
   b. Coso Hot Springs is recognized as a site of such induced seismicity.
   c. Seismicity alters spring flows.
   d. Springflow is reported to have changed at Coso Hot Springs.

4. In March 2004, "Analysis of Causes of Hydrologic Changes at Coso Hot Springs" by: Dr. Robert R. Curry it briefly states:

   a. Significant changes in temperature of the Coso Hot Springs pools are documented by the NAWS monitoring reports. The degree of change is great. The first measurements in the South Pool were around 100 degrees F as late as 1989 but they rose to 200-212 degrees F for surface water by 1994 and have remained there ever since (monitoring data are not available after 2000).
   b. South Pool elevations were initially low from the start of monitoring in 1979 through 1989 with recorded seasonal variation of 4-5 feet. Between 1989 and 1990 pool elevations rose as much as 10-11 feet and seasonal variation increased to as much as 8 feet. Those higher temperatures of about 100 degrees F and have persisted through the record of monitoring presently available.
   c. The coincidence of higher pool volumes and higher temperature also coincide with changes in wells near the Coso Hot Springs fault alignment with steam flow increasing as much a 100x at Shrobers Resort resulting in well failure in 1989-90. This strongly suggests a singe causal factor or chain of factors.
   d. Changes in rainfall and potential recharge do not coincide with observed changes in temperature and pool volume except seasonally, Long term changes in geothermal activity at Coso Hot Springs do not correlate with observed changes in regional precipitation.
   e. Water volumes for recharge of Coso Hot Springs geothermal fluids can be entirely attribute to rainfall and recirculation of geothermal fluids. The regional hydrologic basin of about 8,000 acres that feeds water to the Coso Hot Springs is sufficient to maintain flow in perpetuity with greater flow in wet geologic times and lesser flow in past drier times. As water gets hotter in the springs, more of it evaporates and pool volume may decline. Geologic evidence of past greater flow volumes into and through the Coso Hot Springs implies lesser evaporation and greater shallow groundwater flow.
   f. The Devil's Kitchen geothermal was hydrologically connected to the Coso Hot Springs site. The degree of connection may have diminished with the development there of the Navy One

geothermal production facilities. Navy Two and the BLM sites only marginally may affect the hydrographic basin of the Coso springs. The new Deep Well site exploration lies outside of the recharge area for Coso Hot Springs and should have little or not impact on the water volumes or temperatures there.

g. It is possible to explain increased temperatures at Coso Hot Springs as the result of decreased in shallow (less than 500 feet deep) groundwater upgradient at Navy One as deeper geothermal fluids are extracted and diminished. Lesser water table gradients between the Navy One geothermal site and Coso Hot Springs could result in lesser influx of meteoric water that was recharged west and north of Navy One. However, this possible causal factor does not explain the simultaneous increased of pool water volumes associated with hotter surface water.

h. The most probable cause of the observed changes, based on the record that I have reviewed, is ongoing change in fracture porosity and resulting heat and fluid flow. Although this could be due to regional geologic conditions that have nothing at all to do with geothermal development, observed changes in seismicity associated with exploration drilling and production of geothermal resources have a ***high*** likelihood of contributing to the observed changes at Coso Hot Springs.

A copy of the study is available for your review at your request and it has been shared with the former Commanding Officer of NAWS, Captain, U.S. Navy M.G. Storch in 2004. Furthermore, Dr. Curry shared With Tribal Representatives in 2002 that the Navy's Geothermal Project Deep Test Well would probably Fail (it did, wasting millions of dollars), that the Navy's Geothermal Project failed to do long term Hydrological studies sufficient to project the need for additional water (it did), that one day the Navy's Geothermal Project would need to import water (doing so now) to hydrofrac and that if more water wasn't Injected within the existing Navy Geothermal Project area, the project would fail within the next 25-35 Years (probable without water).

LPPSR now believes that the times of trying to protect Coso Hot Springs are over due to the failure of the US Navy and DOI in utilizing it's fiduciary duty to protect the interests of LPPSR and allow for the continuance of religious/spiritual practices; therefore, LPPSR believes that now is the time to satisfactorily mitigate the adverse effects on significant historic or cultural property as per the 1979 MOA between the US Navy, SHPO and the Advisory Council on Historic Preservation. That MOA failed. The June 28, 1979 MOA between W.L. Harris Rear Admiral, U.S. Navy for the Naval Weapons Center and the Coso Ad Hoc Committee failed not only in not halting the development when substantial alteration or permanent disturbance of the hot springs or the pond occurred, but failed when not working the MOA with Tribal Governments, but with an Ad Hoc Committee; thereby, not affording the tribal concerns any teeth in protecting Coso. Current law facilitates the beneficial use of the Navy Geothermal Project for monetary compensation of utility costs on NAWS China Lake, Caithness, LLC creates profits for its shareholders, and the State of California (Inyo County) benefits from taxation on those profits. If the Navy Geothermal Project continues to make large sums of profit despite the destruction to Coso, to mitigate the destruction of Coso, LPPSR requests to no longer make itself a burden by contributing to the energy consumption of the country; thus, LPPSR is asking to be provided sufficient renewable energy sources through both solar and wind production here on the Reservation, enough to provide power for all domestic needs. This mitigation proposal is worth pennies on the dollar compared to what the Navy Geothermal Project has produced in profits.

Some general issues concerning the EA are:

1. LPPSR has never seen the annual report submitted by the Secretary of the Navy regarding the status of the natural and cultural resources and values of the lands withdrawn under section 802(a).
2. In Section 1.3.7, it should state that federal agencies have a trust responsibility to protect the interest of Tribes and the part about mitigation should be followed through since Coso has undergone adverse effects

   AIRFA, policy of the United States was not followed through on regarding Coso, since it is no longer a viable place of spiritual/religious healing
3. In section 2.1, it is not sufficient or detailed enough to know where to make comments on holding tanks When no visual location is made available.
4. The whole document is non-detailed, if UltraSystems is unable to see an example of how an EA should

When no visual location is made available.

4. The whole document is non-detailed, if UltraSystems is unable to see an example of how an EA should Completed, share with them the EA completed by Deep Rose. This Draft lacks appropriate visual documentation and/or maps to make a clear response to what the project really is.
5. Section 2.1 Yard Lighting is weak, remember, Highway 395 is a scenic by-way. Details on how to best Mitigate unnecessary light is needed and shown to the reader what the impacts will look like
6. Section 2.1 Landscaping is weak too. The reader should be shown what the visual impacts are to make Intelligent comments (Highway 395 is a scenic by-way)
7. The maps shown in the Draft EA lack detail in showing exactly where the project is being undertaken
8. Section 3.1 Air Quality In looking at Table 3.1-2, PM 10 is a serious issue. The area is really classified as Serious Non-Attainment by EPA... again, document is weak and need more data validation to support non-impacts. Within the table, from 2000-2003, Maximum levels have been going up every year. This area need no more impacts
9. Air Quality: Again, the document doesn't show where or is incorrect on where PM monitors are located. Locations cited are further away from the Owens Dry Lake.
10. Section 3.9 Page 40 NA Values: No discussion on the desecration of Coso Hot Springs.
11. Section 4.0 Page 45: No discussion on the cumulative effects on Coso, nor what the mitigation is to alleviate that burden for LPPSR
12. Section 4.8 Page 52 Cultural Resources: See Above Statement for Mitigation on the destruction of Coso
13. Section 4.9.2. There is impacts to NA Values....religious/spiritual

If you have any questions regarding these issues, please feel free to contact our Environmental Coordinator, Mr. Wilfred J. Nabahe at 760-876-4690 or @ wjnabahe@lppsr.org.

Sincerely,

Marjianne Yonge
Chairwoman, LPPSR

Cc: Harold P."Buck" McKeon
SHPO
ACHP
M.K. Gleason, Captain
Ross Swimmer, Office of American Indian Trust
Richard E. Arruda, COC
Bobbie Gollan, Caithness Energy, LLC

Watershed Systems
Hydrology - Geology - Soil Science

Robert Curry, Ph.D., P.G.
600 Twin Lanes, Soquel, Calif. 95073
831 426-6131; FAX 426-9604; curry@cats.ucsc.edu
field: 760 932-7700

March 18, 2002
By FAX, letter follows

Ellen Hardebeck, Control Officer
Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, CA 93514

In re: Coso Geothermal Test Well Project – Proposed Neg Dec

I have been asked to review the proposed Negative Declaration for the Deep Test Well Project, Naval Air Weapons Station, China Lake, California, by the Timbisha Shoshone Tribe. It is my professional opinion that the analysis that has been conducted as summarized in the Mitigated Negative Declaration document of December 2001, is flawed in at least two primary geophysical and hydrologic aspects, and should not be approved as written.

I am a geologist and hydrologist with over 40 years of experience in Eastern California. My PhD was in Geology and Geophysics from UC Berkeley. I serve as consultant and advisor to the Lahontan Regional Water Quality Control Board, and maintain an active research program in the Eastern Sierra through my faculty position at UC Santa Cruz.

I have long espoused development of geothermal energy resources, especially through my early position with the US Senate Public Works Committee and other national energy policy bodies. As a direct result of my long efforts to promote geothermal energy, I have been called upon from time to time to evaluate its environmental impacts and have, on occasion, had to point out potential and real adverse effects that escaped the review of government agencies. The most recent example was my input to two proposed exploratory deep well projects in the Medicine Lake Highlands, where BLM finally reluctantly agreed that one exploratory well project should not go forward. Other serious oversights that I have pointed out include expanded geothermal development on the flanks of Valles Caldera in New Mexico, and certain expansion efforts in the Sonoma Geysers field.

In many cases, the shortcomings of geothermal development proposals articulate around water resource, water supply, and water quality issues. For example, at Mammoth in your own Control District, I was among several specialists who predicted possible limits to available recharge waters, as well as decreases in outflows to Hot Creek and nearby geothermal springs. These changes appear to have occurred, despite the contrary assurances of consultants to the geothermal industry.

My concerns at Coso Hot Springs are different. Here there appears to be a very real possibility that deep wells, both exploratory and production, are inducing seismicity. The issues of induced seismicity were first brought to the public's attention with deep well disposal near Rifle, Colorado, almost 50 years ago. Subsequently, other seismologists proposed the same mechanisms for earthquake swarms noted when new reservoirs were filled in India and elsewhere. It is now reasonably well established that changes in hydrostatic pressure or lithostatic pressure can trigger earthquakes in regions where seismic stress is stored or accumulated in rocks. The human-induced actions do not need to be of great magnitude where background tectonic forces have accumulated stress.

Induced seismicity may be suspected here at Coso because of the close temporal association between initial exploratory drilling and earthquake swarms and Mw 5+ local shallow (4 km or less) earthquake activity (cf; 1982 swarms, Feb 92 M4.0; Nov 96 M5.3; Mar 98 M5.2; and Jul 2001 M5.2). Several investigators have explored mechanisms of fluid injection seismicity or geothermal induced seismicity using the readily available Coso geophysical data sets[1]. The fact that geothermal exploration and development induce seismicity is not controversial. It has occurred at Coso according to several investigators. Several mechanisms may be responsible, including changing heat flow characteristics, moving hot or cold fluids into previously cold or hot zones, and allowing vertical migration of geopressured fluids. What is important and critical here is that some of these changes can occur during exploratory drilling, without any subsequent geothermal field development.

Why do we care about induced seismicity in a remote unpopulated area? Because the factors that induce seismicity also change "geothermal plumbing", or rates and volumes of water flow through the shallow subsurface. This is most clearly demonstrated to the GBUAPCD at Casa Diablo Hot Springs and Hot Creek where periodic earthquake swarms and larger events alternately reduced flow to the historic hot springs and increased flow to Hot Creek and vice-versa through the period from 1930 to 1960 before any geothermal development. That seismicity, like much of the Coso activity, is believed to be associated with active movement of magma under the Long Valley Caldera. But once the geothermal field was developed and heat-flow was concentrated for power production, the Casa Diablo Hot Spring flow diminished. As fluid flow decreases through the hot rock, water temperatures increase. This pattern is similar to that reported at Coso Hot Springs during its geothermal development.

Native Americans were once able to use Coso Hot Springs for spiritual and other purposes. The proposed Neg Dec/EA goes into extensive discussion about how the exploration that is proposed will not be directly visible or audible to persons using the Hot Springs. That sensitivity discussion totally misses the point. The Hot Springs must maintain an adequate volume of water flow and a

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1 Q. Feng & J.M. Lees, Microseismicity, Stress and Fracture within the Coso Geothermal Field [abstract], Abstracts XXI General Assembly Int'l Union Geodesy & Geophys. A372 (1995);

Lou, M., P.E. Malin, and J. A. Rial, 1995. Locating an active fault zone in Coso Geothermal Field by analyzing seismic guided waves frm microearthquake data, Proceedings of the 20th Workshop on Geothermal Reservoir Engineering, Stanford University Press, SGR-TR-150, 115-121 (see also Malins' graduate student's theses).

General references: http://www.nyx.net/~dcypser/induceq/gis.html consistent flow pathway beneath the surface spring to be usable by Native Americans. I believe that there is a very real possibility that reduced reported spring discharge may not be the result of regional climate or magma changes, but is caused by the geothermal development and exploration. No data are presented to counter such a hypotheses. No mitigation is proposed for loss of use because of loss of spring discharge volume. If no loss of volume has occurred despite contentions of tribal elders, then such contentions need to be addressed and dismissed based on fact.

The GBUAPCD is obligated to investigate reasonable issues associated with a proposed action where it serves as the lead agency even if those actions are not within the direct responsibility of that agency. These issues should have been more tightly defined in initial scooping efforts for the EA. The GPO and consultants to the geothermal contractors and Navy propose that 1) magmatic stoping (upwelling through rock) is responsible for the increasing temperatures at Coso Hot Springs; and 2) geothermal exploration and development is taking place in laterally isolated tectonic blocks that can be independently dewatered, rewatered, cooled, and developed without affecting adjacent blocks. Their first proposal is based on only a weak association of local downhole temperature data. I can find no literature provided to support the plausible association with magma movements and hot springs temperatures. Where are measurements of spring flow at Haiwee or other regional springs that can be compared with measured flows at Coso as well as cumulative departures from long-term climatic normals? Where are the data on water use, losses, and injection at Coso plotted against Coso Hot Spring flows? What are the historic records of temperature at the Hot Springs, and how do they correlate with earthquake data? Increasing rock and fluid temperatures based on down-hole temperature records are good but how do they correlate with spring flow? Shallow earthquake swarms do suggest magma changes, but how are we to know that those same swarms are not induced by the geothermal test wells themselves and developments that began in 1966?

Despite the fact that there has been much investigation and some very sophisticated work at Coso, if you do not ask the right questions, you may not get valid answers. In fact, many geophysicists and geologists who have looked at geothermal development at Coso Hot Springs probably see it as a great opportunity to learn more about a young active volcanic field. The EA should ask questions that the scientists have not asked.

The second premise, that each tectonic block is independent of its neighbor from a hydrogeologic standpoint, is apparently supported by at least one short-term tracer study where material injected into a well on one block was not found in water extracted in an adjacent block. That may well be quite true and accurate, but as any geologist knows, subsurface conditions in a volcanic field are not laterally homogeneous. These are not Colorado Plateau flat-lying sedimentary rocks. There is good evidence that variations in porosity vary laterally and with depth and that geophysical tools are available that can define lateral extent of zones of higher and lower porosity and permeability[2]. The hypothesis of isolation of tectonic blocks is too convenient, quite improbable, and poorly supported. It should be supported by additional indirect data such as fluid mass balance in

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[2] Lees, J. M., and H. Wu, (2000) Poisson's ratio and porosity at Coso Geothermal Area, California, *J. Volc. Geotherm. Res.* 95(1-4) , 157-173 (see also prior work of Lees).

spring flows, precipitation, and geothermal water consumption. To demonstrate hydrogeologic isolation with tracer studies, especially at depths of several km in a geothermal area, requires long-term monitoring and more test sites than have been utilized by the University of Utah studies. Without better support, this isolation premise cannot be said to protect the spring flow and traditional uses.

The issue of exploration versus production must be addressed. Geothermal development today generally requires environmental analysis at the exploration phase as well as the development phase, but the foci of those two separate analyses are assumed to be quite different. In fact, many of the fundamental environmental impacts of geothermal development accrue to both the development and production phases. This issue was central to the debate in 2000 about geothermal development in Medicine Lake Highlands. Because time frames for exploration are short, volumes of fluids used in drilling are minor and testing is done quickly so as not to waste the thermal resource, advocates usually propose a mitigated negative declaration just as is being done in this case.

Use of a NegDec for deep drilling in the Coso Volcanic Field should be very cautiously considered. The mere act of drilling provides a conduit for mixing of fluids from differing depths. Careful drilling technology can minimize this risk, but cannot eliminate it. The act of drilling and testing geothermal development potential at various depths also changes heat flow and heat exchange at least locally. This can induce seismic energy release, cause rock fracturing that may be desirable for later production, and thus, by either mechanism, change conduits for fluid flows within, between and across the purported isolated tectonic blocks. While fluids may be somewhat isolated in the short term, seismic energy travels easily from one block to the next and it induces changes in flow of springs. Because there are no overlying freshwater aquifers being put to beneficial use, cross contamination is not an issue. But any release of seismic energy must be associated with a change in stress in the rocks, or a change in temperature, or both. When this happens, I do not believe that we know enough to insure that such seismicity cannot directly affect spring flow at Coso Hot Springs.

Earthquakes may significantly affect spring flow, as my own work demonstrates[3]. Seismic energy release affects both permeablity and porosity of rocks, especially in areas of hot mineralized waters. The larger and more frequent the seismic releases, the greater the effective permeability. This means less "mounding" and more ready lateral spread of groundwater. In a geothermal area with mineralized water this would be expected to diminish concentrated spring flow and to expand lateral extent of less concentrated flows, which should show up as changes in heat flow to the surface and, after decades, potential new springs or renewed spring sites at lower elevations.

In summary, it is my opinion that the EA for this potential Negative Declaration does not adequately address the issues that would be necessary to protect spring flow volumes at Coso Hot Springs. Because of this shortcoming, traditional uses of this hot spring site and its resources by native people are

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[3] Curry, R.R., Bret A. Emery and Tom G. Kidwell, 1994, Sources and Magnitudes of Increased Streamflow in the Santa Cruz Mountains for the 1990 water year after the Earthquake. U.S. Geological Survey Professional Paper 1551-E, The Loma-Prieta, California, Earthquake of October 17, 1989 - Hydrologic Disturbances, p. 31-50, Wash. D.C.

compromised. The volume of literature on Coso Hot Springs is very large and the quality of science that has been expended in prior investigations is high. I cannot purport to know that large literature base or to be able to evaluate all of the science. But I can review and technically evaluate what is being presented to the public in an Environmental Assessment, and I find that the EA does not adequately assess nor does the mitigated Negative Declaration adequately mitigate the issues of reduced or greatly altered cultural use of Coso Hot Springs. For example, one cannot mitigate by monitoring if the actions that cause change cannot be reversed. Thus having the GPO "continue to monitor activities" at Coso Hot Springs does little to alter the course of change in flow volumes. By the time cause and effect are demonstrated, it is too late to alter the causal agent. We are told [EA p. 4-4] that "..pumping activities at OB-2 are monitored to ensure [that] groundwater depletion associated with pumping does not affect the Coso Hot Springs". But we are not told how monitoring ensures anything! If the travel times for recharge of water that ultimately reaches the Hot Springs are, for example, 10 to 20 years; the effects of pumping in the 80's may not have been manifest until the 90's, and cumulative effects of future activities 2 or more miles north of the springs may not become apparent for several more decades. Monitoring cannot mitigate those effects.

Most briefly:

1. Geothermal exploration and development induce seismicity
2. Coso Hot Springs is recognized as a site of such induced seismicity.
3. Seismicity alters spring flows.
4. Springflow is reported to have changed at Coso Hot Springs.

If a full and properly scoped EIR is not seriously being considered by GBUAPCD (and I believe that it should be), then alternative means to insure continued spring flow should be sought by the GPO. Only then may potential impacts to spring flow be mitigated.

Sincerely,

Robert R. Curry
546-50-6406
Registered Professional Geologist

Cc: US Navy, GPO, China Lake
Timbisha Shoshone Tribe
California Indian Legal Services - Bishop

TO: Bill Helmer
Tribal Historic Preservation Officer
Big Pine Paiute Tribe of the Owens Valley
P.O. Box 700
Big Pine, California
93513

FROM: Carl F. Austin
P.O. Box 93
Oakley, Idaho
83346

Big Pine
JAN 29 2007
Paiute Tribe

DATE: 22 January 2007

REFERENCE: Your letter of 3 January 2007

1. In your referenced letter you have asked for my opinion on the GeothermEX simulation with regard to the effect of the proposed cold-water injection program intended to modify the productivity of the Coso geothermal field. In particular you have expressed a concern that the intended cold-water injection program may have some effect on Coso Hot Springs.

2. My opinion regarding the cold-water injection program is based on how I have always taught my geology students to evaluate complex technical presentations. A review of the GeothermEX simulation program as provided was the first action taken. Granted, the GeothermEX simulation program is the result of a complex series of calculations, and the conclusions derived from these calculations are provided as a suite of fine looking drawings. Despite the complexity of the computer derived model, called a simulation by GeothermEX, the problem of selecting a methodology to critique the results of this simulation program is quite simple. The assumptions on which this simulation is based have not been provided. It is a well-known fact in the world of science, especially in the world of modeling, that the first task of any reviewer is to examine the assumptions upon which the model is based in order to determine both if they are reasonable and if they are related to reality. Having done this, then one should further try to determine if the assumptions have been selected in such a way as to make the model yield some preferred outcome.

3. Paragraph 2 of the GeothermEX simulation report states that the initial manipulation of the simulation process was to modifl the chosen parameters (i.e. assumptions) on a trial and error basis until the computer output matched the Coso Operating Company's interpretation (which is simply another set of assumptions) as to what the reservoir was prior to production. Thus we have a result based on the trial and error method of modifling a set of assumptions until the answer achieved then matches a second set of assumptions. Furthermore,

after reading a number of times the **GeothermEX** report provided for my review, there is no way I can determine if the investigators took the desired answer and derived the initial assumptions, or if the initial assumptions were modified repeatedly (the trial and error process they cite) so as to ultimately drive the model to arrive at a desired result.

4. Then in Paragraph 3 of the **GeothermEX** report it is explained how the trial and error process was then continued so as to further modify the first "assumption based on assumption" result with the field's historical performance. The problem with matching the initial double assumption process with the field performance as recorded, is that inherent in the production history of the field are additional unspecified sets of **assumptions** as to the geology and reservoir mechanics involved with the production history. In other words, the production history is presumably factual on a per well basis with respect to well output, but why a particular well produced, declined, or was a *dry* hole is based not only on how a given well was drilled, completed and worked over but on assumptions provided by persons unknown, and what is recorded will be based on their geologic prejudices and **mindsets** as well as on corporate needs and goals.

5. Let us examine for a moment why the geologic prejudices and **mindsets** of the various providers of production data is critical to an evaluation of the proposed cold-water recharge program and why the prediction of where this cold water will report to and when it will do so is little more than guesswork supported by a complex mass of highly impressive calculations based on unidentified and unquantifiable assumptions based on data that is in all likelihood proprietary.

6. There are two basic interpretations of the Coso geothermal field and its geologic setting.

   A. One of these interpretations is that the Coso Mountains in which the shallow geothermal resource currently in production occurs is an **antiform** that has been thrust into position. As such this mountain range is a compressional feature although the sides are slumping off as can be seen in the big landslide that borders Coso Hot Springs or in the rootless granitic blocks that show up so well on seismic data on the Rose Valley side of the range. As an antiform, the crest of the range is in tension for two reasons, one is the hoop stress pattern caused by upward forces within the **antiform** and the other is the tensile stress formed by the folding of the crest of the **antiform** in conformation with the regional stress field that existed at the time the Coso **antiform** was shoved into the position it occupies today. This is the interpretation of Dr. Austin and Bill Durbin as presented in "Coso: Example of a Complex Geothermal Reservoir" published as NWC **TP 6658** in **1985.** The interpretation that Coso involved an **antiform** and thrust faulting was further amplified by Dr. Austin and Jim Moore (at that time chief geologist for California Energy Company) in an invited paper given at the American Association of

Petroleum Geologists, Energy and Minerals Session at the 1987 national meeting of this organization. This technical paper received a national Best Paper Award and was printed in full as "Structural Interpretation of the Coso Geothermal Field" in NWC TP 6841 in 1987. Further delineation of the controlling structural geology of the Coso geothermal field appeared in detail in Plate 2 of the guidebook of the Coso Field Trip, **AAPG** EMD # 1, 2 June 1990, edited by James L. Moore of California Energy Company and Dr. **Mel** Erskine, Consulting Geologist. This cross section is entitled "Coso Range Conceptual Model" and shows a cross section from the Kern Plateau to the **Panamint** Range including detachment faults at depth and the location of the magmatic heat source for Coso which is the heat source for the Deep Rose resource as well. It should be noted that recent published micro-seismic studies strongly support the interpretations of Dr. Austin, Bill Durbin, Jim Moore and Dr. Erskine. The key to understanding the relatively shallow Coso geothermal system is the recognition that one is dealing with ore deposit geology with its prominent **hydrothermally** altered fracture systems and vertical conduits such as breccia pipes superimposed on broad **intrusive/extrusive** features evidenced by hoop stress fractures, perlite domes and explosion vents. In simple terms, this interpretation envisions the present Coso productive field to be a complex three-dimensional network of fractures and breccia pipes underlain by a detachment fault system, and fed by a magmatic heat source that gathers fluids from a number of localities and expels a small portion of these fluids into the relatively shallow Coso fracture system. The separation of the producing portion of the Coso geothermal field into discrete units was nicely verified by the ground noise studies of Teledyne Geotech (published as Technical Report No 1.72-6 in 1972) which stated:

> "The anomalies are clearly separated by stations that exhibit low power values indicating that they are individual reservoirs and not zones of high activity in one big reservoir."

B. The second interpretation of the Coso geothermal system is that it is located at the crest of a horst, a tensile fault block, and is bounded on both sides by normal faults, with some sort of magmatic heat source directly below. The major fracturing of the horst consists of simple north-south fractures parallel to the long dimension of the range. In this view the geothermal reservoir is considered to be essentially a continuous permeable layer of some sort with all of the wells interconnected, just as one sees in a simple petroleum reservoir. This is the long held position of the U.S. Geological Survey, an interpretation accepted by numerous University researchers without regard for the actual field evidence, and by various geologists and reservoir engineers who have been responsible for operating decisions at the Coso geothermal field for the past 20 some years.

7. There is an obvious problem with the "uniform reservoir" or continuous permeable layer interpretation favored by the current operators at Coso, by the U.S. Geological Survey and as best as can be determined from an examination of the **GeothermEX** simulation, by the **GeothermEX** modelers as well. Assuming such a simple essentially continuous reservoir at depth makes predictions of production, and the prediction of fluid flow patterns very easy to perform, but the simple fact is that adjacent wells at Coso show great differences in productivity as well as significant differences in chemistry, temperature and mineralogy. If this were truly a uniform field in terms of permeability, temperature, and chemistry, hence suitable for simplistic bulk modeling, then non-productive wells in the midst of producing areas would not occur and instead of well pads being scattered about in a rather random pattern, the field should have been developed on a simple grid pattern.

8. Given this rather elaborate introduction into the uncertainties involved in the modeling of fluid flow within the Coso geothermal field, one must also consider what the injection of cold, possibly oxygen rich, shallow ground water produced at the former **Firsick** Ranch in Rose Valley will do within the reservoir. About **20** mineralogic and physical chemistry variables control the fate of a geothermal reservoir (see "**A** Strange Breed of Cat – An Essay On Geothermal Explorationists Based on Over **50** Years in the Business" by Dr. Austin and published in the bulletin of the Geothermal Resources Council, **Jan./Feb. 2005).** Ignoring these variables can drastically reduce productivity, to the point of causing entire portions of a reservoir to cease production, can switch fluid flow from one set of fractures to another set, and can cause fluids to migrate long distances to locations where they are not wanted. (See Care and Feeding of a Geothermal Reservoir by Dr. Austin and Richard Austin, presented at the **2005** Annual Geothermal Resources Council Meeting and published in the proceedings.)

9. A map of lineation features, most if not all of which are fractures or micro fracture **swarms,** was prepared by Dr. Austin in **1963** as the original basis for the exploration of the Coso geothermal field. This map is reproduced in NWC TP **6658** as Figure **36.** [It should be noted here that traditional field geology will almost never identify linear micro-fracture swarms in the field yet they are obvious on satellite or high altitude photos. It should also be noted that very few geologists ever learn to recognize the curvilinear fractures readily seen by highly skilled photo annotators.] NWC TP **6658** also shows the fracture pattern that controls the location of the various perlite domes (Fig 40 of this report), and Figure 41 of this report shows the location of the prominent hoop stress fractures of the geothermal system. At least two hoop stress fractures project through the hot springs area. Linkages of various smaller linear features also appear to be positioned so as to be able to trap injected fluids and convey them to Coso Hot Springs as well. Figure **55** of this report presents a plot of possible explosion breccia pipes combined with the hoop stress fracture plot and ground noise data. In all fairness to the horst model, Figure **26** of NWC TP **6658** shows the popular

north-south **fault** pattern as mapped by Roquemore, a map which ignores the fractures and lineation features that do not support the U.S.G. S. graben and horst model for Coso, a problem described by Dr. Austin in his Strange Breed of Cat essay in the GRC bulletin.

10. An immediate problem that can be seen with the various illustrations in the GeothermEX report is that the injected fluid patterns are too smooth and too circular. If Coso is in fact a fracture controlled reservoir, characterized by Dr. Austin in NWC TP 6658 as an Amethyst Vein type of system complete with breccia pipes, hoop stress fractures, explosion vents, **fracture** nodes indicative of buried magmatic activity and the like, then the injected fluid patterns should show ragged boundaries with lengthy linear zones indicative of major permeable fractures. The cold-water injection model provided does not discuss what the effects will be of hydraulic switching phenomena, fracture modification owing to the physical chemistry of the cold injected fluids (or even hot injected fluids if they preheat them), and does not address the long term uncertainties of where injected fluids will go. If the operators of the Coso geothermal field actually believe the injected fluids will spread out in nice neat uniform rather circular patterns, then it would appear they have no concept of the three dimensional fracture network they are trying to produce, which would appear to be at least a significant part of why the field is in trouble and fluid injection is to be attempted.

11. There seems to have been no attempt to relate the points of injection to the three dimensional fracture pattern of the geothermal field or to the details of the holes being chosen for injection. Thus the 88-1 well, drilled by LADWP, was believed to have encountered a cold-water embayrnent **left** over from the flushing of the shallow part of the Coso geothermal field by recent pluvial events that impacted the area. It will be interesting to see where fluids injected into this well actually go. A critical observation regarding fluid injection appears in NWC TP 6658 where the authors stated:

> "With respect to injection, it should be noted that introducing fluids into pipes will not be expected to support productivity in Amethyst Vein-type spreading fracture networks, nor will introducing fluids into the vein networks, such as into Well 31-8, support productivity in either the Condy Pipe or the Jim Moore Pipe. The separate nature of these two pipes is further indicated by the fact that the habit of the pyrite in each is markedly different; **i.e.** it is cubic in Jim Moore and **pyritohedral** in Condy, so that two distinct types of fluids appear to be present. The evidence from alteration and mineral deposition supports the interpretation that data from one pipe can be extrapolated only with great caution even to an adjacent pipe.

It is especially interesting to note the statement made on pages 2 and 3 of the **GeothermEX** report dated 15 September 2005 that was provided to me for comment. The GeothermEX author states:

"While the location of East Flank augmented fluid is relatively close to the COSO hot springs in plan view, the location of this fluid is over 1.5 miles below the surface of the hot springs."

If GeothermEX believes this to be a valid statement, then they should present why they feel this to be the case. The GeothermEX simulation provided to me for review lacked a discussion of the rather obvious three dimensional fracture pattern present in the vicinity of the Coso Hot Springs; did not discuss such things as the effects one can expect to result from the differential pressures the injection of augmentation fluids will cause in the vicinity of the hot springs; did not address the velocity of travel the augmentation fluids can achieve in such fractures as exist, and there is ample evidence such fractures are indeed present; and then GeothermEX goes on to claim a distance of perhaps 8000 feet is a safe distance, a conclusion that appears to be a number with nothing to support it. There are a number of scenarios ignored in this statement, at least three of which are worth identification: 1. the augmented fluids may cause an increase in the violence of the hot springs, already a phenomenon of longstanding controversy as to cause; 2. the augmented fluids may chill off the fractures and their fluids that provide the surface activity at the Coso Hot Springs, causing the thermal activity to stop; and 3. the augmented fluids may for reasons of temperature and chemistry simply cause a permanent blockage of the fractures that transmit heat and fluids to Coso Hot Springs, resulting in the permanent cessation of spring activity at that location. These are valid geologic concerns that GeothermEX should address in detail if they wish to take the position that the fluid augmentation program being proposed presents no risk to Coso Hot Springs for at least the next century or two.

12. All of the foregoing can be summed up in a simple concluding statement.

Based on the GeothermEX simulation as presented, and on the results of my 46 years experience with the geology and development of the Coso Geothermal Project and with the geothermal deposits and ore deposits of the surrounding region as well as at other locations in the western U.S, it is my professional opinion that the operators of the fluid injection system currently proposed for Coso will not know in advance where the injected fluids will actually go, when they will get there, and what will be the effect of this injection program on Coso Hot Springs.

Respectfully

Carl F. Austin
California Professional Geologist
License No.2896

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Ridgecrest Field Office
300 South Richmond Road
Ridgecrest CA 93555
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JUN 26 2006

In Reply Refer To:
8120 CA-650.22 (P)

Delivery Confirmation Requested: FedEx Standard Overnight

Ms. Rachel Joseph, Tribal Council Chair
Lone Pine Paiute-Shoshone Tribe
1101 South Main Street
Lone Pine CA 93545

RE: Hay Ranch Water Extraction and Delivery System project, NEPA tracking number CA-650-2005-100

Dear Ms Joseph:

It is a pleasure to invite the Lone Pine Paiute-Shoshone Tribe to consult with the Ridgecrest Field Office, Bureau of Land Management (BLM), U.S. Department of the Interior (DOI) regarding the proposed Hay Ranch Water Extraction and Delivery System project, located adjacent to the Coso Geothermal Project locale, in Inyo County.

The project applicant, Coso Operating Company, L.L.C., (COC) of Little Lake, California, submitted to this Office in April 2004 a Plan of Development application, CACA 046289, for the construction of a water pipeline between two existing wells in Rose Valley, in the west, and the existing piping system of the Coso Geothermal electrical production complex, in the east, for a total distance of roughly nine miles. The pipeline would be placed underground along its entire length, generally on the south side of Gill Station Road, an Inyo County maintained road. Upon completion, water pumped from the two wells in Rose Valley, will flow at the rate of 3,000 gallons a minute (gpm) and enter the existing COC geothermal piping system at the connection referred to as Injection Well 88-1. The purpose of the undertaking is to provide a supplemental water supply for the COC geothermal electrical production units. The Coso Operating Company has requested from the Ridgecrest Field Office, BLM, the use of a right of way corridor for this pipeline.

The proposed pipeline corridor, and the Area of Potential Effects (APE) of the federal undertaking, would begin at the existing northern well, then vector south to the southern well, both located within a private property parcel owned by the COC, located in Section 26, Township 21 South, Range 37 East, Mt. Diablo Base and Meridian (Sec*, T*S, R*E), then enter BLM public lands near the southeast corner of Section 26. The pipeline corridor would then parallel an existing electrical transmission line south to Gill Station Road. From this point the corridor turns and proceeds generally eastward on the south side of the road through BLM administered public lands until it enters the China Lake Naval Aviation Weapons Station (NAWS) in the SE ¼ of Sec 34, T21S, R38E. From this entry point the pipeline corridor continues another two and a half miles to its connection with Injection Well 88-1. A small water storage tank will be constructed near the southern well, near the start of the pipeline, and a larger tank, with a 1.5 million gallon capacity, will be constructed on the NAWS just south of its boundary with BLM managed lands, and they are also components of the undertaking.

An Environmental Assessment (EA) was completed in the spring of 2006 by UltraSystems for the COC, and released for public comments on May 30, 2006, with a comment period for the general public of two weeks, which closed on June 15, 2006. A copy of the EA computer compact disk is enclosed with this letter. We invite the review of the document by the Tribe, with a requested reply date for written comments by July 28, 2006.

A cultural resources study was conducted of the proposed undertaking APE by the heritage contracting firm ASM Affiliates Inc., of Carlsbad, California, during 2004 and early 2005. Their investigations recorded within the APE six archeological sites, five prehistoric and one historic; along with seven smaller isolates, of which two were rock cairns and the remainders sparse lithic scatters. Four of the sites are located upon BLM public lands and the other two on NAWS property, with six of the isolates discovered on BLM and one on the NAWS. The two prehistoric lithic scatter sites on the NAWS were previously determined significant and eligible for the National Register of Historic Places (NRHP). ASM Affiliates, based upon their research, recommended that one of the sites on BLM lands also be considered as significant and eligible for the NRHP, which this Office concurs with. The remaining three sites have not yet been evaluated for their eligibility status, but they will be treated, for purposes of this undertaking, as if they were significant and eligible for the NRHP.

ASM Affiliates has evaluated the possibilities of the pipeline construction causing adverse effects to these six sites. There is potential for adverse effects occurring, so ASM Affiliates have recommended avoidance, and the realignment of the actual pipeline construction trench into the existing road right-of-way of Gill Station Road, when needed, as a mitigation measure that, if implemented, would prevent adverse effects from occurring to the six sites. This Office concurs with this initial recommendation, and will work with the COC and Inyo County Public Works Dept. to ensure that adverse effects will not happen. A CD disk with a copy of the report by ASM Affiliates is also enclosed with this letter.

We acknowledge, and are aware of, the special relationship and concerns that many Native Americans of California and Nevada, have for the Coso Hot Springs (CHS). It is recognized by this Office as being a traditional cultural property, as well as being listed on the National Register of Historic Places as an Archaeological District. In spite of its physical location on a Department of Defense military base, and beyond the normal management control of the Bureau of Land Management, this Office is ready to work with you to help ensure that adverse effects do not occur to the Coso Hot Springs.

The underlining reason, and need, for the pipeline is that the operations of the geothermal electrical plants are slowly diminishing the hydrologic reservoir that is available for steam generation. The pipeline is being proposed to bring into the Coso basin additional surface water supplies to add to this hydrologic reservoir. This importation could, by its very nature, possibly prevent adverse effects from occurring to the Coso Hot Springs due to the replenishment of the geothermal pool.

We are very much mindful in our on-going deliberations regarding the possible approval of the right-of-way grant to COC that a denial would have no surface impacts to the current operations of the geothermal complex, except to prevent the importation of water. Without this importation, within another 20-30 years, a valid possible scenario is the exhaustion of the Coso geothermal reservoir, and with that the extinction of Coso Hot Springs, along with the demise of the electrical production faculties. The granting of a right-of-way permit, and the subsequent construction of the pipeline, and its operation, by COC, could probably delay beyond the planned life expectancy of the geothermal facilities this exhaustion threshold from ever being reached.

Because of the acknowledged concerns by the Tribe that the proposed pipeline could potentially have an adverse effect upon the Coso Hot Springs, we especially invite your comment on how specifically the granting of the proposed right of way grant to the COC could have adverse effects upon the traditional cultural use of the springs by the Lone Pine Tribe. Suggestions would also be very much appreciated in how to resolve the conundrum that a denial of the pipeline will eventually lead to the extinction of the CHS, but yet its construction and operation could also pose an adverse effect on surface resources.

For public record and time management needs, this letter is being sent by FEDEX standard overnight shipment. We accept the signing by any representative of the Tribe of the FEDEX delivery manifest as proof of receipt of this letter by the Tribe. We do request that your response, submitted by July 28, 2006, be made by written correspondence rather than by telephone, and signed by the appropriate Tribal official.

An important side bar to our consultation is that the Coso Operating Company desires to meet with the Native Tribes and communities of the region themselves, probably during July 2006, to discuss the specifics of this project. Details regarding this meeting are not yet firmed up, beyond the desire to hold such a meeting. As these details, such as dates, time of day, location, agenda, or presentation format, become arranged we will immediately notify you of them.

In closing, your response regarding the granting of a Right of Way permit to the Coso Operating Company, L.L.C., for a water pipeline from Rose Valley to Coso Hot Springs is requested and appreciated. Please address your response to my attention at the Ridgecrest Field Office, 300 South Richmond Road, Ridgecrest CA 93555, and if necessary, please call me at my office phone number (760) 384-5400. Thank you.

Sincerely,

Lynn Gum, Acting

Hector A. Villalobos
Field Manager
Ridgecrest Field Office
Bureau of Land management

Enclosure:
Environmental Assessment computer CD disk
ASM Affiliates heritage report computer CD disk
CC: Case File Number CACA 046289 (2800)

T3 **Sanford K. Nabahe**
Lone Pine Paiute-Shoshone Reservation
P.O. Box 747
975 Teya Road
Lone Pine, California 93545

T3-1 The comment is noted. Previous activity and impacts from the geothermal power plant are part of the existing condition and beyond the scope of the current EIR. Please refer to Master Responses F2 and N3.

Please refer to Master Response C5.2 for a discussion of the connectivity of the Hot Springs to the geothermal reservoir. There is some connection between the hot springs and the geothermal reservoir; however, that relationship is complex and not one-to-one.

T3-2 Monitors identify change and the cause of changes. The Navy participates in ongoing consultation regarding the effect to Coso Hot Springs. Please refer to Master Response F2 for discussion of the implementation of the existing MOA. The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR. The measures in the MOA as established were agreed upon by the signatory parties and remain valid.

T3-3 The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR. The Navy participates in ongoing consultation regarding the effect to Coso Hot Springs.

The proposed project analyzes effects from the baseline, which under CEQA is the existing condition at the issuance of the NOP. The effects of the proposed project on the Hot Springs are addressed on pages 3.5-14 to 3.5-16 of the Draft EIR. The project would not cause growth inducing impacts that could impact the Hot Springs. The project would not cause significant, unavoidable impacts to the Coso Hot Springs with implementation of the existing MOAs. Cumulative impacts of the proposed project on Coso Hot Springs are addressed on pages 4-6 through 4-7 of the Draft EIR. Future geothermal development in the Coso KGRA could have cumulative impacts on the Hot Springs; however, future development is speculative at this time as only leasing and some exploration has been proposed. Leasing and exploration does not mean that development would occur. The type, size, location etc. of development are unknown at this time. CEQA does not require the analysis of speculative projects in the cumulative analysis.

T3-4 Construction would not impact the Coso Hot Springs. Construction activities are located 2.5 mi or more from the Coso Hot Springs. See page 3.5-15 of the Draft EIR. Construction would not be seen, heard, or felt by a person located at the Hot Springs.

Please refer to Master Response C5.2 for a discussion of cold water injection, connectivity between the geothermal reservoir and the Hot Springs, and restoration of the Hot Springs.

T3-5 The comment is noted. Previous activity and impacts from the geothermal power plants are part of the existing condition and beyond the scope of the current EIR except to the extent that they were analyzed in the cumulative impacts. . Please refer to Master Response N3.

T3-6 Please refer to Master Response C5.2 for a discussion of the connectivity of the Hot Springs to the geothermal reservoir. There is some connection between the hot springs and the geothermal reservoir; however, that relationship is complex and not one-to-one.

T3-7 Please refer to Master Response C5.2 for a discussion of the connectivity of the Hot Springs to the geothermal reservoir. There is some connection between the hot springs and the geothermal reservoir; however, that relationship is complex and not one-to-one.

T3-8 The comment is noted.

T3-9 Please refer to Master Response L2 for a discussion of alternatives considered. It is infeasible to change the type of plants at Coso. Alternatives analysis was performed in compliance with CEQA. Please refer to Master Response L1.

T3-10 Please refer to Master Response N9 regarding royalties. The consideration of tax benefits and royalty reductions that Coso could obtain under the Energy Policy Act of 2005 is out of scope of this EIR because it does not relate to environmental impacts.

CEQA requires analysis of a proposed project's potential impacts on population growth and housing supply, but social and economic changes are not considered environmental impacts in and of themselves under CEQA. These factors can be used to determine whether a physical change is significant or not. CEQA permits discussion of social and economic changes that would result from a change in the physical environment and could in turn lead to additional changes in the physical environment (CEQA Guidelines §15064(f)).

A change in royalty payment does not constitute a change in the physical environment and would not lead to changes in the physical environment. The County may require a socioeconomic analysis outside of CEQA to aid in their decision to approve or deny the project; however, it is not a requirement pursuant to CEQA.

FAX

TRANSMITTAL

Date: September 9, 2008

To: MHA/RMT

Attn: PAT CECIL-VISITOR RE: COSO

Phone:

FAX: 650-373-1211

Pages (including this cover): 36

Attached are additional comments on the Coso Hay Ranch EIR.

Sharon M. Birmingham,
Fiscal Supervisor

Inyo County Planning Department
168 North Edwards Street
Post Office Drawer L
Independence, CA 93526
Phone: (760) 878-0263
Fax: (760) 878-0382
E-mail:sbirmingham@inyocounty.us

Attachments can contain viruses that may harm your computer. Attachments may not display correctly.

InyoPlanning

From: Brian Adkins [Brian.Adkins@bishoppaiute.org] **Sent:** Mon 9/8/2008 4:59 PM
To: InyoPlanning
Cc:
Subject: Emailing: DOC006.PDF
Attachments: DOC006.PDF(446KB)

<<DOC006.PDF>> Inyo County Planning Dept.

Please find attached file for public comment period for Conditional Operating Permit #2007-3 Coso Operating Company LLC

Brian Adkins
Bishop Paiute Tribe

BISHOP TRIBAL COUNCIL

September 8, 2008

Planning Department
County of Inyo
168 North Edwards Street
Post Office Drawer "L"
Independence, CA 93526

RE: Conditional Use Permit No. 2007-3/Coso Operating Company LLC (Coso Hay Ranch Water Extraction, Export, and Delivery System)

Dear Planning Department :

T4-1 Coso Hot Springs is a powerful medicinal site located in on Western Shoshone Land. The sacred springs was shared by other Tribal groups in the South West Region. Then the U.S. Military closed the springs to the Indians for the purpose of weapons testing. I believe that was in the World War II era.

T4-2 My personal involvement began at Easter Break in 1971 when a large group of local Indians were escorted to the Coso Hot Springs. It was a wonderful experience to see, hear and sense my Elders reconnect with their Traditional Healing Springs. Since that reunion I've been into Coso Hot Springs three or four times before the Geothermal Project. On one of those trips the late Alan Spoonhunter lead a work crew to set up a redwood steam house over a steam vent. The last time I was at Coso Hot Springs was after the Geothermal Project did its damage. It was sad for my late Brother Alan Spoonhunter and myself to see the function of the steam house destroyed. We did get some peshapi near the evil hissing sound of a geothermal pipe. I haven't been back since that time. This degradation of Coso Hot Springs is a violation of the Native American Religious Freedom Act. Also the U.S. government continues to violated the 1863 Ruby Valley Treaty in regards to Coso Hot Springs. My staff has comprised comments to the EIR below:

T4-3 The Bishop Paiute Tribe would like to thank the Inyo County for letting us comment on the scope and content of the EIR prepared by your agency. The Bishop Paiute Tribe has considered the environmental impacts of this project the following environmental information should be considered:

Potential Impact 3.2-3: The potential to cause a significant alteration in the temperature or water levels of the surface features at Coso Hot Springs through injection of additional water into the Coso geothermal reservoir.

T4-4

First we would like to note that the Bishop Paiute Tribe submitted scoping comments to the Inyo County Planning Department on November 6, 2007, but these comments are not found in the Draft EIR (see Attachment 1). Please include these comments in the Final EIR.

-On page 3.2-51 states that "*Construction of the proposed project would have no impact on the Coso Hot Springs.*"

T4-5

The Coso Hot Springs Analysis (*Technical Summary)* that was commissioned to Innovative Technical Solutions, Inc. (ITSI Report) by the Navy concludes: ". . . the timing of the onset of geothermal fluid withdrawal and changes in hot spring activity at Coso suggest a correlation" (p. 60). The report summarizes how the increase in the steam phase caused by production of groundwaters is correlated with steam phase condensate influx to the pools of Coso Hot Springs. Water levels were documented rising in the pools and temperatures rose to over 100 degrees over previous levels to levels unusable for bathing while the groundwater table in the vicinity of the Hot Springs actually dropped up to 220 feet and reversed its direction after the onset of pumping. The water injected into the Coso for the past twenty years has produced adverse effects on the Coso Hot Springs.

-On page 3.2-53 it is stated that:

T4-6

> *"Projected overall reservoir behaviors based on reservoir modeling by Coso (personal communication 2008) indicates that production declines would slow, suggesting pressure support, and enthalpy would stabilize or decrease, suggesting the impact of injection related to the proposed project on the geothermal reservoir is most likely to reduces the growth of the steam zone within the reservoir".*

As the Tribe does not did not receive or have the opportunity to comment on the referenced modeling effort this statement and the premise that it put forth cannot be adequately addressed. In our letter of November 6 our Tribe had recommended to your department that an in-depth modeling simulation and analysis be conducted with the proposed injection rates and assumptions clearly stated.

-On page 3.2-53 it is stated that "*Geothermal development may or may not have produced observed changes to the Coso Hot Springs*"

T4-7

However Summary #3 -page 10 of the The ITSI (technical summary) report states

> *"FEHM model runs indicate that pressure reductions associate with geothermal production resulted in the development of a laterally extensive steam phase beneath a zone of*

hydrothermal alteration and increased the steam flux up the Coso Wash Fault Zone. This supports the hypothesis that geothermal production can be positively correlated with increases".

T4-7 Combined with summary 3 geochemestry and hydrologic date support the notion that the Coso hot Springs are fed by vapor condensate upwelling along the Coso Wash fault and summary #12 "the timing of the onset of the onset of geothermal fluid withdrawal and changes in hot spring activity suggest a correlation" give the preponderance of evidence is that the geothermal development has most likely produced the observed changes.

Page 3.2-51 states that "*the existing ongoing monitoring program provides a safeguard for the Hot Springs by providing a long history......*"

This monitoring program established by the 1979 MOA between CLNAWS, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation does not provide a safeguard for mitigations and is premature to state that "*No additional mitigation for the proposed project is needed.*" The section of this MOA pertaining to this reads as follows:

T4-8

> *"In the event a perceptible change to the surface activity of the hot springs were to occur over a period of time as a result of the geothermal development program the Navy will cease those actions on the part of the Navy and or its agents which can reasonably be presumed to be causing this effect and will make every reasonable effort to determine what actions could be taken to mitigate this change. The Navy will request the comments of the Owens Valley Paiute-Shoshone Band of Indians, the California State Historic Preservation Officer and the Advisory Council on Historic Preservation (p. 10)." (Memorandum of Agreement between the Commander, Naval Weapons Center, California, State Historic Preservation Officer and the Advisory Council on Historic Preservation (November, 1979))*

More than perceptible change has occurred at Coso Hot Springs. Adverse effects, primarily temperature increase, have occurred at Coso Hot Springs almost since the inception of geothermal power production affecting the traditional use of Coso Hot Springs by Native Americans. We see these changes as a result of geothermal development and will be the source of future talks with the Navy, ACHP and SHPO.

Also a section in the Memorandum of Agreement (MOA) between NAWS, China Lake and the Coso Ad Hoc Committee and the Owens Valley Paiute-Shoshone Band of Indians (July, 1979) states:

> *"11. That material or substantial alteration or permanent disturbance of the hot springs or the pond shall not be permitted. Both the Naval Weapons center and the Native Americans pledge their mutual cooperative efforts to expeditiously develop a preservation and management plan*

acceptable to both parties and to the California state Office of Historic Preservation and approvable by the Advisory Council on Historic Preservation (p. 2)."

T4-8 As mentioned prior there already has been a permanent disturbance of Coso Hot Springs that have left it so hot that many Traditional Practitioners, especially Elders, have stopped using the springs over the years. This disturbance must be addressed and remediated by the Navy before the Tribe can consider supporting actions to continue the geothermal project.

Native American Prayer Site.

T4-9 On page 3.5-15 the Draft EIR states: "There is a Native American prayer site located along Gill Station Coso Road approximately 1,600 feet from the terminus of the proposed project pipeline route into the injection system at the Coso geothermal field." It appears that the injection well is visible from the prayer site. If the pipeline is above ground in this area, then the added construction to the geothermal electric plant could have adverse effects on the use of the prayer site. A simulation of what the injection well and pipeline would like from the prayer site (on both sides of the road) should be added to the Final EIR.

T4-10 In conclusion, the Bishop Paiute Tribe of the Owens Valley recommends the "No Project" Alternative for the proposed project. The Draft EIR states on p. ES-12 that if the No Project Alternative is chosen, then "The Coso Hot Springs could return to a natural state sooner if the power plants and geothermal withdrawal were to cease."

T4-11 The Tribe feels that more sustainable alternatives for electricity generation and tax base support could be pursued -ones that would not support the non-sustainable exploitation of water resources and desecration of important Native American cultural sites.

Respectfully yours,

M Bengochia

Monty Bengochia
Tribal Chairperson
The Bishop Paiute Tribe

Attachment: Letter from Bishop Tribe to Inyo County Planning Department – (Dated November 6, 2007) RE: Notice of Preparation of a Draft Environmental Impact Report for CUP No 2007-03, Coso Hay Ranch Water Extraction, Export, and Delivery System

cc: Reid Nelson, ACHP
Milford Wayne Donaldson, SHPO
Glenn Hall, CEO – Bishop Paiute Tribe
Honorable Tribal Council – Bishop Paiute Tribe
File

Attachment #1

BISHOP TRIBAL COUNCIL

Jan Larsen,
Senior Planner
Planning Department
168 North Edwards Street
Post Office Drawer L,
Independence, CA 93526

November 6, 2007

RE: Notice of Preparation of a Draft Environmental Impact Report For CUP No. 2007-03, Coso Hay Ranch Water Extraction, Export, and Delivery System

Dear Ms. Jan Larsen:

The Bishop Paiute Tribe would like to thank the County of Inyo for letting us comment on the scope and content of the forthcoming EIR to be prepared by your agency. In order for our government to consider the environmental impacts of this project the following environmental information should be considered:

Upon review of the DEIR, the Bishop Paiute Tribe is concerned that the project will impact Tribal sites present on or near the project area. Inyo County went forward with its general plan without consulting the tribe.

According to SB 18, local (city and county) governments are required "to consult with California Native American tribes to aid in the protection of traditional tribal cultural places through local land use planning" (Supplement to General Plan Guidelines: Tribal Consultation Guidelines [Interim] State of California Governor's Office of Planning and Research [March 1 , 2005]). This must be done through government to government contact, not through general announcements of meetings and hearings.

We are requesting to be notified and to be participation of any and all pre/archaeological surveys as well as any and all excavations that will be conducted in preparation for this project. We request to be present for consultation during any archaeological survey or any earth-moving activities at every stage of preparation for the project and at every stage of the project. The Bishop Paiute Tribe has Certifying Cultural Monitors who can represent the Tribe, contact the Tribal Historic Preservation Officer - Theresa A. Stone-Yanez @ 760) 873-3584 Ext. 250.

Hydro geologic impacts to the Coso Hot springs. These hot-springs, a sacred site which is on the National Register of Historic Places is located on Navy land within 6 miles from the proposed injection site and has been re-evaluated by the Bureau of Land Management, Ridgecrest Office as being in the Area-of-Potential- Effects (APE) of the

PAIUTE PROFESSIONAL BUILDING • 50 TU SU LANE • BISHOP, CA 93514
PHONE (760) 873-3584 • FAX (760) 873-4143

System. It is our view that this injection activity poses a potentially significant impact to the area and constitutes further investigation.

The last paragraph of Section V. Cultural Resources- Environmental Checklist Form mentions existing, and proposed, MOAs between agencies regarding the management of the area. In our opinion neither MOAs are sufficient to support the conclusion that this action is less-than-significant. In October of 1988 the temperature levels of the South Pool of the Hot springs began increasing from an average of 121 degrees F in 1987 to and average of 204 degrees F from the period October 1993 whereby it appeared to become stable (Innovative Technical Solutions, Inc. Report Coso Hot Springs Analysis - Technical Contract No. N68711-05-P-0049, dated April 2007). The majority of the conclusions presented in the report points to a correlation between the withdrawal of fluids from the Coso geothermal field in 1987 and the increasing in temperature and water levels at the Coso Hotsprings.

It is suggested that an in-depth modeling simulation and analysis be conducted that incorporates hydrogeological complexity equivalent to or exceeding that of the above referenced study by Innovative Technical Solutions. A range of all proposed and possible injections schemes up to 4,893 acre feet per year of water should be simulated. Effects should be forecast out past the point where temperatures and water levels reach a relative dynamic equilibrium for at least the project period (30 years) after the date of first injection. All assumptions and data should be clearly defined. EIR should take in to consideration and evaluate proposed rates of injection vs. current rates of re-injection of hydrothermal waters, indicate the average temperature and water chemistry of waters proposed imported injected waters vs. existing groundwater.

Sincerely,

Tilford Denver, Bishop Paiute Tribal Chairman

CC: Honorable Tribal Council
Shirley Cain, Tribal Administrator
Tribal Historic Preservation Officer
Theresa A. Stone-Yanez
Tribal Environmental Protection Agency
Brian Adkins, Environmental Manager

50 Tu Su Lane
Bishop, CA 93514

760-873-3665
760-873-4614(fax)

Bishop Paiute Tribe Environmental Management Office

Fax

To: Inyo County Planning Dept. From: Brian Adkins

Fax: 760-878-0382 Pages: 8 incl cover

Phone: 760-878-0263 Date: 9/8/08

Re: Conditional Use Permit #2007-3 / Coso Operating Co. CC:

☐ Urgent ☑ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• Comments:

Please find comments attached. Hard copy to follow.

Thank you
Brian

T4 **Monty Bengochia**
The Bishop Paiute Tribe
50 Tu Su Lane
Bishop, California 93514

T4-1 Comment on the history of the Hot Springs is noted.

T4-2 The comment is noted.

T4-3 The comment is noted.

T4-4 The comment letter containing scoping comments dated November 6, 2007 was excluded from the Draft EIR due to administrative error. The letter will be included in the Final EIR. The letter was considered in the preparation of the Draft EIR.

T4-5 Construction would not impact the Coso Hot Springs. Construction activities are located 2.5 mi or more from the Coso Hot Springs. See page 3.5-15 of the Draft EIR. Construction would not be seen, heard, or felt by a person located at the Hot Springs. Operational impacts are discussed on pages 3.5-14 to 3.5-16 of the Draft EIR

Previous activity and impacts from the geothermal power plants are part of the existing condition and beyond the scope of the current EIR. Please refer to Master Response N3.

T4-6 Please refer to Master Response C5.2 for a discussion of the connectivity between the geothermal reservoir and the hot springs; as well as the impacts of the proposed project on the steam phase of the reservoir. Reservoir modeling by Coso is proprietary information. The results as they pertain to the proposed project are explained on pages 3.2-51 to 3.2-55 of the Draft EIR. Modeling of the geothermal reservoir would not provide definitive results for the impacts on the hot springs since the relationship is so complex. If impacts to the hot springs were to occur, they would be mitigated through the conditions of the existing 1979 MOA.

T4-7 The comment is noted.

T4-8 The comment is noted. Please refer to Master Response F2 for discussion of the MOA and its previous implementation. The previous implementation of the existing MOA by the Navy is beyond the scope of this EIR. The measures in the MOA as established were agreed upon by the signatory parties and remain valid. Any measures that are agreed upon under the 1979 MOA would be applicable to the proposed project through the conditions of the 1979 MOA. No additional mitigation is necessary outside of the MOA because mitigation would be determined through the MOA.

T4-9 Please refer to Master Response F1. A 500-ft section of pipeline would be installed above ground just north of the CLNAWS boundary. This location is 2.6 mi from the prayer site and would not be visible at the prayer site due to distance, its low profile, and topography. The appearance of the land as viewed from the prayer site would be exactly the same as the existing condition after construction. No visual simulation is required. See Appendix B, Sheet P-12 of the Draft EIR for the location of the above-ground section of pipeline.

T4-10 Objection to the project is noted.

T4-11 The comment regarding alternative electricity generation and tax base support is noted.

3: REVISIONS AND ERRATA

3.1 Introduction

This section summarizes text revisions and errata to the Draft EIR. Revisions reflect changes identified in the preparation of the responses to comments on the Draft EIR. Global changes are changes that apply throughout the Draft EIR.

Specific changes are listed in page order with reference to the relevant sections and pages in the Draft EIR. Text added to the EIR is underlined; and deleted text is ~~stricken~~.

Some changes to the project description and environmental analysis were made in response to public comments. Revisions include clarifications to mitigation measures and some changes in the project description of permits needed. Neither the comments received nor the responses to those comments introduce significant new information that was not addressed or evaluated in the Draft EIR. No substantial revisions that would merit recirculation of the Draft EIR, as defined by 15088.5 of Title 14 of CEQA, were made to the project or analyses after public comment. These revisions and corrections merely clarify and amplify the information and conclusions already circulated.

3.2 Global Text Edits

The following global changes are made throughout the Final EIR:

- Any reference to project acreage of 59.5 ac is changed to 60.5 ac.
- Any reference to the substation acreage of 0.5 ac is changed to 1.5 ac.
- Any reference to the mechanical and electrical equipment building (MEER) is changed to mechanical and electrical equipment room.
- Any reference to the Haley Substation is changed to the Haiwee Substation.
- Any reference to the long-term pumping test is changed to 14-day pumping test.

3.3 Specific Text Edits

3.3.1 TEXT EDITS

Executive Summary

Page ES-1

ES.1.1 PROJECT DESCRIPTION

Overview

The Coso Operating Company, LLC (COC) is seeking a 30-year Conditional Use Permit (CUP No. 2007-03) from the Inyo County Planning Commission (County) for the Coso Hay Ranch Water Extraction and Delivery System project.

The proposed project includes extracting groundwater from two existing wells on the Coso Hay Ranch, LLC property (Hay Ranch) in Rose Valley, and delivering the water to the injection distribution system at the Coso geothermal field in the northwest area of the China Lake Naval Air Weapons Station (CLNAWS).

The project elements are described in Table ES.1-1 and shown in Figure ES.1-2. The project would occupy approximately ~~59.5~~ 60.5 acres, as shown in Table ES.1-2. The project location is shown in Figure ES.1-1.

Project Objective

The proposed project's objectives are ~~is needed~~ to provide supplemental injection water to the Coso geothermal field in order to minimize the annual decline in reservoir productivity due to evaporation of geothermal fluids from power plant cooling towers.

Page ES-5 (Table ES.1-1)

Pipelines	Hay Ranch Property & Hay Ranch to Coso Road, along BLM lands, to the CLNAWS Geothermal Field	• Piping from groundwater wells to a collection tank at the lift pump station • A main pumped transmission pipeline from the lift pump station to a high point tank • A main gravity transmission pipeline to transfer water from the high point tank to the injection well

Page ES-5 (Table ES.1-1)

Substation	Hay Ranch Property	• A ~~3-5 megawatt (MW)~~ 5 megavolt-ampere (MVA) 115-12kV SAS Automated substation including electrical equipment such as ~~transformers switchgear, and motor control centers to power the pumps and supply power to auxiliary equipment and lighting~~ a 115kV low profile switchrack with four bays, two 5MVA transformers (one normally in service and one spare) with isolating disconnects, surge arrestors and neutral CTs, and a 12kV low profile switchrack consisting of three positions with provisions to expand to four additional positions. • A prefabricated mechanical and electrical equipment room (MEER) ~~building~~ • An electrical distribution line to supply power to the well down hole pumps and to the lift pump station

Page ES-5 (Table ES.1-2)

Table ES.1-2: Project Facility Acreage

Facility	Location	Acreage
Wells	Hay Ranch property	Negligible/Existing
Lift Pump Station	Hay Ranch property	4.75 acres
Pipeline (total)	Hay Ranch property, BLM lands, CLNAWS	53.5 acres
	Hay Ranch property	*4.5 acres*
	BLM lands	*33.2 acres*
	CLNAWS	*15.8 acres*
High Point Tank (1.5 million gallon)	CLNAWS	0.75 acres
Substation and distribution line	Hay Ranch Property	~~0.5~~ 1.5 acres
	TOTAL	**~~59.5~~ 60.5 acres**

Page ES-7 to ES-8

HYDROLOGY AND WATER QUALITY

The project as proposed could have significant impacts to groundwater users in the Rose Valley, as well as surface waters that are dependent upon groundwater. The project will be required to monitor groundwater levels in a network of wells, that will provide an early warning system, and allow for mitigation in the form of a shortened duration of pumping, to avoid significant impacts. The duration of pumping will likely be shortened significantly below thirty years, to as little as 1.2 years, based on model results, to avoid significant impacts.

Impacts to groundwater wells would be mitigated. The applicant would be responsible for lowering pumps or deepening wells in Rose Valley that are impacted by groundwater withdrawal from Hay Ranch.

Springs at Portuguese Bench and Rose Spring would not be impacted by the proposed project because these springs are located at higher elevations and, most likely, their source of water is predominantly Sierran recharge. Impacts to springs (not associated with Little Lake) would not occur.

Little Lake Ranch is a private property that includes wetlands and open water habitat~~currently undergoing habitat restoration efforts~~, which is continually maintained, and is used for recreational hunting. The property is located nine miles south of Hay Ranch. The lake, surface waters, and springs at Little Lake Ranch are sourced completely by ~~perched~~ groundwater. The proposed project has the potential to draw down the groundwater table and therefore impact the surface waters at Little Lake. A substantial reduction in the amount of water available at Little Lake is defined as greater than 10% reduction in water available to the surface features at Little Lake.

Page ES-9

The project could indirectly impact wetlands in the Rose Valley, particularly at Little Lake. Hydrology mitigation requires the monitoring and cessation or reduction of pumping prior to significant groundwater drawdown near Little Lake, defined as no greater than 10% decrease in groundwater inflow available to Little Lake. Even with mitigation, the project may result in a minimal lowering of the groundwater table beneath Little Lake. Groundwater table drawdown of ~~by~~ up to ~~less than~~ 0.3 feet. could develop within 10 years after start of pumping and persist for 10 to 20 ~~as much as 50~~ years; thereafter groundwater levels would slowly recover to pre-pumping levels over a period of 100 years or more. At no time would the groundwater flow available to Little Lake be reduced by more than 10%. ~~however w~~Wetland vegetation would be unlikely to ~~not~~ change to a different community type because the change in water level would be minor and largely within the natural seasonal variation already experienced at the lake. Wetland restoration efforts have been designed to considerable variation in water availability on the Little Lake Ranch property. Changes related to the proposed project would fall within the range that has been previously experienced.

Impacts to wetland vegetation would be less than significant.

Page ES-9

Several known cultural resource sites are located within the project region. Project construction has the potential to disturb or cause an adverse change to known and unknown resources, including the potential to disturb human remains. Mitigation measures are defined to minimize impacts to historic and archaeological resources to less than significant levels. Mitigation includes worker training, performing additional testing and data recovery if needed, moving pipeline alignments to avoid sites, flagging sites, performing additional surveys for the substation site and connection, and directing water away from sites during maintenance activities. All mitigation measures or resulting actions would be coordinated with the BLM and would be consistent with the Programmatic Agreement being developed ~~between~~among the BLM, State Historic Preservation Office, and the Advisory Council on Historic Preservation.

The proposed project is also subject to the existing 1979 Memorandum of Agreement ~~between~~among the CLNAWS, the State Historic Preservation Office, and the Advisory Council on Historic Preservation, which addresses effects to the Coso Hot Springs (a site listed on the National Register of Historic Places) from geothermal development activities.

Page ES-11

Construction trucks may access or leave the Hay Ranch property using an un marked, unpaved road off of US 395 insteadof using the protected turn lanes at the Gill Station Coso Road intersection with US 395. This could lead to potentially significant impacts regarding transportation hazards. Coso would be required to apply for and receive an encroachment permit from Caltrans prior to use of this road for construction activities on the Hay Ranch property. Application for an encroachment permit would require verification from Coso that the road meets current standards ans is a safe access (i.e., turning radius, storage length, etc.) for the type and number of vehicles that may use it. Mitigation would ensure implementation of improvements to the road as necessary, and the placement of warning and construction signage in accordance with standards developed by the California Department of Transportation (Caltrans)~~, and would~~ to reduce impacts to less than significant levels.

Page ES-20 to ES-21

Biology-8: The population of crowned muillas shall be avoided during construction. If the crowned muillas cannot be avoided during construction, a plan shall be prepared for restoration (as well as an attempt at relocation of the individual plant), and seeds of the plant shall be collected. The plan shall include at a minimum (a) the location of where the plant shall be seeded or replanted, with preference for on-site replacement such as over the pipeline route; (b) the plant species and seeding rate; (c) a schematic depicting the replanting or seeding area; (d) the planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on-site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria ~~and providing for conservation of the mitigation site in perpetuity~~.

Page ES-22 (Table ES2.1)

Potential Impact 3.5-1: Potential to cause a substantial adverse change in	PS	**Cultural Resources-4:** The entire proposed ~~0.5~~1.5 acre substation site, and the path to interconnect the substation to the proposed switchyard near the lift pump station, shall be	LS

the significance of a known or unknown historical or archaeological resource		subject to an intensive pedestrian survey for cultural resources, consistent with the previous survey work performed for this project. If resources are found that are potentially eligible for the National Register of Historic Places, the substation site shall be moved to a surveyed area without resources. If resiting the substation to avoid potentially significant resources is (resources eligible for the NRHP, also known as historic properties) not possible, data recovery shall be accomplished in the context of a detailed research design and in accordance with current professional standards. The plan shall result in the extraction of sufficient volumes of non-redundant archaeological data so as to address important regional research consideration; detailed technical reports shall be prepared to document the findings. The survey and substation siting shall be performed prior to sale of land to Southern California Edison. A Native American ~~crew member/~~monitor shall be present during all survey work.	

Page ES-23 (Table ES.2-1)

Cultural Resources-4: The entire proposed ~~0.5~~ 1.5-acre substation site, and the path to interconnect the substation to the proposed switchyard near the lift pump station, shall be subject to an intensive pedestrian survey for cultural resources, consistent with the previous survey work performed for this project. If resources are found that are potentially eligible for the National Register of Historic Places, the substation site shall be moved to a surveyed area without resources. If resiting the substation to avoid potentially significant resources is (resources eligible for the NRHP, also known as historic properties) not possible, data recovery shall be accomplished in the context of a detailed research design and in accordance with current professional standards. The plan shall result in the extraction of sufficient volumes of non-redundant archaeological data so as to address important regional research consideration; detailed technical reports shall be prepared to document the findings. The survey and substation siting shall be performed prior to sale of land to Southern California Edison. A Native American ~~crew member/~~monitor shall be present during all survey work.

Page ES-29

Potential Impact 3.14-4: The potential to degrade US 395 or Gill Station Coso Road beyond pre-project conditions	PS	**Traffic-4:** The applicant shall regrade and restore any areas of Gill Station Coso Road and US 395 and its ROW that are disturbed by construction including installation of the pipeline and high point tank. The applicant shall take photo documentation of the roadway conditions before construction and after construction and shall provide these photographs to County Public Works upon request.	LS

Chapter 1: Introduction

Page 1-3

NEPA requires that federal agencies consider and document environmental impacts prior to making certain decisions. The proposed pipeline crosses BLM lands. A portion of this project is also located on CLNAWS on Navy withdrawn lands. BLM and Navy each must review and decide whether or not to grant approval of this project, and have cooperated in the preparation of an Environmental Assessment (EA) to provide sufficient evidence and analysis for each to independently determine whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact with respect to the project under NEPA. The Navy may also determine~~d~~ that the project is categorically exempt because the action is to grant COC a right-of-way. Injection of fluids was considered under several environmental documents (NWC 1979, BLM 1980, NWC 1983, NWC 1986, NWC 1988).

Figure 1.1-2 shows the boundaries of the Coso Known Geothermal Resource Area (KGRA) in relation to the proposed project. The Coso KGRA encompasses an area of approximately 107 square miles and extends from east of Haiwee Reservoir southward to just east of Little Lake Ranch.

Chapter 2: Project Description

Page 2-2 (Table 2.3-1)

Substation	Hay Ranch Property	• A ~~3-5 megawatt (MW)~~ 5 megavolt-ampere (MVA) substation including electrical equipment such as ~~transformers, switchgear, and motor control centers to power the pumps and supply power to auxiliary equipment and lighting~~ 115kV transformers and 12kV switchbacks along with isolating disconnects, surge arrester, and lighting • A prefabricated mechanical-electrical ~~and electrical building~~ equipment room (MEER) • A tap line into the substation from the existing 115 kV subtransmission line adjacent to the substation • An electrical transmission line to supply power to the well down hole pumps and to the lift pump station

Pages 2-2 and 2-3 (Table 2.3-1)

Pipeline	Hay Ranch Property &Hay Ranch to Coso Road, along BLM lands, to the CLNAWS Geothermal Field	• Piping from groundwater wells to a collection tank at the lift pump station • A main pumped transmission pipeline from the lift pump station to a high point tank • A main gravity transmission pipeline to transfer water from the high point tank to the injection well

Page 2-3 (Table 2.3-2)

Table 2.3-2: Project Facility Acreage

Facility	Acreage	Location
Wells	Negligible	Hay Ranch property
Lift Pump Station	4.75 acres	Hay Ranch property
Pipeline (total)	53.5 acres	Hay Ranch property, BLM lands, CLNAWS
	4.5 acres	Hay Ranch property
	33.2 acres	BLM lands
	15.8 acres	CLNAWS
High Point Tank (1.5 million gallon)	0.75 acres	CLNAWS
Substation and 12.4 kV Subtransmission Line	~~0.5~~ 1.5 acres	Hay Ranch Property
	60.5 acres	**TOTAL**

Page 2-10

~~A minimum of four transformers would be required for the electrical installation. The substation capacity would be sized between approximately 3 and 5 MW to serve the project and an existing SCE customer load of less than 1 MW that SCE currently serves from the Los Angeles Department of Water and Power (LADWP) Haley substation. The capacity of the substation would depend on~~

~~standard equipment available, which would likely be a 5 MW transformer. The substation would likely be derated to maintain the 3 MW rating.~~ Two transformers would be required for the electrical installation. The substation capacity will be 5 MVA and will serve the project and an existing SCE customer load of less than 1 MW that SCE currently serves from the Los Angeles Department of Water and Power (LADWP) Haiwee Substation. The substation capacity would be based on the standard equipment available.

Page 2-10

The proposed substation would be an unmanned, 115-12 kilovolt (kV), ~~28~~ 5 megavolt-ampere (MVA) substation automation system (SAS) constructed on a plot approximately ~~0.5 acres~~ 260 by 240 feet in size on the Hay Ranch property. It would contain:

- A 115-kV, low profile switchrack with four bays
- Two ~~14~~ 5-MVA transformers (one normally in service and one spare) with isolating disconnects, surge arrestors, and neutral current transformers (CTs)
- A 12-kV, low profile switchrack consisting of three positions with provision to expand to four additional positions
- A prefabricated metal mechanical-electrical equipment room (MEER) ~~building~~.

Page 2-11

A 20-inch pipeline would run from the storage tank on the Hay Ranch property along an existing access road ~~on the Hay Ranch property~~ located on BLM administered public lands to Gill Station Coso Road. The proposed pipeline would be installed under Gill Station Coso Road and proceed east, approximately 50 feet from the edge of the road.

Page 2-11

The 20-inch pipeline would be approximately ~~9.3~~ 8.3 miles in length, extending from the tank on the Hay Ranch property to the injection system at CLNAWS.

Page 2-12

The pipeline construction right-of-way would be 50 feet wide and would follow the proposed alignment shown in Figure 2.3-1. Trenching equipment, cranes, welders, and earthmoving equipment would be utilized to install the pipeline. The majority of pipeline construction would take place on BLM administered lands and Navy lands.

Page 2-13

One of the water storage tanks would be located on the Hay Ranch property, as part of the lift pump station shown in Figure 2.3-1 and Figure 2.3-3. The second water storage tank would be located on public lands administered by the Navy along Gill Station Coso Road, as shown in Figure 2.3-4.

Page 2-14

The proposed project would take approximately 110 days to construct the water infrastructure and 12 months to construct the substation. Several areas of the project would be constructed concurrently. No more than 20 workers would be working in any single area or component at one time; however, as many as 40 workers may be working on the overall construction project at once. SCE has not yet determined the total number of workers nor the number of workers at any given time that would be required to construct the substation; however, it is expected to be around 40 workers.

Page 2-17

Table 2.5-1: Required Permits or Approvals for the Proposed Project	
Agency	**Approval or Permit**
Federal	
US Navy, China Lake Naval Air Weapons Station	Permits and rights-of-way for pipeline and high point water tank.
Bureau of Land Management, Ridgecrest	NEPA compliance and right-of-way for pipeline on public lands
US Fish and Wildlife Service	Consultation with the BLM under Section 7 of the Endangered Species Act
State	
California Department of Fish and Game	Responsible agency for CEQA review California Endangered Species Act (CESA) permitting agency
State Historic Preservation Office	Consultation and compliance under Section 106 of the National Historic Preservation Act; consultation with BLM
California Department of Transportation (Caltrans), District 9	Encroachment Permit. Required only if the COC is to access the Hay Ranch parcel off of Highway 395 via Rose Valley Ranch Road.
Regional	
Lahontan Regional Water Quality Control Board	Issuance of National Pollutant Discharge Elimination Permits for construction
Great Basin Unified Air Pollution Control District	Authority to Construct permits
Local	
Inyo County Planning Commission	Approval of the Conditional Use Permit (CUP 2007-003)
Inyo County Water Department	Compliance with Inyo County Code Section 18.77, Regulation of Water Transfers
Inyo County Environmental Health Services Department	Construction of monitoring wells
Inyo County Public Works Department	Building and Grading Permits for pipeline along Coso Road

Chapter 3: Environmental Impact Analysis

Page 3.2-39 (Hydrology and Water Quality)

Hydrology-2: Mitigation for effects to groundwater wells in Rose Valley shall depend upon the specific characteristics of each well, and the use of the well. The applicant shall use monitoring data and the numerical groundwater flow model described in Appendix C2 to track groundwater levels throughout the valley. The applicant shall work with the County Water Department to identify wells that may be affected by groundwater drawdown as the project progresses. The evaluation of wells depths and uses in the Rose Valley as compared with groundwater drawdown shall be made semi-annually and reported to the Inyo County Water Department. The owner of any wells that may potentially be impacted within the six months after an evaluation shall be contacted by the applicant to assess the need for additional pumping equipment on the well or deepening of the well. The applicant shall be responsible for the cost of equipping or deepening wells that are impacted by groundwater drawdown as a result of the proposed project. The applicant would also bear the costs of any additional energy costs required to pump the wells. The applicant shall also evaluate any wells that are brought to the attention of the applicant by the user to evaluate if groundwater drawdown from the proposed project is impacting the well. If it is determined by the County or by the applicant (using well monitoring data and modeling) that the well in question is being impacted by the proposed project, the applicant shall fund the necessary adjustments to the well to secure the previous uses of the well. Disputes as to the cause of well water drawdown or appropriate corrective measures shall be resolved by the County.

Page 3.3-13 (Geology and Soils)

Ground subsidence or collapse could occur from withdrawal of fluid from unconsolidated sediments, poorly consolidated rock, or clay-rich basins. The well driller's logs (California Department of Water Resources 1971; California Department of Water Resources 1974) show that the soils in the project area are stable alluvial materials as expected from alluvial fan deposits and stream deposits. The Rose Valley basin is not filled with compressible clay, which would be more prone to subsidence. ~~The total amount of water pumped during operation of the proposed project would be approximately 0.27 percent of the total aquifer volume.~~ Subsidence, however, is related to resulting drawdown and not the change in aquifer volume. The drawdown in the immediate vicinity of the pumped wells could be sufficient to cause subsidence if the soils consisted of compressible clays or poorly-consolidated sediments; however, the sediments are well consolidated and not clay-rich. Subsidence in the Rose Valley is generally not expected due to the coarse-grained and highly consolidated nature of the deposits. Impacts would be less than significant.

Page 3.3-14 (Geology and Soils)

Groundwater pumping ~~would not~~ could result in significant reductions in surface water levels in Rose Valley, as described in Section 3.2 Hydrology and Water Quality. Concern has been expressed that reductions in surface waters would increase soil erosion in the valley. However, ~~M~~mitigation has been included in Section 3.2 Hydrology and Water Quality to monitor groundwater drawdown, with contingency plans to prevent surface water impacts (primarily at Little Lake) from groundwater drawdown. With implementation of the mitigation in Section 3.2 Hydrology and Water Quality, surface waters would not be significantly impacted and wind blown soil erosion would not increase.

Page 3.4-15 (Biological Resources)

The Gill Station Coso Road Improvement Project survey identified Mohave ground squirrel habitat from where the unpaved road (off of the Hay Ranch property where the proposed pipeline would be installed) meets Gill Station Coso Road up to the CLNAWS boundary (where that survey ended). This area corresponds to the BLM managed portion of the Hay Ranch project area. The BLM administered lands begin at the Hay Ranch property boundary and continue east to the CLNAWS boundary for 8.3 miles. In this section, the highest quality habitat was found closest to the CLNAWS boundary (and likely onto the CLNAWS lands). The narrow alluvial valley in this area is characterized by soils suitable for burrow construction. It supports a diverse creosote bush community, with a number of other shrub and herbaceous species present as well (Leitner 2007).

Page 3.4-27 (Biological Resources)

Pipeline. The pipeline ~~route~~ would be buried for all but a few small sections of the route; about 500 feet in length would not be buried.

Pages 3.4-28 to 3.4-29

Project operation would result in the temporary loss of 53.5 acres of potential habitat and the permanent loss of about ~~6~~ 7 acres of potential habitat for desert tortoise and Mohave ground squirrel (the entire project area is assumed to be Mohave ground squirrel habitat). 5~~5~~6.25 acres of permanent loss would be on private land, 0.03 acres on BLM managed lands, and 0.75 acres would be on CLNAWS land. Compensation for Mohave ground squirrel is included in the existing mitigation plan for the geothermal development for the 0.75 acres of loss on BLM and the 0.03 acres on BLM managed lands. The plan was evaluated under CEQA in 1988 and is applicable for all geothermal projects associated with geothermal development at Coso and within the Coso KGRA. The goal of the mitigation program was to eliminate grazing pressure by cattle on the food source for the Mohave ground squirrel. Cattle can adversely affect the ground squirrels directly by competing for the limited forage or indirectly by trampling ground squirrel burrows and reducing shrub cover necessary for ground squirrel thermoregulation and protection from predators. The plan effectively preserved several acres of Mohave ground squirrel habitat, allowing for 2,193 acres of habitat disturbance associated with geothermal projects. Implementation of this plan minimizes effects to Mohave ground squirrel from the proposed project to less than significant levels. Six acres of land would be debited from the total mitigation credit acreage. Temporarily disturbed habitat would be restored to natural conditions after construction to minimize impacts to Mohave ground squirrel habitat. The mitigation plan does not provide compensation for permanent disturbance on private lands. The approximately 6.25 acres of permanent disturbance on private lands would require an Incidental Take Permit under section 2081 of the Fish and Game Code and compensation for loss of habitat.

The project would also result in temporary and permanent loss of habitat for desert tortoise. Portions of the project fall under different plans for the compensation of lost desert tortoise habitat based on surface management. Table 3.4-4 summarizes the loss of habitat, ownership, and compensation for both Mohave ground squirrel and desert tortoise. With compensation as described, impacts to habitat for desert tortoise and Mohave ground squirrel would be considered less than significant.

Construction

Construction of all project components could have the potential to impact the following federal and/or State listed threatened or endangered species:

- Desert tortoise
- Mohave ground squirrel

The project construction could also impact several special status plant, reptilian, mammalian, and avian species as listed on Table 3.4-1 and Table 3.4-2.

Mohave Ground Squirrel. Mohave ground squirrels are known to occur in areas adjacent to the project site, and the entire project area supports Mohave ground squirrel habitat (all project components). Any ground-disturbing activities could take an indeterminate number of Mohave ground squirrels. Animals could be trapped underground in burrows or in above ground middens, or crushed by project equipment. In addition, approximately 53.5 acres of habitat for these species would be temporarily disturbed during construction of project components. This habitat disturbance may be significant for species with limited ranges such as the Mohave ground squirrel.

Project impacts are expected to be potentially significant for Mohave ground squirrels, a species listed as threatened under the California Endangered Species Act. Although it is unlikely that the loss of habitat for this project would jeopardize the continued existence of Mohave ground squirrels throughout its range, the project site is surrounded by mostly undisturbed native desert habitat, much of which is presumably occupied by Mohave ground squirrels.

Mitigation for Mohave ground squirrel impacts during construction would include a training program as described in mitigation measure Biology-5 and several of the measures listed in mitigation measure Biology-6. Additionally, compensation mitigation for temporary and permanent impacts ~~on~~ to ~~6 acres and temporary impacts on 59.5 acres of~~ Mohave ground squirrel habitat ~~is~~ on public lands is covered under the existing Mohave Ground Squirrel Mitigation Plan for development of the Coso Known Geothermal Area (KGRA). This plan was developed in 1988. The plan effectively preserved several acres of Mohave ground squirrel habitat in anticipation of up to 2,193 acres of disturbance associated with geothermal development in the Coso KGRA. The BLM identified that up to 2,193 acres of land could be disturbed in order to develop the geothermal resources in the Coso

KGRA, which could impact the Mohave ground squirrel. The mitigation program was designed by the BLM, CLNAWS, and the CDFG to compensate for the 2,193 acres of Mohave ground squirrel habitat that could be impacted on CLNAWS lands and 35 acres outside of the CLNAWS boundary. The compensation land is located on CLNAWS and includes exclusion of grazing species to enhance the Mohave ground squirrel population over the area. The program has included monitoring over the last 26 years and is still in effect for additional habitat losses associated with geothermal development in the area. ~~As of 1988,~~ To date, ~~about 885~~ 474.69 acres of surface disturbance of the permitted 2,193 acres on CLNAWS, and 0 acres of the 35 acres for public lands off of CLNAWS has been used (~~BLM 1988~~ Brock, personal communication 2008). The 53.5 temporary acres of impact ~~are within the allowed acreage in the mitigation plan.~~ would be restored after construction. The Navy would account for project associated impacts according to the provisions of the plan. Thirty-three acres of the 35 acres of disturbance allowed on public lands outside of CLNAWS would be deducted and 15.8 acres of the remaining 1,718.31 acres of disturbance allowed on CLNAWS lands would be deducted. Impacts from habitat loss would be less than significant. The mitigation plan was evaluated under both NEPA and CEQA in 1988 and remains in effect. Implementation of this plan minimizes effects to Mohave ground squirrels to less than significant levels.

Permanent impacts to 6.25 acres of private lands that include Mohave ground squirrel habitat would be mitigated through providing compensation according to mitigation measure Biology-7. The measure requires a 3:1 replacement ratio for lands permanently disturbed. This ratio incorporates both the impacts to Mohave ground squirrel and desert tortoise. With implementation of this measure, impacts to Mohave ground squirrel would be less than significant. Additionally, an Incidental Take Permit under Section 2081 of the CDFG Code would be required for Mohave ground squirrel.

Page 3.4-30, Table 3.4-4 (Biological Resources)

Table 3.4-4: Summary of Temporary and Permanent Habitat Losses and Compensation by Land Management Authority

Land Owner	Temporary Habitat Loss	Permanent Habitat Loss	Compensation for Mohave Ground Squirrel	Compensation for Desert Tortoise
Private	~9 acres	~~~5~~6.25 acres	~~Compensation falls under the 1988 Mitigation Plan for geothermal development at CLNAWS. This plan allows for up to 2,193 acres of Mohave ground squirrel habitat disturbance for geothermal development. This project falls within the acreage allowance~~ Compensation for desert tortoise, described in the next column would also suffice as compensation for Mohave ground squirrel. The applicant will provide three acres for every acre that is permanently lost due to project activities.	To compensate for loss, three acres for every acre that is permanently lost due to project activities would be purchased by the project proponent and deeded to the CDFG or the Desert Tortoise Preserve. This provides compensation on private land for both Mohave ground squirrel and desert tortoise. The location of compensation lands would be approved by the CDFG. The project proponent would also pay a one-time endowment fee for the long-term management of these lands. Mitigation can also suffice through a payment to the Desert Tortoise Preserve Committee covering the land cost for a 3:1 compensation ratio and fees for long-term management. Habitat which is temporarily disturbed by project activities

				would be restored to natural conditions.
BLM	~33.2 acres	0.03 acres (for a 500 foot section of above ground piping)	Compensation falls under the 1988 Mitigation Plan for geothermal development	Compensation falls under the West Mojave Plan and would include a fee payment at a 5:1 fee ratio (pay a fee of five times the average value of an acre of land within the habitat conservation area) for permanently impacted habitat. Habitat which is temporarily disturbed by project activities would be restored to natural conditions.
CLNAWS	~13,757 acres	0.75 acres	Compensation falls under the 1988 Mitigation Plan for geothermal development	Impacts to tortoise fall under the 2004 China Lake CLUMP and China Lake Desert Tortoise Management Plan, which include habitat compensation and a habitat impact and take allowance for all activities on CLNAWS.

Page 3.4-32 (Biological Resources)

Biology-7: The applicant shall purchase replacement land occupied by desert tortoise <u>and Mohave ground squirrel</u> at a ratio of 3 acres for every 1 acre disturbed on the Hay Ranch property (for a total of 18 acres). The replacement land shall be deeded to the CDFG for the Desert Tortoise Preserve. The location of compensation lands shall be approved by the CDFG. The project proponent shall also pay a one-time endowment fee for the long-term management of these lands.

Page 3.4-33 (Biological Resources)

Individual tortoises may be injured or killed during construction activities. Construction of the pipeline would result in temporary habitat loss of about 53.5 acres on private, BLM, and CLNAWS lands. ~~Several signs of desert tortoise were found during the survey for the Gill Station Coso Road Improvements project, with one burrow found within 200 feet of the dirt road along which the pipeline route is proposed (near the intersection with Gill Station Coso Road).~~

Page 3.4-33

Biology-8: The population of crowned muillas shall be avoided during construction. If the crowned muillas cannot be avoided during construction, a plan shall be prepared for restoration (as well as an attempt at relocation of the individual plant), and seeds of the plant shall be collected. The plan shall include at a minimum (a) the location of where the plant shall be seeded or replanted, with preference for on-site replacement such as over the pipeline route; (b) the plant species and seeding rate; (c) a schematic depicting the replanting or seeding area; (d) the planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on-site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria ~~and providing for conservation of the mitigation site in perpetuity~~.

Page 3.5-5 (Cultural Resources)

The BLM ~~is currently consulting~~ <u>has completed consultation</u> with the State Historic Preservation Office<u>, the tribes, and the Advisory Council on Historic Preservation (ACHP)</u> for impacts associated with the proposed project (see Regulatory Setting, below) and is proceeding under an approved Programmatic Agreement (PA). The County is also currently consulting directly with the tribes via letters and plans to conduct in-person government-to-government communication. Tribal members attended the scoping meeting in Lone Pine in October 2007.

Page 3.5-5 (Cultural Resources)

An archaeological survey and evaluation for the project was conducted by ASM Affiliates in 2005 and is presented in a report entitled *Cultural Resources Inventory for the Hay Ranch Water Extraction and Delivery System, Coso Geothermal Project, Inyo County, California* (ASM 2005). This cultural resource inventory included a literature review for previously recorded historic and prehistoric materials present in the project area and a pedestrian survey of a 50-foot wide (15.35 meters) corridor along the entire project pipeline route as identified in the site drawings in Appendix B. The area of potential effect (APE) for the survey includes the area around the well, tanks, substation, ~~and~~ the pipeline route, and Coso Hot Springs.

Page 3.5-8 (Cultural Resources)

The BLM prepared an Environmental Assessment (EA) pursuant to NEPA for the proposed project. The BLM has entered into formal consultation pursuant the Section 106 with the SHPO and the ACHP regarding determinations and findings for the proposed Hay Ranch Water Delivery and Extraction System project. The BLM, CLNAWS, SHPO, and the ACHP have proposed to execute a Programmatic Agreement to resolve issues regarding effects of this project on historic properties. Interested Native American tribes and the County of Inyo have been invited to become concurring parties to this agreement. CLNAWS entered into a Memorandum of Agreement (MOA) with the SHPO, and the Advisory Council on Historic Preservation in 1979 regarding the management of Coso Hot Springs and any potential effects that may arise from geothermal energy production.

Determination of NRHP eligibility of any discovered resources on the substation site, which is located on private land, falls under the State determination of the California Register of Historical Resources or should be categorized as a unique or important resource under CEQA. No federal agency or SHPO consultation is required under Federal Regulation 36 CFR 800. Inyo County would be the lead agency for CEQA review.

Page 3.5-10 (Cultural Resources)

All mitigation measures or resulting actions will be coordinated with the BLM and be consistent the Programmatic Agreement being developed ~~between~~among the BLM, SHPO, and the ACHP, and to which the County has been invited to be a concurring party.

Page 3.5-11 (Cultural Resources)

Substation and Associated Facilities. The substation site and the path to interconnect the substation to the proposed switchyard near the lift pump station has not been previously surveyed for the presence of cultural resources. This area would not likely contain cultural resources due to previous disturbance from farming; however, mitigation measures Cultural Resources-1, Cultural Resources-2, Cultural Resources-3, and Cultural Resources-4 would be implemented to minimize any potential impacts to known or unknown historic or archaeological resources to less than significant levels. Mitigation measure Cultural Resources-4 requires performing a ground survey over the ~~0.5~~1.5-acre substation site and the path to interconnect the substation to the proposed switchyard near the lift pump station. If any resources are found, the facilities would be moved (and new areas resurveyed) to avoid resources. This work would be performed prior to sale of land to Southern California Edison.

Page 3.5-12 (Cultural Resources)

Cultural Resources-4: The entire proposed ~~0.5~~ 1.5-acre substation site, and the path to interconnect the substation to the proposed switchyard near the lift pump station, shall be subject to an intensive pedestrian survey for cultural resources, consistent with the previous survey work performed for this project. If resources are found that are potentially eligible for the National Register of Historic Places, the substation site shall be moved to a surveyed area without resources. If resiting the substation to avoid potentially significant resources is (resources eligible for the NRHP, also known as historic properties) not possible, data recovery shall be accomplished in the context of a detailed research design and in accordance with current professional standards. The plan shall result in the extraction of sufficient volumes of non-redundant archaeological data so as to address important regional research consideration; detailed technical reports shall be prepared to document the findings. The survey and substation siting shall be performed prior to sale of land to Southern California Edison. A Native American ~~crew member/~~monitor shall be present during all survey work.

Page 3.8-7 (Agricultural Resources)

Construction would not indirectly impact future use of the Hay Ranch property as agricultural land or preclude the Hay Ranch property from being designated as Prime Farmland in the future. Construction is short-term (lasting about ~~110 days~~120 days for the pumping infrastructure and 12 months for construction of the substation). Topsoil would be stockpiled and replaced and only small amounts of water would be needed. Since construction is temporary and would only occur on a small portion of the overall property, it would not directly or indirectly impact future use of the Hay Ranch property for agriculture or impede a designation as Prime Farmland.

Page 3.10-6 (Hazards and Hazardous Materials)

The proposed substation would have ~~a minimum of four transformers~~ two 5-MVA transformers, ~~sized at a total of approximately 3-5 megawatts (MW)~~. The transformers would contain transformer oil. The oils would be utilized and stored in compliance with the requirements of the Inyo County Environmental Health Services Department and Inyo County Building and Safety Department. The substation would be surrounded by a locked 8-foot chain link and razor wire fencing, and a sign would be posted to keep out intruders. Signage would be placed at the facility for notification in case of emergency or other hazardous accidents related to the substation. The transformers could leak or spill if they are damaged during a seismic event, fire, or other unforeseen incident. The following mitigation measure would be implemented to reduce impacts to less than significant levels.

Page 3.14-7 (Traffic and Transportation)

The majority of construction vehicles would access the project site along existing US 395 and Gill Station Coso Road. The intersection of Gill Station Coso Road with US 395 is controlled with turn pockets, acceleration-deceleration lanes, and a stop sign. No additional transportation hazards would result from the use of this intersection by construction vehicles. Trucks delivering heavy equipment would likely access the project site via the transmission line right of way north of Gill Station Coso Road.

Delivery and other trucks ~~could also~~ may access the site via a driveway off of US 395 along Rose Valley Ranch Road. Use of this route is unlikely. Visibility in the project area is good; however, some vehicles would enter and exit the Hay Ranch property directly from or onto US 395. These locations are not controlled and trucks entering the highway at slow speeds could cause an increase in transportation hazards at that location. If this access point were to be used, the applicant would need to apply for an encroachment permit from Caltrans, District 9. The application for the encroachment permit would require evaluation of the road and intersection to verify that it meets current standards and provides safe access (i.e., turning radius, storage length, etc.) for the type and number of vehicles that may use it. If turning radii are not adequate, mitigation measure Traffic-2 requires that the route not be used in order to prevent further environmental impacts associated with other improvements such as creating acceleration/deceleration lanes on Highway 395. If it is adequate, the encroachment permit may require refreshing the pavement and pavement markings at the intersection. Implementation of the following mitigation measure if Rose Valley Ranch Road is to used for access during project construction would reduce impacts associated with access hazards to less than significant levels.

Traffic-2: This mitigation measure would only be necessary if Coso decides to use Rose Valley Ranch Road to access the Hay Ranch parcel directly off of US 395. If Rose Valley Ranch Road is determined to have an inadequate turning radius for the proposed project usage during the encroachment permit application process, the route shall not be used. If the turning radius is adequate, all other recommendations in the encroachment permit shall be implemented.

During project hours, construction signs shall be posted along northbound US 395 between Coso Junction and the northern extent of the Hay Ranch parcel. Signage shall indicate slower construction traffic ahead, and shall be ~~coordinated with Caltrans to meet any Caltrans requirements~~ installed in compliance with encroachment permits.

Construction vehicles would be located along Gill Station Coso Road during construction of the proposed pipeline and the 1.5 million gallon water tank. Vehicles would park on the shoulder and would not create any increased transportation-related hazards.

Page 3.14-10

Traffic-4: The applicant shall regrade and restore any areas of Gill Station Coso Road and US 395 and its ROW that are disturbed by construction including installation of the pipeline and high point tank. The applicant shall take photo documentation of the roadway conditions before construction and after construction and shall provide these photographs to County Public Works upon request.

Chapter 4: Cumulative Impacts

Page 4-3

Deep Rose, LLC is conducting some exploration for geothermal resources ~~in southern Inyo County on State Lands Commission lands~~ near the West Coso Geothermal leasing Area on three geothermal lease applications pending with the BLM, covering approximately 4,500 acres of public lands. ~~If a resource is located, Deep Rose, LLC would apply for permits for geothermal development.~~ The area of exploration is located in the southern McCloud Flat region within Section 16, Township 21 South, Range 38 East, Mount Diablo Meridian, Inyo County, California, within the West Coso Geothermal Leasing Area. ~~This is~~ Current exploration is located approximately 5.75 miles northeast of Hay Ranch.

Page 4-5

Aesthetics

The proposed project would have less than significant impacts on aesthetics. The possible LADWP leakage recovery project at Haiwee Reservoir would capture approximately 900 acre-feet per year of water that is currently leaking into the Rose Valley. Removal of this groundwater, in addition to removal of groundwater in the proposed project, could cumulatively impact aesthetics by resulting in a loss of wetlands, wildlife and vegetation at Little Lake. Structures associated with the LADWP reservoir project would be located 2 miles north of the Hay Ranch property. Given the minimal impacts to visual resources on the Hay Ranch property due to visual screening and the distance of the structures from the highway and the distance between the projects, cumulative impacts would not be significant. Other related projects may lead to more buildings along US Highway 395 near the project's vicinity, but these buildings would likely be landscaped and built to blend with the existing environment and would not be considered cumulatively significant.

Page 4-5 and 4-6

Cultural Resources

Rose Valley and surrounding regions are known to be rich in cultural resources. The proposed project would have less than significant effects to cultural resources with implementation of project mitigation measures. The Haiwee Reservoir leakage recovery, Little Lake habitat restoration, and Caltrans US Highway 395 Coso Junction Rest Area improvements would not be expected to disturb any previously undisturbed grounds and would not affect the Coso Hot Springs as these projects would not be in the same groundwater basin.

The Gill Station Coso Road improvements project proposed by Inyo County would disturb artifacts and sites of historical and archeological importance. Mitigation would be implemented and would avoid significant cumulative impacts. Crystal Geyser and Deep Rose Geothermal project could aggregate the amount of resources disturbed due to future ground disturbance; however, with implementation of mitigation, the impacts would not be cumulatively significant.

Development of Deep Rose is speculative at this time; however, the potential Deep Rose geothermal project's reservoir is reportedly greater than 15,000 feet below the surface of Rose Valley and below the basement of the aquifer. It does not appear to be connected to the Rose Valley aquifer. It is over 3.1 miles west of the Coso Hot Springs and the Coso Geothermal system separated by an zone with no evidence of recent volcanism, a different pattern of seismicity and different geology. There is no evidence to connect Coso Hot Springs and the Deep Rose project.

Page 4-7

Hydrology and Water Quality

The proposed project could cause groundwater table drawdown throughout Rose Valley. With monitoring to provide early warning of potential impacts and mitigation in the form of reducing pumping rates, the impacts of the proposed project would be less than significant. Construction and operation of the Crystal Geyser project is not expected to significantly aggregate impacts to Rose Valley groundwater resources project because of the smaller rate of extraction proposed for the plant and the fact that the extraction would occur outside Rose Valley.

Deep Rose, LLC has pending applications for the leasing of approximately 4,500 acres of BLM-managed lands and has requested leasing of an additional 17,600 acres. The BLM is beginning to prepare the environmental review for leasing in the area. The BLM has acknowledged that water, potentially from the Rose Valley, would be required for these leases and water usage would be addressed in a leasing document pursuant to NEPA (Haggerty 2008). The amount of water that may be required for exploration of the additional acreage and development of a geothermal plant is speculative at this time; however, any withdrawal from the Rose Valley would compound with withdrawals associated with the proposed project. Deep Rose would be required to submit applications with the County for any additional water export from Rose Valley as well as for exploration activities and for future development of a geothermal plant. If submitted, these applications would be subject to CEQA review. The baseline condition at the time of initiation of that project would be required to consider the Coso project.

The South Haiwee Reservoir Leakage Recovery project, if implemented, would likely have aggregate impacts to Rose Valley groundwater resources. Analysis using the numerical model indicated that the Reservoir Leakage Recovery project would cause additional drawdown in Rose Valley, additively increasing to that predicted for the Hay Ranch project. ~~with the~~ The ~~greatest~~ largest increase in drawdown is estimated by the model to be ~~of~~ up to 10 feet in wells in the Dunmovin community at the north end of the valley and up to 0.5 feet at the south end of the valley near Little Lake, which would be a significant impact. However, to commence SHRSR groundwater pumping in Rose Valley, the City of Los Angeles is required to submit a detailed proposal to Inyo County as an application to pump groundwater. Prior to taking any action with the potential to affect the environment, Los Angeles, in cooperation with Inyo County, would be required to complete a CEQA analysis of the project and would not be allowed to take any action that would cause a significant detrimental effect to the environment. Although it has indicated some inclination to establish such a project, the City has taken no affirmative steps to do so and the likelihood of such a project is speculative. As such, it need not be mitigated as a cumulative impact by Coso. Since LADWP would be required to mitigate its pumping impacts, there is little likelihood that those impacts could be cumulatively considerable when added to the impacts from the Coso project. Any loss of groundwater flowing to the Hay Ranch as a result of improving the retention capability of the Haiwee Reservoirs, will be accommodated by the fact that Coso must comply with the established trigger levels.

~~If the Reservoir Leakage Recovery project operates over the same time frame as the Hay Ranch project, then either a greater reduction in extraction rates would be necessary at Hay Ranch or a reduction in the amount of groundwater extracted for the Reservoir Leakage Recovery project would be needed to avoid incurring significant impacts at Little Lake. The reduction in allowable Hay Ranch extraction rates would amount to approximately the same 870 acre-ft per year contemplated for the Reservoir Leakage Recovery project. However, if the Reservoir Leakage Recovery project continues~~d ~~indefinitely as would be expected, a greater reduction in Hay Ranch extraction rates, or a reduction in the Reservoir Leakage Recovery project extraction rates, would be needed to mitigate potential impacts to Little Lake. The amount of this additional reduction was not modeled for the predictive simulations of the Hay Ranch project because the time frame for monitoring and mitigation in that case extends well beyond the proposed time frame for the Hay Ranch project. Since the Reservoir Leakage project is only conceptual at this time (i.e. an application has not yet been filed with Inyo County), and mitigation on the Hay Ranch project likely shortens the period of time that the project can operate, these projects may not temporally overlap~~.

The Hay Ranch project is predicted to have little to no significant impacts on groundwater quality. The project may cause a slight reduction in TDS concentrations at some locations near the south end of Rose Valley because it would intercept high TDS geothermal waters. The Crystal Geyser and South Haiwee Reservoir Leakage Recovery projects are unlikely to have cumulatively significant impacts on groundwater quality.

Chapter 5: Alternatives

Page 5-2

5.2.2 ~~INCREASE~~ MAINTAIN POWER GENERATION THROUGH POWER PLANT ENHANCEMENTS

Introduction

One alternative considered was the potential for ~~increasing~~ minimizing the annual decline in power generation output through power plant enhancements. This alternative has the potential to achieve the project objective of ~~increased~~ minimizing the decline in power generation. The feasibility of improved power generation was investigated by comparing possible increased output from various potential plant efficiency improvements to the cost of the improvements for improved power generation and to the cost from projected decrease in steam production declines related to the project.

Page 5-2 to 5-3

The analysis was based on production rates and enthalpies forecast through 2035 for the Coso geothermal projects, with and without additional injection. The approximate additional output associated with the additional flow rates and associated different enthalpy during the period was calculated ~~(Global Power Solutions 2008)~~ based on these forecasts. This amount of additional output relative to the total project price of $13.4 million produces an average of nearly 18 MW (see Figure 5.2-1 below) of additional output, or a cost of less than 750/kW. All other possible power generation improvements were then compared to this value.

Chapter 6: Report Preparers

Page 6-1

6.1.3 CONSULTANT TEAM

This EIR was prepared for and under the direction of the Inyo County Department of Planning by MHA Environmental Consulting, an RMT Business, of San Mateo, California. The following staff contributed to this report:

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The following references have been added to Chapter 7: References.

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3.4 Graphics Edits

3.4.1 OVERVIEW

This section includes edits to graphics found in the Draft EIR and new graphics to be included in the Final EIR. The page on which the graphic is located, the figure number, a short description of the changes to the graphic, and the graphic is provided below.

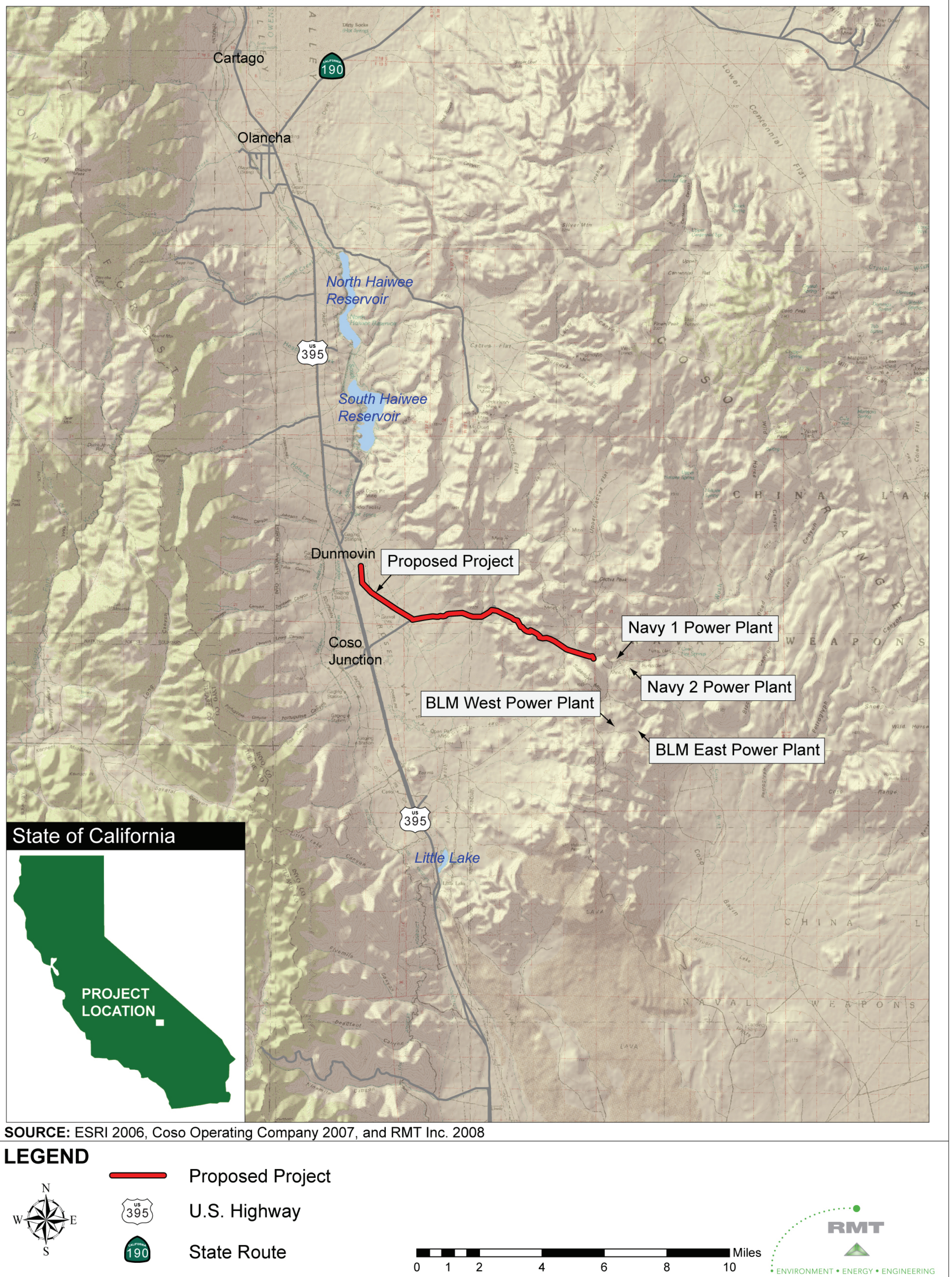
3.4.2 EDITS TO EXISTING FIGURES

Executive Summary

Page ES-2, Figure ES 1-1

The following figure has been modified to show the BLM East and BLM West power plants at the Coso geothermal field.

Figure ES 1-1: Project Location



SOURCE: ESRI 2006, Coso Operating Company 2007, and RMT Inc. 2008

Page ES-3, Figure ES 1-2

The following has been modified to show the BLM East and BLM West power plants at the Coso geothermal field.

Figure ES 1-2: Project Components

SOURCE: ESRI 2006, Google Earth Pro 2007, Coso Operating Company 2007, and RMT Inc. 2008

LEGEND

- Project Pipeline
- Navy Air Station Boundary
- Hay Ranch Parcel
- Proposed Pump Station
- Injection System
- Water Tank
- Wellsite
- Proposed Substation
- U.S. Highway

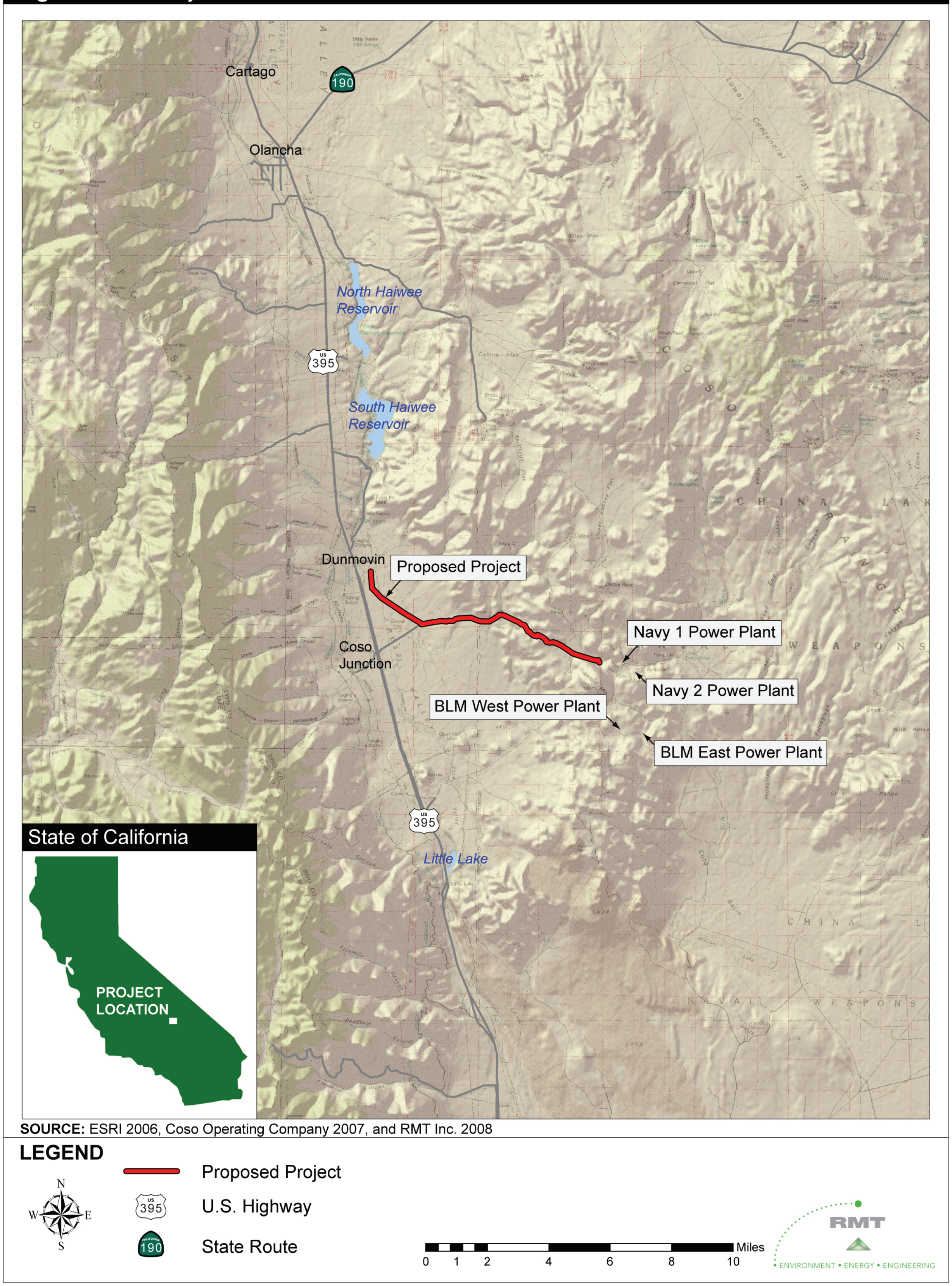
0 .75 1.5 3 Miles

Chapter 1: Introduction

Page 1.2-1, Figure 1.1-1

The following has been modified to show the BLM East and BLM West power plants at the Coso geothermal field.

Figure 1.1-1: Project Location



SOURCE: ESRI 2006, Coso Operating Company 2007, and RMT Inc. 2008

Chapter 2: Project Description

Page 2-5, Figure 2.3-1

The following has been modified to show the BLM East and BLM West power plants at the Coso geothermal field.

Figure 2.3-1: Project Components

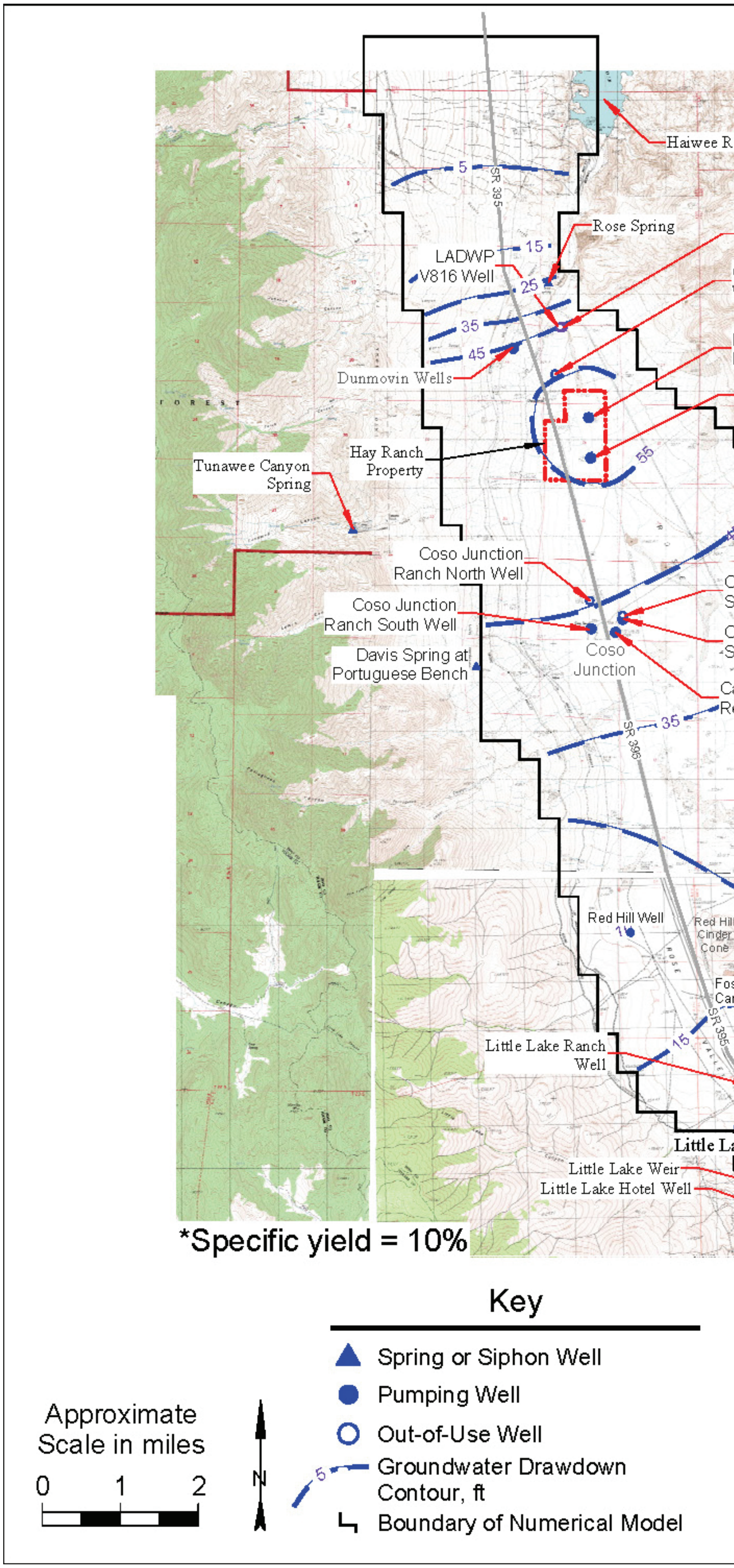
SOURCE: ESRI 2006, Google Earth Pro 2007, Coso Operating Company 2007, and RMT Inc. 2008

LEGEND

Chapter 3: Environmental Impacts

Page 3.2-25, Figure 3.2-14

The following figure was revised to show contour lines.

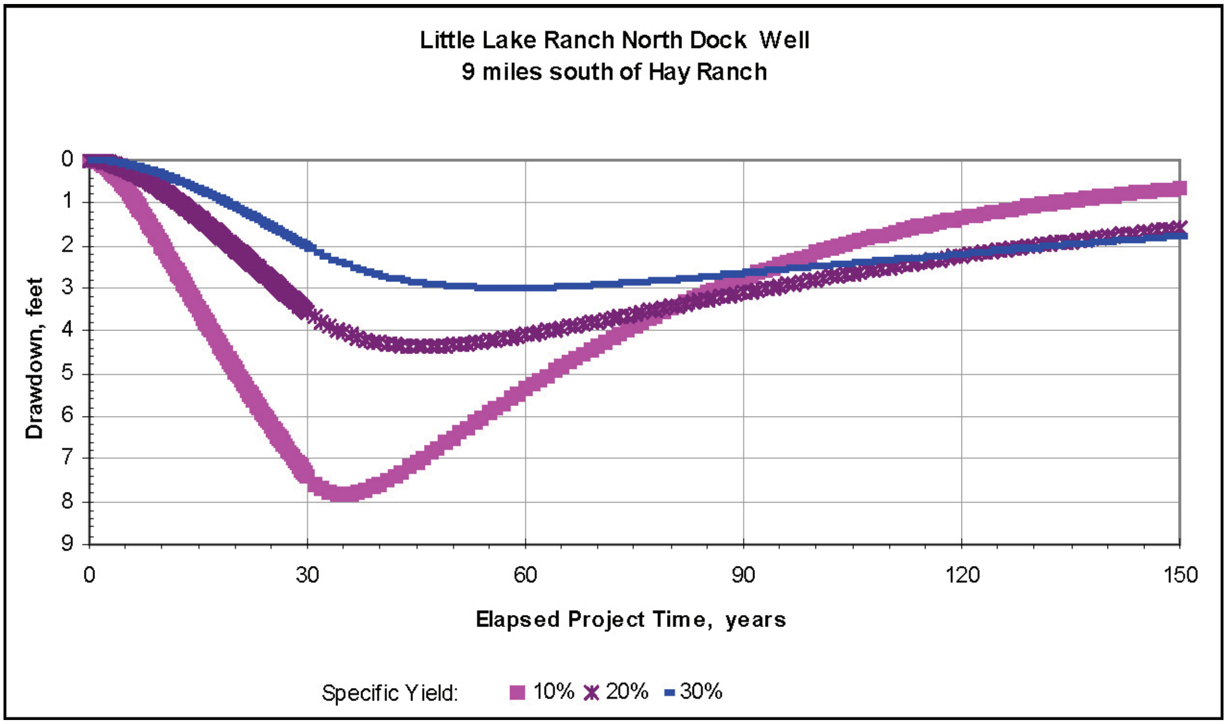


Predicted Groundwater Table Drawdown after 30 Years at Full Project Development Rate of 4,839 acre-ft/yr

Figure 3.2-14

Page 3.2-44, Figure 3.2-16

The following figure has been edits to show the units on the “x” and “y” axes.

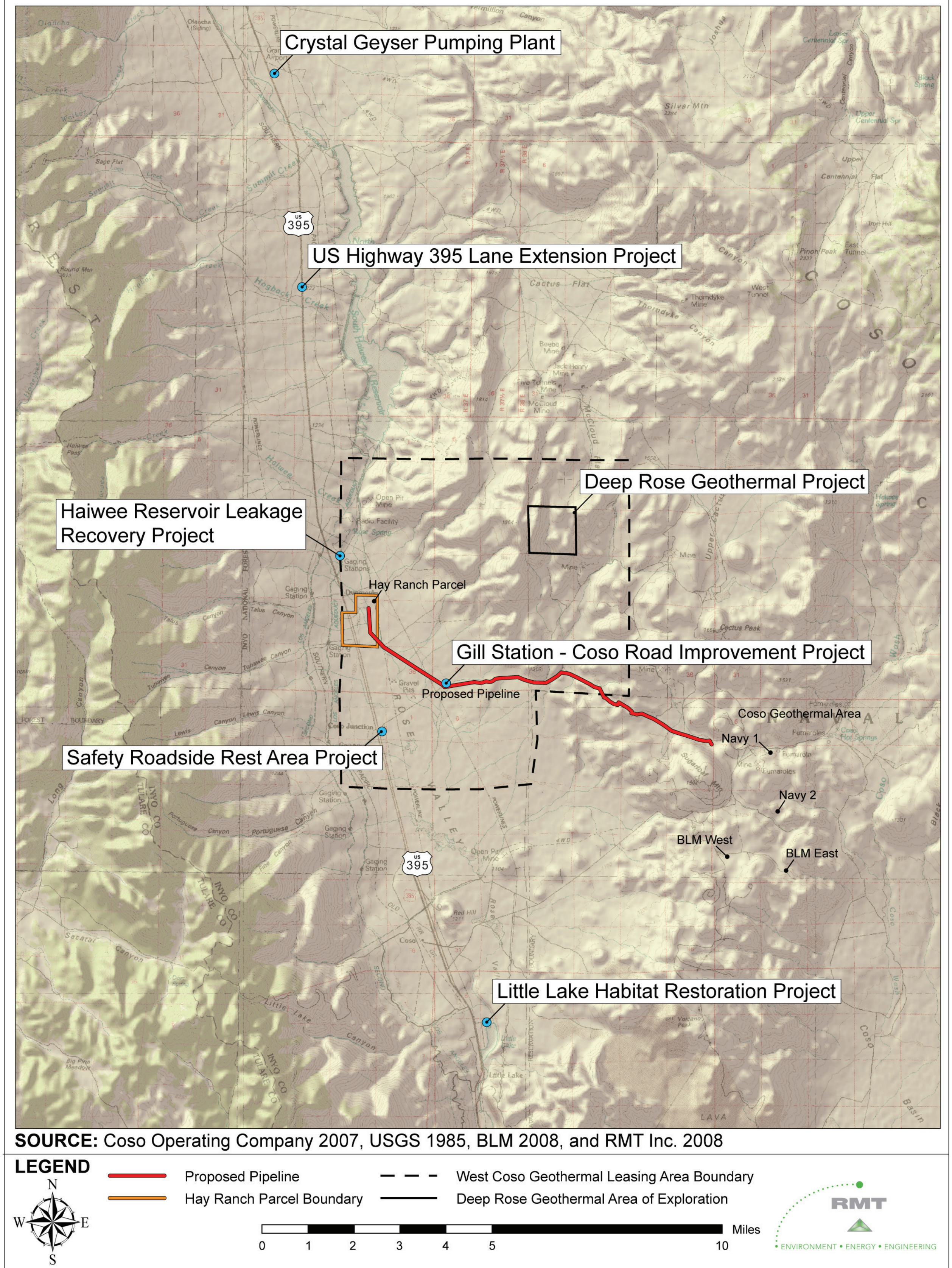


Chapter 4: Cumulative Impacts

Page 4-2, Figure 4.2-1: Related Projects and the Proposed Project

The leasing area for the Deep Rose Project has been added to the following figure. This figure has also been modified to show the BLM East and BLM West power plants at the Coso geothermal field.

Figure 4.2-1: Related Projects and the Proposed Project



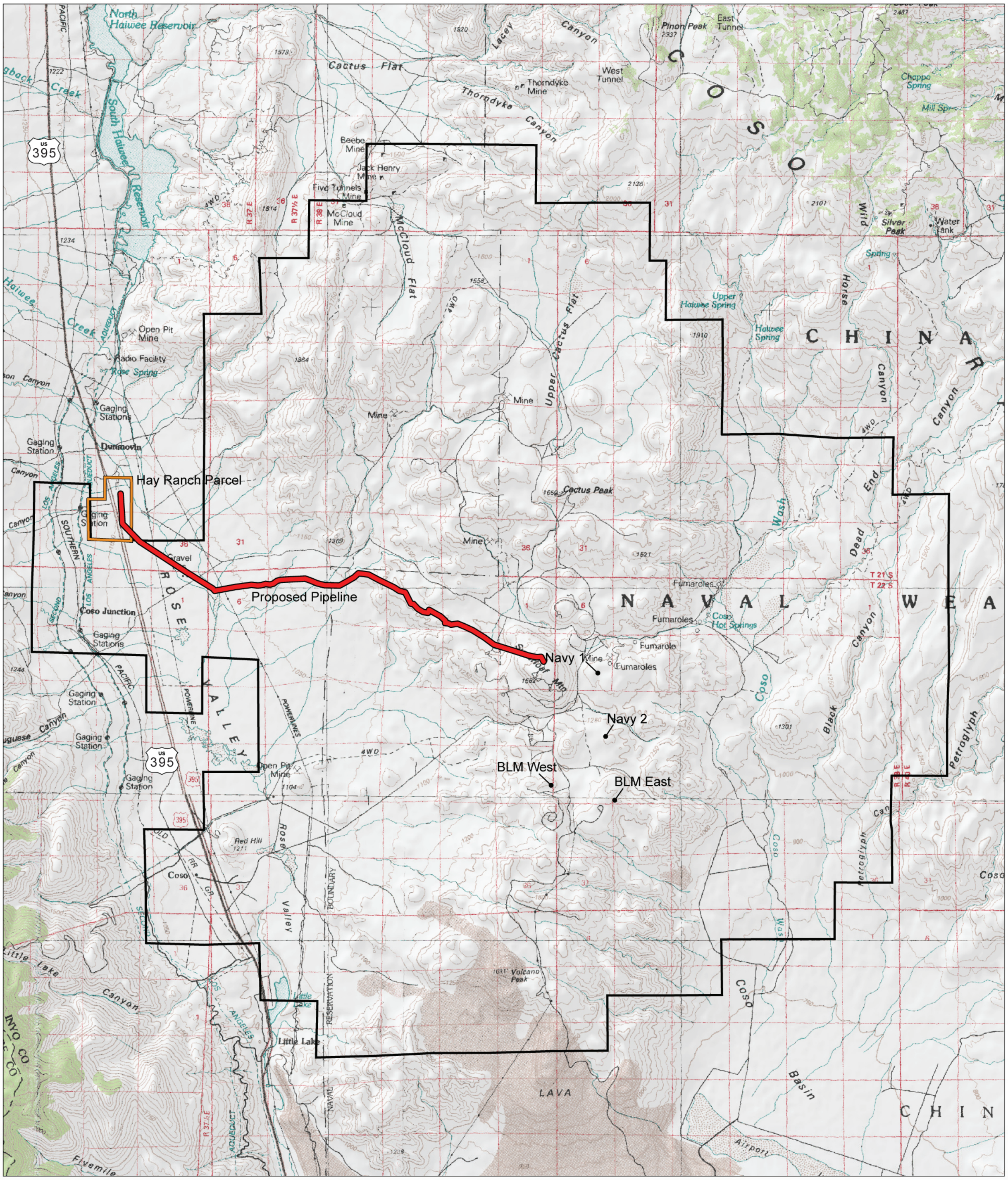
SOURCE: Coso Operating Company 2007, USGS 1985, BLM 2008, and RMT Inc. 2008

3.4.3 NEW FIGURES

To be inserted after Page 1-3, Figure 1.1-2: The Coso Known Geothermal Resource Area

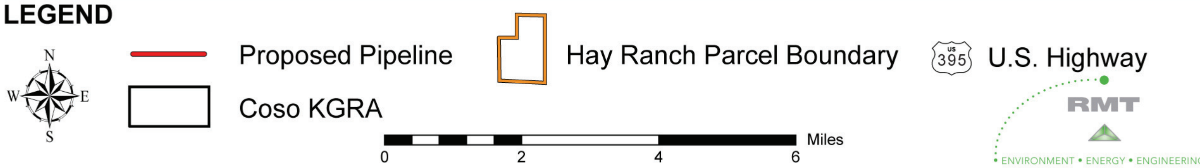
The following Figure 1.1-2 was created to provide supplemental information that depicts the Coso Known Geothermal Resource Area (KGRA).

Figure 1.1-2: Proposed Project and the Coso KGRA



SOURCE: U.S. Geological Survey, EROS Data Center, Sioux Falls, SD, Coso Operating Company 2007, and RMT Inc. 2008

LEGEND



3.5 Appendix Edits and Additions

3.5.1 APPENDIX A: SCOPING (NOP COMMENT LETTERS)

The attached comment letters from Native American tribes have been added to Appendix A. These scoping letters were missing from the Draft EIR due to administrative/production error, although they were considered in the preparation of the Draft EIR.

California Regional Water Quality Control Board
Lahontan Region

Linda S. Adams
Secretary for Environmental Protection

Victorville Office
14440 Civic Drive, Suite 200, Victorville, California 92392
(760) 241-6583 • Fax (760) 241-7308
http://www.waterboards.ca.gov/lahontan

Arnold Schwarzenegger
Governor

October 29, 2007

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File: Environmental Doc Review
Inyo County

Ms. Jan Larsen, Senior Planner
Inyo County Planning Department
Post Office Box Drawer L
Independence, CA 93526
FAX (760) 878-0382

COMMENTS ON THE NOTICE OF PREPARATION FOR THE ENVIRONMENTAL IMPACT REPORT FOR CONDITIONAL USE PERMIT NUMBER 2007-03, TO PUMP WATER FROM COSO HAY RANCH TO PROVIDE FLUID TO THE GEOTHERMAL FIELD IN THE CHINA LAKE NAVAL AIR WEAPON CENTER, LOCATED AT THE COSO HAY RANCH IN ROSE VALLEY AREA , INYO COUNTY (SCH # 2007101002)

California Regional Water Quality Control Board, Lahontan Region (Water Board) staff has reviewed the Notice of Preparation dated October 1, 2007 for an Environmental Impact Report (EIR) on the above-referenced Project.

General Comments

The Regional Board has adopted a Water Quality Control Plan for the Lahontan Region (Basin Plan), which contains prohibitions, water quality standards, and policies for implementation of those standards. The Basin Plan is available on line at the Regional Board's Internet site at http//:www.waterboards.ca.gov/lahontan/. The Project must comply with all applicable water quality standards and prohibitions of the Basin Plan.

Our comments are submitted in compliance with California Environmental Quality Act (CEQA) Guidelines §15096, which requires CEQA responsible agencies to specify the scope and content of the environmental information germane to their statutory responsibilities and lead agencies to include that information in the environmental document for their project. The State Water Resources Control Board (SWRCB) and the Water Board regulate discharges which could affect the quality of water of the State in order to protect the chemical, physical, biological, bacteriological, radiological, and other properties and characteristics of water which affects its use.[1] A number of activities associated with the project will apparently require permits issued by the SWRCB. The required entitlements may include:

- Discharge of fill material - Clean Water Act (CWA) §401 water quality certification for federal waters; or Waste Discharge Requirements for non-federal waters, and
- Land disturbance - CWA § 402(p) stormwater permit (Construction Stormwater Permit)

[1] Water Code section 13050(g)

Hydrology and Water Quality

The proposed Project involves the development of commercial on currently vacant and undeveloped land. This development will alter the existing drainage patterns of rainfall absorption and surface water runoff, causing an increase in rates of stormwater discharge.

Urban development degrades water quality through a complex of interrelated causes and effects, which, unmanaged, ultimately destroy the physical, chemical, and biological integrity of the watersheds in which they occur. The primary potential adverse impacts of urban development projects on water quality are:

- the direct physical impacts to aquatic, wetland, and riparian habitat and other beneficial uses;
- generation of construction-related and post-construction urban pollutants;
- alteration of flow regimes and groundwater recharge as a result of impervious surfaces and storm drain collector systems; and
- disruption of watershed level aquatic functions, including pollutant removal, floodwater retention, and habitat connectivity.

These factors have historically resulted in a cycle of destabilized stream channels, poor water quality, and engineered solutions to disrupted flow patterns, culminating in loss of natural functions and societal values in the affected basins. The number and variability of the pathways through which water quality degradation can occur complicates analysis, but understanding how these pathways operate within the specific circumstances of this project is essential to effectively mitigating the adverse effects.

In order to evaluate the project regarding the above potential impacts, the Project must describe how it will avoid or minimize each potential cause of water quality degradation, what effects will remain unmitigated through project design, and the magnitude of the remaining adverse effects.

It must also address how hydromodification may result in substantial additional sources of polluted runoff, and promote recharge of poorer quality water or otherwise substantially degrade groundwater quantity or quality. Drainage channels should be avoided to minimize impacts, and any unavoidable impacts to these waters of the State must be mitigated. Mitigation must be identified in the EIR including timing of construction. Mitigation must replace functions and values of drainages lost. It is not sufficient to state that mitigation will be accomplished through permits acquired and that appropriate governmental agencies will be notified.

Additionally, please be sure that the EIR completely evaluates the potential cumulative impacts of the project considering other existing and potential projects.

Effective Stormwater Management

The EIR for this project must specifically identify features for both the short-term (construction) and the post-construction periods that will control stormwater on-site or prevent pollutants from non-point sources from entering and degrading groundwater. The foremost method of reducing impacts to watersheds from urban development is "Low Impact Development" (LID), the goals of which are maintaining a landscape functionally equivalent to predevelopment hydrologic conditions and minimal generation of nonpoint source pollutants. LID results in less surface runoff and less pollution routed receiving waters. Principles of LID include:

- Maintaining natural drainage paths and landscape features to slow and filter runoff and maximize groundwater recharge,
- Reducing the impervious cover created by development and the associated transportation network, and
- Managing runoff as close to the source as possible.

We understand that LID development practices that would maintain aquatic values could also reduce local infrastructure requirements and could benefit energy conservation, air quality, open space, and habitat. Many planning tools exist to implement the above principles, and a number of recent reports and manuals provide specific guidance regarding LID. These principles can be incorporated into the proposed project design.

Natural drainage patterns must be maintained and/or restored to the extent feasible. Designs that use vegetated areas for stormwater management and infiltration on-site are preferable and are the most effective means of filtering sediment and pollution, and regulating the volume of runoff from land surfaces to adjacent washes.

Minimum-disturbance activities (such as preservation of vegetation and grade) protect and preserve the natural drainage system. They emulate and preserve the natural hydrologic cycle, moving stormwater slowly over large permeable surfaces to allow it to percolate into the ground. In addition, preservation and minimum-disturbance activities may be more cost effective than revegetation practices or structural controls, especially long-term. Design features of future development should be incorporated to ensure that runoff is not concentrated by the proposed project, thereby causing downstream erosion. Storm drain systems do not promote the same beneficial uses as a natural ecosystem.

Thank you for the opportunity to comment on your project. If you have any questions regarding our comments, please contact me at (760) 241-7376, or e-mail me at mhakakian@waterboards.ca.gov.

Sincerely

Mack Hakakian

Mack Hakakian, PG
Engineering Geologist

cc: State Clearinghouse (SCH # 2007101002)

MH/rc/CEQA comments/Coso Hay Ranch Water Extraction System

Jan Larsen, Senior Planner
Inyo County Planning Department
168 North Edwards Street
P.O. Drawer L
Independence, CA 93526

Subject: NOP of DEIR for CUP No. 2007-03, Coso Hay Ranch Water Extraction, Export and Delivery System.

How much water volume is currently used at the Coso project. List what exact purposes the water is be used for and how much water for each specific purpose?

How much water is currently recovered for re-injection use at Coso? What percentage recovery is there? What is the cost per 1% increase in recovery volumes?

Detail studies that demonstrate a need for additional water. Who did these studies and when? What peer reviews or alternatives were given?

Detail the analysis for upgrading recovery of water for re-injection? List costs and alternative methods for using less water and recovering more.

List specifically the amount of water pumped at the Hay Ranch in the past (volume rated per month)

List water levels at the Hay Ranch wells by year during pumping, with volume pumped per month and the rate of recovery per month.

Display any and all correspondence with former Hay Ranch operator/owners that discuss pumping, well draw down and recovery rate? This includes correspondence with any consultants of the Hay Ranch or Coso Geothermal where the above topics were discussed.

List the amount/cost of power to be used in pumping the Hay Ranch wells and pumping water through 20" pipes to the Coso site.

Monitoring wells must be placed between the Hay Ranch and Little lake, Triggers for reduction in pumping or the shut off of pumps must be independent of any other possible causes. If monitoring wells reach a certain level then pumping is reduced or pumps are shut off. Triggers should be placed so as to occur long before any impacts begin at Little Lake or elsewhere in the area. No attributability clause should be part of the decision. Inyo County is currently in endless disagreement with LADWP over attributibility clauses in their water agreement with Los Angeles. The Coso Project has an unsustainable lifespan of 20-30 years while the Little Lake wetands and springs have a sustainable lifespan. Coso will come and go. Little lake and other local resources will remain if allowed to by Inyo County.

If data on hydrology is lacking then that data should be gathered before any consideration of project approval occurs. This project must not be approved as an experiment. That type of land use decision making is reckless and full of risk.

List the dollar amount of subsides per business year by the State of California and the Federal Government for the Coso project. This includes price supports, tax provisions etc. These figures should be shown in the analysis of alternatives to pumping the Hay Ranch.

This concludes my comments, Mike Prather

Mike Prather
Drawer D
Lone Pine, CA 93545

356-1

Carla Scheidlinger, President
Owens Valley Committee
P.O. Box 77
Bishop, CA 93515

November 2, 2007

Jan Larsen, Senior Planner
Inyo County Planning Department
P.O. Drawer L
Independence, CA 93526

Subject: Notice Of Preparation of Draft EIR for CUP No. 2007-03, Coso Hay Ranch Water Extraction, Export and Delivery System

Dear Ms. Larsen:

This letter presents the comments of the Owens Valley Committee (OVC) on the Notice of Preparation of a Draft EIR for Conditional Use Permit No. 2007-03. This project proposes to pump up to 4,893 acre feet of water per year from Rose Valley groundwater and transport that groundwater nine miles to the east, to another groundwater basin, for reinjection into the Coso Geothermal Field.

OVC requests that the Draft EIR contain an analysis of the need for the project and the carbon and energy costs of the project compared with the project benefits of providing "clean" energy. The stated objective of the project is to "sustain the generation of electricity without using fossil fuels and the associated generation of greenhouse gasses." (Initial Study p. 10) The Draft EIS should contain an analysis that addresses the amount of fossil fuels and greenhouse gasses that will be expended in the construction of the project, including the manufacture and transportation to the site of the necessary materials such as nine miles of 20" diameter steel pipe. It should also include the energy costs to pump the groundwater to the surface, pump it nine miles to the geothermal area, and pump it back into the ground. How do these costs compare with the stated objective of generation of electricity without using fossil fuels and generation of greenhouse gases?

OVC is most concerned with the potential hydrologic and biological resource impacts of the project. These potential impacts must be fully addressed in the Draft EIR. Biological resource impacts could potentially arise from the construction of the project and from the long-term groundwater pumping and export. Construction impacts could potentially affect sensitive wildlife such as the Mohave Ground Squirrel and the Desert Tortoise. Pumping could potentially impact "several local springs and the outflow from Little Lake." (Initial Study p. 10) These springs and the aquatic and riparian habitats at Little Lake are important biological resources that must be protected.

In assessing the potential for hydrologic impacts, that in turn could affect biological resources at springs and at Little Lake, the County must carefully assess the hydrologic models used in the analysis and the available data from water pumped at the Hay Ranch in the past. It must also consider the potential Los Angeles Department of Water and Power project that may pump approximately 900 acre feet of water per year to recapture seepage from Haiwee Reservoir. (Initial Study p. 16) Modeling of hydrologic impacts based on apparently limited data (Initial Study p. 16) is not reassuring.

The Initial Study states (p. 16) that the EIR will contain a detailed monitoring plan "to assess any impacts to Little Lake and develop triggers to reduce or curtail pumping if significant impacts are detected." OVC is not in favor of such a course of action. If significant impacts due to groundwater drawdown are detected at Little Lake how long would it take to recover in the very arid environment of Rose Valley? We suspect a rather long time. Instead, we believe that the objective of any monitoring and mitigation program should be to avoid impacts to the potentially affected local springs and to the valuable aquatic and riparian habitats at Little Lake. Such a program to try to avoid these impacts should be developed in the EIR.

Thank you for the opportunity to comment on this project.

Sincerely,

Carla Scheidlinger, President
Owens Valley Committee

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
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Fax (916) 657-5390
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ds_nahc@pacbell.net

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INYO COUN...
PLANNING DEPT.

October 22, 2007

Ms. Jan Larsen
INYO COUNTY PLANNING DEPARTMENT
P.O. Drawer L
Independence, CA 93526

Re: SCH# 2007101002; CEQA Notice of Preparation (NOP) draft Environmental Impact Report (DEIR) and Conditional Use Permit No. 2007-03/Coso Operating Company, LLC (Coso Hay Ranch Water Extraction, Export and Delivery System); Inyo County, California

Dear Ms. Larsen:

Thank you for the opportunity to comment on the above-referenced document. The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR per CEQA guidelines § 15064.5(b)(c). In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE),' and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following action:

√ Contact the appropriate California Historic Resources Information Center (CHRIS). Contact information for the 'Information Center' nearest you is available from the State Office of Historic Preservation in Sacramento (916/653-7278). The record search will determine:

- If a part or the entire (APE) has been previously surveyed for cultural resources.
- If any known cultural resources have already been recorded in or adjacent to the APE.
- If the probability is low, moderate, or high that cultural resources are located in the APE.
- If a survey is required to determine whether previously unrecorded cultural resources are present.

√ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure.
- The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.

√ Contact the Native American Heritage Commission (NAHC) for:

* A Sacred Lands File (SLF) search of the project area and information on tribal contacts in the project vicinity who may have information on cultural resources in or near the APE. Please provide us site identification as follows: USGS 7.5-minute quadrangle citation with name, township, range and section. This will assist us with the SLF.

- Also, we recommend that you contact the Native American contacts on the attached list to get their input on the effect of potential project (e.g. APE) impact. In many cases a culturally-affiliated Native American tribe or person will be the only source of information about the existence of a cultural resource.

√ Lack of surface evidence of archeological resources does not preclude their subsurface existence.

- Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
- Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.

√ Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigations plans.

- CEQA Guidelines §15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the Initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American groups, identified by the NAHE, to ensure the appropriate and dignified treatmentof Native American human remains and any associated grave goods.
- Health and Safety Code §7050.5, Public Resources Code §5097.98 and CEQA Guidelines §15064.5(d) mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

√ Lead agencies should consider avoidance, as defined in CEQA Guidelines §15370 when significant cultura resources are discovered during the course of project planning or execution.

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contact List

Native American Contacts
Imperial County
October 23, 2007

Big Pine Band of Owens Valley
David Moose, Chairperson
P. O. Box 700 — Owens Valley Paiute
Big Pine , CA 93513
bigpinetribaladmin@earthlink.
(760) 938-2003
(760) 938-2942-FAX

Timbisha Shoshone Tribe
Joe Kennedy, Chairperson
785 North Main Street, Suite Q — Western Shoshone
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dianne@timbisha.org
(760) 873-9003
(760) 873-9004 FAX

Bishop Paiute Tribe
Tilford Denver, Chairperson
50 Tu Su Lane — Paiute - Shoshone
Bishop , CA 93514
(760) 873-3584
(760) 873-4143

Bishop Paiute Tribe
Brian Adkins, Environmental Mger
50 Tu Su Lane — Paiute - Shoshone
Bishop , CA 93514
tcsec@paiute.com
(760) 873-3076

Fort Independence Community of Paiute
Carl Dahlberg Chairperson
P.O. Box 67 — Paiute
Independence , CA 93526
stephanie@fortindependence.
(760) 878-2126
(760) 878-2311- Fax

Lone Pine Paiute-Shoshone Reservation
Sandy Jefferson Yonge, Cultural Representative
880 Zucco Road — Paiute Shoshone
Lone Pine , CA 93545
hutsie@qnet.com
(760) 876-5658
(760) 876-8302 fax

Lone Pine Paiute-Shoshone Reservation
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(760) 876-8302 Fax

Timbisha Shoshone Tribe THPO
Barbara Durham, Tribal Historic Preservation Officer
P.O. Box 206 — Western Shoshone
Death Valley , CA 92328
dvdurbarbara@netscape.com
(760) 786-2374
(760) 786-2376 FAX

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American with regard to cultural resources for the proposed SCH#2007101041 CEQA Notice of Completion; Negative Declaration for Starlite Estates Subdivision Project located in Bishop; Inyo County, California.

Native American Contacts
Imperial County
October 23, 2007

Big Pine Band of Owens Valley THPO
Bill Helmer, Tribal Historic Preservation Officer
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Bishop Paiute Tribe THPO
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(760) 873-3584, Ext 250
(760) 873-4143 - FAX

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Native American Contacts
Inyo County
October 22, 2007

Big Pine Band of Owens Valley
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Ron Wermuth
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Lone Pine Paiute-Shoshone Reservation
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This list is only applicable for contacting local Native American with regard to cultural resources for the proposed SCH#2007101002; CEQA Notice of Preparation (NOP); draft Environmen tal Impact Report (DEIR) and Conditional Use Permit #2007-03/Coso Operating Company LLC (Coso Hay Ranch Water Extraction, Export and Delivery System); Inyo County, California.

Native American Contacts
Inyo County
October 22, 2007

Lone Pine Paiute-Shoshone Reservation
Sandy Jefferson Yonge, Cultural Representative
880 Zucco Road — Paiute
Lone Pine , CA 93545 — Shoshone
hutsie@qnet.com
(760) 876-5658
(760) 876-8302 fax

Timbisha Shoshone Tribe THPO
Barbara Durham, Tribal Historic Preservation Officer
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Death Valley , CA 92328
dvdurbarbara@netscape.com
(760) 786-2374
(760) 786-2376 FAX

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BISHOP PAIUTE TRIBE

BISHOP TRIBAL COUNCIL

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INYO CO.
PLANNING DEPT.

Jan Larsen,
Senior Planner
Planning Department
168 North Edwards Street
Post Office Drawer L,
Independence, CA 93526

November 6, 2007

RE: Notice of Preparation of a Draft Environmental Impact Report For CUP No. 2007-03, Coso Hay Ranch Water Extraction, Export, and Delivery System

Dear Ms. Jan Larsen:

The Bishop Paiute Tribe would like to thank the County of Inyo for letting us comment on the scope and content of the forthcoming EIR to be prepared by your agency. In order for our government to consider the environmental impacts of this project the following environmental information should be considered:

Upon review of the DEIR, the Bishop Paiute Tribe is concerned that the project will impact Tribal sites present on or near the project area. Inyo County went forward with its general plan without consulting the tribe.

According to SB 18, local (city and county) governments are required "to consult with California Native American tribes to aid in the protection of traditional tribal cultural places through local land use planning" (Supplement to General Plan Guidelines: Tribal Consultation Guidelines [Interim] State of California Governor's Office of Planning and Research [March 1 , 2005]). This must be done through <u>government to government contact</u>, not through general announcements of meetings and hearings.

We are requesting to be notified and to be participation of any and all pre/archaeological surveys as well as any and all excavations that will be conducted in preparation for this project. We request to be present for consultation during any archaeological survey or any earth-moving activities at every stage of preparation for the project and at every stage of the project. The Bishop Paiute Tribe has Certifying Cultural Monitors who can represent the Tribe, contact the Tribal Historic Preservation Officer - Theresa A. Stone-Yanez @ 760) 873-3584 Ext. 250.

<u>Hydro geologic impacts to the Coso Hot springs</u>. These hot-springs, a sacred site which is on the National Register of Historic Places is located on Navy land within 6 miles from the proposed injection site and has been re-evaluated by the Bureau of Land Management, Ridgecrest Office as being in the Area-of-Potential- Effects (APE) of the

System. It is our view that this injection activity poses a potentially significant impact to the area and constitutes further investigation.

The last paragraph of Section V. Cultural Resources- Environmental Checklist Form mentions existing, and proposed, MOAs between agencies regarding the management of the area. In our opinion neither MOAs are sufficient to support the conclusion that this action is less-than-significant. In October of 1988 the temperature levels of the South Pool of the Hot springs began increasing from an average of 121 degrees F in 1987 to and average of 204 degrees F from the period October 1993 whereby it appeared to become stable (Innovative Technical Solutions, Inc. Report <u>Coso Hot Springs Analysis - Technical</u> Contract No. N68711-05-P-0049, dated April 2007). The majority of the conclusions presented in the report points to a correlation between the withdrawal of fluids from the Coso geothermal field in 1987 and the increasing in temperature and water levels at the Coso Hotsprings.

It is suggested that an in-depth modeling simulation and analysis be conducted that incorporates hydrogeological complexity equivalent to or exceeding that of the above referenced study by Innovative Technical Solutions. A range of all proposed and possible injections schemes up to 4,893 acre feet per year of water should be simulated. Effects should be forecast out past the point where temperatures and water levels reach a relative dynamic equilibrium for at least the project period (30 years) after the date of first injection. All assumptions and data should be clearly defined. EIR should take in to consideration and evaluate proposed rates of injection vs. current rates of re-injection of hydrothermal waters, indicate the average temperature and water chemistry of waters proposed imported injected waters vs. existing groundwater.

Sincerely,

Tilford Denver, Bishop Paiute Tribal Chairman

CC: Honorable Tribal Council
Shirley Cain, Tribal Administrator
Tribal Historic Preservation Officer
Theresa A. Stone-Yanez
Tribal Environmental Protection Agency
Brian Adkins, Environmental Manager

Department of Water and Power the City of Los Angeles

ANTONIO R. VILLARAIGOSA
Mayor

Commission
H. DAVID NAHAI, President
EDITH RAMIREZ, Vice-President
MARY D. NICHOLS
NICK PATSAOURAS
FORESCEE HOGAN-ROWLES
BARBARA E. MOSCHOS, Secretary

RONALD F. DEATON, General Manager

November 1, 2007

Mr. Thomas A. Brooks, Director
Inyo County Water Department
163 May Street
Bishop, CA 93514

Dear Mr. Brooks:

Subject: South Haiwee Reservoir Leakage Recovery Project

This is in response to your August 23, 2007 letter requesting additional information on the Los Angeles Department of Water and Power's (LADWP) South Haiwee Reservoir Leakage Recovery Project.

Rose Valley is located to the south of the City of Los Angeles' Haiwee Reservoir Complex which consists of North and South Haiwee Reservoirs and the Haiwee Hydroelectric Power Plant. The construction of these reservoirs was completed in 1913 to provide storage and flow control for the First Los Angeles Aqueduct (LAA1) operations. These reservoirs also provide the needed storage and flow control for the Second Los Angeles Aqueduct operations.

The South Haiwee Reservoir is approximately 105 acres in area, with inflow from North Haiwee Reservoir. As is typical of reservoirs with earthfilled dams, South Haiwee Reservoir has been leaking water through the bottom and through its dam.

Leakage Estimate

According to the Brown and Coldwell Groundwater Modeling Report (Report) which was prepared for the Inyo County Planning Commission prior to issuance of Conditional Use Permit No. 2005-03, approximately 900 acre-feet of water is leaking from the South Haiwee Reservoir into Rose Valley groundwater aquifer.

LADWP does not have any reasons to doubt the accuracy of the Report's leakage estimate; however, in order to comply with your request, LADWP is working on independently verifying the leakage estimate from the South Haiwee Reservoir into the Rose Valley groundwater aquifer. We expect that a leakage estimate from this evaluation will be available by January 7, 2008. Unless information from this evaluation significantly contradicts the results from the Report, LADWP's Project will be based on recovery of approximately 900 acre-feet of water leakage from South Haiwee Reservoir.

Leakage Recovery Project

The City of Los Angeles owns a 160-acre former alfalfa field at the northern end of Rose Valley along with other properties in the area. This 160-acre property was acquired on or about 1988 to partly accommodate LADWP's Rose Valley Aquifer Storage Project. The Phase 1 feasibility study for Rose Valley Aquifer Storage Project was completed in January 1992.

There are two existing wells (Wells V816 and V817) on this 160-acre property which were used to irrigate and grow alfalfa. Both of these wells were recently video logged. Specifications of each well, as observed in the video log, are shown on the table below.

Well number	Total depth (ft)	Casing Diameter (in)	Screen interval (ft)	Casing material	Comment
V816	380	18	297-380	Fiber Glass	Damaged casing
V817	470	18	290-465	Steel	Good condition

Ground elevation near both wells is roughly the same, and depth to water was approximately 70 feet from the top of the casing.

Well V817 will be utilized for recovery of leakage water from the South Haiwee Reservoir since the Well V816 casing is damaged.

As shown on the enclosed map, Well V817 is located approximately 1,700 feet east of the LAA1. The elevation difference between the top of Well V817 and the LAA1 is 64 feet. Utilizing an 8-inch-diameter pipeline, the friction loss will be approximately 10 feet. Therefore, to pump and transport leakage recovery water from Well V817 to the LAA1, approximately 74 feet of head is required at the well head. This head could be produced by either the pump in the well or a booster pump at the surface.

The pipeline and associated appurtenance will be installed in the vicinity of the existing unimproved access road located within the City of Los Angeles' property as shown on the enclosed map. The pipeline will be installed with a minimum of 18 inches of cover or as otherwise required.

There are two potential sources of electrical power for the Project. The power may be provided to the Project from the Haiwee Hydroelectric Power Plant or through a low-sulfur stationary generator. If power is provided from the Haiwee Hydroelectric Power Plant, approximately 5,400 linear feet of electrical overhead facilities must be installed along the existing LAA1 right-of-way from the Haiwee Hydroelectric Power Plant to Well V817.

Power may also be provided through a more direct alignment to Well V817 from the Haiwee Hydroelectric Power Plant requiring the installation of approximately 3,100 linear feet of electrical overhead facilities. Under this alternative, approximately 1,600 linear feet of right-of-way grant must be obtained from the U.S. Department of Interior, Bureau of Land Management, for installation, maintenance, and operation of electrical overhead facilities.

If power is provided from a low-sulfur stationary generator, the generator will be installed within 30 feet radii of the well head or as otherwise required by existing regulations. The immediate area within the well head, pump, and low-sulfur stationary generator, if utilized, will be fenced off using standard 6-foot-high chain link fence.

The planned pumping rate from Well V817 will be approximately 1.2 cubic-feet-per-second, and the water will be used for municipal purposes.

If you have any questions, please feel free to contact me at (760) 873-0225.

Sincerely,

ORIGINAL SIGNED BY
GENE L. COUFAL

Gene L. Coufal
Manager
Aqueduct Section

Enclosures

c: Ms. Jan Larsen, Inyo County Planning Department
Mr. Joseph Greco, Caithness Operating Company

BIG PINE PAIUTE TRIBE OF THE OWENS VALLEY
Big Pine Indian Reservation

October 17, 2007

Jan Larsen, Senior Planner
Inyo County Planning Department
P.O. Drawer L,
Independence, CA 93526

RE: Conditional Use Permit No. 2007-03/Coso Operating Company LLC (Coso Hay Ranch Water Extraction, Export, and Delivery System)

Dear Ms. Larsen:

Please accept these scoping comments regarding the Environmental Impact Report for the above referenced "Hay Ranch Project."

V. Cultural Resources. The EIR should have a new, in-depth analysis of the potential effects of injecting cold water into the Coso geothermal reservoir on Coso Hot Springs. In May, 2007, upon the advice of the Big Pine Paiute Tribe, other area tribes, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP), BLM changed its initial APE (Area of Potential Effects) for the Project to include Coso Hot Springs. Coso Hot Springs is on the National Register of Historic Places and is a sacred site for area tribes as well as for other Native Americans.

The potential impacts of the proposed Project on Coso Hot Springs have never been adequately assessed. The study conducted by GeothermEX was not particularly in-depth, and was critiqued by Dr. Austin, a geologist familiar with the Coso geothermal reservoir (see **Attachment 1**). The brief GeothermEX study was also conducted before the study commissioned by Naval Air Weapons Station, China Lake's Geothermal Office, *Hydrologic Analysis of the Coso Geothermal System: Technical Summary N68711-05-P-0049, Innovative Technical Solutions, Inc., April 26, 2007.* This study may be very helpful as background data for the analysis of the water injection effects on Coso Hot Springs.

Since the Project's effects on Coso Hot Springs are presently not adequately analyzed, and it is unknown as to whether mitigation measures may reduce the Project's impacts to a Less Than Significant Level with Mitigation, the impact on Cultural Resources should be checked as a "Potentially Significant Impact."

The Native American Heritage Commission is not involved in any MOAs (Memorandum of Agreements) with China Lake Naval Air Weapons Station (CLNAWS). CLNAWS is a party to two MOAs regarding the effects of geothermal production within the Coso Geothermal Reservoir on Coso Hot Springs: *Memorandum of Agreement between the Commander, Naval Weapons Center and the Coso Ad Hoc Committee, Owens Valley Paiute-Shoshone Band of Indians (July, 1979), and Programmatic Memorandum of Agreement between the Commander, Naval Weapons Center, California State Historic Preservation Officer and the Advisory Council on Historic Preservation (November, 1979).* Both MOAs have provisions which require consultation with Native Americans and a discussion of mitigation measures if there are negative impacts on Coso Hot Springs which can be attributed to geothermal production in the Coso geothermal reservoir. Especially after the geothermal study stated above, a preponderance of the evidence suggests that geothermal production in the Coso Geothermal Reservoir has had negative impacts on Coso Hot Springs almost since the inception of geothermal production. The

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monitoring program substantiates the heating up of Coso Hot Springs so that it is unusable for many traditional Native American users of Coso Hot Springs.

In light of the negative effects which geothermal production has had on Coso Hot Springs for two decades, the Environmental Impact Report should also address whether the continuance of the geothermal production (as augmented by the injection of cold water from Hay Ranch) will have cumulative negative effects on Coso Hot Springs.

The monitoring program merely records the changes at Coso Hot Springs, which since geothermal production have been negative. The monitoring program is not mitigation. Geothermal production has already produced negative impacts on the traditional use of Coso Hot Springs by Native Americans, and mitigation measures have yet to be agreed upon by all the interested parties. Thus, there are no specifics as to what mitigation measures would reduce the Project's impacts to a Less Than Significant level.

VIII. Hydrology and Water Quality. The Project's proposed withdrawal of huge amounts of water from the Rose Valley aquifer have to adequately address potential impacts to wildlife, plants, springs, and wetlands in the region. The analysis in the previous Mitigated Negative Declaration for the Project was not adequate.

XVII. Mandatory Findings of Significance. The Project could potentially "eliminate important examples of the major periods of California history or prehistory," and thus has a potentially significant impact. Coso Hot Springs is one of the most important multi-tribal sacred sites in California, and the inception of geothermal production in the Coso Geothermal Reservoir has severely disrupted traditional practices for two decades. The proposed Project may prolong the life of geothermal production and continue to degrade traditional use of Coso Hot Springs. No mitigation measures to offset these negative effects have been proposed.

In addition, the Project's cumulative effects of prolonging the documented negative effects of geothermal production on Coso Hot Springs has to be assessed.

Since the Project is subject to both the California Environmental Policy Act (CEQA) as well as NEPA (National Environmental Policy Act), please coordinate the EIR with the revised Environmental Assessment by the Bureau of Land Management which will be necessary due to the new findings produced by the EIR.

Thank you for providing the Big Pine Paiute Tribe of the Owens Valley the opportunity to submit comments regarding the scope and content of the Environmental Impact Report for the Hay Ranch Project. Please keep us informed of all pertinent hearings, deadlines, and the availability of all relevant documents.

Sincerely,

Virgil Moose

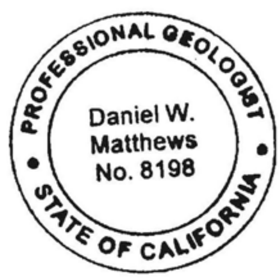
Virgil Moose
Tribal Chairperson
Big Pine Paiute Tribe of the Owens Valley

3.5.2 APPENDIX C2: GROUNDWATER FLOW MODELING

Several edits have been made to Appendix C2 for clarification purposes. The entire Appendix is included here with edits shown in strike out for deleted text and underline for new text. New figures and tables have also been added, as indicated in the revised text of the appendix. None of the edits represent significant changes that require recirculation of the EIR.

APPENDIX C2
NUMERICAL GROUNDWATER FLOW MODELING
ROSE VALLEY, INYO, COUNTY, CALIFORNIA

Prepared by:



Daniel W. Matthews, R.G.

APPENDIX C2
NUMERICAL GROUNDWATER FLOW MODELING
ROSE VALLEY, INYO, COUNTY, CALIFORNIA

C2-1 Introduction

This appendix describes the numerical groundwater flow model developed for the Rose Valley, California, groundwater basin for the Environmental Impact Report (EIR) being prepared by MHA|RMT on behalf of Inyo County for the Coso Operating Company (COC) Water Extraction and Delivery System Project ("the Project"). For this project, GEOLOGICA, Inc. (GEOLOGICA) revised and recalibrated a numerical model previously developed by Brown and Caldwell (2006) for the Rose Valley groundwater basin. Groundwater flow evaluations were conducted using the U.S.G.S. MODFLOW computer code (McDonald and Harbaugh, 1988) implemented in the Groundwater Vistas graphical environment (Environmental Simulations, 2007).

C2-1.1 Purpose

The purposes of the evaluations and analysis described in this appendix were: to evaluate the groundwater conditions; analyze the potential impacts to groundwater resources in Rose Valley according to CEQA guidelines; and, to define mitigation measures to reduce potentially significant effects of the construction and operation of the proposed COC Hay Ranch project.

C2-1.2 Scope

The scope of this task included evaluating information regarding hydrogeologic conditions in Rose Valley, revising an existing numerical groundwater flow model of Rose Valley developed by Brown and Caldwell (2006) as needed to better represent those conditions, calibrating the model to new data from a pumping test conducted in November/December 2007, and developing scenarios to evaluate the proposed project, alternatives to the proposed project, and possible mitigation measures to reduce the impact of the proposed project. In addition, GEOLOGICA conducted sensitivity analyses to evaluate the impact of uncertainty in various input parameters and various withdrawal scenarios on model predictions.

C2-2 Environmental Setting

C2-2.1 Physiography

Rose Valley is a long, narrow valley located on the eastern flank of the Sierra Nevada Mountains in Inyo County, California. The alluvial portion of the groundwater basin is approximately 16 miles long from the southern end of the Haiwee Reservoir to just south of Little Lake, and has a maximum width of approximately 6 miles at its widest point. Rose Valley is topographically separated from the Owens Valley to the north by Dunmovin Hill, a topographic high that is composed of a massive landslide or series of debris flow deposits that originated from the Sierra Nevada range to the west (Bauer, 2002). Rose Valley is separated from the Indian Wells Valley to the south by a topographic high formed by a combination of granitic rocks and volcanic flows, and by the Little Lake Gap, which is an approximately 1,000 ft wide water-carved canyon within the volcanics (Bauer, 2002). **Figure C2-1** depicts physiographic features of the study area. The ground surface of the valley floor generally slopes gently to the south at a rate of 30 to 35 feet per mile.

C2-2.2 Geology

Rose Valley is a graben surrounded and underlain by igneous and metamorphic basement rocks of the Sierra Nevada and Coso Ranges. Alluvial sediments were encountered to depths as great as 3,489 feet in borings advanced in the north central portion of the basin (Schaer, 1981) and may extend to depths greater than 5,000 feet below ground surface (bgs) based on gravity surveys (GeoTrans, 2004). Younger (30 to 0.4 million years old) volcanic rocks of the Coso Range outcrop east of the central and northern Rose Valley and are predominately rhyolitic, dacitic, and andesitic in composition. The southern boundary of the Rose Valley groundwater basin is marked by outcrops of volcanic rocks related to eruptions within or flows from the Coso Range and volcanic cinder cones in the Red Hill area.

As summarized by Bauer (2002), the basin fill consists, in descending order, of recent alluvial fan deposits including debris flows from the bordering Sierra Nevada Mountains, volcanic deposits including basalt, ash, cinders, and tuff, lacustrine deposits of the Coso Formation, and older alluvial fan deposits from the Sierra Nevada and Coso Ranges. The recent alluvial deposits usually occur between ground surface and depths of up to 800 ft, and consist of a mixture of sands and gravels interbedded with clay. The maximum drilled thickness of these deposits occurs in the north central part of the valley near the Hay Ranch property. The Coso Formation uncomformably overlies basement rocks in the Coso Range and Rose Valley, and is comprised of a heterogeneous assemblage of primarily lacustrine deposits, with lesser amounts of volcanic tuff and alluvial fan deposits. Bauer (2002) described the Coso Formation as being comprised of four members in descending stratigraphic order: the Rhyolite Tuff Member, the Coso Lake Beds Member, the Coso Sand Member, and the Basal Fanglomerate Member.

- The Rhyolite Tuff Member occurs along the east side of the southern Haiwee Reservoir and extends south into the north end of the valley along the western slope of the Coso Range.
- The Coso Lake Beds Member reportedly is composed of alternating beds of fine-to-coarse-grained sand, arkosic, green clay with interspersed volcanic ash, and thin-bedded white rhyolitic tuffs containing pumice fragments. Deposits of the Coso Lake Beds Member reportedly extend north into the southern Owens Valley, where it is known as the Owens Lake Bed Member.
- The Coso Sand Member consists of poorly consolidated, fine-to-coarse grained alluvial gravels, sand, and red clay beds derived from the granitic basement rocks of the Coso Range and reworked Sierra Nevada alluvial fan materials. The Coso Sand Member occurs at depths from 1,500 ft to 3,000 ft bgs and the unit is thickest to the west, decreasing in thickness rapidly to the east.
- The Basal Fanglomerate Member was infrequently encountered in well borings drilled in the valley. It consists of reworked colluvial deposits localized by basement topography and structures.

Figure C2-2 presents a map illustrating the estimated thickness and extent of alluvial fill deposits based on the interpretation of drilling logs and gravity surveys developed by GeoTrans (2004).

C2-2.3 Hydrogeology

C2-2.3.1 Hydrostratigraphic Units

The principal hydrostratigraphic units that comprise the Rose Valley aquifer consist of recent alluvial deposits, and the Coso Lake Bed and Coso Sand Members of the Coso Formation. Older bedrock is largely impermeable or low permeability and typically impedes or excludes groundwater flow.

C2-2.3.2 Groundwater Occurrence and Flow

The groundwater table is typically first encountered during drilling within the upper portion of the recent alluvial deposits. Depth to groundwater ranges from 140 to 240 ft bgs in the north and central parts of Rose Valley to approximately 40 ft bgs at the northern end of the Little Lake Ranch near the south end of the valley. Depth to groundwater and calculated groundwater elevation used to develop the November 2007 groundwater elevation contour map are tabulated in **Table C2-1**. It should be noted that COC engaged triad / holmes associates in November 2007 to survey the location and reference point elevations of wells used for groundwater level measurements. These wells had not previously been surveyed. A groundwater elevation contour map of Rose Valley developed from depth to water measurements made on November 19, 2007 (**Figure C2-1)** indicates southeasterly groundwater flow along the axis of the northwest to southeast trending valley. With one exception, the November 2007 monitoring results were consistent with observations reported by Bauer (2002) for data collected in 1998. Water level measurements in Navy well 18-28, located in southeastern Rose Valley (**Figure C2-1**) indicated that the groundwater elevation in this area was approximately 10 ft higher than expected. This well was not available to previous investigations. The higher groundwater elevation is believed to be the result of impeded groundwater flow through the volcanic deposits south of the Red Hill cinder cone, towards Little Lake, and/or groundwater upwelling from the geothermal system underlying the Coso Range to the northeast.

Because the ground surface slopes more steeply to the south than the groundwater table, the groundwater table surfaces at and discharges from springs beneath Little Lake, sustaining the lake and the surface water discharge across the Little Lake Weir (see **Figure C2-~~2~~ 3** for locations). Additional groundwater discharges from Coso Spring and the Little Lake Ranch siphon well as the ground surface elevation drops more steeply to the south of Little Lake.

Long term groundwater level monitoring conducted by COC indicates that groundwater levels have generally risen 1 to 2 feet throughout Rose Valley over the last 5 years (see **Figure C2-~~3~~ 4**). This is most likely a response to increased precipitation recharge in the mountains during the last few years. There were no significant changes in groundwater extraction in Rose Valley nor identified groundwater recharge other than precipitation infiltration at higher elevations (discussed in Section C2-2.5). An approximately 1 ft rise was observed in the Cal-Pumice well north of the Hay Ranch property, 1.5 ft rises were observed in Lego and G-36 wells on Navy property seven miles southeast of Hay Ranch, and 2 ft rises were observed in the Hay Ranch wells. Groundwater levels in the LADWP wells (V816 and V817) fell from 2002 to mid-2005 then rose until the spring of 2007 when they began falling again.

The groundwater levels in the LADWP wells 2 miles south of the Haiwee Reservoir were approximately 170 ft higher than groundwater levels in the closest monitored well to the south, Cal-Pumice, throughout the long term monitoring period, suggesting a surface water flow component or input from a groundwater basin at a different groundwater elevation potential (i.e., Owens Valley). Groundwater levels in the LADWP wells were more variable than any other wells in the valley. The source of this variation is not well known. Water levels in Haiwee Reservoir and the flow rate in the LADWP aqueduct rose during the time water levels were monitored for the 2007 pumping test while groundwater levels in the LADWP wells fell; positive correlation between rising reservoir levels and groundwater elevation would be expected if seepage from the reservoir strongly influenced groundwater levels. The absence of correlation between reservoir levels and groundwater levels in the LADWP wells suggests varying rates of groundwater influx from Owens Valley may be the cause of groundwater level fluctuations at the north end of Rose Valley. Groundwater level monitoring data collected by COC beginning in September 2001 are tabulated in **Table C2-2**. Long term monitoring well locations are shown on **Figure C2-1**.

C2-2.3.3 Initial Evaluation of Aquifer Properties

The transmissivity of the upper portion of the alluvial deposits was previously estimated to range from 9,000 to 69,800 gpd/ft (1,200 to 9,330 ft^2/day) based on data presented in the Rockwell Report (1980). Based on 24-hour pumping tests conducted in the Hay Ranch wells, GeoTrans (2003) concluded that the transmissivity of the Rose Valley aquifer near Hay Ranch was approximately 10,000 ft^2/day and estimated that the (horizontal) hydraulic conductivity was approximately 20 ft/day. GeoTrans concluded that they had insufficient data to estimate aquifer storage properties.

Based on a 14-day pumping test conducted in the Hay Ranch South well and monitored in wells throughout the valley, GEOLOGICA concluded that the best estimate of the transmissivity and horizontal hydraulic conductivity of the aquifer were approximately 14,750 ft^2/day and 24 ft/day, respectively (see Appendix C1). The vertical hydraulic conductivity of the alluvial aquifer in central Rose Valley was estimated to be 0.01 ft/day using a Neuman “Beta” coefficient of 0.01 from the aquifer testing type curve match and an aquifer thickness of 600 ft. The storage coefficient applicable to early time response and saturated soil below the water table was found to be 0.001. Long-term values for specific yield could not be estimated accurately from the pumping test data because the pumping test duration is relatively short compared to the proposed duration of pumping (years). However, a reasonable estimate of specific yield can be obtained from the detailed evaluation conducted by Danskin for Owens Valley, where a values of 10% was used for specific yield. This is discussed in more detail later in this appendix.

C2-2.4 Surface Water

The average annual precipitation in Rose Valley ranges from 5 to 7 inches while the area’s annual evapotransporation rate is estimated to be 65 inches (CWRCB, 1993). Consequently, surface water bodies in the Rose Valley area consist of perennial springs sustained by groundwater flow, ephemeral streams and washes that mainly flow in the winter, and manmade lakes and reservoirs. Surface water features of interest are shown on **Figure C2-1** and discussed below.

C2-2.4.1 Haiwee Reservoir

The South Haiwee Reservoir is located at the north end of Rose Valley approximately 4 miles north of Hay Ranch. The crest of the south Haiwee Dam is located at approximately 3,766 ft MSL. Because of seismic stability concerns, the water level in the reservoir is currently limited to a maximum elevation 3,742 ft MSL. During construction of the dam, a trench was reportedly excavated to a depth of up to 120 ft below ground surface, until it tagged basalt bedrock, and backfilled with clay to seal the base of the dam (LADPS, 1916); however, the remainder of the reservoir is unlined. Weiss (1979) estimated that underflow from Haiwee Reservoir contributed approximately 600 acre-ft of water per year to the Rose Valley groundwater basin, indicating that the Reservoir is potentially an important source of recharge.

C2-2.4.2 Springs and Siphon Wells

Bauer (2002) identified several springs in Rose Valley including:

- Rose Spring located approximately 2 miles south of Haiwee Reservoir
- Tunawee Canyon Spring located approximately 3 miles southwest of the Hay Ranch
- Davis Siphon Well Spring located at Portuguese Bench
- Little Lake Fault Spring and Little Lake Canyon Spring located near the south end of Rose Valley, and
- Coso Spring located on the Little Lake Ranch property southeast of Little Lake.

Approximate spring locations are shown on **Figure C2-1**. As shown on **Figure C2-1**, only the Rose Spring is located within the numerical model grid area. No data were identified regarding the groundwater discharge rates from the Rose, Tunawee Canyon, Little Lake Fault, or Little Lake Canyon Springs. The groundwater discharge rate from the Davis Spring, referred to as the Davis Siphon Well in Appendix C1, was measured during the November/ December 2007 pumping test and ranged from 4.5 to 4.2 gallons per minute (gpm) or approximately 7 acre-ft/yr. The Davis Spring is located on the west central side of Rose Valley at Portuguese Bench at an elevation of approximately 3,870 ft MSL. Because the Davis Siphon well and spring discharge are located more than 600 ft higher than the groundwater table in the Rose Valley aquifer east of the Davis property at Coso Junction, they are not directly hydraulically connected to the alluvial aquifer. As discussed in Appendix C1, monitoring of the spring discharge rate during the 2007 pumping test did not provide any evidence of impact to the spring from pumping at Hay Ranch. Discharge from the spring that is not used on the Davis property infiltrates back into the ground after which it percolates downward to recharge the alluvial aquifer.

Based on their locations, elevations, and isotope chemistry (discussed in Section 3.2), the source of water for the Tunawee Canyon, Davis, and Little Lake Canyon springs is mainly derived from precipitation recharge in the Sierra Nevada mountains, while that for the Rose Spring appears to be a combination of Sierra Nevada precipitation recharge and seepage from Owens Valley and Haiwee Reservoir. Because the Tunawee Canyon, Davis, and Little Lake Canyon springs are located outside of the main body of the Rose Valley aquifer at elevations above the groundwater table in the Rose Valley aquifer and derive their water source wholly or mainly from Sierra Nevada precipitation recharge, they are unlikely to be impacted by the proposed project. The Rose spring, located near the north end of Rose Valley at an elevation (3,580 ft MSL) approximately 300 ft above the groundwater table in the aquifer, is also unlikely to be impacted by the proposed project. Based on its isotope chemistry, location, and elevation, Coso Spring, on the Little Lake Ranch property, is partially or wholly sourced by groundwater flowing from Rose Valley. Discharge from Coso Spring likely will be influenced by changes in groundwater conditions in Rose Valley; however, the spring is outside (south of) the model grid and is not directly represented in the model.

At the south end of Rose Valley, groundwater flow through the Little Lake Gap is constrained by bedrock on the west, an apparent subsurface bedrock rise below, and low or reduced permeability in the basalt lava flows to the east. The ground surface in the area slopes to the south, gently between the northern property line and Little Lake, then more steeply south of Little Lake. As a result of the combination of south-sloping ground surface and bedrock barriers to lateral or vertical groundwater flow, groundwater surfaces in this area to discharge via submerged springs into Little Lake and from the Coso Spring southeast of Little Lake (**Figure C2-~~2~~** **3**). Groundwater discharging from the Coso Spring flows into the upper Little Lake pond (P-1). A siphon well located south of Little Lake (below the elevation of Little Lake and Coso Spring) brings additional groundwater to the surface where it is piped to the lower Little Lake pond (P-2). The intake for the siphon well is lower than the Little Lake Weir but higher than the Coso Spring. The siphon well is believed to be screened between elevations of approximately 3,120 and 3,130 ft MSL. Coso Spring is located at an approximate elevation of 3,120 ft MSL.

Little Lake Ranch staff can control the water level in the lake, allowing it to rise in the winter and fall in the summer by adjusting the height of a weir located at the south end of the lake. Overflow from the Little Lake weir is conveyed to the upper Little Lake pond (P-1) through an open channel. The discharge from both ponds flows through an open channel to the south where it is used to fill additional ponds when flow is adequate. As a result of evapotranspiration and infiltration, none of the surface water on the Little Lake Ranch property flows off the property (ULLR, 2000).

The only spring flow and groundwater discharge rate data for the Little Lake Ranch property were reported in Bauer (2002). Bauer (2002) measured the discharge rate from Little Lake, the flow rate from Coso Spring, and the stream flow rate in the North Culvert, south of pond P-2 and South Culvert, at the south end of the property, several times between 1996 and 1998. These data are summarized in **Table C2-3** and schematically illustrated on **Figure C2-4** **5** Bauer did not measure the flow rate from the siphon well. The North Culvert captures flow from the Little Lake Weir stream, Coso Spring, and the discharge from the upper and lower ponds. Bauer's measurements do not include evapotranspiration losses in the pond or conveyance system or identify possible measurement errors. As shown on **Figure C2-4** **5**, the flow rate from Coso Spring ranged between 1,000 and 2,000 acre-ft/yr, averaging approximately 1,500 acre-ft/yr. The discharge rate from the Little Lake Weir ranged from zero in the summer of 1997 to 1,750 acre-ft/yr in the winter of 1998, averaging approximately 800 acre-ft/yr. In dryer years, e.g., 1997, Little Lake apparently does not discharge water across the weir in summer months.

C2-2.4.3 Lakes

One perennial lake, Little Lake (also described above), is located at the south end of Rose Valley approximately 9 miles south of the Hay Ranch property (**Figures C2-1** and **C2-~~2~~** **3**). The U.S.G.S. Little Lake quad topographic map places the elevation of the lake at approximately 3,145 ft MSL. The lake is reportedly 3 to 5 ft deep and covers an area of approximately 75 to 90 acres at its maximum extent. The water level in the lake can be manipulated by raising or lowering boards in a discharge weir located at the south end of the lake but is also influenced by evaporation in the summer, as well as direct rainfall and storm water inflow from Little Lake Canyon wash to the west in the winter.

Bauer (2002) monitored the water level in the lake and the groundwater level in a monitoring well near the north end of the lake between January 6, 1997 and March 21, 1998. The variation in water level in Little Lake and groundwater elevation adjacent to the lake during that period is illustrated on **Figure C2-4** 5. The water level in the lake decreased nearly 1 foot between January and August and then rose nearly 1.2 foot in the following fall and winter. Any adjustments to the discharge weir in that time period were not noted by Bauer. Groundwater elevation measured in a well located approximately 500 feet from the north shore of Little Lake dropped nearly 0.8 ft between spring and summer 1997 and rose nearly 1 foot in the winter and following spring, but was always 3 foot or more higher than the lake level, indicating that the lake was always fed by groundwater. From this figure it appears that discharge of water from the Little Lake Weir stopped when the lake level dropped below approximately 3,142 ft but increased to an annualized rate of 1,750 acre-ft/yr when the lake water level rose to 3,143 ft MSL. Over this same period the discharge rate from Coso spring actually increased when the lake stopped discharging and decreased when the lake resumed discharging, indicating that the hydrologic system in this area is very complex. Based on these data, naturally occurring groundwater level fluctuations of 1 ft measured 500 ft north of Little Lake appears to correlate with significant changes in surface water flow rates on the Little Lake Ranch property.

C2-2.5 Groundwater Flow Components and Water Budget

The Rose Valley groundwater system is primarily recharged by mountain front recharge derived from precipitation and snowmelt that falls at higher elevation in the Sierra Nevada front range. As noted in Section C2-2.3.2, the south sloping groundwater table observed at the north end of Rose Valley indicates groundwater enters Rose Valley from Owens Valley to the north and/or from seepages losses from the south Haiwee Reservoir. This inflow is incorporated into the model.

As discussed in Section 3.2, some precipitation recharge likely occurs in the Coso Range on the east side of the valley but was conservatively neglected for the current modeling effort. Also, perhaps as much as 250 acre-ft/yr of groundwater may enter southeastern Rose Valley as upwelling from the Coso geothermal system based on proportions of chloride and stable isotopes in groundwater in southeastern Rose Valley, but was conservatively neglected in this analysis. Leakage from the LADPW aqueducts that traverse Rose Valley was assumed to be a negligible component of total groundwater inflow to the basin.

Currently, the principal groundwater outflow components consist of groundwater underflow and surface water discharges to the Indian Wells Valley to the south, and evapotranspiration from Little Lake and phreatophytic vegetation on the Little Lake Ranch property. Because of the dry climate, essentially all of the precipitation falling on Rose Valley is lost to evapotranspiration. However, because the groundwater table is located 40 or more feet below ground surface over all but the southern tip of the valley, evapotranspiration does not factor into the groundwater budget except on the Little Lake Ranch property. Inflow and outflow components of the groundwater budget for Rose Valley are discussed in more detail below.

C2-2.5.1 Groundwater Inflow Components

Principal inflow components consist of mountain front recharge, groundwater inflow from Owens Valley to the north and/or seepage from Haiwee Reservoir.

Mountain Front Recharge

Precipitation recharge in the Sierra Nevada range west of Rose Valley is the principal source of groundwater to the Rose Valley basin. Due to the rain shadow effect caused by the Sierra Nevada's, the precipitation rate in the Coso Range on the east side of Rose Valley is low. To be conservative, it was assumed that the evapotranspiration potential exceeded potential precipitation recharge throughout Rose Valley and the Coso Range. Methodologies to directly measure mountain front recharge are poorly defined; typically groundwater recharge from precipitation is estimated as a percentage of total recharge.

Brown and Caldwell (2006) concluded that precipitation rates in the Rose Valley area range from about 6 inches per year (in/yr) on the valley floor to up to 20 in/yr at the crest of the Sierra Nevada range and that only precipitation falling at elevations above 4,500 ft results in groundwater recharge. In the mountains, precipitation rate (including rainfall and snow melt) is strongly dependent on altitude. Danskin (1998) established an empirical relationship between precipitation rate and altitude based on precipitation and snow records collected routinely for more than 50 years in 20 survey stations along the western side of Owens Valley. Using the empirical relationship developed in the Danskin report, Brown and Caldwell estimated that the average precipitation rate for the elevation ranging from 4,500 ft to 6,500 ft was 10 in/yr, increasing to 15 in/yr for parts of the watershed above 6,500 ft. Using a geographic information system (GIS), to evaluate the contribution from areas of varying elevation in the Sierras west of Rose Valley, Brown and Caldwell estimated that the total precipitation volume that could potentially recharge the Rose Valley groundwater basin was approximately 42,000 acre-ft/yr.

For the purposes of the initial evaluation of potential impacts of groundwater development at Hay Ranch, they further assumed that only 10 % (4,200 acre-ft/yr) of the potential mountain front precipitation recharge actually reaches Rose Valley. Danskin (1998) used a value equivalent to 6% of Sierra Nevada range precipitation for the mountain front recharge component of the numerical groundwater flow model developed to evaluate groundwater development in Owens Valley. It should be noted that in the Rose Valley model, additional recharge components were incorporated into mountain front recharge term that resulted in a larger (10%) recharge term, including recharge on the alluvial fans, and recharge beneath and between stream channels, whereas in Danskin's model mountain front recharge alone was equal to 6%; the other components were also added into Danskin model, but were treated separately. Williams (2004) estimated that mountain front precipitation recharge in Indian Wells Valley amounted to approximately 8% of precipitation in the Sierra Nevada range to the west. However, Williams noted that the Maxey-Eakin Method for estimating precipitation recharge in the Sierra Nevada range conservatively neglects areas receiving less than 8 in/yr of precipitation; consequently, higher recharge rates are possible. Because the mountain front precipitation recharge rate as assumed for the Brown and Caldwell groundwater flow model yielded reasonable calibration results in the steady state model, a recharge rate of 4,200 acre-ft/yr was also used in the revised numerical model developed for this EIR. The recharge was added to model layers 2, 3, and 4, and model sensitivity analysis showed that the results were not sensitive to the layer to which the recharge was added.

Groundwater Inflow/Seepage from the North

As noted previously, Weiss (1979) estimated seepage losses from the Haiwee Reservoir to be on the order of 600 acre-ft/yr. Previous investigators (Bauer, 2002; Brown and Caldwell, 2006) and GEOLOGICA's review of groundwater elevation contour patterns in the north end of Rose Valley indicate that groundwater inflow from southern Owens Valley and/or seepage losses from the south Haiwee Reservoir recharge the Rose Valley groundwater basin at the north end of the valley. Using a steady-state numerical groundwater flow model of the Rose Valley groundwater basin, Brown and Caldwell (2006) estimated the groundwater influx from the north to be approximately 788 acre-ft/yr, which is similar to the estimate of Weiss (1979). Recalibration of the numerical groundwater flow model for this study indicated a slightly higher groundwater inflow rate from the north (Owens Valley/Haiwee Reservoir) of 890 acre-ft/yr.

C2-2.5.2 Groundwater Outflow Components

Principal groundwater outflow components from Rose Valley consist of discharge to the Indian Wells Valley from the Little Lake area and an area in the southeast part of the valley, east of Red Hill, and evapotranspiration in the Little Lake area. Limited groundwater extraction was identified in Rose Valley.

Groundwater Discharge from Southeastern Rose Valley

Brown and Caldwell (2006) estimated that approximately 2,050 acre-ft/yr of groundwater discharges from Rose Valley in the southeast part of the valley (southeast of Navy well 18-28) as underflow to Indian Wells Valley. Williams (2004) concluded that existing estimates of recharge to the Indian Wells Valley significantly underestimated interbasin transfers and referenced an estimate of groundwater underflow from Rose Valley to Indian Wells Valley of 10,000 acre-ft/yr developed by Thompson (1929). Recalibration of the numerical groundwater flow model for Rose Valley indicated an underflow rate from Rose Valley to Indian Wells Valley in this area of 850 acre-ft/yr. This is less than half the value of 2,050 acre-ft/yr assigned to this term in the Brown and Caldwell (2006) numerical modeling analysis. This difference is discussed in the model calibration section.

Groundwater Discharge at Little Lake

Groundwater discharge by several processes in the Little Lake area is the dominant outflow component from Rose Valley. The processes operating at Little Lake include:

- Evaporation from the lake surface;
- Transpiration from phreatophyte plants on the property;
- Discharge from Coso Spring;
- Discharge from the Little Lake Weir; and
- Discharge from the Little Lake Siphon well.

Bauer (2002) estimated that evaporation from the Little Lake water surface consumes approximately 500 acre-ft/yr based on a lake surface area of 75-90 acres and evaporation rate of 80 in/yr. As discussed in Section 3.4, plant communities identified on the Little Lake Ranch property were described as akalai desert (saltbush scrub), palustrine (pond) and lacustrine (lake) wetlands, and riparian (creek) habitat. Beginning in 2000, Little Lake Ranch, Inc., conducted various projects intended to restore or enhance 90 acres of lacustrine wetlands, 10 acres of palustrine emergent wetlands, about 6 acres of palustrine/riparian habitat (1.6 mile long creek corridor), and an additional 220 acres of wetland and upland habitat, and 1 acre of wetland and associated upland habitat was acquired. As a result of shallow groundwater in this area, at least 300 acres of the 1,200 acre Little Lake Ranch property hosts various species of plants. Studies summarized in the U.S.G.S. Water-Supply Paper for Owens Valley (Danskin, 1998) concluded that wet land plant species in the desert climate prevalent in Owens (and Rose Valley) transpire between 20 and 36 in/yr. Using an average evapotranspiration value of 28 in/yr over the 300 acres yields an estimated 700 acre-ft/yr for transpiration processes (in addition to 500 acre-ft/yr assumed for surface water evaporation from Little Lake). Consistent with the 2006 numerical model, the model grid extends to the south end of Little Lake, as a result evaporation from ponds and the outfall stream and evapotranspiration from plants on the Little Lake Ranch property south of Little Lake are not explicitly represented in the model. Consequently, the evapotranspiration component of the 2007 numerical model includes 500 acre-ft/yr for evaporation from Little Lake and ~~2~~700 acre-ft/yr for evapotranspiration from plants around the lake.

As discussed in Section C2-2.4.2, the flow rate measurements in the North Culvert, south of the lower pond (P-2) captures the discharge from the Little Lake Weir, Coso Spring, and Little Lake Siphon well. The discharge rate measured in the North Culvert ranged from 885 to 5,357 between January 6, 1997 and March 21, 1998 and averaged 3,000 acre-ft/yr. The domestic well by the ranch house, several irrigation wells, and the former Little Lake Hotel well are not believed to extract significant quantities of groundwater. The combined total of measured lake, spring, and groundwater discharges and estimated evapotranspiration losses in the Little Lake Ranch area is approximately 4,200 acre-ft/yr. All of the groundwater discharged in the Little Lake area that is not evaporated or transpired by plants (represented by flow observed at the North Culvert) infiltrates back into the ground on the property (approximately 3,000 acre-ft/yr) and continues as groundwater underflow to Indian Wells Valley (no surface water flow leaves the property). This is slightly lower than the value of 3,300 acre-ft/yr estimated by Williams (2004) for interbasin transfer from Rose Valley to Indian Wells Valley but does not include the groundwater underflow component from the southeastern Rose Valley discussed in the previous section.

Existing Extraction Wells

Currently, approximately 50 acre-ft/yr of groundwater production from wells occurs in Rose Valley. No significant agricultural irrigation has occurred in the valley since the Hay Ranch ceased alfalfa growing operations. As many as 30 domestic wells are believed to extract relatively small quantities of groundwater for domestic uses and small scale irrigation in the Dunmovin area. This pumpage is not represented in the groundwater flow model because it is believed to amount to less than 10 acre-ft/yr. The LADWP, Cal-Pumice, and Hay Ranch wells are not being pumped and are not known to have been used in the last five years. The Coso Ranch South well, southern Coso Junction Store well (Coso Junction #2), and the Cal Trans well at Coso Junction are regularly used for businesses in the area. The Coso Ranch North well and northern Coso Junction Store well (Coso Junction #1) are not being used at present. Cal-Pumice and the cinder mine near Red Hill reportedly takes 5 to 10 truckloads of water a day during the week from the Coso Ranch South well and Red Hill well, respectively, which was set in the model as a continuous withdrawal of ~~2005 cubic feet per day (cfd) o~~r roughly 10 gpm (15 acre-ft/yr). The Coso Junction Store well supplies the general store and COC offices in Coso Junction and was also represented as a continuous withdrawal of 10 gpm ~~2005 cfd~~ (15 acre-ft/yr). Extraction from the Cal Trans well was assumed to be negligible. Wells on the Navy property in Rose Valley including the Lego well, well G-36, and well 18-28 are not being pumped. Water wells on the Little Lake Ranch property were discussed in the previous section.

C2-2.5.3 Groundwater Budget

The groundwater elevation monitoring data suggest that groundwater inflows have equaled or slightly exceeded groundwater outflows from the Rose Valley groundwater basin in the past five years. Assuming that groundwater inflows equal outflows, that is, that steady state conditions prevail, the resulting conceptual Rose Valley groundwater budget is tabulated in the table below. Values from the 2006 numerical groundwater flow model are also listed for comparison purposes:

Table C2-4: Conceptual Groundwater Budget Components

Budget Components	2006 Model		2007 Model	
	Flow Rate, acre-ft/yr	Simulation Package used in Model	Flow Rate, acre-ft/yr	Simulation Package used in Model
Groundwater Inflow				
Mountain Front Recharge	4,191	Well	4,191	Well
Groundwater Underflow from the North	788	Constant Head	788	Constant Head
Total Inflow	4,979		4,979	
Groundwater Outflow				
Existing extraction wells	0	--	40	Well
Groundwater underflow to Indian Wells Valley exiting from southeastern Rose Valley	2,050	General Head	739	General Head
Evaporation from Little Lake and Evapotranspiration from adjacent Palustrine wetland plants	500	Evapo - transpiration	700	Evapo - transpiration
Plant transpiration on Little Lake Ranch property south of Little Lake (outside model grid)	0	--	500	--
Groundwater Discharge through Little Lake Gap to Indian Wells Valley	2,429	Drain	3,000	General Head
Total Outflow	4,979		4,979	

*Conceptual budget, simulated budget components were adjusted during model calibration process.

C2-3 Numerical Model Development

Brown and Caldwell (2006) developed a three-dimensional, numerical model of the Rose Valley groundwater basin which was then revised, and recalibrated, by GEOLOGICA for the EIR developed for the COC groundwater project at Hay Ranch. The revised model incorporates new groundwater elevation data collected by COC staff as well as time-drawdown data from a 14-day pumping test conducted at Hay Ranch in November/ December 2007. COC also engaged a surveyor in November 2007 to survey well locations and elevations which allowed a more accurate evaluation of groundwater elevation patterns in the valley than has been possible in the past.

The revised model is intended to represent the structure of the local aquifer system, as well as the inflow and outflow components discussed in previous sections. A steady-state version of the model was first (re)calibrated using groundwater elevation measurements made on November 19, 2007, prior to the start of the constant rate pumping test at Hay Ranch. The steady-state model incorporated available information regarding aquifer boundary conditions, discharge data measured at Little Lake, and pumping and recharge estimates discussed in Section C2-2. The steady-state model was then modified to a transient model by adding storage terms for saturated soil below the groundwater table (storage coefficient) and soil at the water table (specific yield) and calibrated to time-drawdown observations from the November/December 2007 pumping test. The transient version of the numerical model was then used to predict the response of the Rose Valley aquifer system proposed Hay Ranch project development alternatives as well as the added effect of pumping by the LADWP at it's wells at the north end of the valley. The model design and setup are discussed in detail in the following sections.

Groundwater flow evaluations were conducted using the U.S.G.S. MODFLOW computer code (McDonald and Harbaugh, 1988) implemented in the Groundwater Vistas graphical environment (Environmental Simulations, 2007).

C2-3.1 Model Domain and Finite Difference Grid

The model domain, which remains unchanged from the Brown and Caldwell (2006) modeling evaluation, covers 132 square miles, extending 8.25 miles in the east-west direction and 16 miles in the north-south direction. The model domain extends from the groundwater divide near the south Haiwee Reservoir on the north to the Little Lake Gap area to the south, and is bounded by impermeable boundaries representing the Sierra Nevada Mountains on the west and by Coso Range to the east. **Figure ~~C2-2~~ C2-1** illustrates the location of the finite-difference grid relative to pertinent features of the Rose Valley basin. Consistent with the representation developed in the 2006 numerical model, the southern edge of the active portion of the model grid extends to the south edge of Little Lake; consequently, Coso spring, the Little Lake Ranch siphon well, and palustrine and riparian wetland areas south of Little Lake are not explicitly represented in the model.

The model domain was discretized into 64 rows and 33 columns. The cell size of the grid is 1/4 mile in both length and width, representing a 40-acre area. No flow (inactive) model cells were specified along the east and west margins of the model domain to represent the shape of the aquifer within basin fill deposits.

C2-3.2 Model Layer Configuration

Three model layers were originally used to represent the aquifer system in Rose Valley. As part of the recalibration process, GEOLOGICA subdivided the uppermost model layer into two layers to better represent the semi-confined behavior of the aquifer. The location of the contact between layer 1 and 2 was specified as being just below the bottom depth of shallower wells in the valley (including Cal-Pumice, Coso Store #1 and #2, and the Lego, G-36, and 18-28 wells) which is on the order of 400 ft bgs. The uppermost two layers (layers 1 and 2) were configured to represent: debris flows and debris avalanche in the Dunmovin Hill in the northern part of Rose Valley; the recent alluvial deposits in the center of Rose Valley, and interbedded volcanic deposits and alluvium in the south and southeast part of Rose Valley. Layer 1 was specified as unconfined with transmissivity determined by MODFLOW as the product of horizontal hydraulic conductivity and current saturated thickness and storage represented using specific yield. Layers 2, 3, and 4 were configured as confined units in MODFLOW with transmissivity calculated as the product of horizontal hydraulic conductivity and the layer thickness at that location and storage represented using a confined aquifer storage coefficient. Layer 3 was configured to represent the Coso Lake Beds Member and modeled as confined as described above. Layer 4 was configured to represent the Coso Sand Member and modeled as confined as described above.

Model layers 1 and 2, together, 3, and 4, were constructed to have variable thickness and spatial extent. The basis for specifying layer thickness and the bottom elevation of each of layers 2, 3, and 4 is described in Brown and Caldwell (2006). ~~m~~ Maps ~~Contour~~ depicting ~~of~~ the bottom elevations of layers 1, 2, 3, and 4 are ~~depicted~~ shown in ~~the Brown and Caldwell report (Figures 8,9 and 10) corresponding to the bottom elevations of layers 2,3 and 4 in the current model~~ **Figures C2-6** through **C2-9**, respectively. Total model thickness from land surface ranged from 150 ft within Little Lake Gap to 3,500 ft near Hay Ranch.

C2-3.3 Model Boundary Conditions

The active portion of the model domain is bounded on the west and east by igneous and metamorphic rocks of the Sierra Nevada and Coso Range which are presumed to be impermeable. Groundwater discharge to Indian Wells Valley in the southeast part of Rose Valley (east of Red Hill) through fractured basalt flows and/or basalt flows overlying alluvial deposits was represented using a head dependent boundary condition. Model cells that represent bedrock areas form the inactive portion of the model domain and also serve as no-flow boundaries. Boundary conditions specified in Layers 1 and 2, 3, and 4, are depicted in **Figures C2-~~5~~ 10**, **C2-~~6~~ 11**, and **C2-~~7~~ 12**, respectively.

No Flow Boundaries/Inactive Cells

The location of no flow boundaries, and thereby, inactive cells in the model domain were essentially the same as those specified in the Brown and Caldwell (2006) model.

Specified Flux Boundaries and Wells

Along the western boundary of the active mode domain, Brown and Caldwell (2006) used specified flux boundaries to represent mountain front recharge derived from precipitation and snowmelt that falls on the Sierra Nevada (**Figures C2-~~5~~ 10**, **C2-~~6~~ 11** and **C2-~~7~~ 12**). Due to the steep topography present on the east side of the Sierra Nevada Mountains, and the absence of well developed drainages on the Rose Valley basin floor, it was assumed that the mountain front recharge could infiltrate to all model layers, and the total mountain front recharge of 4,200 acre-ft/yr was distributed from top to bottom at a ratio of 2:1:2 based on hydraulic conductivity and layer thickness with less recharge assumed to infiltrate the low permeability Coso Lake Beds Member (layer 3). This resulted in specified fluxes of 1,680 acre-ft/yr in layer~~s 1 and~~ 2, 840 acre-ft/yr in layer 3 and 1,680 acre-ft/yr in layer 4.

<u>Fixed groundwater withdrawal rates were specified for existing water supply wells in Rose Valley as detailed in Section C2-2.5.2. Groundwater extraction rates from the two Hay Ranch wells, Hay Ranch North and Hay Ranch South, were varied depending on the pumping scenario being simulated. Both wells are represented in the model as spanning the entire thickness of model layers 1 and 2.</u>

Constant Head Boundary

On the northern edge of the model domain, a constant head (CH) boundary was used to represent the groundwater divide near the south Haiwee Reservoir (**Figure C2-~~5~~ 10)** The groundwater elevation at this boundary was fixed in these cells at a value of 3,750 ft MSL based on groundwater level measurements made by Bauer in 1998 (Bauer, 2002). Groundwater elevations at the south end of Owens Valley near the Haiwee Reservoirs most likely vary with time as a result of changes in pumping rates in Owens Valley and changes in water levels in the reservoirs. No time-series groundwater level measurement data were identified therefore this elevation is fixed in the model. The magnitude of the groundwater inflow rate across this boundary from Owens Valley and/or seepage from Haiwee Reservoir was controlled by modifying the hydraulic conductivity of the alluvium represented by layers 1 and 2 in the model during the model calibration process.

Evapotranspiration

Surface water evaporation from Little Lake and evapotranspiration from phreatophyte plants around the lake was represented using the MODFLOW Evapotranspiration (ET) package with ET cells specified in Layer 1 (**Figure C2-~~5~~ 10**). The extinction depth for the ET cells was set to 15 ft below ground surface, the same value as was used in the 2006 model, and consistent with the value used in the USGS model of Owens Valley (Danskin, 1998). Bauer (2002) estimated the surface water evaporation rate from Little Lake to be approximately 500 acre-ft per year, presumably when the lake is at its maximum depth. The relationship between lake level and surface area is unknown, presumably, at lower water levels the lake covers less area and may lose less water to evaporation. MODFLOW reduces the calculated evapotranspiration loss in proportion to the groundwater table depth below ground surface; no evapotranspiration occurs when the groundwater table is at or below the extinction depth (15 ft), half as much evapotranspiration is calculated when the groundwater table is located at half the extinction depth (7.5 ft) below ground surface. The evapotranspiration rate was adjusted during model calibration to yield a total evapotranspiration loss of approximately 500 acre-ft per year in the steady state model, consistent with the 2006 model.

General Head Boundaries

The groundwater outflow to Indian Wells Valley from the southeast part of Rose Valley near well 18-28 was simulated using general head boundary (GHB) cells specified in layers 3 and 4 (**Figures C2-~~6~~ <u>11</u>** and **C2-~~7~~ <u>12</u>**). GHB cells in MODFLOW allow groundwater inflow or outflow from the model at a rate dependent on the difference between groundwater elevation in the model and a specified elevation and a conductance assigned to the general head boundary cell; however, the groundwater elevation in the GHB cell is calculated by MODFLOW during a simulation, not fixed like a CH boundary cell. Brown and Caldwell used groundwater elevations measured in the Lego Well in Rose Valley and historical water level elevations measured in the Indian Wells Valley (presented in Bloyd and Robson, 1971) to estimate the flow across this boundary. The conductance and groundwater elevation in the GHB cells were adjusted during the model calibration process to better simulate groundwater elevations observed in the southeast part of Rose Valley.

The groundwater outflow to Indian Wells Valley in the Little Lake area was represented using GHB cells specified at the south end of the model grid near Little Lake (**Figure C2-~~5~~ 10**). This is a departure from the treatment of these groundwater outflow terms in the Brown and Caldwell model in which MODFLOW drain cells were used to represent groundwater discharge and the evaporation package was used to represent evaporation from Little Lake. The principal items of interest in the Little Lake area are groundwater elevation near the lake, which impacts lake level and discharge, and the amount of groundwater flow available for discharge to springs and transpiration by wet land plants. The MODFLOW evaporation package varies the estimated evaporation rate depending on the calculated depth to groundwater, which is not currently an issue in this area. The MODFLOW drain package stops calculating flow to the drain when the local groundwater elevation drops below the base of the drain. It is anticipated that groundwater will continue to discharge to Indian Wells Valley at a reduced rate, even if pumping draws groundwater levels down below the level of Little Lake at some point in the future; thus the MODFLOW drain package does not adequately represent possible worst case conditions in the area. Use of MODFLOW GHB cells in this area better represents hydrogeologic conditions and allows both groundwater elevation and discharge rate to be easily monitored during simulations.

C2-3.4 Model Initial Aquifer Parameters

Aquifer horizontal hydraulic conductivity for the revised model was initially specified with the distribution developed by Brown and Caldwell which ranged from values of 0.28 to 100 ft/day in layers 1 and 2, 0.03 to 2.8 ft/day in layer 3, and 0.28 ft/day in layer 4. Confined aquifer ~~storativity~~ specific storage was initially specified as 2 x 10^{-6}/ft based on the storage coefficient of 0.001 estimated from the 2003 pumping test (GeoTrans, 2003) and an average effective aquifer thickness of 600 ft. Layer 1 specific yield was initially specified as 10 % as specified in the original model, equal to that specified for Owens Valley by Danskin (1998). Aquifer vertical hydraulic conductivities were initially specified as the same value as horizontal hydraulic conductivity except near the Hay Ranch where the vertical hydraulic conductivity was reduced to 1 ft/day to be more consistent with the lower vertical hydraulic conductivity indicated by the November/December 2007 pumping test results.

C2-3.5 Model Recalibration

Calibration of the numerical model of groundwater flow conditions in Rose Valley, was conducted in an iterative process which consisted of attempting to match groundwater level drawdown observed during the 2007 pumping test, which was mainly by adjusting parameters local to the Hay Ranch. ~~then matching m~~Model parameters were then adjusted across the entire model domain to better fit groundwater inflow/outflow calculations and groundwater elevations measured prior to the pumping test. This process was repeated until both the steady-state model fit the November 2007 groundwater elevation data and the transient version of the model fit the pumping test data.

C2-3.5.1 Initial Calibration to 2007 Pumping Test Data

Time-water level measurements from the Hay Ranch North and the Coso Ranch North wells were used to calibrate the revised numerical model. Boundary groundwater discharge inflow and outflow rates were fixed for this evaluation. A model simulation of the Hay Ranch South well pumping at a rate of 1,925 gpm for 14 days was developed with monitoring points at the Hay Ranch North and Coso Ranch North well locations and other locations in Rose Valley. Then horizontal and vertical hydraulic conductivity, confined aquifer storativity, and unconfined aquifer specific yield were adjusted until a best fit was obtained between observed and model predicted groundwater level drawdown. Plots of predicted versus observed groundwater level drawdown versus time for the Hay Ranch North and Coso Ranch North wells are shown on **Figure C2-14 9**. A good fit was obtained to the Hay Ranch North well data; the observed water level response of the Coso Ranch North well was complicated by unmetered wells pumping in the area and barometric pressure induced water fluctuations, neither of which are readily reproduced in the numerical model so the model fit to these data was more difficult to assess.

C2-3.5.2 Steady-State Model Recalibration

After developing preliminary, revised estimates of aquifer hydraulic parameters by calibrating to pumping test data, groundwater elevations were simulated and compared to observed elevations. Then the steady-state model was further recalibrated to improve the match between the observed groundwater elevation distribution throughout Rose Valley and estimated groundwater inflow/outflow components. During the model calibration process, mountain front recharge rates and constant head boundary elevations remained unchanged. Hydraulic conductivity and general head boundary cell conductance values were adjusted until a reasonable match was obtained between observed and predicted groundwater elevations and groundwater flow component targets. Groundwater flow rate targets consisted of: a total groundwater budget (inflow and outflow) of approximately 5,000 acre-ft/yr; with approximately 800 acre-ft/yr for inflow from Owens Valley, and no more than 4,200 acre-ft/yr discharged to the Little Lake Gap. Groundwater elevation targets were developed from data presented in **Table C2-1**.

C2-3.5.3 Calibrated Model Parameters

Aquifer storage terms were initially estimated from the pumping test calibration, understanding that these estimates would be relevant to simulations of a duration similar to that of the pumping test (14 days) and that longer stresses of months or years would likely have different values for specific yield. Final values of 7 x 10^{-7}/ft were identified for confined aquifer ~~storativity~~ specific storage (applicable to layers 2, 3, and 4) and 3 % for specific yield (applicable to layer 1 only) based on calibration to the pumping test data.

The distribution of calibrated model hydraulic conductivity values are illustrated on **Figures C2-~~8~~ 13** through **C2-~~11~~ 6** for layers 1 through 4, respectively. Horizontal hydraulic conductivity ranged from values of 0.08 to 200 ft/day in layers 1 and 2, 0.03 to 2.8 ft/day in layer 3, and a constant value of 0.28 ft/day in layer 4. The main changes in the hydraulic conductivity distribution developed for the recalibrated model were: 1) lower vertical hydraulic conductivity in the alluvial deposits near the central part of Rose

Valley; 2) lower horizontal hydraulic conductivity in the area south of the Red Hill cinder cone where volcanic deposits interfinger with alluvial sands; and, 3) slightly higher horizontal hydraulic conductivities in the alluvial deposits near Little Lake and to the north. The horizontal hydraulic conductivity of alluvial deposits near the Hay Ranch, represented by layers 1 and 2, was unchanged from the 2006 model. A lower vertical hydraulic conductivity value of 0.019 ft/day (compared to 2.4 ft/day previously) was used in this area based on the results of the 2007 pumping test.

C2-3.5.4 Calibrated Model Accuracy

The accuracy of the model calibration efforts was evaluated first by comparison of observed and simulated groundwater elevations; and second by comparison of conceptual and simulated groundwater budgets. **Figure C2-1~~2~~ 7** shows a comparison of predicted groundwater elevation contours versus groundwater elevations observed in November 2007. **Figure C2-1~~3~~ 8** shows a plot of predicted versus observed groundwater elevation at the eleven target locations for the steady state model. A perfect match is indicated by the dashed line on **Figure C2-1~~3~~ 8**.

The model simulated groundwater elevations scatter closely around the ideal calibration line throughout the central and southern portions of Rose Valley but are lower than the observed values in the Cal-Pumice and LADWP wells at the north end of the valley. Excluding the values for the Cal-Pumice and LADWP wells, the residual and absolute mean errors were –1 and +2.2 ft which are less than 1 % of the observed range in groundwater elevations along the length of Rose Valley. Including the Cal-Pumice and LADWP wells, the residual and absolute mean errors are still less than 5% of the observed range in groundwater elevations. The discrepancy between predicted and observed groundwater elevations at the north end of the valley points to a shortcoming in the data available for developing the model in that area, and, consequently, a shortcoming in the model. As noted previously, groundwater elevations are expected to vary seasonally near Haiwee Reservoir but have not been measured since Bauer’s work in 1998. Data from 1998 monitoring were used to develop the boundary conditions for the north end of the model.

Figure C2-14 9 presents a comparison of the simulated versus observed groundwater level drawdown in the Hay Ranch North and Coso Ranch North wells during the November/December 2007 pumping test. The model simulates the drawdown observed in the Hay Ranch North well reasonably well with an average error of 0.2 ft but does less well with the Coso Ranch North well. The model predicted no more than 0.1 ft of drawdown in the Coso Ranch North well while the groundwater level may have drawn down as much as 0.25 ft during the pumping test. The model predicts nearly 0.3 ft of drawdown in the Cal-Pumice well which cannot be confirmed because of a pre-existing falling water level trend in that well. The model predicts that less than 0.01 ft of drawdown develops in the Lego, 18-36, or Little Lake Ranch North wells, consistent with field observations.

The accuracy of the calibration was also evaluated by comparing the conceptual and simulated water budgets. Previous estimates of the groundwater underflow into Rose Valley from Owens Valley/Haiwee Reservoir ranged from 600 to 788 acre-ft/yr. The recalibrated model estimated the groundwater inflow from the north to be 890 acre-ft/yr. Brown and Caldwell estimated the groundwater underflow to Indian Wells Valley from southeastern Rose Valley to be as much as 2,050 acre-ft/yr. The recalibrated model estimated the groundwater underflow by this pathway as 850 acre-ft/yr. The groundwater outflow from the Little Lake area including evaporation losses has been estimated to be between 2,900 and 3,800 acre-ft/yr. The recalibrated model estimated the groundwater outflow from the Little Lake area to be 4,200 acre-ft/yr but that total included transpiration losses from wetland plants that were not considered in previous estimates.

C2-3.5.5 Sensitivity Analyses

Sensitivity analyses was performed on the major groundwater flow model input parameters. The input parameters analyzed in the sensitivity analysis included:

- Horizontal hydraulic conductivity;
- Vertical hydraulic conductivity;
- Specific storage and specific yield;
- General head boundary cell conductance;
- Evapotranspiration rate at Little Lake; and,
- Total mountain front recharge and recharge layer.

Sensitivity analysis was conducted by running repeated simulations in which parameters were changed one at a time while all other parameters were held to the best estimates developed in the calibration process. The sensitivity of a particular parameter was evaluated by comparing the effect of changing the parameter on the standard deviation of calibration residuals.

Steady-State Model Sensitivity Analysis

Analyses were performed to assess the sensitivity of the steady-state groundwater flow model to values selected for horizontal and vertical hydraulic conductivity, constant head and general head boundaries, mountain front recharge, and evapotranspiration at Little Lake. A steady-state simulation by default does not use specific yield or specific storage.

Results of the steady-state model sensitivity analysis are shown on **Figures C2-20 through C2-22.** In these figures, the X-axis on the three charts is the multiplier used to change the parameter value with a value of one corresponding to the best estimate from model calibration. The Y-axis on the charts is the resulting standard deviation of calibration residuals. To allow for comparison of sensitivity, the axis' limits are the same on all three charts. The steady-state model is most sensitive to horizontal hydraulic conductivity values in layers 1 and 2 near Hay Ranch and Little Lake. The steady-state model is less sensitive to vertical hydraulic conductivity which is expected because there are no major pumping stresses in the steady-state model. As depicted on **Figure C2-22**, the steady-state model is also somewhat sensitive to total mountain front recharge, where changing the recharge by plus or minus 50% changed the calibration residual by 5 to 15%. The steady-state model was insensitive to whether mountain front recharge was applied to layer 2, only, or split between layers 1 and 2.

(Transient) Pumping Test Calibration Model Sensitivity Analysis

Analyses were performed to assess the sensitivity of the transient groundwater flow model to values selected for horizontal and vertical hydraulic conductivity, specific storage, and specific yield.

Results of the transient model sensitivity analysis are shown on **Figure C2-23**. In this figure, the X-axis on the three charts is the multiplier used to change the parameter value with a value of one corresponding to the best estimate from model calibration. The Y-axis on the charts is the resulting standard deviation of calibration residuals. To allow for comparison of sensitivity, the axis' limits are the same on all three charts. The transient model is most sensitive to horizontal and vertical hydraulic conductivity values in layers 1 and 2 near Hay Ranch and specific yield. The transient model is less sensitive to hydraulic conductivity values in layers 3 and 4 which is expected because the Hay Ranch well pumped for the aquifer test is only screened in layers 1 and 2. Moreover, because layers 1 and 2 have much higher hydraulic conductivity values than layers 3 and 4, the vast majority of the groundwater flow is through the upper two layers, and the presence of the lower two layers has a relatively minor affect on the flow system.

C2-3.5.~~5~~ 6 Model Limitations/Data Gaps

The process of reviewing hydrogeologic data for the site and recalibrating the model identified several data gaps and resulting limitations of the numerical groundwater flow model developed for Rose Valley. These include:

- Lack of recent seasonal groundwater elevation data north of Rose Valley adjacent to the southern Haiwee Reservoir. As discussed in Section C2-3.5.4, the model underpredicted steady state groundwater elevations in the Cal-Pumice and LADWP wells by 16 and 105 ft, respectively while matching groundwater elevations in wells in the remainder of the valley to within 1 to 5 ft. The model also represents groundwater elevation as fixed at the north end of the model grid which is inconsistent with monitoring data for the LADWP wells which indicated groundwater level fluctuations of up to 7 ft seasonally. The cause of these fluctuations and the discrepancy between predicted and observed groundwater elevations in this area are not well understood and need further investigation~~.~~, but are likely related to an apparent lower hydraulic conductivity and higher hydraulic gradient in the northern portion of the valley. However, because the model matches groundwater elevation observations in central and southern Rose Valley reasonably well, it is useful for prediction of pumping impacts through the central and ~~at the~~ southern ~~end~~ portions of the valley.

- Lack of transmissivity or storativity data outside the Hay Ranch area. It should be noted that estimated aquifer hydraulic parameters were initially evaluated by conducting a pumping test at the Hay Ranch. As noted previously, drawdown was only observed near the Hay Ranch, so estimates of aquifer parameters elsewhere in Rose Valley are heavily dependent on assumptions and parameters built into the numerical model.

- Lack of recent seasonal flow measurements or water level measurements on the Little Lake Ranch property. The most recent data for Little Lake water level and groundwater and spring discharges at the Little Lake Ranch date to 1998. While groundwater elevations in Rose Valley appear to be similar or higher than Bauer observed in 1998, suggesting the flow measurements are still applicable, future monitoring programs should include the hydrogeologic features at Little Lake~~.~~ if permitted by the property owners.

It should be noted that as outlined in Section C4 of this Appendix, recalibration of the model is mandated as part of a process of continual improvement of the model predictions. As new data are obtained and the actual response fo the aquifer to pumping is observed over months or years of time, the model will be recalibrated, first within a year of pumping startup, and then as needed depending on how well the water level drawdowns observed at various monitoring points match the predicted drawdowns. These mandated recalibrations will result in increased levels of accuracy for the model over time.

C2-4 Analysis of Groundwater Development Scenarios

This section discusses the evaluation of several groundwater development scenarios. For these scenarios, the numerical groundwater flow model developed for Rose Valley was run in transient mode, using the calibrated aquifer hydraulic conductivity and boundary cell elevation, conductance, and flow values identified in Section C2-3.5.3. An aquifer storage coefficient value of 7×10^{-7}/ft was used for model layers 2, 3, and 4.

The model calibration to the 2007 pumping test data yielded an estimated specific yield for the alluvial aquifer of 3 %. This value is quite low for typical sand and gravel aquifers such as occur in Rose Valley and is believed to underestimate the specific yield value applicable to multi-year pumping. Specific yield values estimated from pumping tests frequently underestimate the actual drainable porosity of the aquifer (see Neuman, 1975; Zhan and Zlotnik, 2002). Published values of specific yield (Johnson, 1967; Morris and Johnson, 1967) range from 2 % for clay to 35 % for well-graded gravels as tabulated in Table C2-5. Groundwater-yielding sediments encountered in Rose Valley consist primarily of sand and gravel interbedded with clays; most of the groundwater will come from the more readily drainable sand and gravel horizons. Because a representative long-term specific yield estimate could not be determined from the pumping test data, a range of values corresponding to high, medium, and low values of 30%, 20% and 10 % were used in the project development impact analyses discussed below.

C2-4.1 Full Project Development

Full project development consists of pumping the two Hay Ranch wells at a combined total extraction rate of 4,839 acre-ft/yr with pumping evenly divided between the two wells. For this evaluation, 180 year transient simulations were performed with groundwater table drawdown and groundwater discharge rates reported at regular intervals to evaluate aquifer conditions, during and after the specified 30 years of continuous pumping. All aquifer parameters were maintained as described for the calibrated model with the exception that specific yield in the uppermost model layer was set to values of 10%, 20% or 30% for individual model runs to assess sensitivity to this parameter. The model predicted groundwater table drawdown after 30 years of pumping at the full project development rate is depicted on **Figure C2-24**.

Table C2-5: Values of Specific Yield from Johnson, 1967

Soil Type	Minimum	Average	Maximum
Clay	--	2	5
Sandy clay (mud)	3	7	12

Silt	3	18	19
Fine sand	10	21	28
Medium sand	15	26	32
Coarse sand	20	27	35
Gravelly sand	20	25	35
Fine gravel	21	25	35
Medium gravel	13	23	26
Coarse gravel	12	22	26
Volcanic Tuff	--	21	--
Till, predominantly sand	--	16	--
Till, predominantly gravel	--	16	--

C2-4.1.1 Evaluation of Potential Drawdown Impacts

Numerical values for initial groundwater elevation throughout the active portion of the model domain were established by running a steady state simulation with aquifer parameters and boundary conditions set as described in preceding sections with no pumping whatsoever at Hay Ranch. A transient version of the calibrated numerical model, with the same aquifer parameters and boundary conditions as the steady state model, was used to predict aquifer response to various rates and durations of pumping at Hay Ranch. Drawdown at selected observation points was calculated by having MODFLOW import the final groundwater elevations from the steady state model and subtract predicted groundwater elevations at these observations points from the output of the transient model simulation run. These values were then saved as a series of time-drawdown predictions at selected monitoring points.

C2-4.1.2 Evaluation of Potential Groundwater Flow Impacts

Numerical values for initial groundwater flow rates in various portions of the model domain were established as for drawdown by running a steady state simulation with aquifer parameters and boundary conditions set as described in preceding sections with no pumping whatsoever at Hay Ranch. A transient version of the calibrated numerical model, with the same aquifer parameters and boundary conditions as the steady state model, was used to predict aquifer response to various rates and durations of pumping at Hay Ranch. Changes in groundwater flow rates in various portions of the model were then evaluated by comparing the groundwater flow rates predicted in the steady state model with no Hay Ranch pumping to the groundwater flow rates predicted in the transient model with specified rates and duration of pumping at the Hay Ranch wells. The Groundwater Vistas groundwater Mass Balance Export function to extract groundwater flow rates from selected portions of the model domain in the steady state and transient model simulations, respectively.

C2-4.1.2 Sensitivity of Long-Term Pumping Simulations to Aquifer Parameters

Because the pumping impact scenario simulations introduce a significant pumping stress at Hay Ranch in the form of higher pumping rates and longer pumping durations than are represented in the steady-state model or the transient model calibrated to the November/December 2007 pumping test, the impact scenarios are sensitive to a slightly different set of aquifer parameters. Sensitivity was evaluated in terms of the predicted groundwater table drawdown near Little Lake.

The impact scenario simulations are highly sensitive to the specific yield of the Rose Valley aquifer. At a specific yield of 10%, the drawdown predicted at Little Lake after 30 years of pumping at 4,839 acre-ft per year reached a maximum of just under 8 ft, whereas at a specific yield of 30% the maximum predicted drawdown drops to just over 3 ft. The impact scenario simulations are insensitive to aquifer specific storage with no change in drawdown predicted at Little Lake for values 10 times lower or 10 times higher than the value of 7 x 10^{-7}/ft estimated from model calibration efforts. This is a reflection of the fact that specific storage contributes little to long-term groundwater production while drainage of soil pores reflected by the specific yield is a major factor.

Sensitivity to hydraulic conductivity and recharge was also tested. Responses to changes in vertical and horizontal hydraulic conductivity values for the impact scenarios are comparable to those of the transient simulation developed to calibrate the model to the November/December 2007 pumping test. As would be expected, the impact scenarios are highly sensitive to estimated total mountain front recharge. The drawdown predicted at Little Lake increases to a maximum of 12 ft if only half the recharge assumed for the base case simulations is available and decreases to a maximum of 4 ft if 50% more recharge is available. Consequently, long-term monitoring will be needed during project operation to evaluate aquifer response to pumping and better refine parameter estimates developed for the EIR.

C2-4.2 Cumulative Effects Analysis

The Cumulative Effects Analysis consisted of developing and running a transient model simulation scenario in which the Hay Ranch wells were pumped at the full project development rate of 4,839 acre-ft/yr plus pumping was simulated at the LADWP wells at a rate totaling 900 acre-ft/yr using the MODFLOW well package. Initial attempts at performing this analysis failed because the model cell in which LADWP well V816 is located went dry before the end of the simulation, terminating groundwater extraction at that location.

The extraction rate from the LADWP property was then dispersed between several well nodes and eventually reduced until a stable simulation run could be conducted. That occurred when extraction of approximately 770 acre-ft/yr was distributed between three pumping nodes. Potential impacts to groundwater elevation and flow rates were then performed as described in Sections C2-4.1.1 and C2-4.1.2, respectively.

C2-5 Analysis of Mitigation Measures

Potential measures to mitigate possible impacts to groundwater resources of Rose Valley caused by implementation of the full development project rate of 4,839 acre-ft/yr extraction from the Hay Ranch wells were evaluated using the numerical groundwater flow model. The mitigation measures evaluated consisted of:

- Reducing Hay Ranch pumping rates below the full project development rate of 4,839 acre-feet per year;
- Reducing Hay Ranch pumping duration from the full project duration of 30 years; and,
- Augmenting the water supply to Little Lake by extracting groundwater on the Little Lake Ranch property and pumping that water into the lake.

Techniques for evaluating potential groundwater table drawdown and changes to groundwater flow rates used in the evaluation of potential mitigation measures are the same as those described in Section C2-4 and are not discussed further here.

C2-5.1 Little Lake Water Supply Augmentation

The calibrated numerical groundwater flow model was used to evaluate the potential for augmenting the water supply available to maintain the water level in Little Lake. Prolonged pumping of the Hay Ranch wells could result in groundwater table drawdown near Little Lake that could reduce groundwater inflow to the lake and consequently reduce lake levels. A potential mitigation measure to restore or maintain lake levels would involve pumping groundwater from an existing or new well on the Little Lake Ranch property and pumping the water into Little Lake. Augmentation by pumping groundwater from one of the Little Lake Ranch wells into the lake reportedly has been conducted in the past; however, details of previous augmentation efforts were not available for review. Adding water to the lake would provide water closer to the ground surface for irrigation needs and maintenance of phreatophyte plant communities. Augmentation might only be needed during the summer months when phreatophyte plants actively grow and transpire soil moisture.

Augmentation was evaluated by specifying groundwater extraction from a well node located on the Little Lake Ranch property and injection of an equal amount of water via a well node located within the footprint of Little Lake. The amount of groundwater needed to augment lake levels is difficult to estimate at this time because there are not much data on the hydrologic features at the lake. A simulation in which groundwater was extracted from the Little Lake Ranch House well at an annualized rate of 740 acre-ft/yr (450 gpm) and reinjected into Little Lake was conducted. The augmentation simulation assumed that 1) production at the Hay Ranch would be reduced to 2,424 acre-ft/yr (1,500 gpm) beginning in the 20^{th} year after project startup, and, 2) that extraction from the Little Lake Ranch House well coupled with injection into Little Lake would start at the same time. Results of the augmentation simulation indicated that water could be added to Little Lake to maintain surface water level and flows. However, groundwater drawdown on the property could be increased over and above the amount induced by pumping the wells at Hay Ranch as a result of the groundwater extraction. Because most of the groundwater diverted into the lake ultimately infiltrates back into the ground on the property, the increased drawdown is expected to be small. For this augmentation scenario, the model predicted an increase in drawdown of approximately 0.1 ft below Little Lake as a result of the pumping on the property and increased approximately 1 to 2 ft around the Little Lake Ranch House well.

Analysis of the capacity of one or more of the wells on the Little Lake Ranch property would need to be completed early in the project, preferably during the baseline monitoring period, to establish the viability of this mitigation option. An analysis of the interaction between groundwater and lake levels and discharge rates would also need to be completed during the baseline monitoring period to evaluate the potential amount of water needed, should an augmentation scheme be employed later in the life of the project.

C2-6 References

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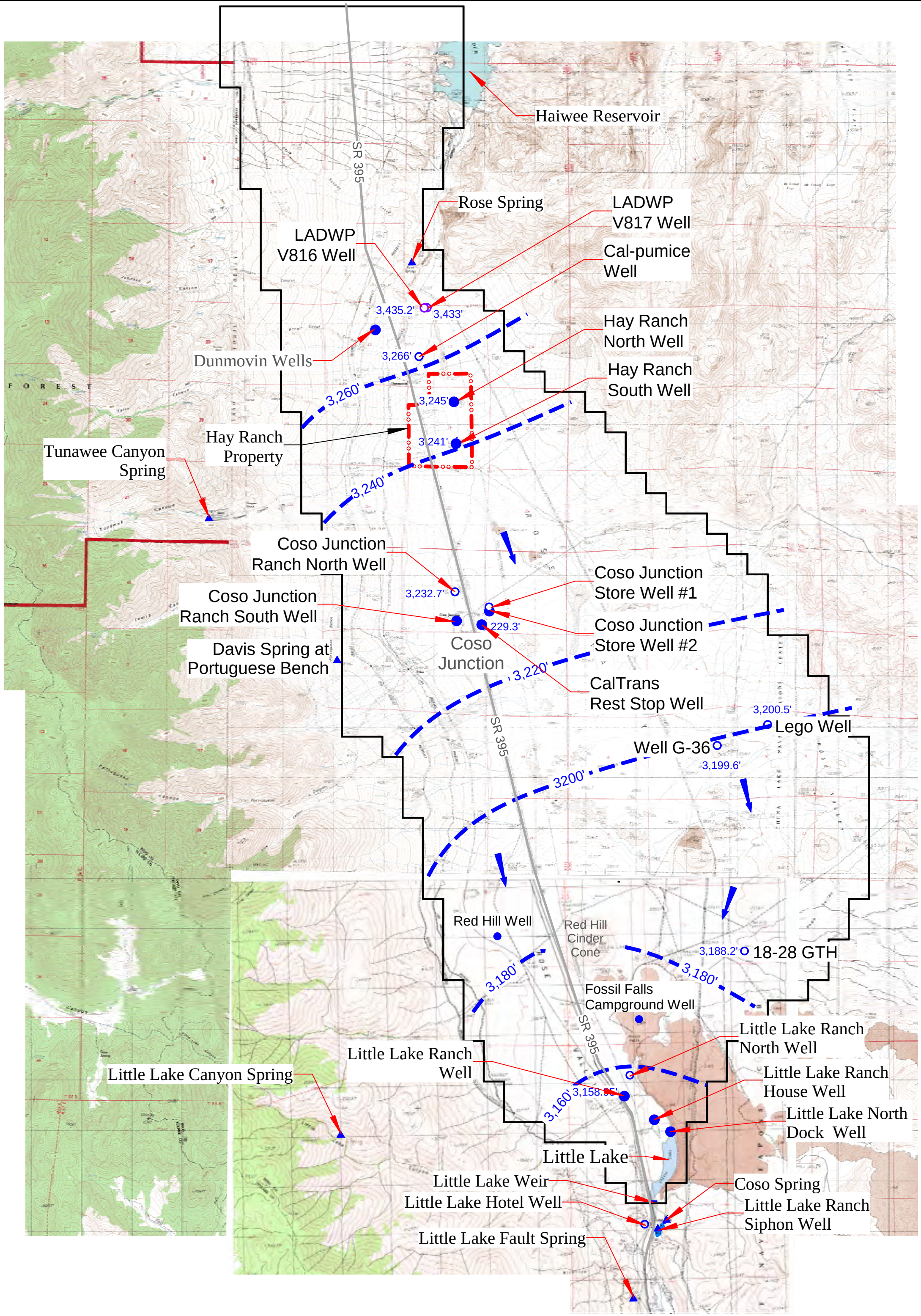


Key

- ▲ Spring or Siphon Well
- ● Pumping Well
- ○ Out-of-Use Well
- 3,160' Groundwater Elevation Contour, ft
- Groundwater Flow Direction
- Boundary of Numerical Model

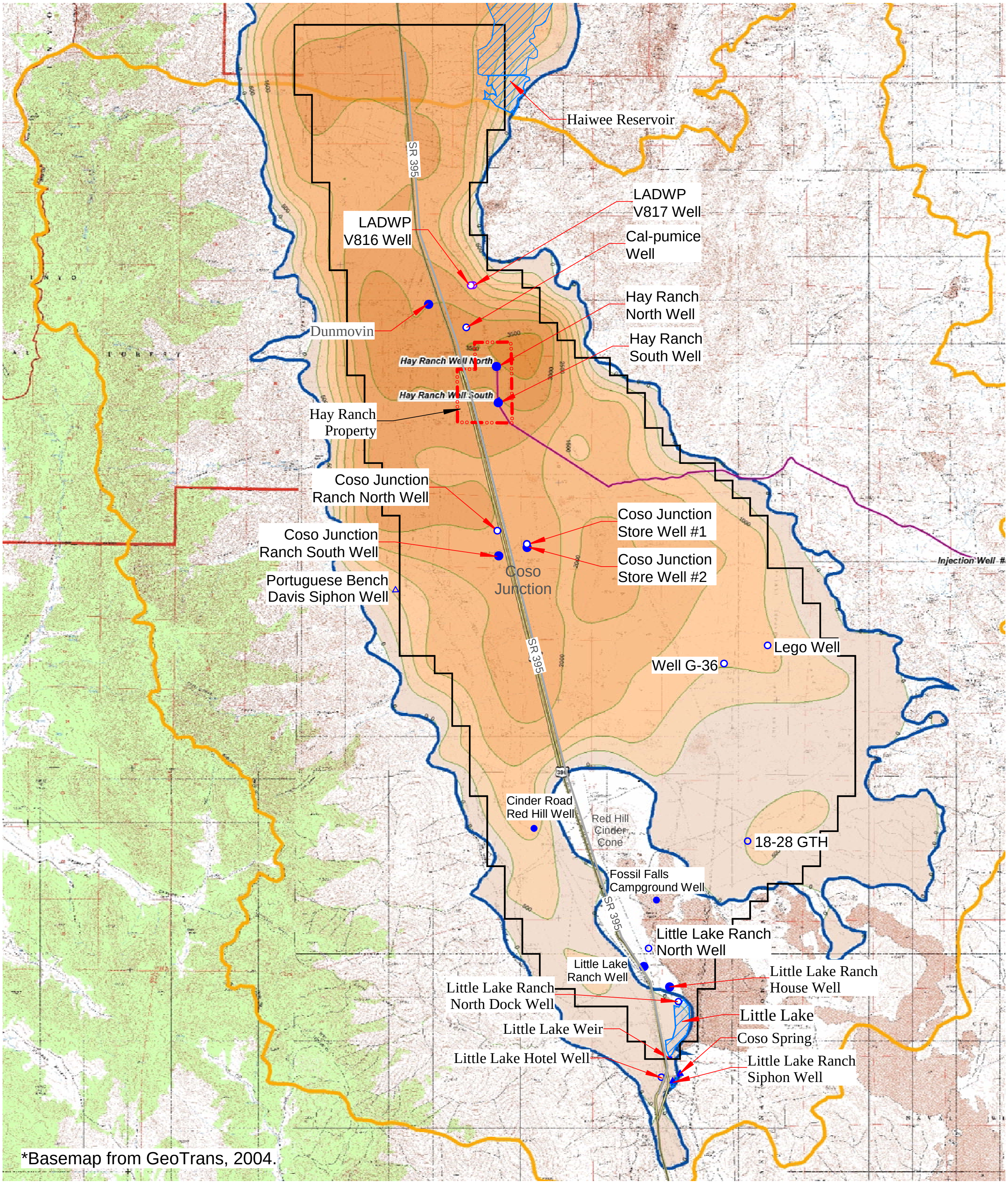
Approximate Scale in miles

0 1 2

N

Study Area Map and Groundwater Elevation Contour Map - November 2007

Figure C2-1



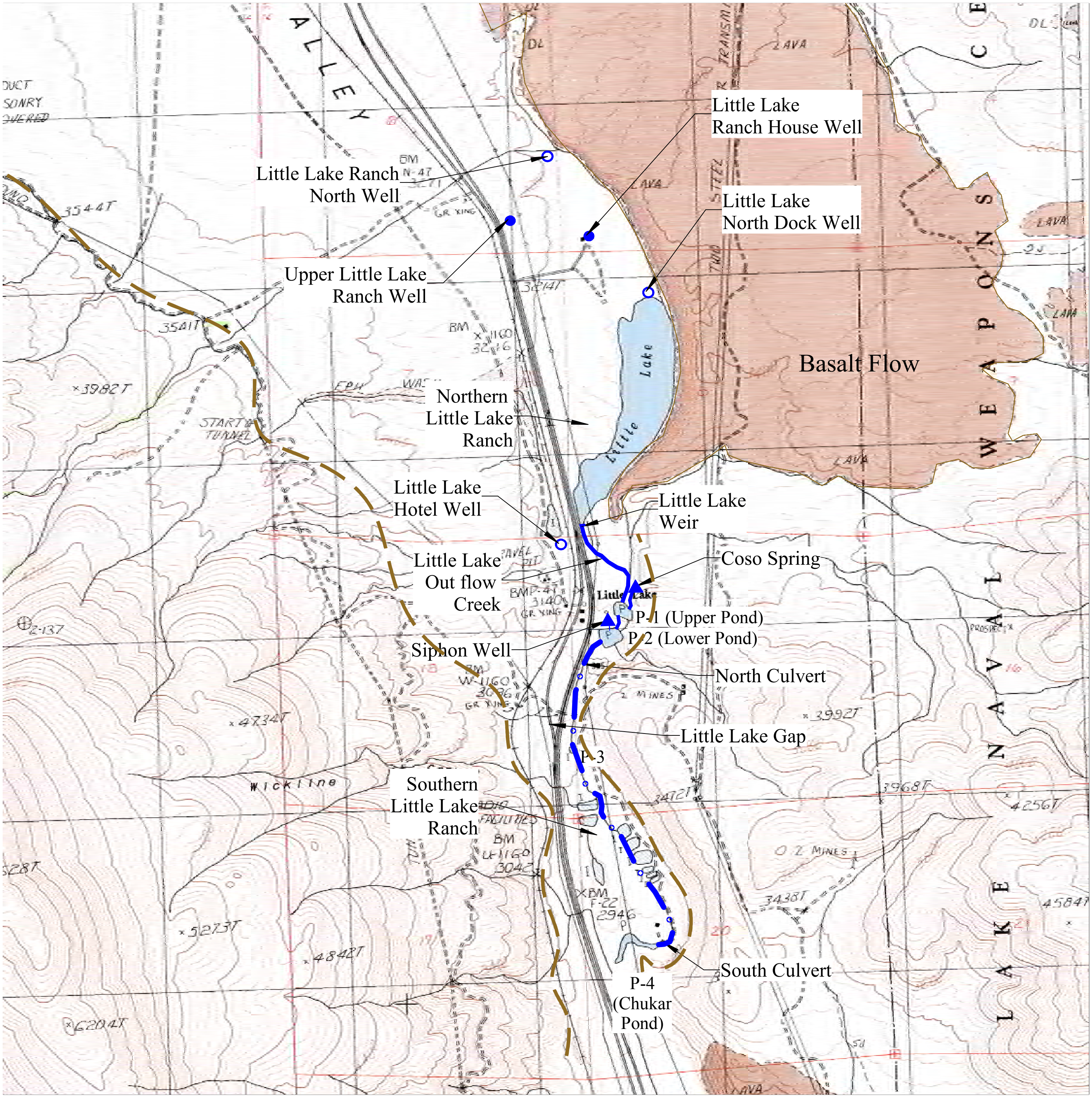
Key

Spring or Siphon Well	Watershed Boundary
Pumping Well	Approximate Surficial Extent of Alluvium
Out-of-Use Well	Estimated Alluvial Thickness Contours (feet)
Boundary of Numerical Model	

N

Alluvial Thickness Map

Figure C2-2



Key

- Spring or Siphon Well
- Pumping Well
- Out-of-Use Well

Approximate Scale in miles

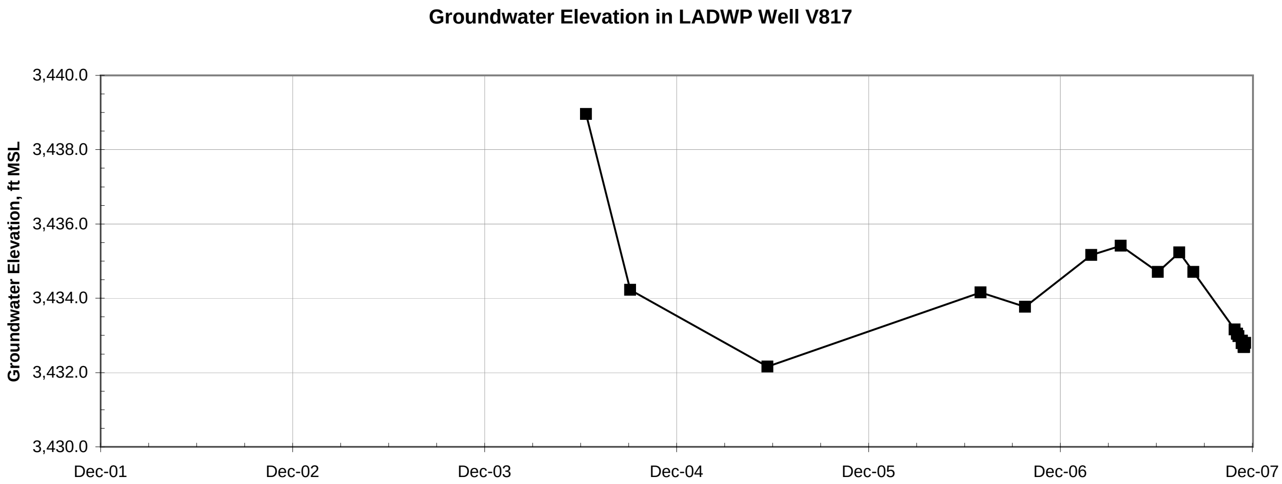
0 0.5

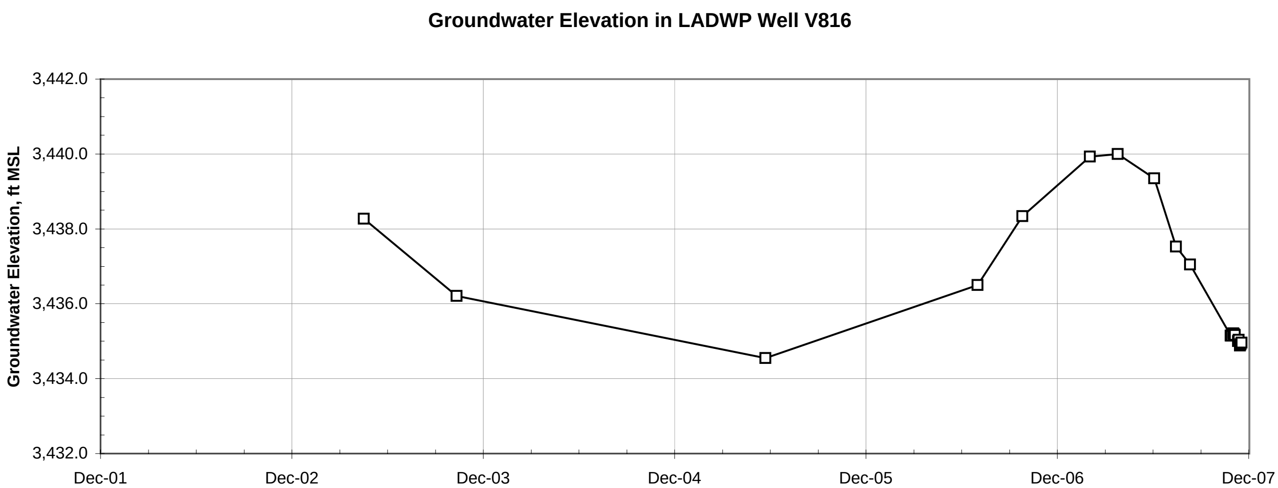
N

Hydrologic Features of Little Lake Ranch

Figure C2-3

Figure C2-4
Rose Valley Groundwater Level Hydrographs





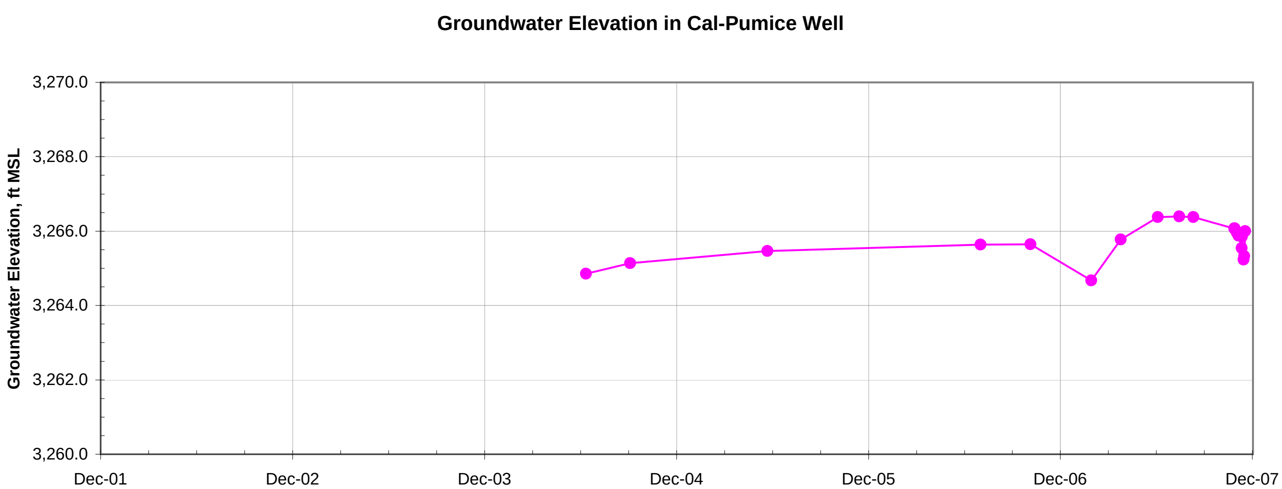
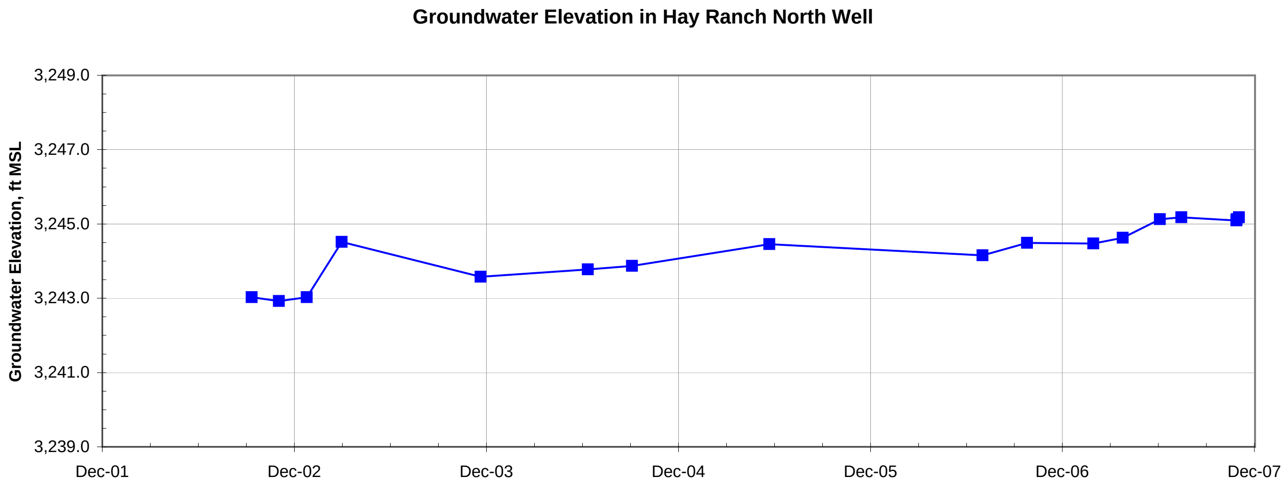
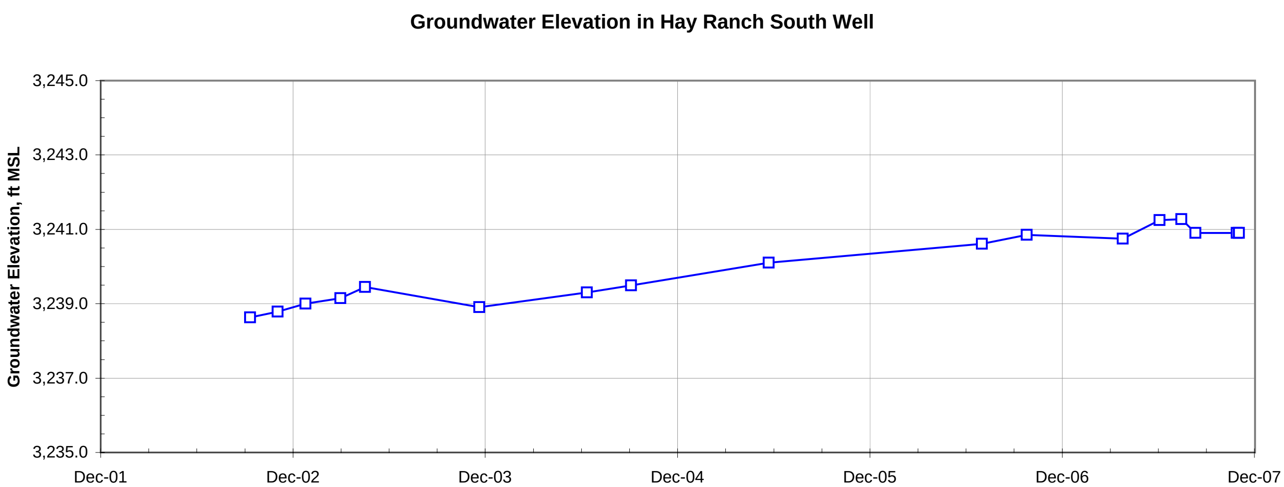


Figure C2-4
Rose Valley Groundwater Level Hydrographs





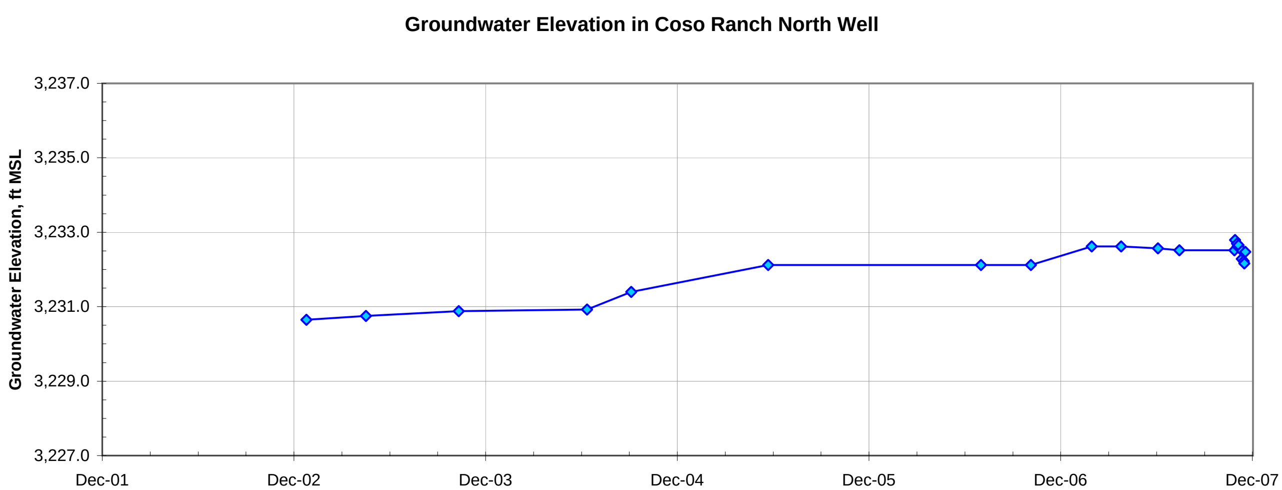
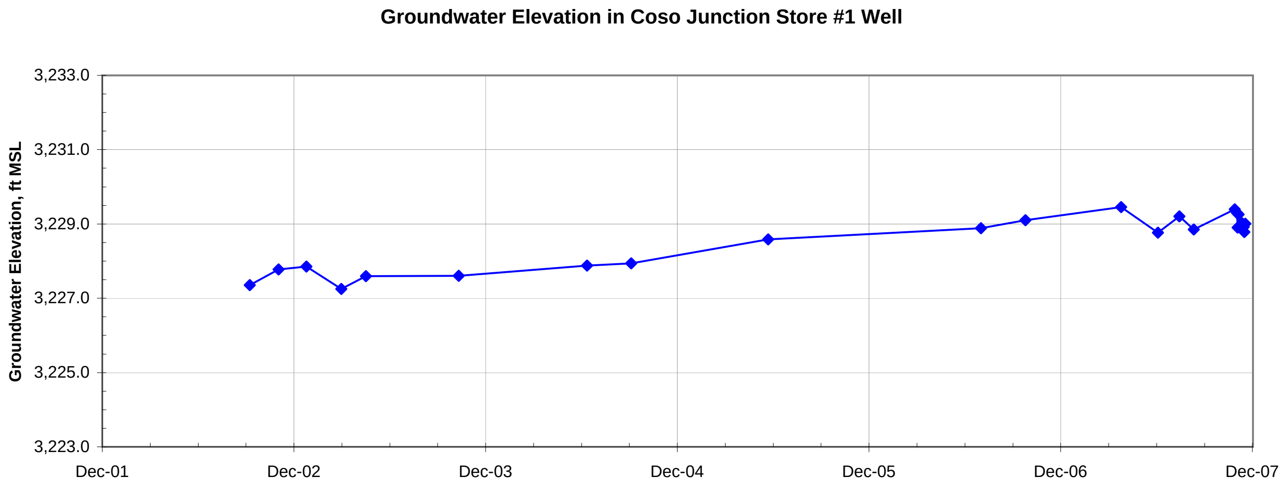
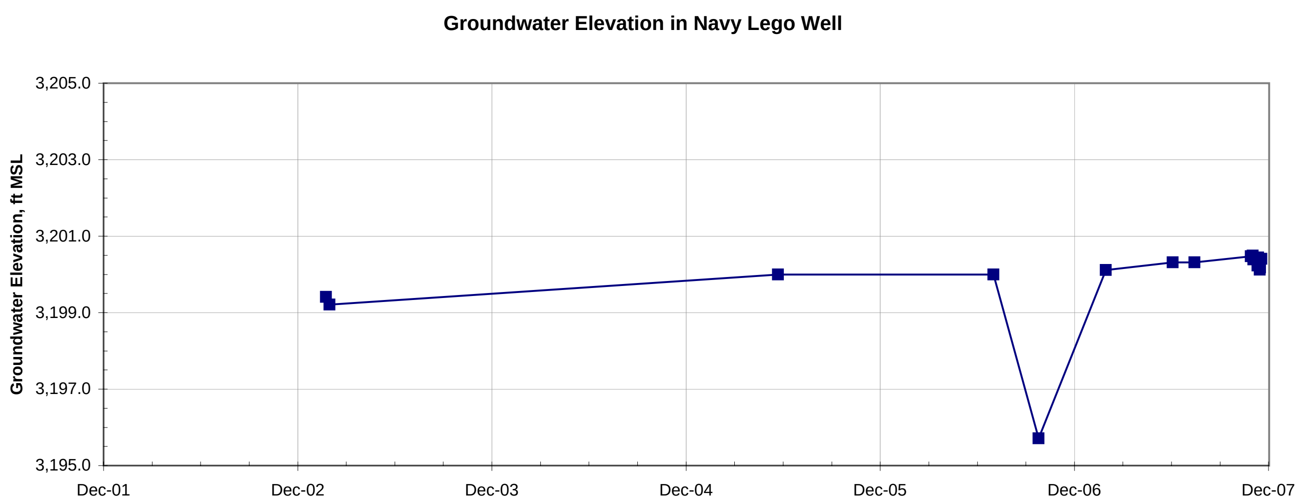


Figure C2-4
Rose Valley Groundwater Level Hydrographs





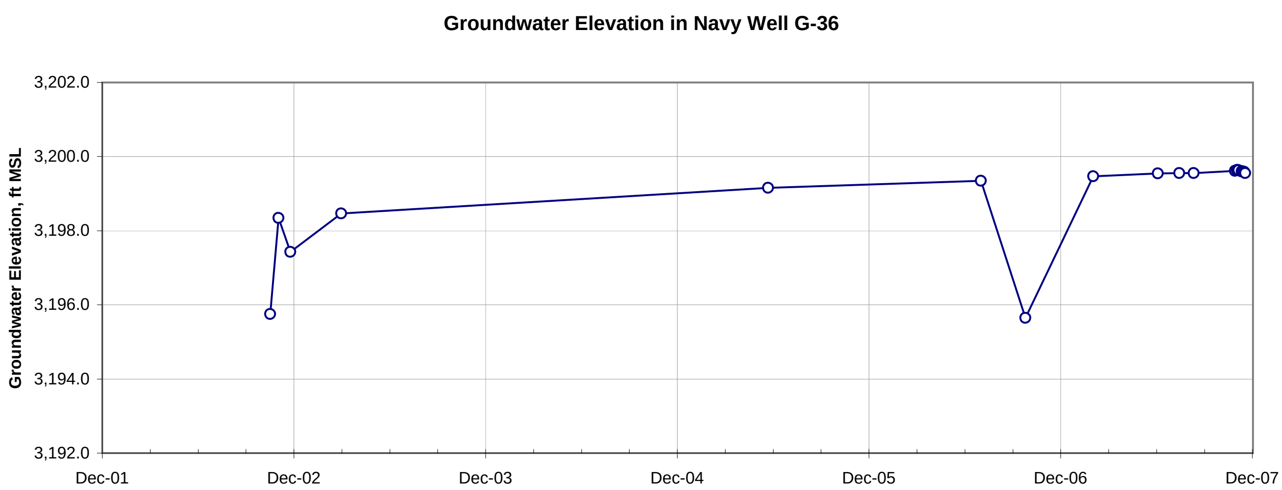
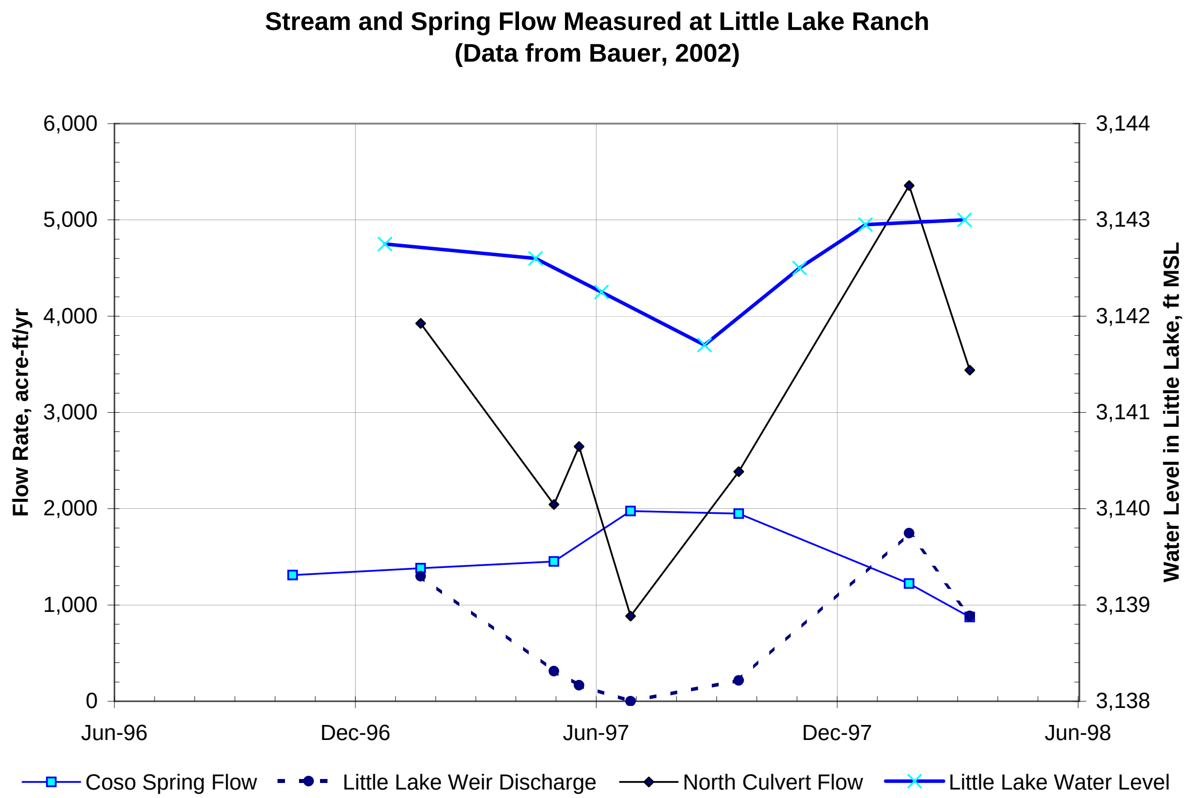
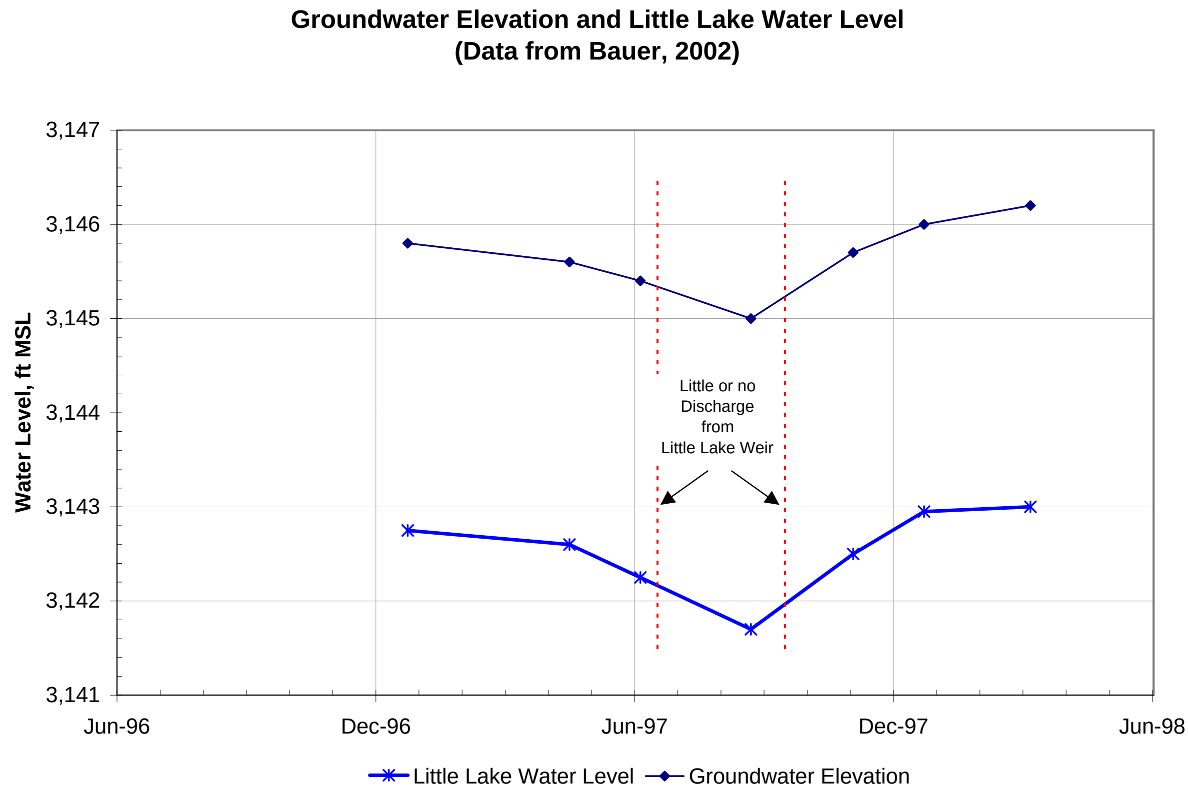
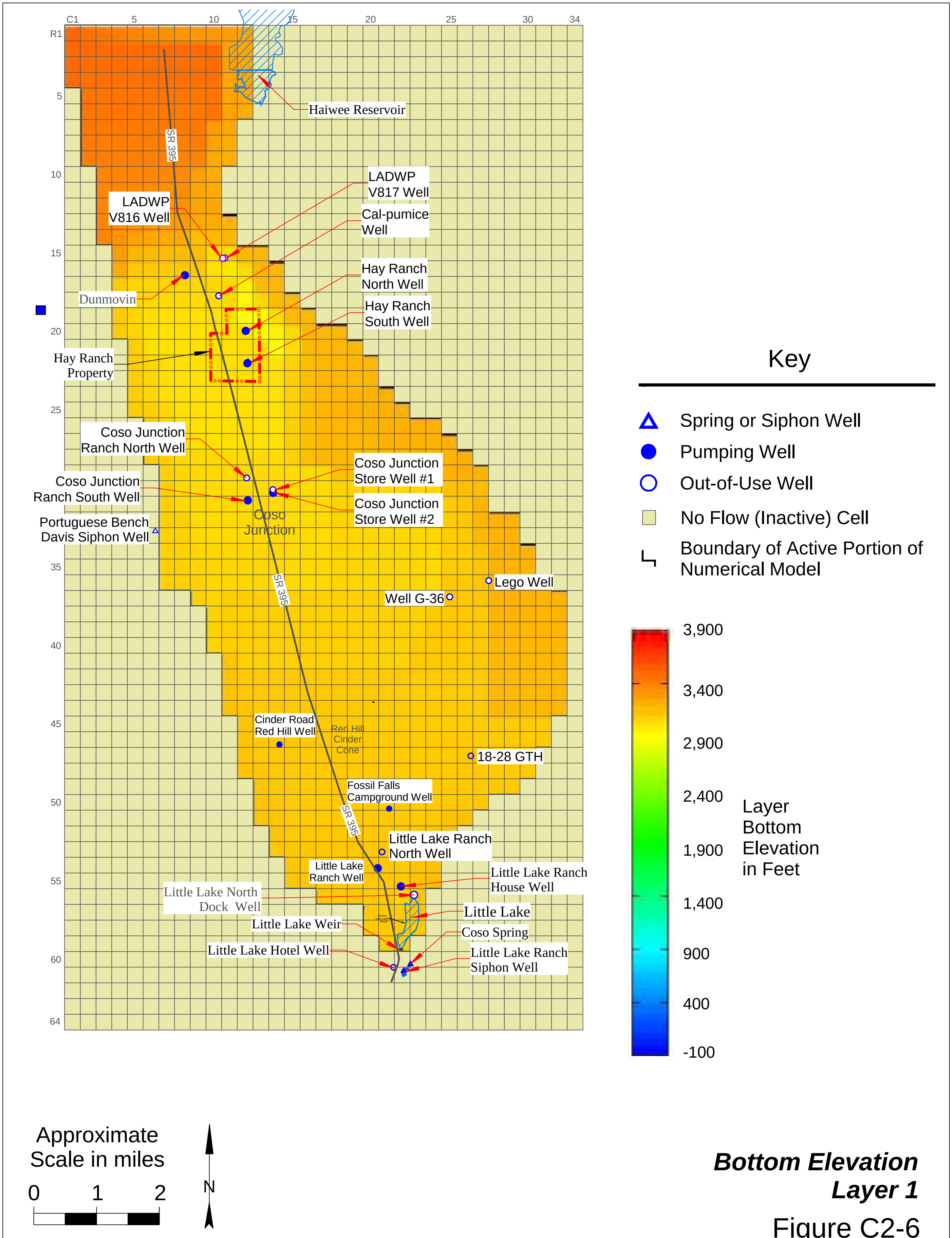


Figure C2-5
Flow and Water Level Measurements at Little Lake

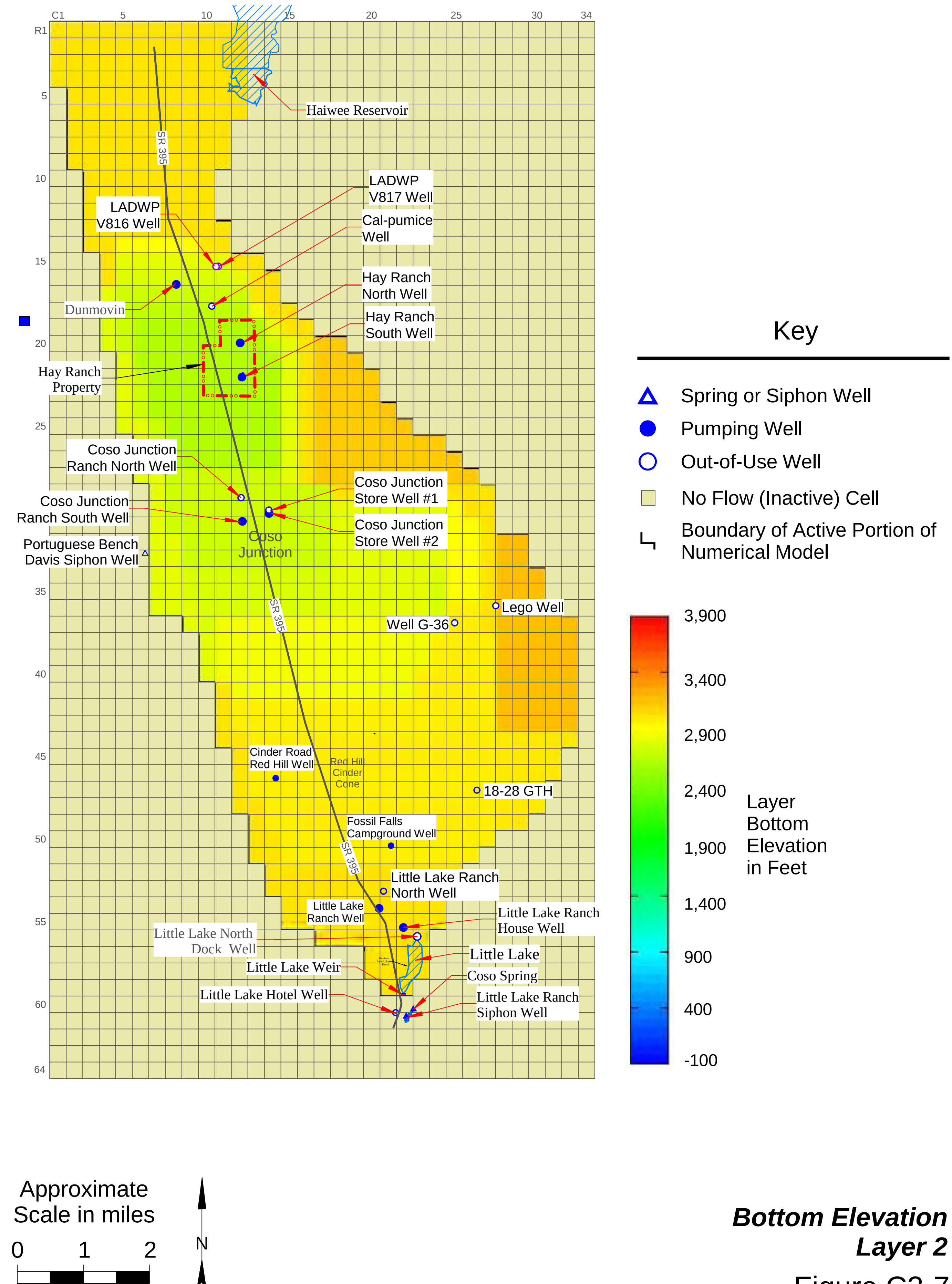






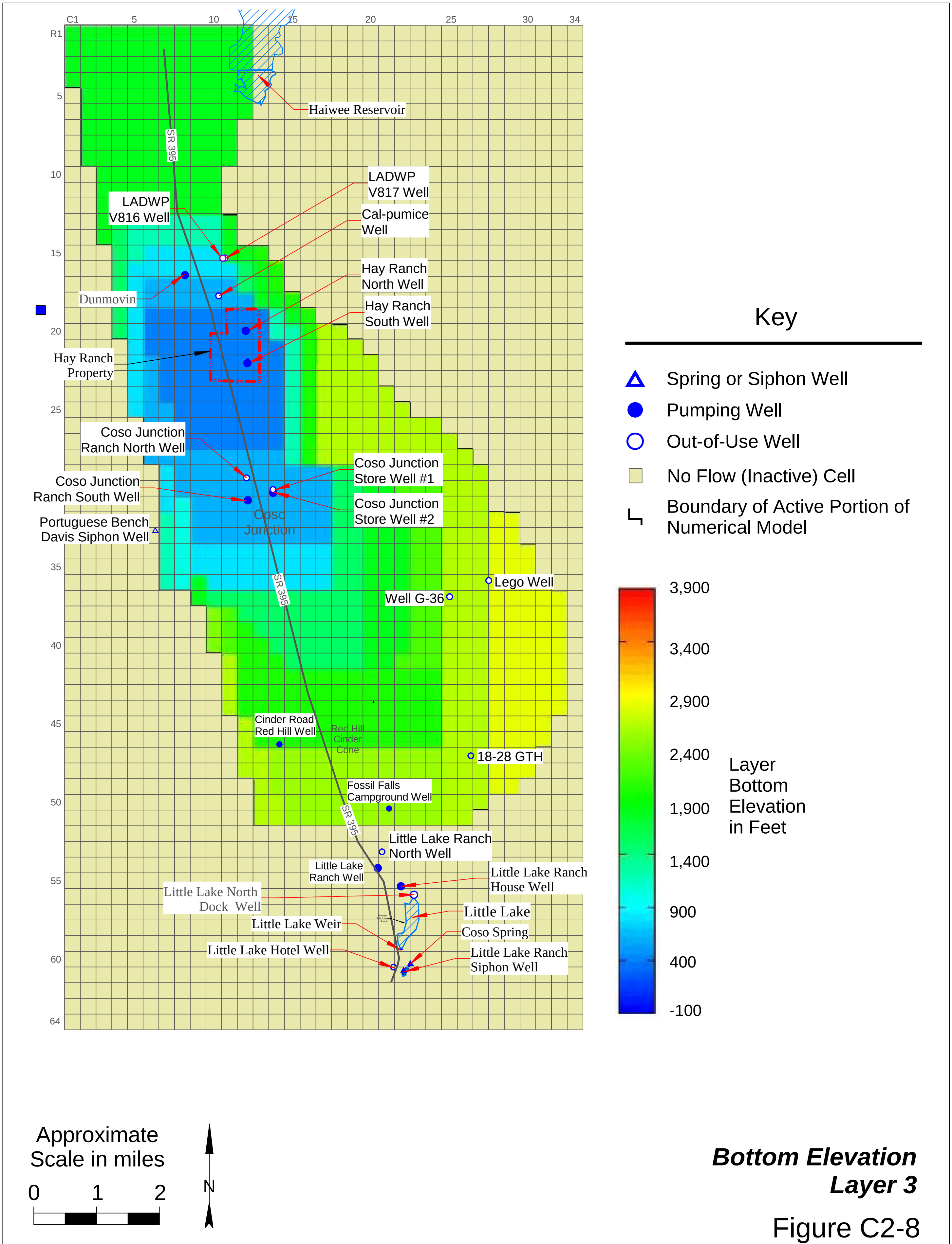
Bottom Elevation Layer 1

Figure C2-6



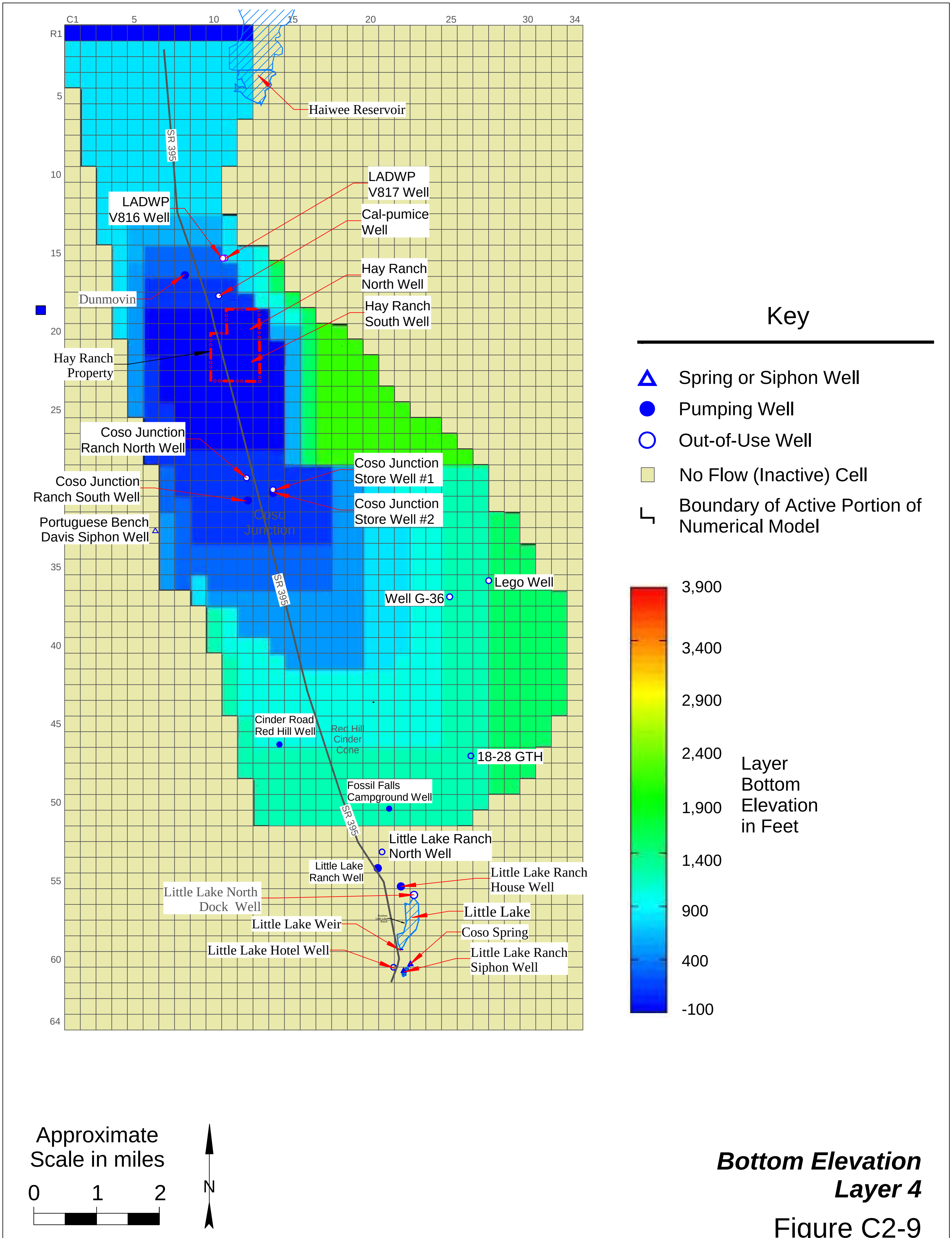
Bottom Elevation
Layer 2

Figure C2-7



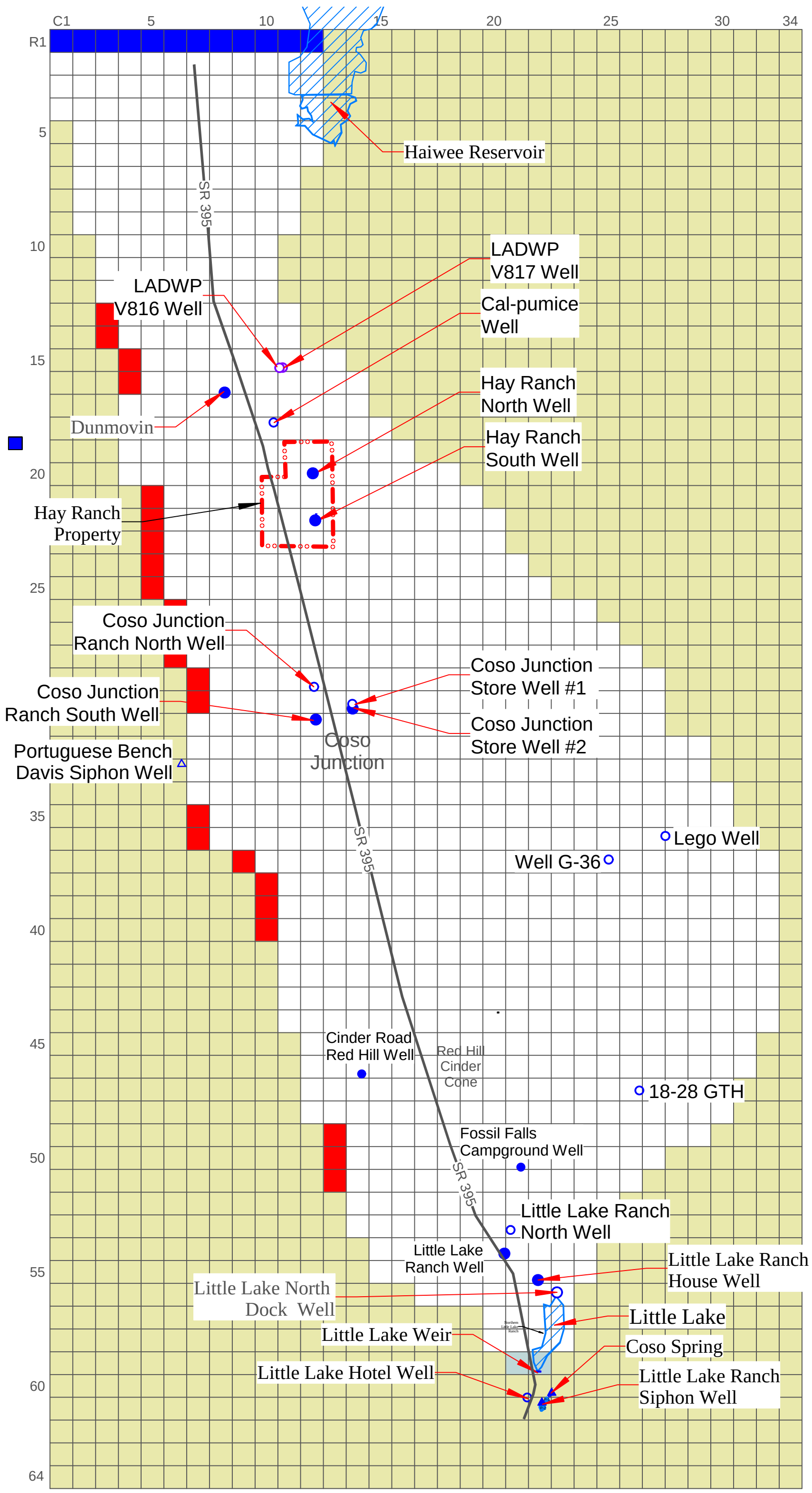
Bottom Elevation Layer 3

Figure C2-8



Bottom Elevation Layer 4

Figure C2-9



Key

- Spring or Siphon Well
- Pumping Well
- Out-of-Use Well
- Specified Flux Cell (Layer 2)
- Constant Head Cell
- General Head Boundary Cell
- No Flow (Inactive) Cell
- Evapotranspiration Cell (Layer 1 only)

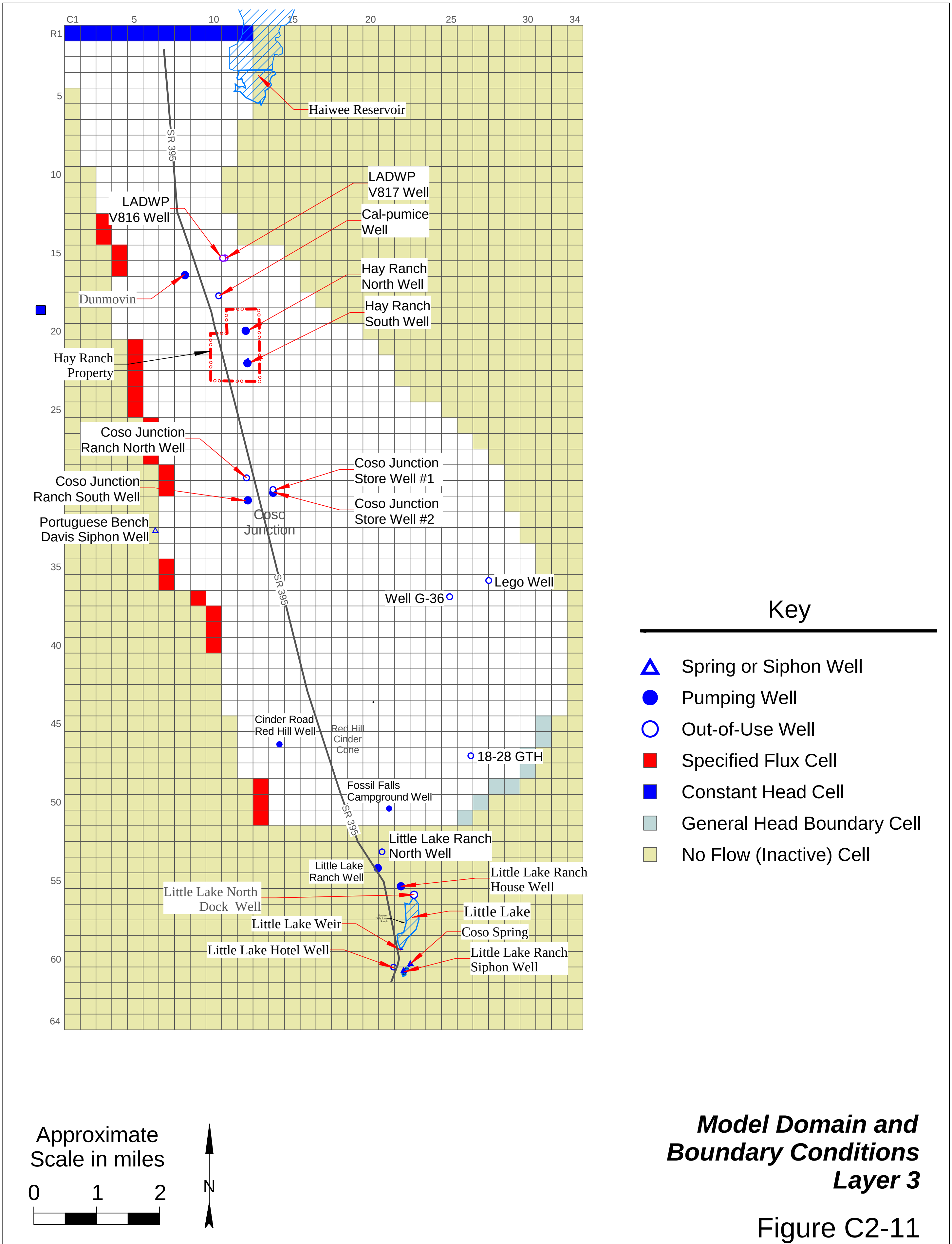
Approximate Scale in miles

0 1 2

N

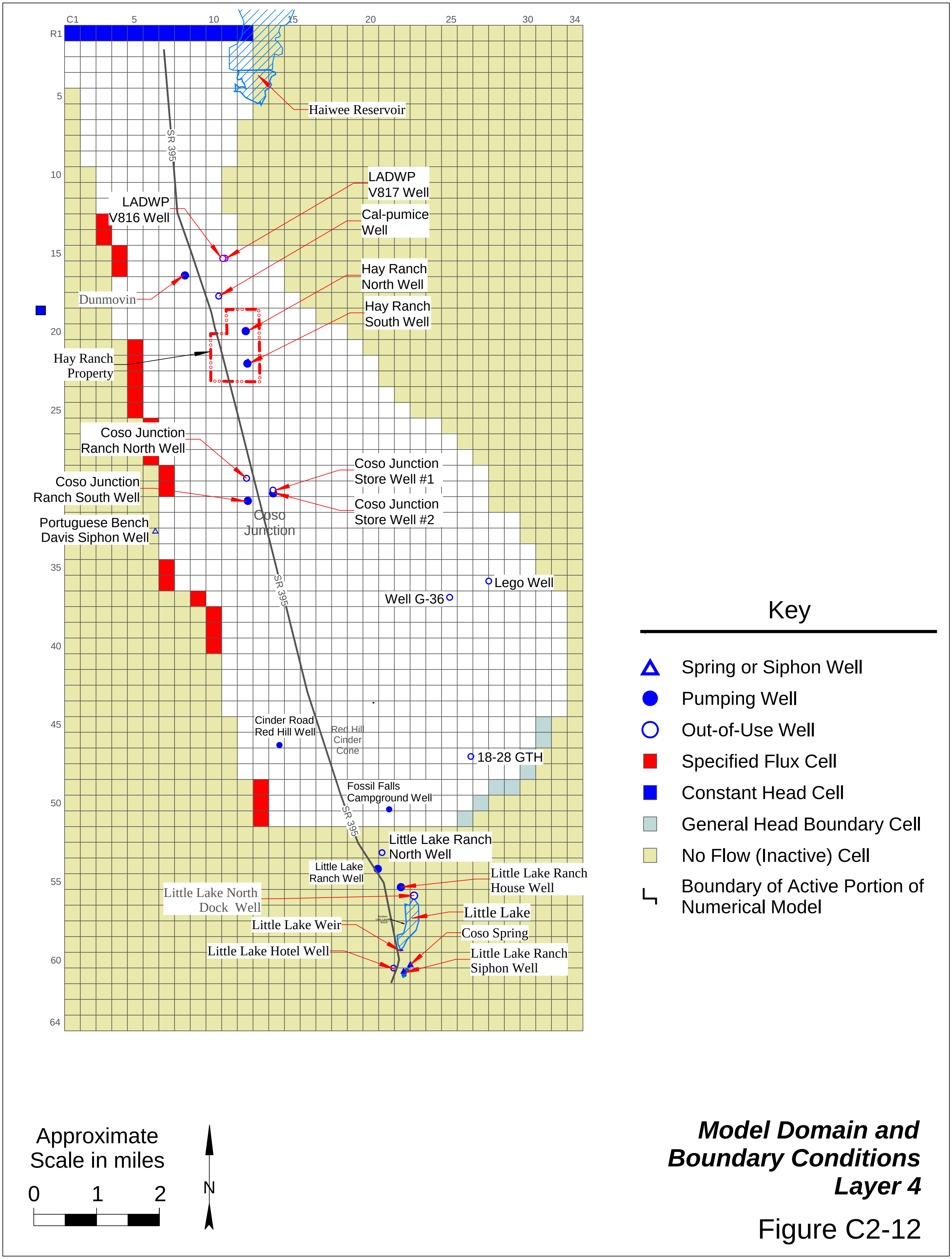
Model Domain and Boundary Conditions Layers 1 and 2

Figure C2-10



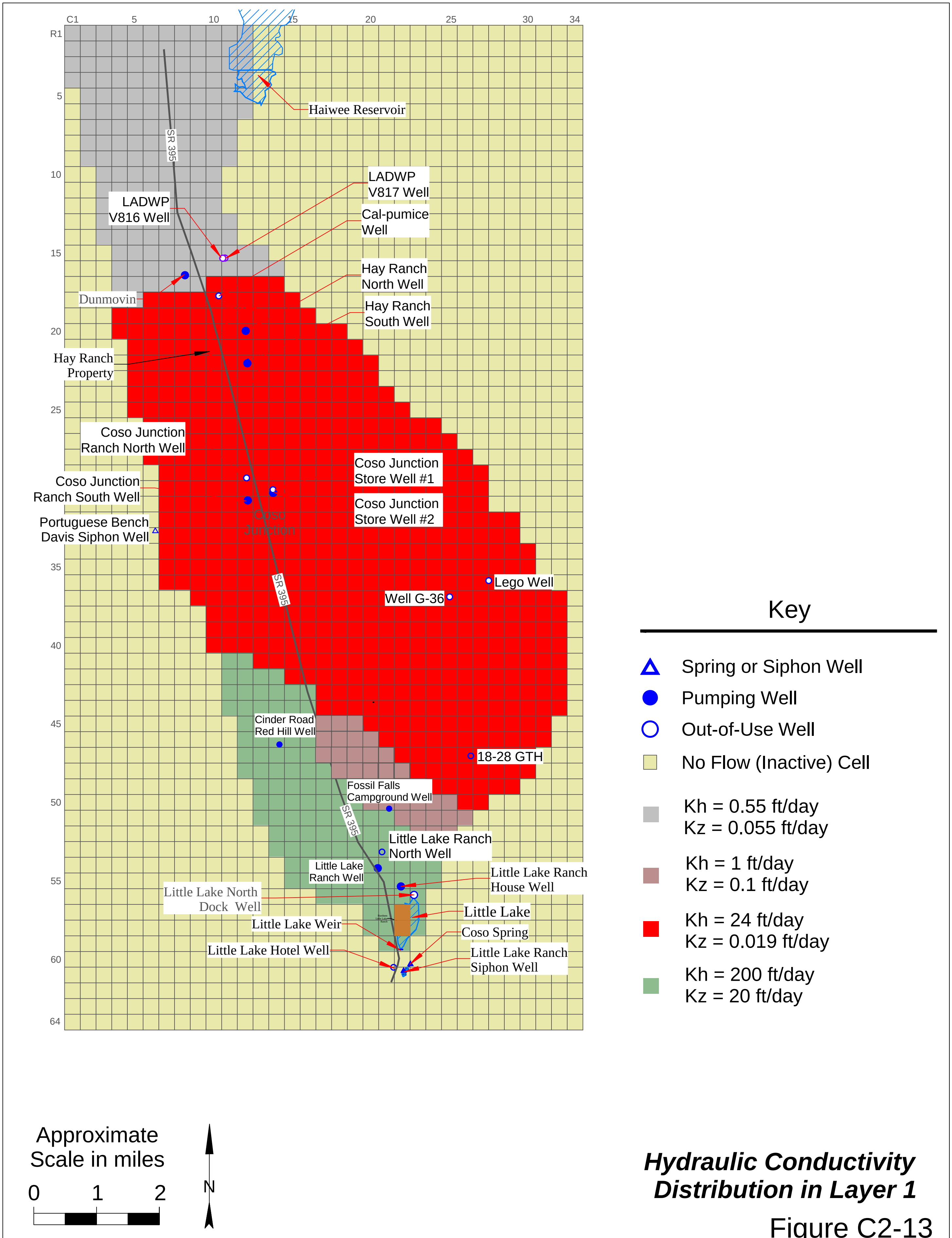
Model Domain and Boundary Conditions Layer 3

Figure C2-11



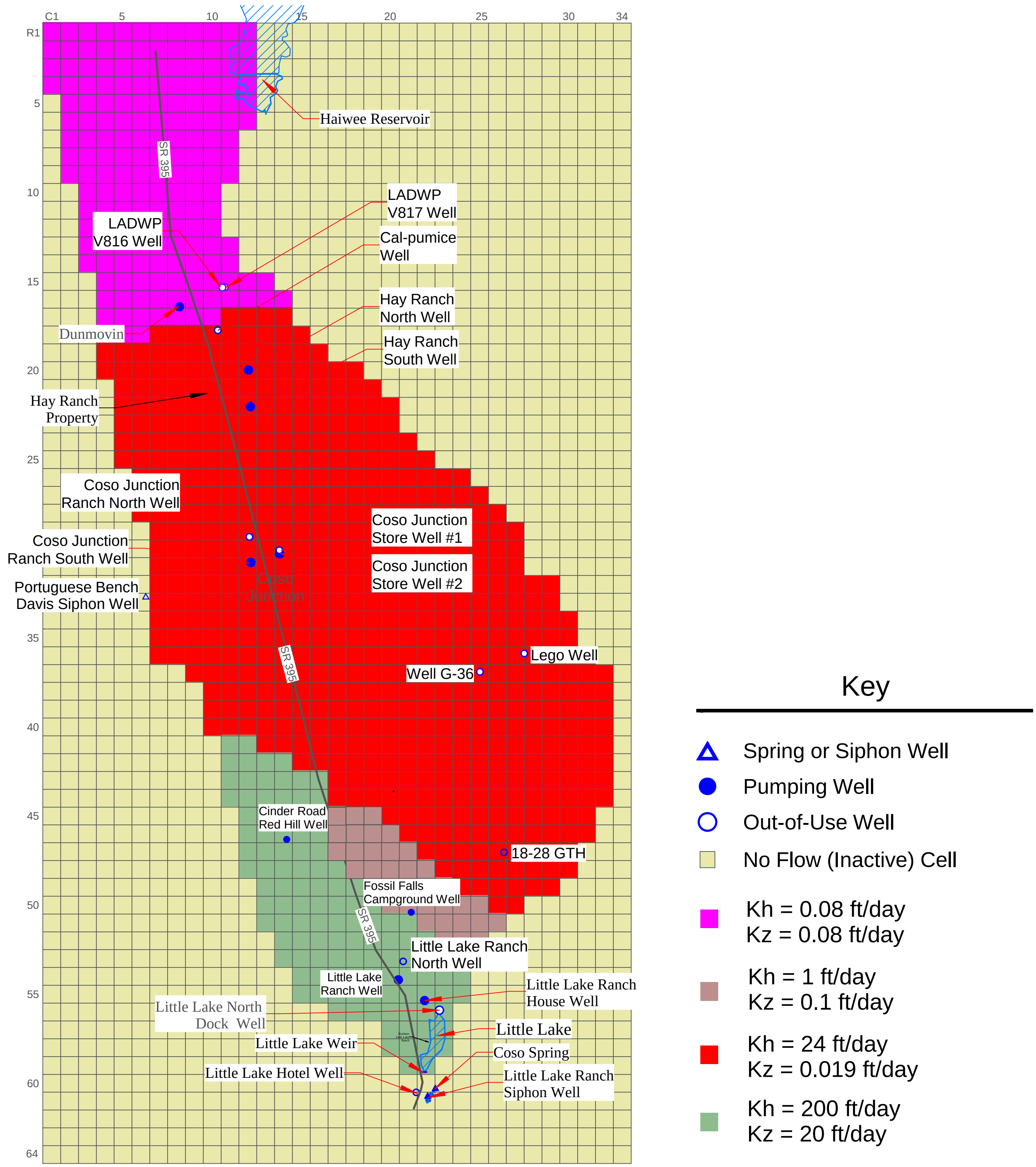
Model Domain and
Boundary Conditions
Layer 4

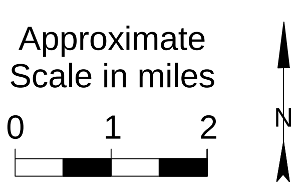
Figure C2-12



Hydraulic Conductivity Distribution in Layer 1

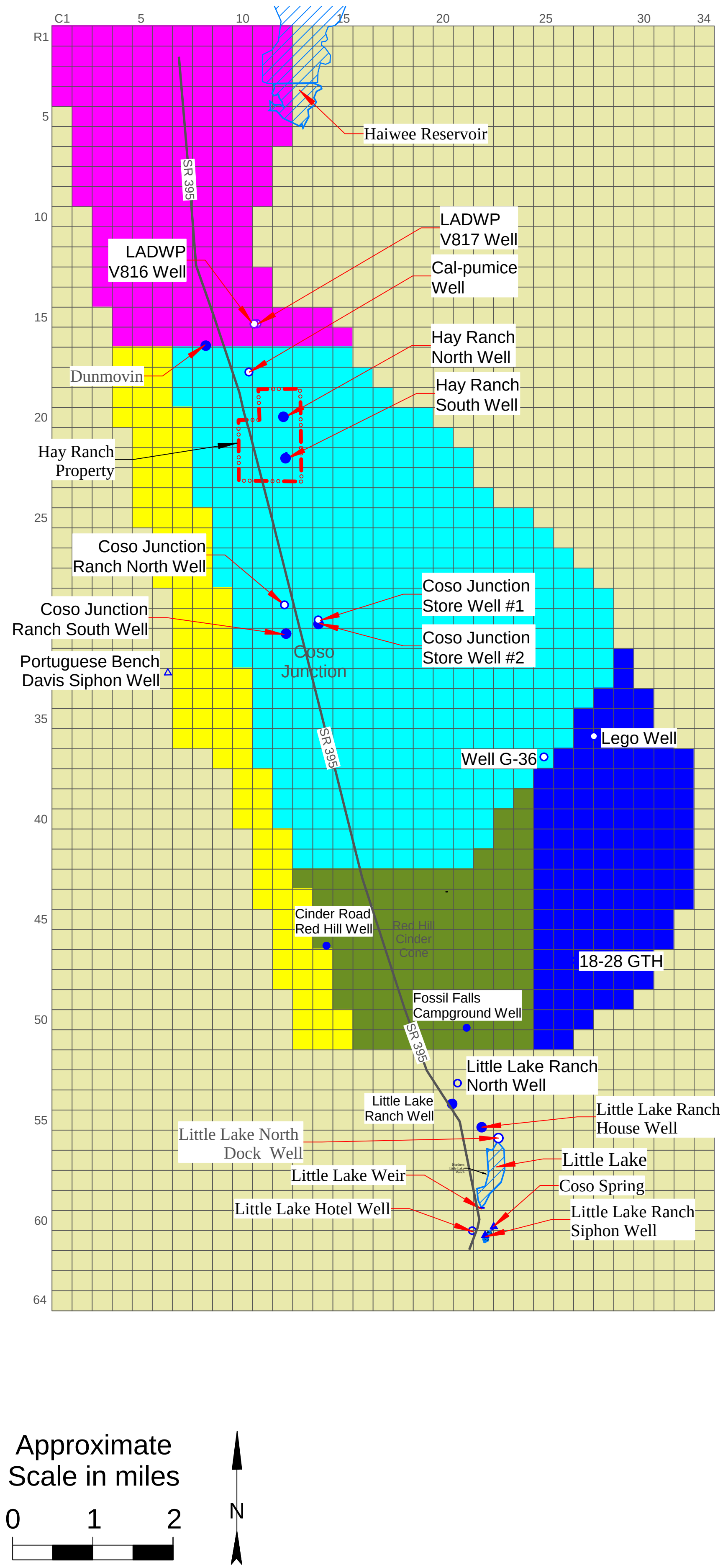
Figure C2-13





Hydraulic Conductivity Distribution in Layer 2

Figure C2-14

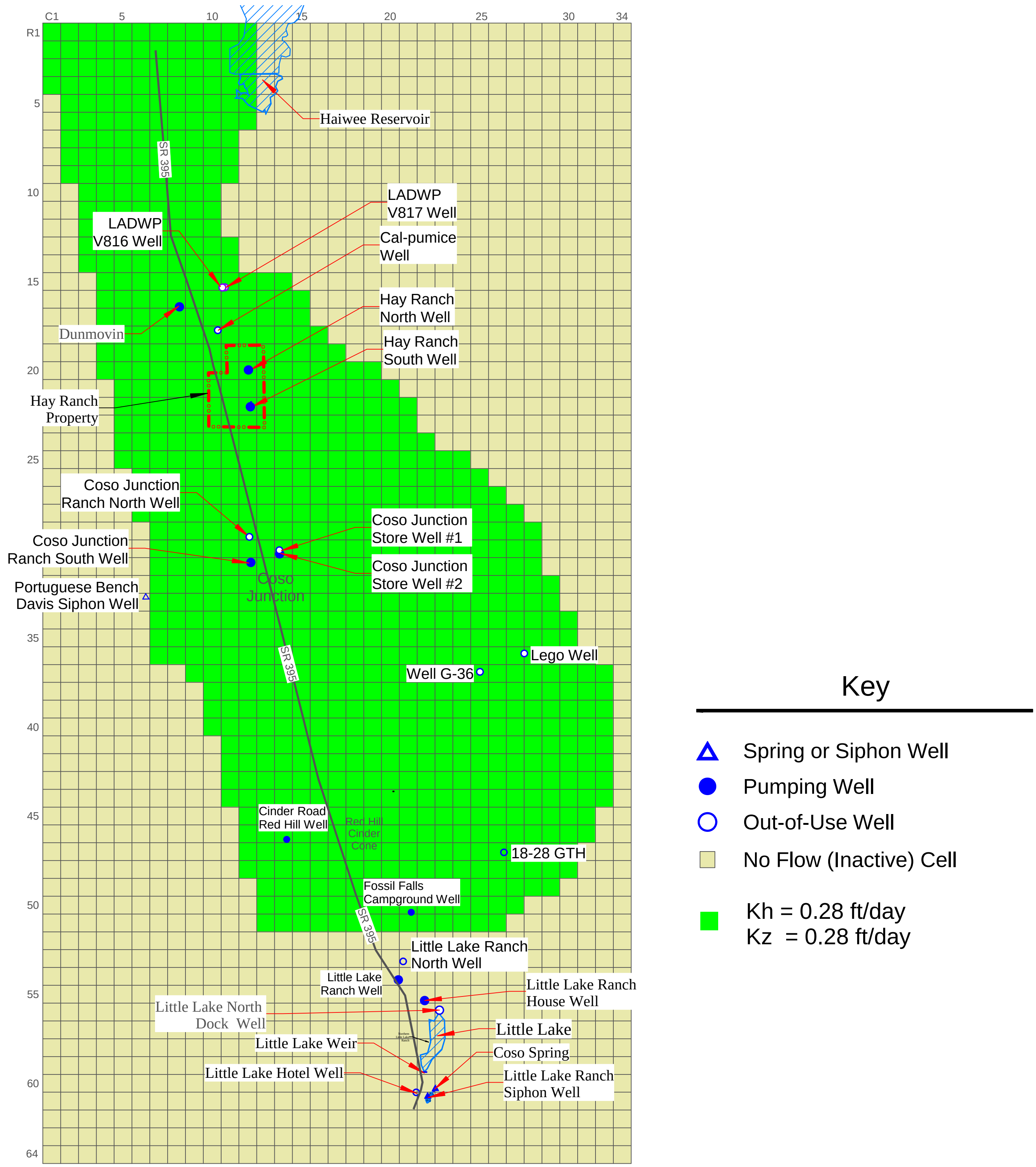


Key

- Spring or Siphon Well
- Pumping Well
- Out-of-Use Well
- No Flow (Inactive) Cell
- Kh = 0.08 ft/day, Kz = 0.08 ft/day
- Kh = 0.03 ft/day, Kz = 0.003 ft/day
- Kh = 1.5 ft/day, Kz = 1.5 ft/day
- Kh = 2.8 ft/day, Kz = 0.28 ft/day
- Kh = 0.28 ft/day, Kz = 0.28 ft/day

Hydraulic Conductivity Distribution in Layer 3

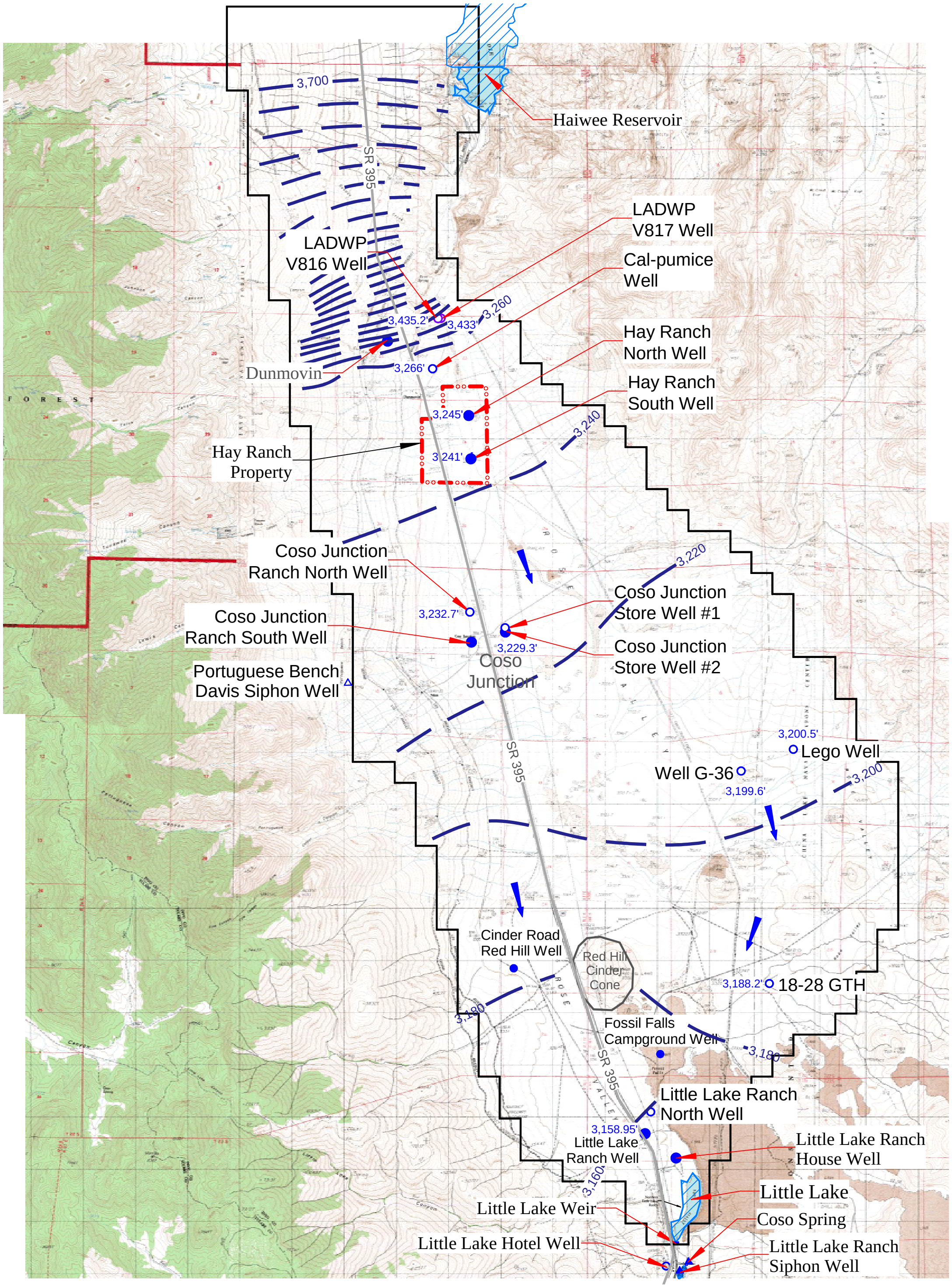
Figure C2-15



Approximate
Scale in miles
0 1 2
N

Hydraulic Conductivity
Distribution in Layer 4

Figure C2-16



Key

- Spring or Siphon Well
- Pumping Well
- Out-of-Use Well
- 3,160' Predicted Groundwater Elevation Contour, ft
- 3,158.95' Groundwater Elevation Observed in November 2007
- Groundwater Flow Direction

Approximate Scale in miles

0 1 2

N

Predicted Groundwater Elevation Contours Compared to Groundwater Elevation Observed in November 2007

Figure C2-17

Figure C2-18
Comparison of Simulated versus Observed Groundwater Elevation in Recalibrated Steady-State Numerical Model

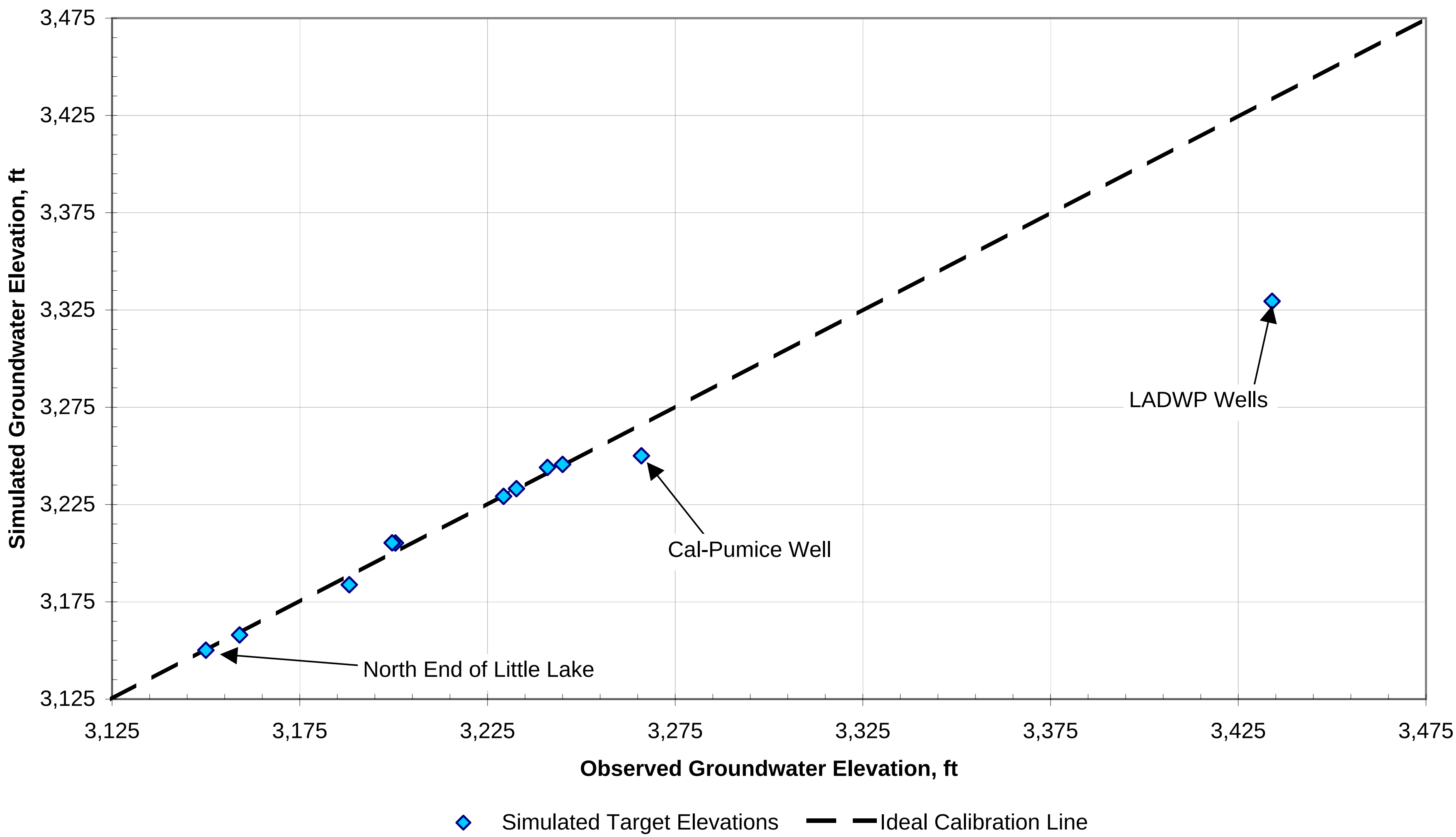
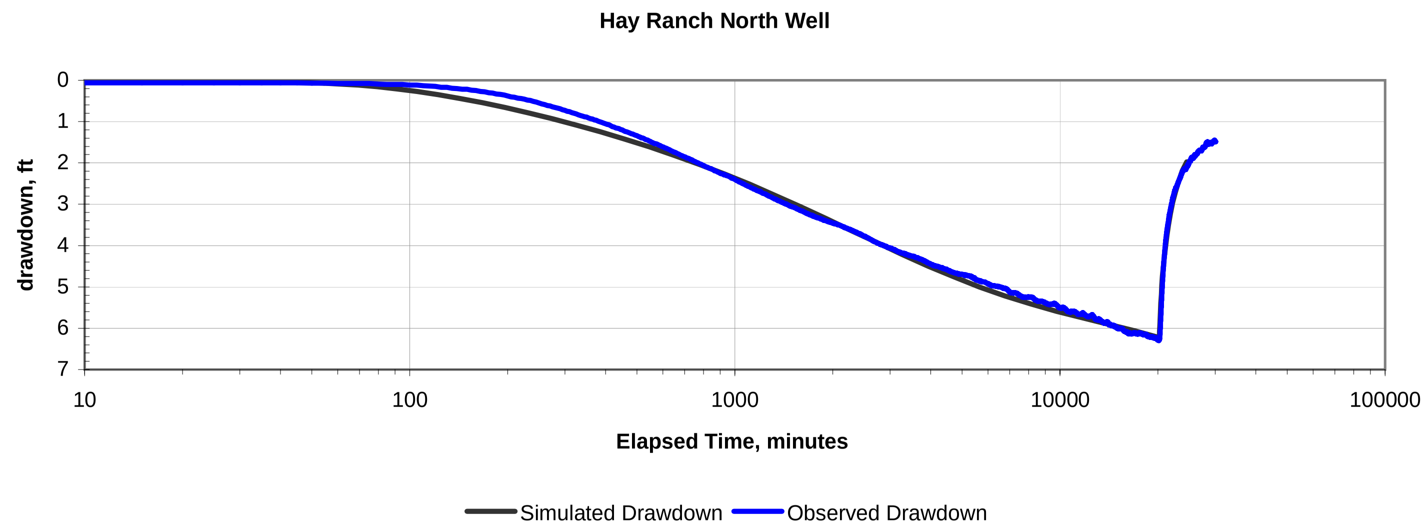
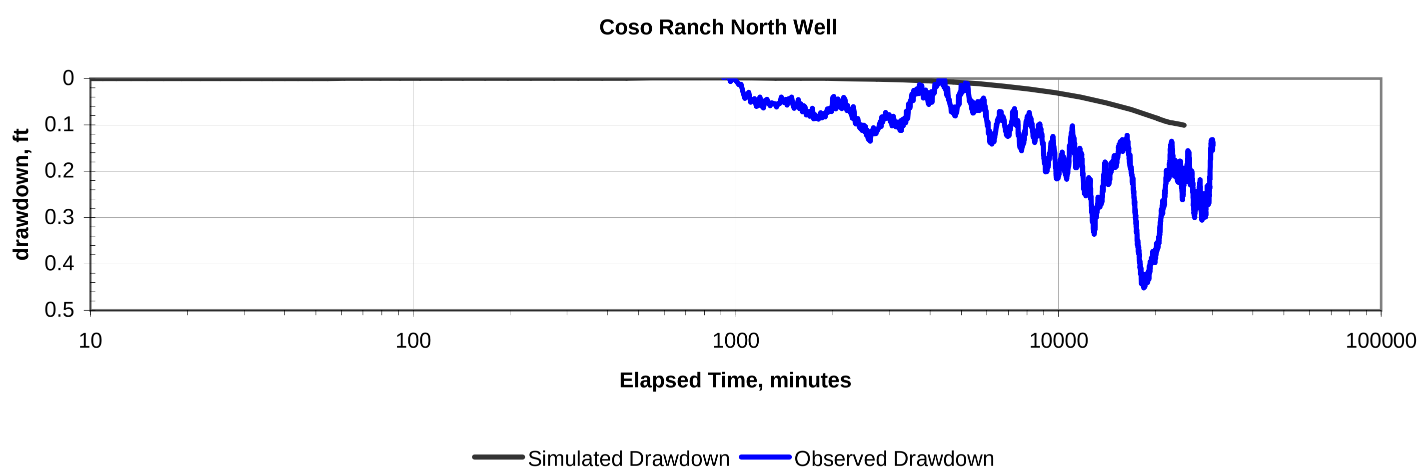
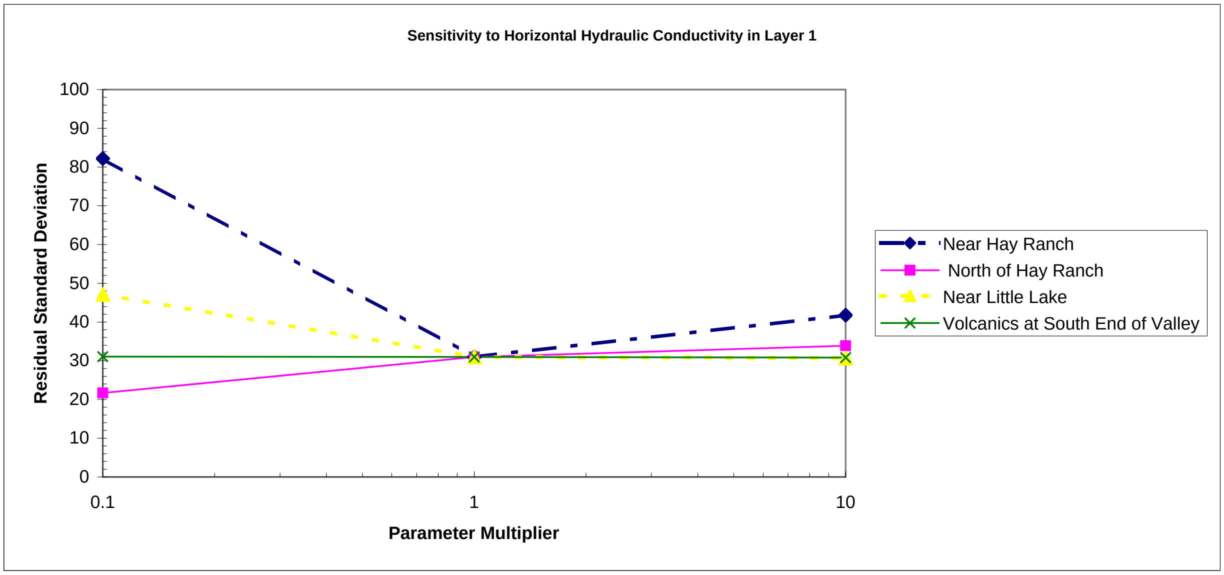
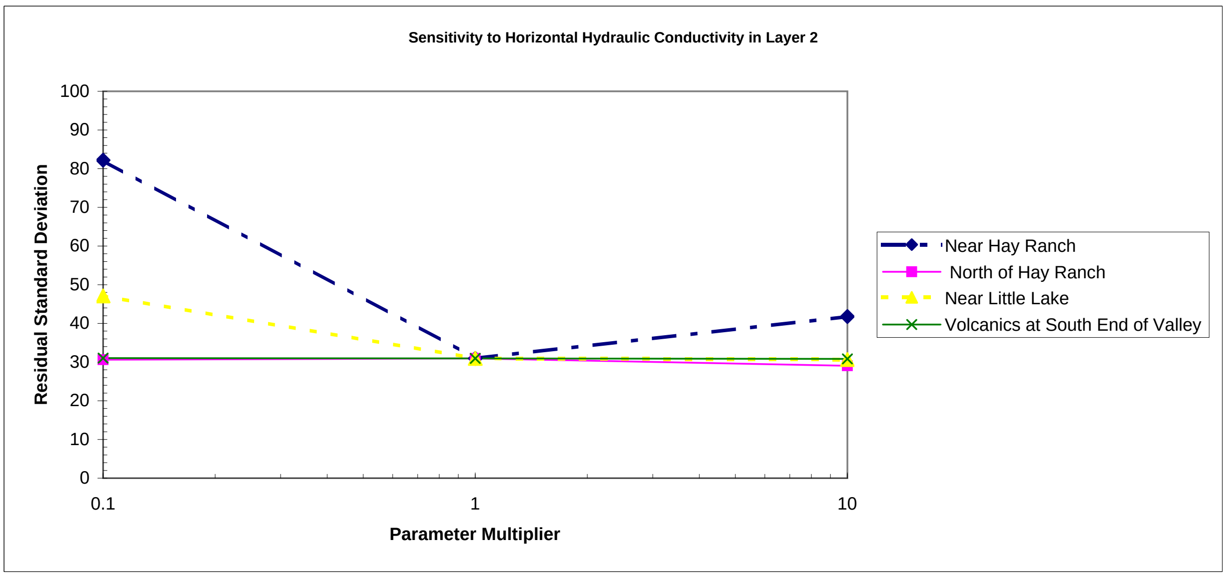


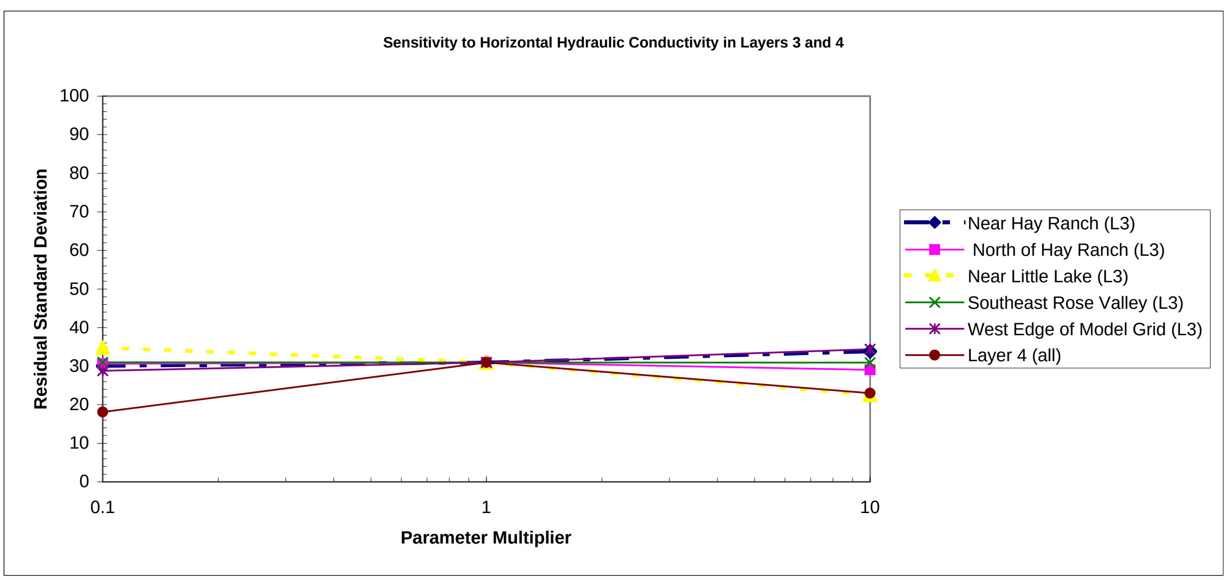
Figure C2-19
Results of Model Calibration to November/December 2007 Pumping Test





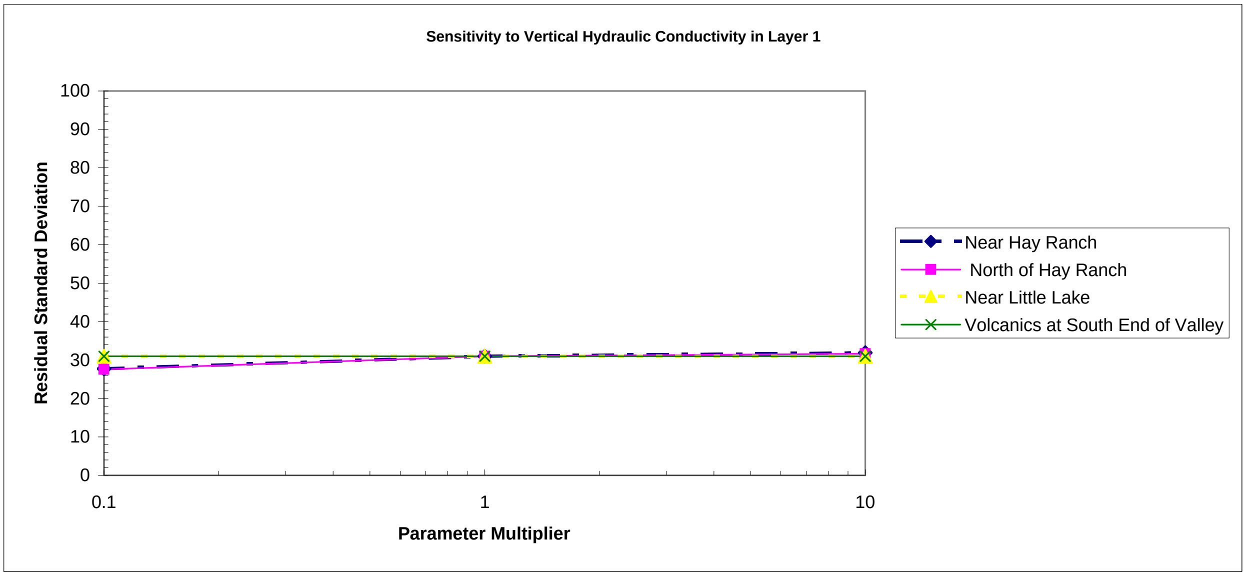


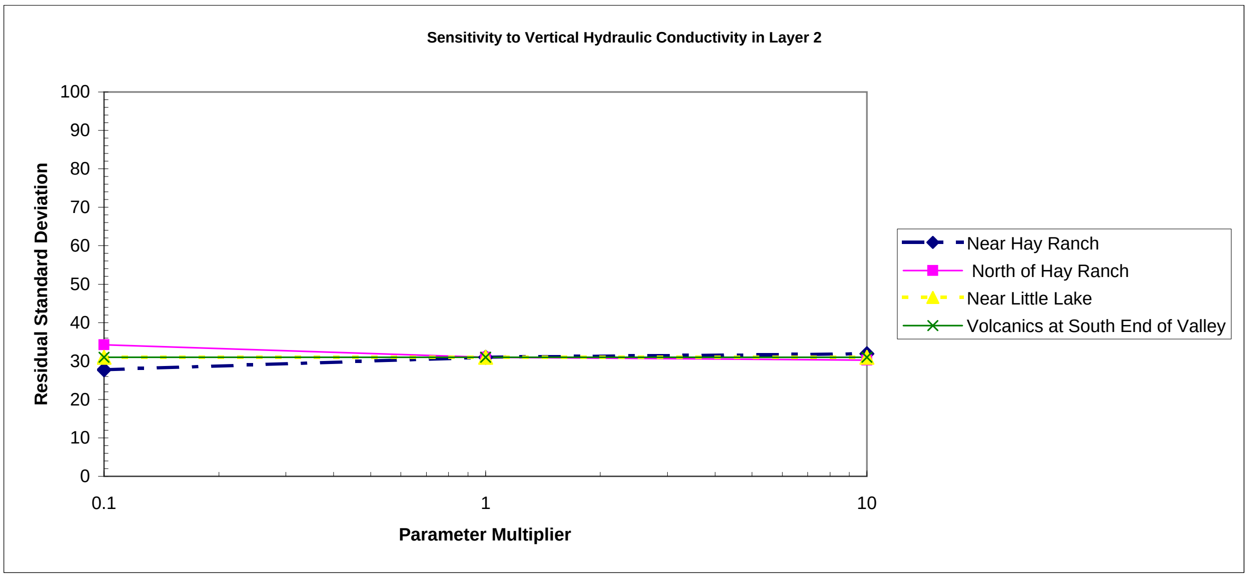


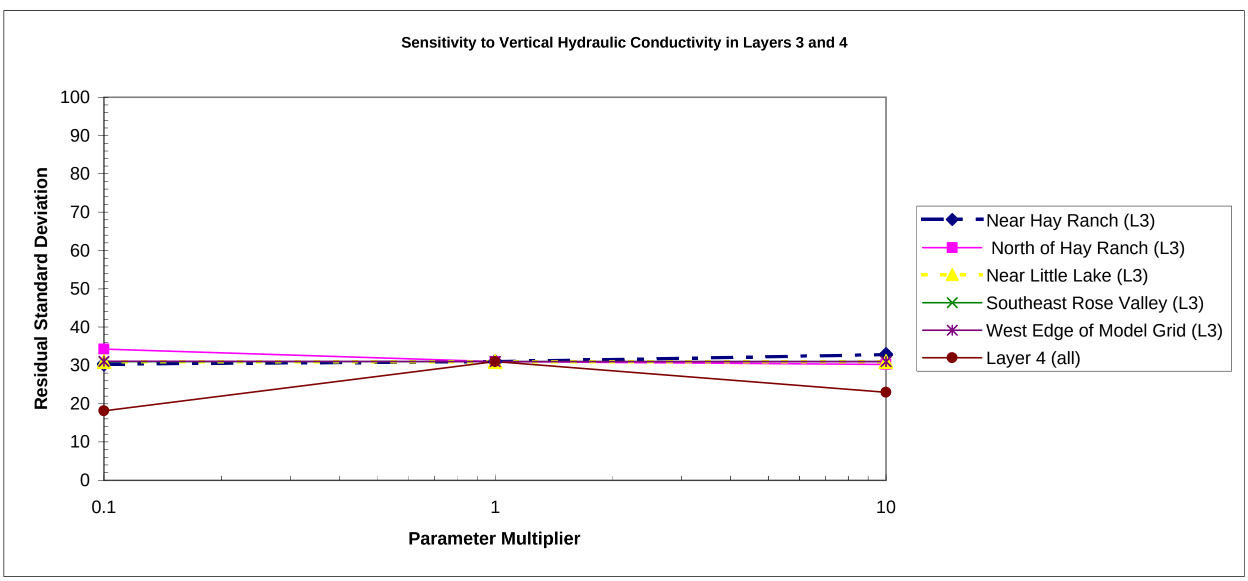


Steady-State Model
Sensitivity to Horizontal Hydraulic Conductivity

Figure C2-20

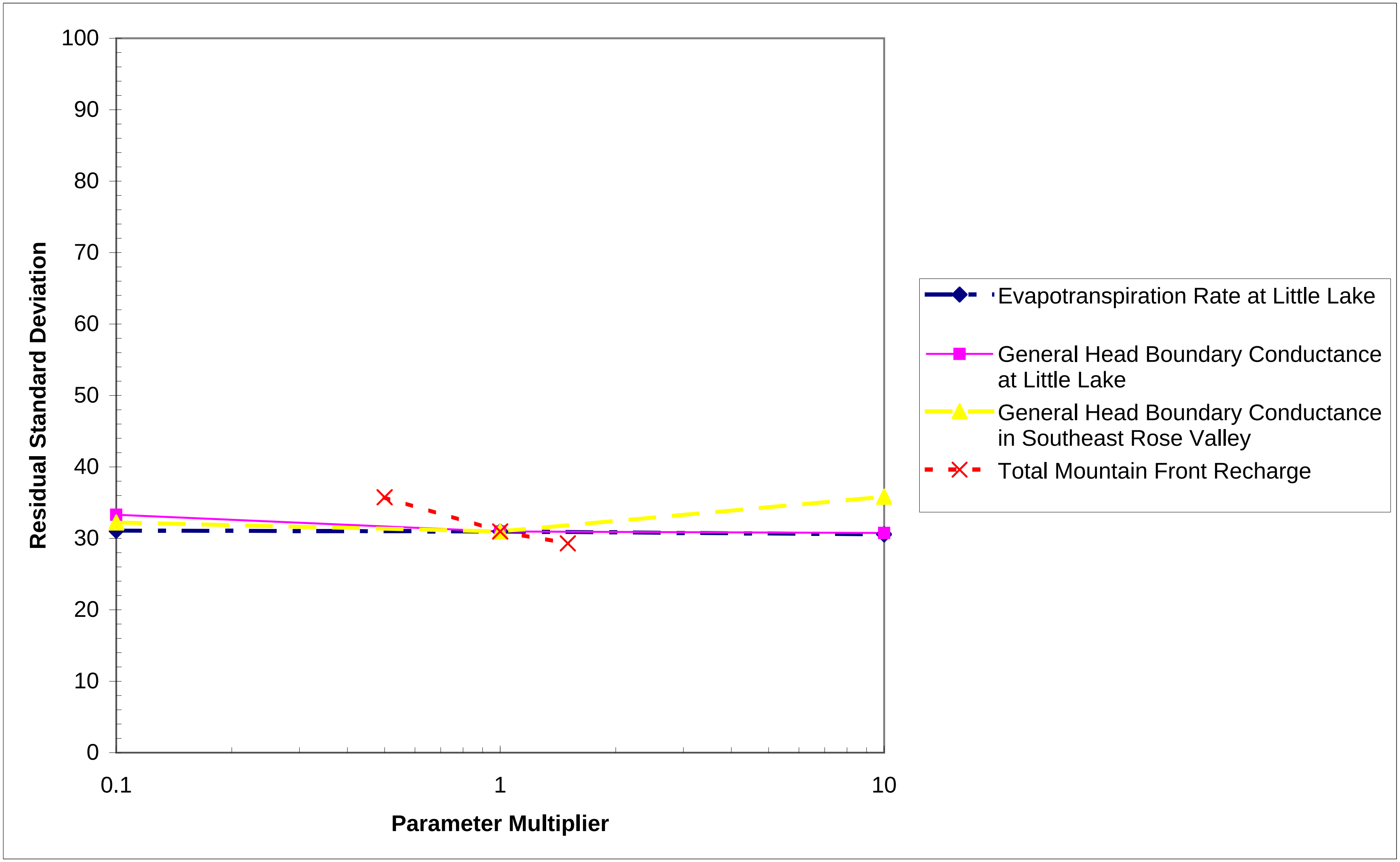






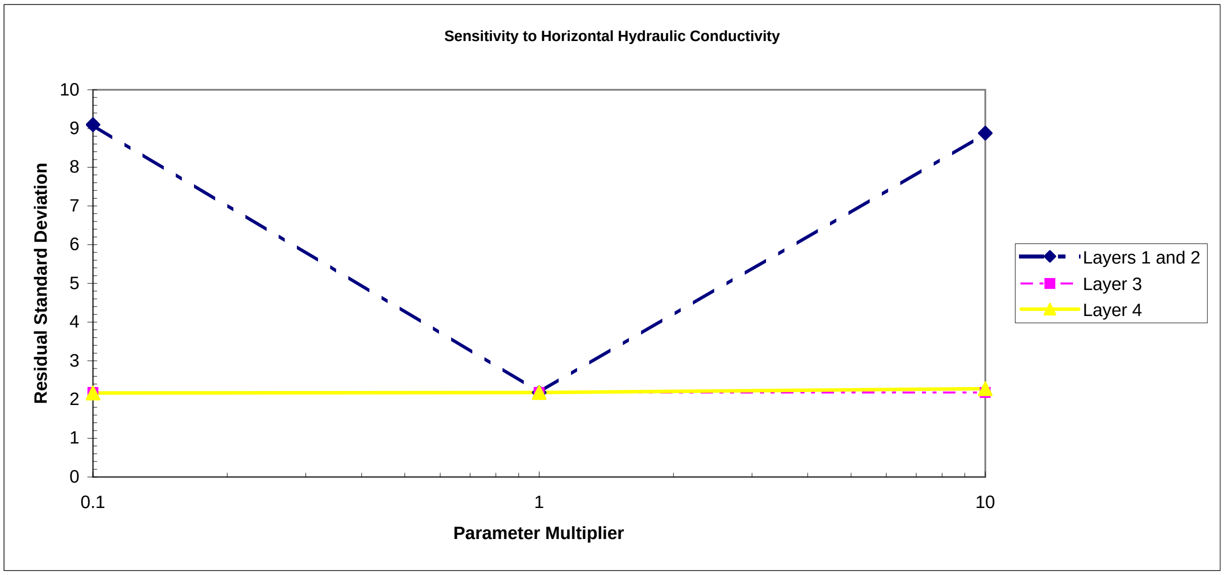
Steady-State Model
Sensitivity to Vertical Hydraulic Conductivity

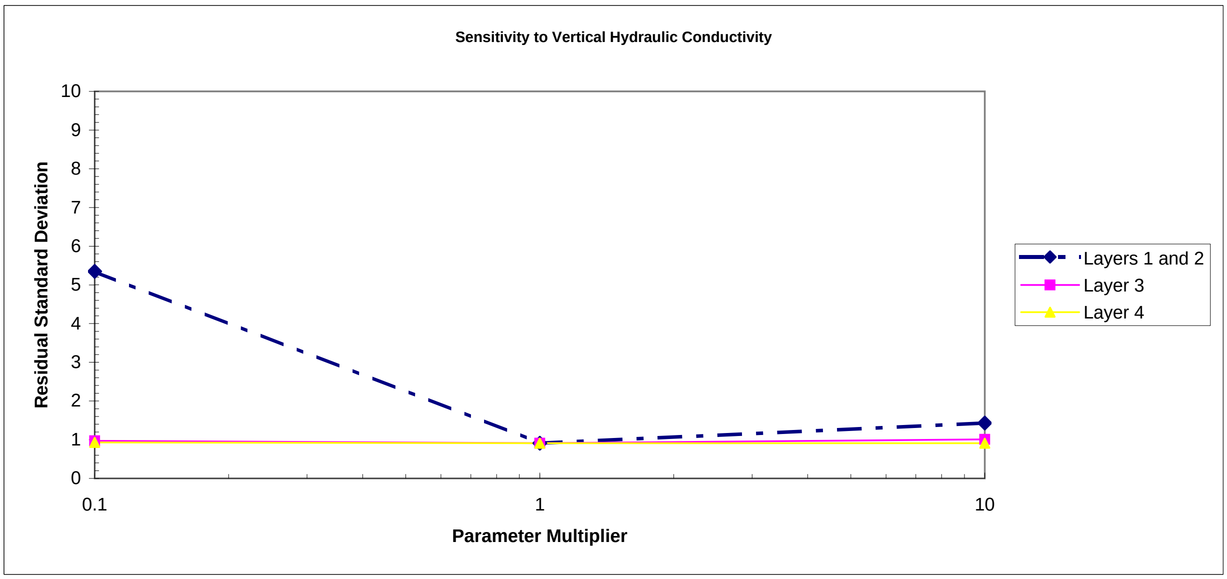
Figure C2-21

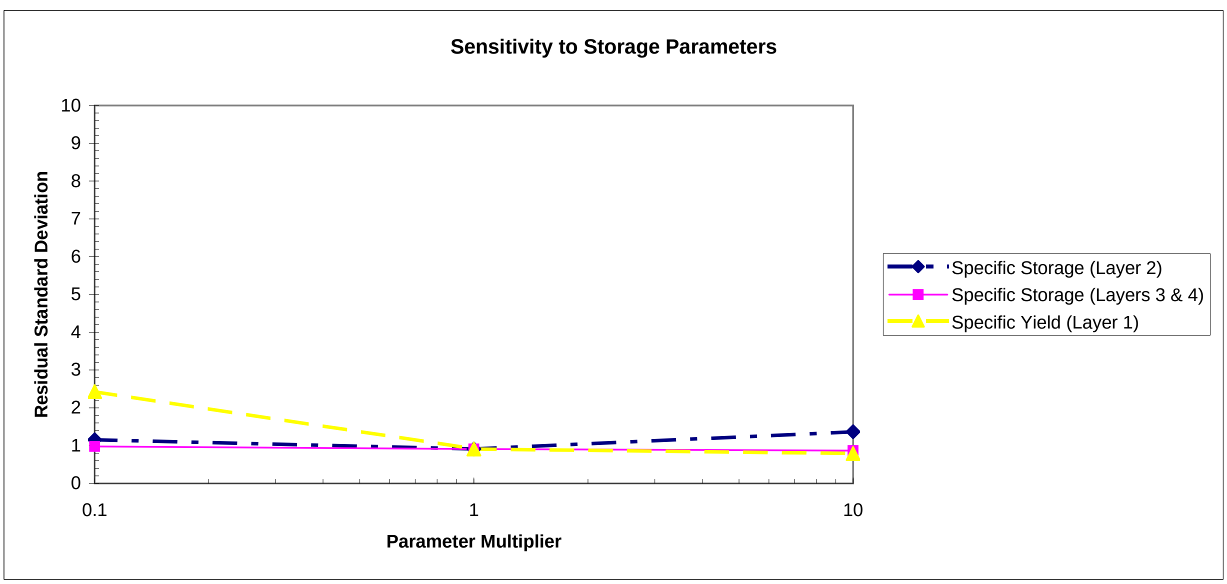


Steady-State Model
Sensitivity to Evapotranspiration Rate,
General Head Boundary Conductance,
and Total Mountain Front Recharge

Figure C2-22

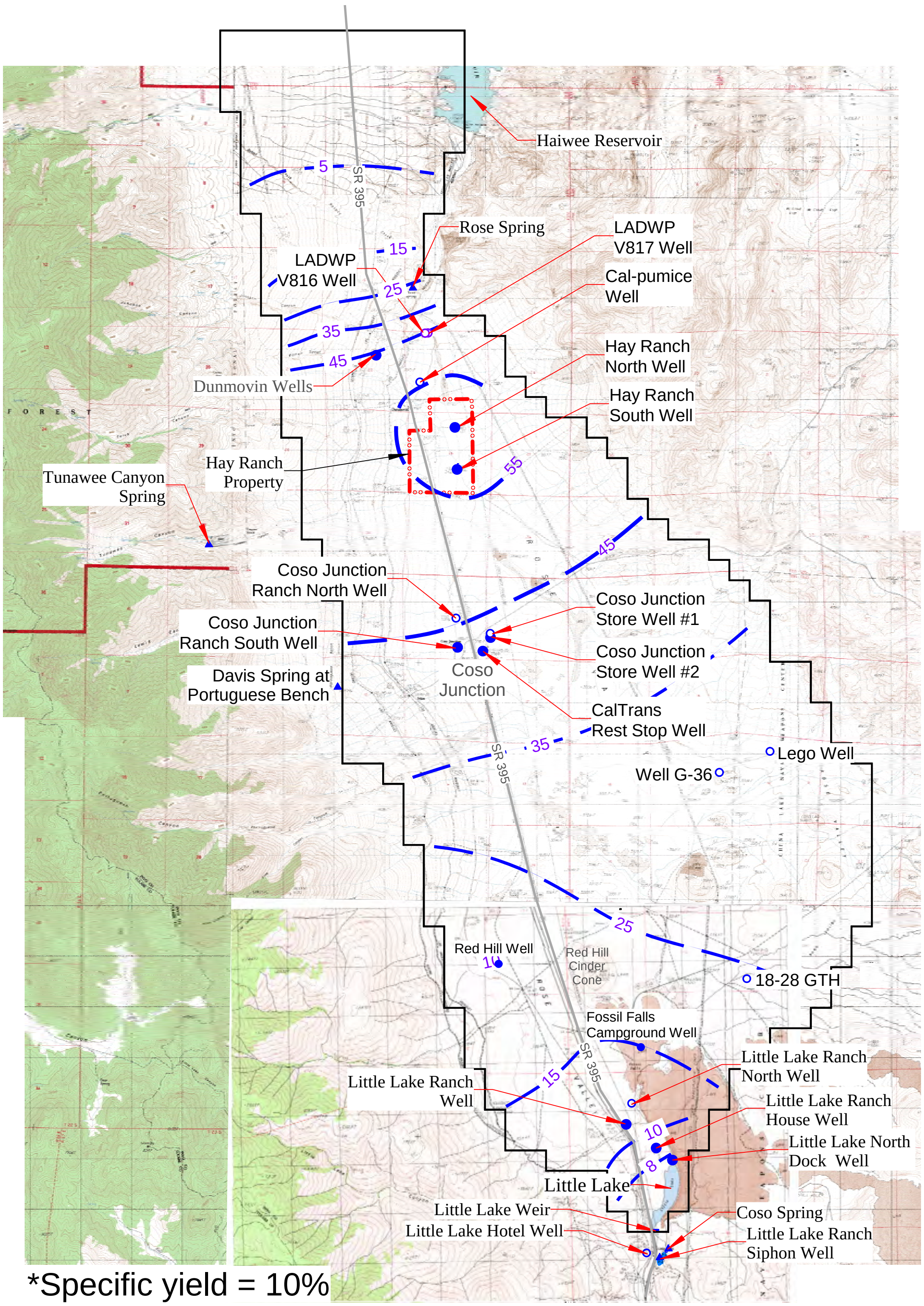






Transient Model
Sensitivity Analysis Results

Figure C2-23



Key

- Spring or Siphon Well
- Pumping Well
- Out-of-Use Well
- Groundwater Drawdown Contour, ft
- Boundary of Numerical Model

Approximate
Scale in miles

0 1 2

N

Predicted Groundwater Table Drawdown after 30 Years at Full Project Development Rate of 4,839 acre-ft/yr

Figure C2-24

Table C2-1
Rose Valley EIR

November 2007 Groundwater Elevation Data
Used for Steady-State Model Calibration Targets

Well	Reference Point Elevation, ft MSL	Depth to Groundwater, ft	Groundwater Elevation, ft
LADWP V816	3,515.35	80.15	3,435.20
LADWP V817	3,511.86	78.86	3,433.00
Cal-Pumice	3,506.38	240.38	3,266.00
Hay Ranch North	3,436.78	191.78	3,245.00
Hay Ranch South	3,420.25	179.35	3,240.90
Coso Junction Store #1	3,372.10	142.80	3,229.30
Coso Ranch North	3,402.72	170.02	3,232.70
G-36	3,379.85	180.25	3,199.60
Lego	3,422.81	222.31	3,200.50
18-28 GTH	3,362.62	174.42	3,188.20
Little Lake Ranch North	3,199.15	40.20	3,158.95

Elevation survey to NGVD 1929 by triad/holme associates.

Table C2-2
Rose Valley EIR

Historic Water Level Monitoring Data

Date	Depth to Groundwater, ft	Groundwater Elevation, ft
Coso Junction Store Well #1		
December 15, 1998	139.00	3,233.10
September 27, 2002	144.75	3,227.35
November 21, 2002	144.33	3,227.77
January 13, 2003	144.25	3,227.85
March 20, 2003	144.85	3,227.25
May 6, 2003	144.51	3,227.59
October 30, 2003	144.50	3,227.60
June 30, 2004	144.22	3,227.88
September 22, 2004	144.16	3,227.94
June 10, 2005	143.52	3,228.58
July 20, 2006	143.22	3,228.88
October 13, 2006	143.00	3,229.10
April 13, 2007	142.65	3,229.45
June 22, 2007	143.34	3,228.76
August 2, 2007	142.90	3,229.20
August 29, 2007	143.25	3,228.85
November 15, 2007	142.71	3,229.39
November 19, 2007	142.80	3,229.30
November 20, 2007	143.20	3,228.90
November 22, 2007	142.85	3,229.25
November 28, 2007	143.15	3,228.95
November 29, 2007	143.09	3,229.01
December 2, 2007	143.18	3,228.92
December 3, 2007	143.32	3,228.78
December 5, 2007	143.10	3,229.00
	Top of casing elevation, ft:	3,372.10
Fossil Falls Campground Well		
October 1, 2002	141.36	--
November 21, 2002	141.42	--
March 20, 2003	141.39	--
June 10, 2005	141.13	--
July 20, 2006	141.25	--
October 13, 2006	141.20	--

Table C2-2
Rose Valley EIR

Historic Water Level Monitoring Data

Date	Depth to Groundwater, ft	Groundwater Elevation, ft
Fossil Falls (continued)		
February 19, 2007	141.25	--
June 22, 2007	141.23	--
August 2, 2007	141.25	--
	Top of casing elevation, ft:	NM
Well G-36 TGH (G-36)		
November 5, 2002	184.10	3,195.75
November 21, 2002	181.50	3,198.35
December 13, 2002	182.42	3,197.43
March 20, 2003	181.38	3,198.47
June 10, 2005	180.69	3,199.16
July 20, 2006	180.50	3,199.35
October 13, 2006	184.20	3,195.65
February 19, 2007	180.38	3,199.47
June 22, 2007	180.30	3,199.55
August 2, 2007	180.29	3,199.56
August 29, 2007	180.29	3,199.56
November 15, 2007	180.23	3,199.62
November 19, 2007	180.22	3,199.63
November 20, 2007	180.21	3,199.64
November 22, 2007	180.22	3,199.63
November 28, 2007	180.25	3,199.60
November 29, 2007	180.24	3,199.61
December 2, 2007	180.26	3,199.59
December 3, 2007	180.26	3,199.59
December 5, 2007	180.29	3,199.56
	Top of casing elevation, ft:	3,379.85

Table C2-2
Rose Valley EIR

Historic Water Level Monitoring Data

Date	Depth to Groundwater, ft	Groundwater Elevation, ft
Hay Ranch North Well		
December 15, 1998	199.00	3,237.78
September 30, 2002	193.75	3,243.03
November 21, 2002	193.85	3,242.93
January 13, 2003	193.75	3,243.03
March 20, 2003	192.26	3,244.52
December 9, 2003	193.20	3,243.58
June 30, 2004	193.00	3,243.78
September 22, 2004	192.91	3,243.87
June 10, 2005	192.32	3,244.46
July 20, 2006	192.62	3,244.16
October 13, 2006	192.29	3,244.49
February 16, 2007	192.30	3,244.48
April 13, 2007	192.15	3,244.63
June 22, 2007	191.65	3,245.13
August 2, 2007	191.60	3,245.18
November 14, 2007	191.68	3,245.10
November 15, 2007	191.65	3,245.13
November 19, 2007	191.60	3,245.18
November 20, 2007	194.30	3,242.48
November 22, 2007	196.08	3,240.70
November 28, 2007	197.61	3,239.17
November 29, 2007	197.56	3,239.22
December 2, 2007	198.07	3,238.71
December 3, 2007	198.32	3,238.46
December 5, 2007	194.14	3,242.64
December 17, 2007	192.72	3,244.06
	Top of casing elevation, ft:	3,436.78
Hay Ranch South Well		
December 15, 1998	182.00	3,238.25
September 30, 2002	181.62	3,238.63
November 21, 2002	181.46	3,238.79
January 13, 2003	181.25	3,239.00
March 20, 2003	181.10	3,239.15
May 6, 2003	180.80	3,239.45

Table C2-2
Rose Valley EIR

Historic Water Level Monitoring Data

Date	Depth to Groundwater, ft	Groundwater Elevation, ft
Hay Ranch South (continued)		
December 9, 2003	181.34	3,238.91
June 30, 2004	180.95	3,239.30
September 22, 2004	180.76	3,239.49
June 10, 2005	180.15	3,240.10
July 20, 2006	179.64	3,240.61
October 13, 2006	179.40	3,240.85
April 13, 2007	179.50	3,240.75
June 22, 2007	179.00	3,241.25
August 2, 2007	178.98	3,241.27
August 29, 2007	179.35	3,240.90
November 15, 2007	179.35	3,240.90
November 19, 2007	179.35	3,240.90
	Top of casing elevation, ft:	3,420.25
Coso Ranch North Well		
January 13, 2003	172.07	3,230.65
May 6, 2003	171.97	3,230.75
October 30, 2003	171.84	3,230.88
June 30, 2004	171.80	3,230.92
September 22, 2004	171.32	3,231.40
June 10, 2005	170.60	3,232.12
July 20, 2006	170.60	3,232.12
October 23, 2006	170.60	3,232.12
February 16, 2007	170.10	3,232.62
April 13, 2007	170.10	3,232.62
June 22, 2007	170.15	3,232.57
August 2, 2007	170.20	3,232.52
November 14, 2007	170.20	3,232.52
November 15, 2007	169.93	3,232.79
November 19, 2007	170.02	3,232.70
November 20, 2007	170.10	3,232.62
November 22, 2007	170.07	3,232.65
November 28, 2007	170.44	3,232.28

Table C2-2
Rose Valley EIR

Historic Water Level Monitoring Data

Date	Depth to Groundwater, ft	Groundwater Elevation, ft
Coso Ranch North (continued)		
November 29, 2007	170.22	3,232.50
December 2, 2007	170.50	3,232.22
December 3, 2007	170.56	3,232.16
December 5, 2007	170.25	3,232.47
	Top of casing elevation, ft:	3,402.72
LADWP Well V817 (LADWP #1)		
June 30, 2004	72.90	3,438.96
September 22, 2004	77.63	3,434.23
June 10, 2005	79.70	3,432.16
July 20, 2006	77.70	3,434.16
October 13, 2006	78.09	3,433.77
February 16, 2007	76.70	3,435.16
April 13, 2007	76.45	3,435.41
June 22, 2007	77.15	3,434.71
August 2, 2007	76.63	3,435.23
August 29, 2007	77.15	3,434.71
November 15, 2007	78.70	3,433.16
November 19, 2007	78.81	3,433.05
November 20, 2007	78.82	3,433.04
November 22, 2007	78.88	3,432.98
November 28, 2007	79.07	3,432.79
November 29, 2007	79.00	3,432.86
December 2, 2007	79.17	3,432.69
December 3, 2007	79.17	3,432.69
December 5, 2007	79.06	3,432.80
	Top of casing elevation, ft:	3,511.86

Table C2-2
Rose Valley EIR

Historic Water Level Monitoring Data

Date	Depth to Groundwater, ft	Groundwater Elevation, ft
LADWP Well V816 (LADWP #2)		
May 6, 2003	77.08	3,438.27
October 30, 2003	79.14	3,436.21
June 10, 2005	80.80	3,434.55
July 20, 2006	78.85	3,436.50
October 13, 2006	77.01	3,438.34
February 19, 2007	75.42	3,439.93
April 13, 2007	75.35	3,440.00
June 22, 2007	76.00	3,439.35
August 2, 2007	77.82	3,437.53
August 29, 2007	78.30	3,437.05
November 14, 2007	80.20	3,435.15
November 15, 2007	80.20	3,435.15
November 19, 2007	80.14	3,435.21
November 20, 2007	80.16	3,435.19
November 22, 2007	80.18	3,435.17
November 28, 2007	80.34	3,435.01
November 29, 2007	80.31	3,435.04
December 2, 2007	80.46	3,434.89
December 3, 2007	80.43	3,434.92
December 5, 2007	80.39	3,434.96
	Top of casing elevation, ft:	3,515.35
Lego Well		
February 11, 2003	223.40	3,199.41
February 18, 2003	223.60	3,199.21
June 10, 2005	222.82	3,199.99
July 20, 2006	222.82	3,199.99
October 13, 2006	227.10	3,195.71
February 16, 2007	222.70	3,200.11
June 22, 2007	222.50	3,200.31
August 2, 2007	222.50	3,200.31
November 15, 2007	222.34	3,200.47
November 19, 2007	222.32	3,200.49
November 20, 2007	222.42	3,200.39
November 22, 2007	222.41	3,200.40

Table C2-2
Rose Valley EIR

Historic Water Level Monitoring Data

Date	Depth to Groundwater, ft	Groundwater Elevation, ft
Lego (continued)		
November 28, 2007	222.58	3,200.23
November 29, 2007	222.37	3,200.44
December 2, 2007	222.69	3,200.12
December 3, 2007	222.63	3,200.18
December 5, 2007	222.41	3,200.40
	Top of casing elevation, ft:	3,422.81
Cal-Pumice (Pumice Mine) Well		
December 15, 1998	242.00	3,264.38
June 30, 2004	241.52	3,264.86
September 22, 2004	241.24	3,265.14
June 10, 2005	240.91	3,265.47
July 20, 2006	240.74	3,265.64
October 23, 2006	240.73	3,265.65
February 16, 2007	241.70	3,264.68
April 13, 2007	240.60	3,265.78
June 22, 2007	240.00	3,266.38
August 2, 2007	239.98	3,266.40
August 29, 2007	240.00	3,266.38
November 14, 2007	240.31	3,266.07
November 15, 2007	240.30	3,266.08
November 19, 2007	240.42	3,265.96
November 20, 2007	240.40	3,265.98
November 22, 2007	240.50	3,265.88
November 28, 2007	240.83	3,265.55
November 29, 2007	240.52	3,265.86
December 2, 2007	241.14	3,265.24
December 3, 2007	241.05	3,265.33
December 5, 2007	240.38	3,266.00
	Top of casing elevation, ft:	3,506.38

NM - Not surveyed, elevation cannot be calculated.
Elevation survey to NGVD 1929 by triad/holme associates.

Table C2-3
Rose Valley EIR

Summary of Bauer (2002) Stream and Spring Flow Measurements

Location	Date Measured	Instantaneous Flow Rate, acre-ft/yr
Coso Spring	10/28/1996	1,311
South Culvert(1)	10/28/1996	318
Coso Spring	2/2/1997	1,382
Little Lake Weir	2/2/1997	1,299
North Culvert(2)	2/2/1997	3,924
South Culvert	2/2/1997	515
Coso Spring	5/14/1997	1,451
Little Lake Weir	5/14/1997	312
North Culvert	5/14/1997	2,043
South Culvert	5/14/1997	583
Little Lake Weir	6/2/1997	166
North Culvert	6/2/1997	2,646
South Culvert	6/2/1997	676
Coso Spring	7/11/1997	1,976
Little Lake Weir	7/11/1997	0
North Culvert	7/11/1997	885
South Culvert	7/11/1997	428
Coso Spring	10/1/1997	1,949
Little Lake Weir	10/1/1997	217
North Culvert	10/1/1997	2,384
South Culvert	10/1/1997	627
Coso Spring	2/7/1998	1,222
Little Lake Weir	2/7/1998	1,746
North Culvert	2/7/1998	5,357
South Culvert	2/7/1998	1,866
Coso Spring	3/25/1998	874
Little Lake Weir	3/25/1998	887
North Culvert	3/25/1998	3,439
South Culvert	3/25/1998	917

Notes:

(1) Most southerly surface water flow measurement point on the property.

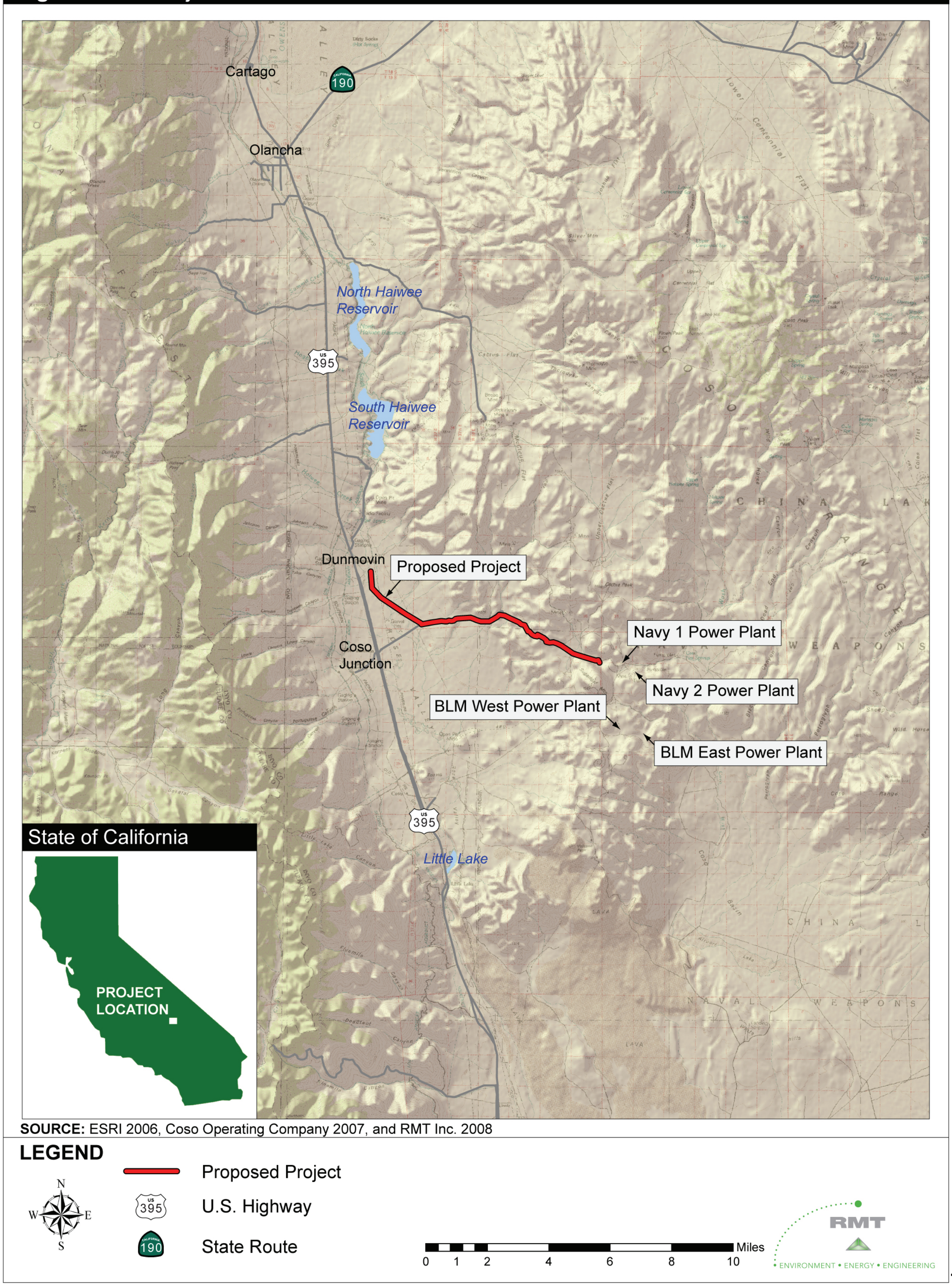
(2) Flow rate in ditch discharging from lower Little Lake pond (P-2); contains combined flow from Little Lake Weir, Coso Spring, and siphon well.

3.5.3 APPENDIX C4: HMMP

Page C4-3, Figure C4-1

The following figure has been modified to show the BLM East and BLM West power plants at the Coso geothermal field.

Figure C4-1: Project Location



SOURCE: ESRI 2006, Coso Operating Company 2007, and RMT Inc. 2008

<

<Insert revised figure>>

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Table C4-1: Drawdown Trigger Levels (in feet)

Project Elapsed Time, years	Dunmovin Area well	Pumice Mine well	Hay Ranch Observation well	Coso Ranch North well	Coso Junction #1 well	Navy G-36 well	Navy Lego well	Cinder Road, Red Hill ~~Cinder Road~~ well	Navy 18-28 well	Little Lake Ranch North well
	Distance from Hay Ranch South Well (feet)									
	9,000	***6,100***	***1,300***	***9,700***	***10,900***	***26,000***	***27,300***	***32,000***	***38,000***	***42,600***
0.25	<0.2	0.5	3.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
0.5	0.3	1.3	4.7	0.4	0.3	<0.2	<0.2	<0.2	<0.2	<0.2
0.75	0.7	3.3	8.1	0.9	0.7	<0.2	<0.2	0.2	<0.2	<0.2
1	1.1	5.3	11.5	1.4	1.2	<0.2	<0.2	0.2	<0.2	<0.2
1.2	1.5	6.9	13.2	1.8	1.5	0.2	0.2	0.3	<0.2	<0.2
1.25	1.6	7.1	11.8	1.9	1.6	0.2	0.2	0.3	<0.2	<0.2
1.5	1.9	7	7.9	2.1	1.8	0.2	0.2	0.3	<0.2	<0.2
1.75	2.1	6.5	6.9	2.3	2	0.3	0.3	0.3	<0.2	<0.2
2	2.3	6	6.2	2.4	2.1	0.3	0.3	0.4	<0.2	<0.2
3	2.7	4.8	4.8	2.5	2.2	0.5	0.4	0.4	<0.2	0.2
4	2.8	4.1	4	2.5	2.2	0.6	0.6	0.5	0.2	0.3
5	2.7	3.6	3.5	2.4	2.2	0.7	0.7	0.6	0.3	0.3
Maximum Acceptable Drawdown (in feet)	2.8	7.2	13	2.5	2.3	1.1	1.1	0.7	1	0.4
Time to Max drawdown (years since pumping began)	4	1.3	1.2	3	3.5	14.5	15	12	22	13

NOTES

1) For any wells where predicted drawdown is less than or equal to 0.25 feet, actions related to these trigger points shall not be enforced, unless the drawdown seen in these wells is greater than 0.25 feet. Drawdown values of <0.25 feet are difficult to accurately detect.

2) Based on current groundwater flow model results, these maximum drawdown values listed above result from pumping the Hay Ranch production wells at design rates for 1.2 years, with specific yield values of 10%. These maximum acceptable drawdowns can occur several years after pumping at Hay Ranch ceases.

3) With the exception of Hay Ranch, every monitoring point is subject to access approval from the appropriate owner. If approval is not forthcoming, alternative appropriate monitoring points will be established by Inyo County, if necessary.

Page C4-10

C4.3.1 HMMP IMPLEMENTATION RESPONSIBILITIES AND SCHEDULE

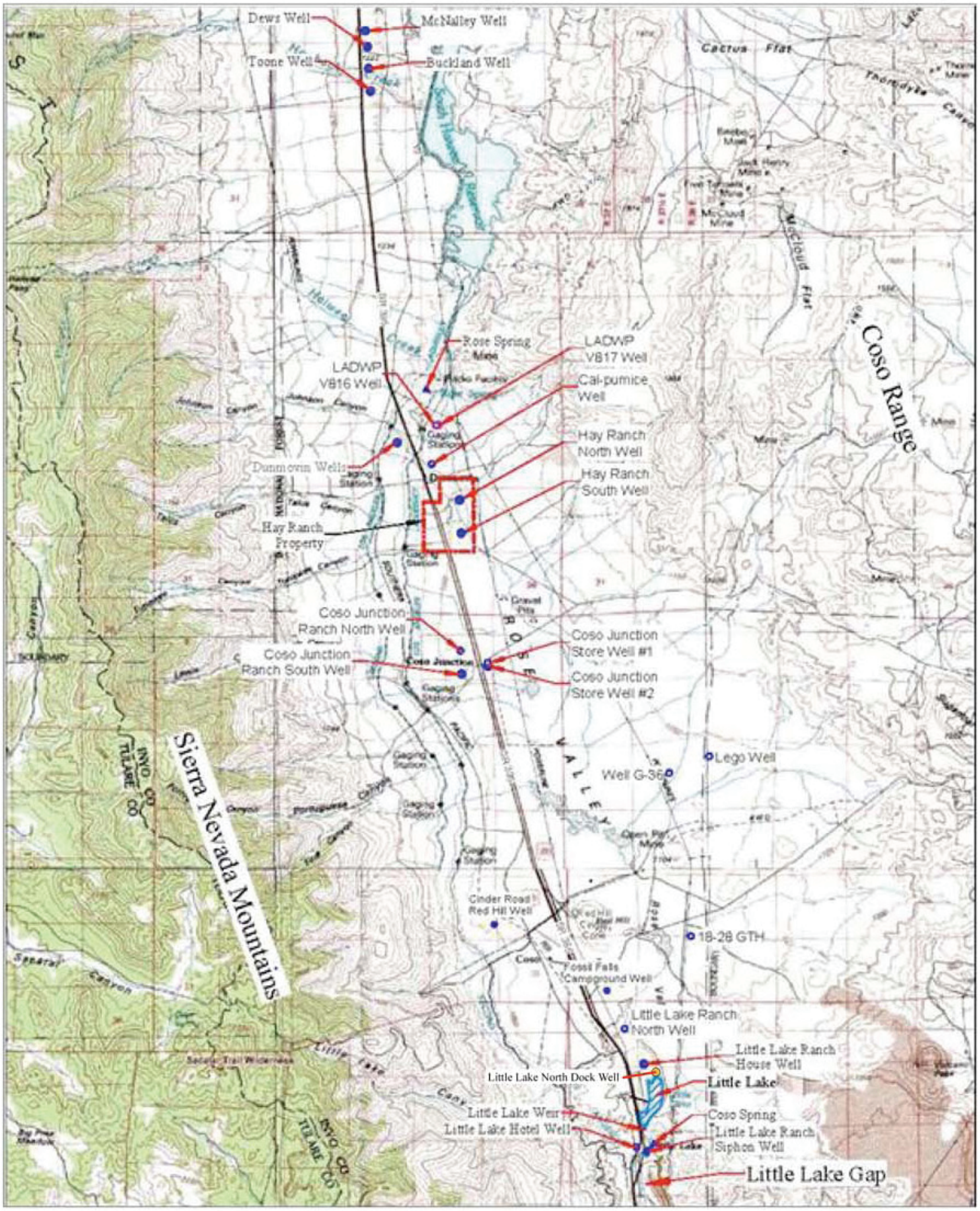
The monitoring and mitigation described in this HMMP will be performed by COC. COC will report results to the Inyo County Water Department on a monthly basis, and within 20 days of data collection. In addition, COC will submit quarterly and annual reports to the Inyo County Water Department summarizing the changes observed during the year and cumulative changes of the entire monitoring period, including conclusions and recommendations evaluating those changes relative to natural conditions such as rainfall and snowfall, assessing the significance of any changes compared to threshold levels if any, documenting any additional hydrologic modeling or adjustments to model-predicted impacts, and documenting any mitigation measures taken with respect to private wells or changes in Hay Ranch extraction rates. The applicant may request that Inyo County Water

Department allow changes in monitoring frequency by presenting hydrologic data to support a reduction in monitoring frequency that would not compromise the ability to monitor the response of the aquifer to pumping. Data will also be provided to a designated contact at Little Lake Ranch, LLC.

Page C4-13

The following Figure C4-3 has been edited to show the Little Lake North Dock Well. The North Dock well is an observation point only, and does not have a trigger point assigned to it. All wells shown are subject to the approval of the land owner. If approval is not forthcoming, alternative appropriate monitoring points would be established by Inyo County, if necessary.

Figure C4-3: Existing Wells that will be used in Hydrologic Monitoring



SOURCE: Geologica 2008

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Page C4-14

i. **Establish background groundwater levels**. Establishing a pre-pumping statistical background water level for each designated monitoring point is essential, in order to distinguish between natural seasonal variability versus drawdown caused by pumping associated with the project. Establishing a background for each monitoring point will require pre-pumping measurements to be conducted for a sufficient period of time to encompass normal seasonal variations in water level.

A minimum of 6 months of water level data will be required to establish the background water level at each monitoring point, and it is recommended but not required that 12 months of data be collected. For monitoring points with more extensive long-term monitoring data, e.g., the Hay Ranch wells, all groundwater measurements collected to date will be used to evaluate background conditions. The reference levels will be identified for each monitoring well during the 6 month baseline study period. An addendum to this HMMP will be required after the first six months of baseline data collection that lists the reference elevations for calculating drawdown for each trigger point monitoring well.

The applicant shall conduct statistical evaluation of the background water level data by a qualified person approved by Inyo County Water Department and provided by the applicant. An appropriate statistical method to calculate the background water levels shall be proposed by the applicant, subject to approval by Inyo County. Upon approval, the background water level for each monitoring point shall be calculated by the applicant and presented to Inyo County Water Department for review and approval. It is anticipated that statistical methods similar to those used to calculate background concentrations of naturally occurring chemical constituents at RCRA and CERCLA sites may be applicable.

Pages C4-15 to C4-19

Table C4-2: Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Groundwater Level, Extraction				
Hay Ranch North and Hay Ranch South wells	Total Groundwater Extracted	Daily	Pumpage not to exceed 4,839 acre-ft per year (13.25 acre-ft per day)	Reduce or discontinue pumping.
Six New Hay Ranch Observation wells (2 nests of 3 wells)	Groundwater Elevation	Measured hourly at a minimum using dedicated pressure transducer with data downloaded and plotted weekly for the first 3 months, then monthly. Supplement with manual measurements	Deviation of observed drawdown in two or more wells is at least 0.25 feet more than predicted trigger level value at any time beyond 4 months.	Alert County. County evaluates whether reduced pumping is appropriate prior to model recalibration. If appropriate, recalibrate model within one month and reassess impact to Little Lake.

		weekly for the first three months, then monthly. Hourly collection of data may be reduced to once every 4 hours,if appropriate and approved by Inyo County, as demonstrated by the analysis.	Groundwater level decline in two or more wells exceeding updated model predicted drawdown trigger levels by more than 0.25 feet in any quarterly data collection and monitoring period	Alert County. County to determine if decreased pumping is necessary immediately. Increase monitoring frequency to weekly for one month to confirm observation. Include results as part of quarterly data submittal. Recalibrate model within one month.

Table C4-2 (*Continued*): Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
			Maximum acceptable drawdown level from Table C4-1 exceeded	Pumping ceases until the model is recalibrated and will re-start only if it can be shown that pumping can continue at a rate that will maintain ~~wetlands and~~ water levels at Little Lake Ranch.
Pumice Mine well	Groundwater Elevation	Monthly for first two years, then quarterly	Deviation of observed drawdown at least 0.25 feet from predicted trigger level value at any time beyond the first quarter in two or more wells	Alert County. Recalibrate model within one month. Reassess potential impact to Little Lake. County to evaluate whether reduction in pumping is warranted.
LADWP V816			Groundwater level decline exceeding updated model predicted drawdown trigger levels by more than 0.25 feet in any well in any quarterly data collection and monitoring period	Alert County. Increase monitoring frequency to weekly for one month to confirm observations. Include results as part of quarterly data submittal. Recalibrate model within one month. County to evaluate
Dunmovin well				
Coso Junction #1, Coso Ranch North Well				
Lego well				
Well G-36				
Well 18-28				

Table C4-2 (*Continued*): Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Fossil Falls Campground well. New well to be located between Coso Jnc and Cinder Road Red Hill well				whether and when a reduction in pumping is warranted.
Cinder Road, Red Hill well			Maximum acceptable drawdown level from Table C4-1 exceeded	Pumping ceases until the model is recalibrated and will re-start only if it can be shown that pumping can continue at a rate that will maintain ~~wetlands and~~ water levels at Little Lake Ranch.
Little Lake Ranch North well	Groundwater Elevation	Monthly for first two years, then quarterly	Deviation of observed drawdown at least 0.25 feet more than predicted value at any time beyond the first quarter	Revise trigger level based on Little Lake hydrology study Reduce or cease pumping at Hay Ranch at the direction of the County. Augment flow to Little Lake in accordance with EIR Section 3.2.3 (Hydrology-3) and implement the Augmentation Plan to maintain groundwater level above trigger level
			Groundwater level decline exceeding updated model predicted drawdown by more than 50% in the well in any quarterly data collection and monitoring period	Alert County. Increase monitoring frequency to weekly for one month to confirm observations. Include results as part of quarterly data submittal. Recalibrate model within one month. County to evaluate whether and when a reduction in pumping is warranted. .
			Maximum acceptable drawdown level from Table C4-1 exceeded	Pumping ceases until the model is recalibrated and will re-start only if it can

Table C4-2 (*Continued*): Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
				be shown that pumping can continue at a rate that will maintain ~~wetlands and~~ water levels at Little Lake Ranch.
At least two of McNalley, Toone, Dews, or Buckland wells located west of Haiwee Reservoir	Groundwater Elevation	Monthly for first two years, then quarterly	N/A. Information used to update model	N/A
Haiwee Reservoir	Stage level	Request average weekly values from LADWP	N/A. Information used to update model	N/A
LADWP Aqueduct	Flow rate			
Little Lake Hydrology				
Little Lake Hotel Well and Little Lake North Dock well	Groundwater Elevation (or closed well pressure)	Measured hourly using dedicated pressure transducer with data downloaded and plotted weekly for the first 2 months, then monthly. <u>Hourly collection of data may be reduced to once every 4 hours,if appropriate and approved by Inyo County, as demonstrated by the analysis.</u>	No threshold applied, Information used to update model and trigger levels.	N/A
Little Lake	Lake Water Level Elevation			
Little Lake Weir	Little Lake Weir Discharge and Weir Height(1)			
Little Lake North Culvert Weir	Little Lake System Discharge Rate			
Groundwater beneath Little Lake (minimum of four locations)	Groundwater elevation relative to lake	Monthly for 6 months after startup; then Quarterly		
Little Lake Ranch Pond P1	Occurrence of Siphon Well Discharge	Weekly by visual inspection; discontinue at end of baseline monitoring period		
Little Lake	Major operational changes	Request quarterly reporting of any major operational changes to lake level or groundwater pumping on property.	1 ft or more change in lake level or groundwater pumping on property in excess of 100 gpm daily average	None applicable. Data to be used for model updates, if needed, and for evaluating basin wide groundwater level responses in quarterly data submittal

Table C4-2 (*Continued*): Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program				
Monitored Location (1)	**Parameters Monitored**	**Monitoring Frequency**	**Threshold Requiring Action**	**Action if Threshold Exceeded**
Groundwater Quality				
Hay Ranch North and Hay Ranch South wells	Specific Conductivity/TDS	Quarterly	TDS increase to 2,000 mg/L or greater	Increase monitoring frequency to monthly for 3 months and monitor 18-28, G-36; evaluate basin wide response and determine whether reduction in pumping or supply of alternative water source is warranted
Coso Junction #2, Little Lake Ranch North well	Specific Conductivity/TDS	Quarterly	TDS increase to 1,500 mg/L or greater	Increase monitoring frequency to monthly for 3 months and monitor 18-28, G-36; evaluate basin wide response and determine whether reduction in pumping or supply of alternative water source is warranted
Well Yield				
Dunmovin wells, Coso Junction wells, Red Hill well, Fossil Falls Campground well	Well Yield	Quarterly	Decrease in yield of 25% or more from pre-startup levels	Mitigate well impacts per EIR Section 3.2.3 (Hydrology-2) and the Private Well Mitigation Plan
Precipitation Recharge				
Little Lake Canyon Precipitation Gauge	Precipitation totals	Daily using continuous recorder	No threshold applicable. Use data to identify basin groundwater level response (west side vs. east side) and mountain vs. valley precipitation for future numerical model updates	Recalibrate model and reassess impact to Little Lake
Haiwee Reservoir Precipitation Gauge				
(1) With the exception of Hay Ranch, every monitoring point is subject to access approval from the appropriate owner. If approval is not forthcoming, alternative appropriate monitoring points will be established by Inyo County if necessary.				

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- If monitoring data collected during the first year show that a majority of monitoring points record drawdowns consistently lower than predicted, then Coso can recalibrate the Hydrology Model and make new predictions of the acceptable duration of pumping which will be summarized in a report provided to the County. Evaluation and correction of background levels for each well shall be conducted to account for natural variation and to separate effects of pumping from natural effects. The County will evaluate the report and data, and will make a determination as to whether continued operation is appropriate.

3.5.3 APPENDIX E: MEMORANDUM OF AGREEMENT BETWEEN NAVY AND SHPO

The following 1979 MOA between the Commander, Naval Weapons Center and the Coso Ad Hoc Committee, Owens Valley Paiute-Shoshone Band of Indians (July 1979) has been included as a new appendix to the EIR at the request of a commenter. The MOA is included as additional supplemental information and does not constitute significant new information that would require recirculation of the EIR.

MEMORANDUM OF AGREEMENT

The Commander Naval Weapons Center acting for and on behalf of the U. S. Government and the Coso Ad Hoc Committee, Owens Valley Paiute-Shoshone Band of Indians, acting for and on behalf of the Indians represented by that group, as well as for certain Indian people in the Kern Valley Indian Community area, are desirous of entering into this agreement for the mutual benefit of both parties. The general subject of the agreement is access to and related matters concerning the area known as Coso Hot Springs, located within the Naval Weapons Center, China Lake, California.

The parties hereafter referred to as the Naval Weapons Center and the Native Americans respectively, hereby agree:

1. That the terms of this Memorandum of Agreement are based upon the primacy of the mission of the Naval Weapons Center and that any or all access provisions herein agreed to shall be premised on a not-to-interfere with that mission basis;

2. That both parties to this Memorandum of Agreement recognize the provisions of Public Law 95-341 "Native American Religious Freedom" and its mandate for an evaluation of existing laws and regulations. Therefore, the terms of this Memorandum of Agreement are subject to review at the request of either party following the Presidential submittal of the evaluation to the Congress;

3. That the requirements of the Historic Preservation Act of 1966 (Public Law 89-665) shall be scrupulously adhered to by both parties and that both parties agree to diligently pursue the formulation and acceptance of a preservation and management plan for the Coso Hot Springs National Register of Historic Places site;

4. That upon request a maximum of eight (8) scheduled weekend visits per year shall be reserved exclusively for members of the Owens Valley Paiute-Shoshone Band of Indians and/or the Kern Valley Indian Community. Such visits shall be limited to a maximum of twenty five (25) vehicles and one hundred (100) people on any given weekend. The duration of any one weekend visit shall be from sunrise Saturday to sunset Sunday. However, up to three (3) two-night visits may be scheduled on Federal holidays which fall on weekends;

5. That unscheduled visits shall be considered on a case-by-case basis by the Commander, Naval Weapons Center, upon receipt of a written request by the Chairperson of the Coso Ad Hoc Committee describing the need for the visit, or a Committee member in the Chairperson's absence. In instances which the Chairperson considers a bona fide emergency, the request may be made by telephone and shall be followed with written confirmation;

6. That Native American groups other than the Owens Valley Paiute-Shoshone Band of Indians and those from the Kern Valley Indian Community are not covered by this agreement. However, medicine men who may be visiting the aforesaid groups may accompany these groups. Requests from other Native American groups shall be considered on a case-by-case basis;

7. That the boundaries of the visit area shall be the immediate vicinity of the Prayer Site, Coso Hot Springs, the old resort of the same name, and a designated overnight camping area. These areas are specified on a map accompanying this Memorandum of Agreement;

8. That appropriate sanitary facilities shall be provided by the Naval Weapons Center and installed in the camping area;

9. That the visiting Native Americans shall carry out all trash and garbage and shall police up their own camping area. On-site rubbish receptacles shall not be provided by the Naval Weapons Center;

10. That the Naval Weapons Center shall provide an escort for all visits; the escort shall be a person acceptable to the Ad Hoc Committee. During any ceremony, upon request, the escort shall withdraw to a discrete distance and shall not intrude on traditional rites;

11. That material or substantial alteration or permanent disturbance of the hot springs or the pond shall not be permitted. Both the Naval Weapons Center and the Native Americans pledge their mutual cooperative efforts to expeditiously develop a preservation and management plan acceptable to both parties and to the California State Office of Historic Preservation and approvable by the Advisory Council on Historic Preservation;

12. The Naval Weapons Center will provide Assumption of Risk forms t the Coso Ad Hoc Committee to be signed by each adult individual desiring t enter the Naval Weapons Center under provisions of this agreement. A designated Indian visit leader will be responsible for assembling all executed Assumption of Risk forms from each adult visitor for presentatio to the Navy escort at time of entry. The Naval Weapons Center will maintain a permanent file of signed Assumption of Risk forms and repeat visitors will not be required to provide new forms for subsequent visits.

MEMORANDUM OF AGREEMENT

13. That in the event the mission of the Naval Weapons Center requires use of its ranges, any or all visits shall be subject to cancellation without prior notice and under the same conditions are subject to immediate termination. The Coso Ad Hoc Committee shall be responsible for assisting the Naval Weapons Center, when and if necessary, in the event immediate evacuation of visitors from the area is required to conduct the mission of the Naval Weapons Center;

14. That the Naval Weapons Center reserves the right to prohibit future access if the terms of this Memorandum of Agreement are deliberately or materially violated by visiting Native Americans; and that the standards of conduct established for Naval Weapons Center personnel, federal, state or local agencies, and contractors while on the NWC ranges will be observed by visiting Native Americans.

W. L. Harris
For the Naval Weapons Center
Rear Admiral, U. S. Navy

Date June 28, 1979

Madeline Naylor
For the Coso Ad Hoc Committee

Ruth Brown
For the Coso Ad Hoc Committee

Hazel S. Maclean
For the Coso Ad Hoc Committee

Phyllis Hunter
For the Coso Ad Hoc Committee

Patti E. Wilmouth
For the Coso Ad Hoc Committee

Date July 25, 1979 9:15 a.m.

Approved as to Form on behalf of the Owens Valley Paiute-Shoshone Band of Indians

Anthony J. Mauller
CALIFORNIA INDIAN LEGAL SERVICES

Date June 25 1979

A year of negotiations between the Naval Weapons Center, China Lake, Calif., and the Owens Valley Paiute-Shosone Indians for a program permitting use by local Indians of the Coso Hot Springs area on the Center's test ranges were concluded on July 28, 1979, at the Coso Hot Springs site with the signing of an agreement for Indian use of the area. Present at the signing as shown in the photo are, left to right, Patti Wermuth, Kern River Valley Indian Community; Lt. Cmdr. Perry S. Patterson, USN, Staff Judge Advocate, Naval Weapons Center; Phyllis Hunter, Coso Ad Hoc Committee; Neddeen Naylor, Chairperson, Coso Ad Hoc Committee; Capt. Jon R. Ives, CEC, USN, Naval Weapons Center Public Works Officer; Art Maillet, California Indian Legal Services; Tilly Barling, Natural Resources Officer, Naval Weapons Center; Ruth Brown, member, Native American Heritage Commission; and Hazel McLean, Coso Ad Hoc Committee.

APPENDIX 1:
MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

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MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

December 2008

Prepared for:
Inyo County Planning Department
168 N. Edwards Street
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Independence, California 93526

Prepared by:
MHA Environmental Consulting, an RMT Business
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San Mateo, California 94402

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1: INTRO TO MMRP

1.1 Introduction

1.1.1 CEQA REQUIREMENTS

The County of Inyo has prepared an Environmental Impact Report (EIR) (with the assistance of RMT Inc.) to identify and evaluate potential environmental impacts associated with the Conditional Use Permit (CUP 2007-003) Application for the Coso Hay Ranch Groundwater Extraction and Delivery System. Many mitigation measures are defined in the EIR to reduce potentially significant impacts of the construction and operation of the proposed project.

The California Environmental Quality Act (CEQA) Section 15097(a) requires that:

> "The public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects."

CEQA Section 15097(a) describes mitigation monitoring or reporting.

> "…In order to ensure that the mitigation measures and project revisions identified in the EIR or negative declaration are implemented, the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

CEQA Section 15097(c) defines monitoring and reporting responsibilities of the lead agency.

> "(c) The public agency may choose whether its program will monitor mitigation, report on mitigation, or both. "Reporting" generally consists of a written compliance review that is presented to the decision making body or authorized staff person. A report may be required at various stages during project implementation or upon completion of the mitigation measure. "Monitoring" is generally an ongoing or periodic process of project oversight. There is often no clear distinction between monitoring and reporting and the program best suited to ensuring compliance in any given instance will usually involve elements of both. The choice of program may be guided by the following:

> (1) Reporting is suited to projects which have readily measurable or quantitative mitigation measures or which already involve regular review. For example, a report may be required upon issuance of final occupancy to a project whose mitigation measures were confirmed by building inspection.
>
> (2) Monitoring is suited to projects with complex mitigation measures, such as wetlands restoration or archeological protection, which may exceed the expertise of the local agency to oversee, are expected to be implemented over a period of time, or require careful implementation to assure compliance.
>
> (3) Reporting and monitoring are suited to all but the most simple projects. Monitoring ensures that project compliance is checked on a regular basis during and, if necessary after, implementation. Reporting ensures that the approving agency is informed of compliance with mitigation requirements."

This Mitigation Monitoring and Reporting Program (MMRP) is meant to facilitate implementation of the mitigation measures and provide a framework for monitoring to verify that mitigation measures are executed properly. Implementation of the MMRP also ensures all measures have been carried out and that compliance is reported in an easy to reference format. This process protects against the risks of non-compliance.

1.2 Purpose of MMRP

The purpose of the MMRP is to:

- Comply with the requirements of CEQA and the CEQA Guidelines
- Clearly define parties responsible for implementing and monitoring the mitigation measures
- Organize the measures into a format that can be more readily implemented by the applicant and monitored by the County and other agencies
- Provide a clear methodology and framework for verifying and reporting that the mitigation measures were implemented on a timely basis

1.3 MMRP Format

1.3.1 MMRP OVERVIEW

The MMRP includes tables to facilitate the implementation of all mitigation defined in the Final EIR. All non-hydrology mitigation measures are presented in Chapter 2 of this MMRP. The four hydrology mitigation measures are found in Chapter 3: Hydrologic Monitoring and Mitigation Plan of this MMRP.

1.3.2 NON-HYDROLOGY MITIGATION MEASURE TABLES

The mitigation measures are presented in a series of tables based on the time of implementation (i.e., pre-construction, construction, and operation). The tables include measures, the implementation methods and verification methods. All measures except for those found in Chapter 3.2 Hydrology and Water Quality are addressed in these tables.

1.3.3 HYDROLOGIC MONITORING AND MITIGATION PROGRAM

The project includes and extensive hydrologic monitoring and mitigation program (HMMP). The program is included in Chapter 3 of this MMRP.

The HMMP includes the:

- Monitoring, data collection, and reporting schedules;
- Actions that must be taken to implement the hydrologic mitigation measures defined in the Final EIR to ensure less than significant impacts to ground and surface waters in the Rose Valley;
- Reporting requirements for the applicant and to be reviewed by the County; and
- Responsible parties for implementing mitigation, for overseeing and reviewing reports and results, and ensuring compliance with all requirements of the plan.

1.4 MMRP System Execution

This MMRP system is designed to assist the applicant in implementing and reporting on the mitigation measures defined in the Final EIR. The MMRP would also facilitate monitoring of the measures by the County to ensure compliance. Implementation of the MMRP requires close coordination between the County and the applicant.

Pre-construction measures should be verified and relevant documents reviewed (such as plans, survey reports, etc.) as they are completed. The applicant would fund a monitor that is chosen by and reports to the County to verify that mitigation measures are being implemented in the field.

The hydrologic monitoring program would be implemented and monitored as described in the HMMP.

2: IMPLEMENTATION TABLES

2.1 Introduction

2.1.1 OVERVIEW

This chapter of the MMRP includes tables that facilitate the implementation of all of the non-hydrologic mitigation measures presented in the Final EIR. The tables include all mitigation measures identified in the Final EIR, except for mitigation measures identified in Chapter 3.2 Hydrology and Water Quality, of the Final EIR. Implementation of those measures is through the HMMP. The HMMP is found in Chapter 2 of the MMRP.

The mitigation measures are divided into 3 tables, corresponding to the phases of the project

- ***Table 2-1*** includes all pre-construction measures. These are measures that must be implemented prior to commencement of any ground disturbing activities. These measures include preparation of plans such as an Erosion Control Plan and performing surveys for sensitive species.
- ***Table 2-2*** includes all construction measures. These measures would be implemented during the construction phase of the project. These measures must also be implemented for any maintenance work over the life of the project that requires the excavation and replacement or repair of project components, such as pipelines.
- ***Table 2-3*** includes mitigation measures that would be implemented over the life of the project. If any excavation were to occur to replace or repair project components during the operation phase of this project or for decommissioning this project, the measures in Table 2-2 must be implemented.

Each table is further divided into the following columns:

1) MM#	2) Mitigation Measure	3) Implementation Schedule	4) Implementing Action	5) Verification Schedule	6) Method of Verification	7)Monitoring Entity

1) Column 1 includes the mitigation measure number from the EIR for reference.
2) Column 2 includes the text of the mitigation measure to be implemented.

3) Column 3 includes the scheduled timing for implementation.
4) Column 4 includes the actions necessary for implementation.
5) Column 5 describes the schedule that implementation of the measure should be verified by the monitoring entity.
6) Column 6 describes how to monitor and report on implementation, such as field verification, review of plans, coordination with an agency, documentation of compliance, etc.
7) Column 7 lists the agencies and parties responsible for monitoring.

2.2 Non-Hydrology Mitigation Measure Tables

Table 2-1: Pre-Construction Measures

1) MM#	2) Mitigation Measure	3) Implementation Schedule	4) Implementing Action	5) Verification Schedule	6) Method of Verification	7) Monitoring Entity
Geology and Soils						
Geology-1	An ***erosion control plan*** shall be prepared and implemented to the satisfaction of CLNAWS and the BLM to mitigate for any potential impact to CLNAWS and BLM lands.	The plan shall be prepared at least 30 days prior to construction and submitted to Inyo County Planning Department, the BLM, and the Navy.	Prepare the plan and submit to the BLM and CLNAWS for approval.	Prior to construction.	Review of the plans.	Inyo County Planning Department BLM Navy
Biological Resources						
Biology-2	**Pre-Construction Tortoise Surveys.** To prevent take of desert tortoises, an authorized biologist shall survey the project site prior to construction to identify individual tortoises that may be within or very near project boundaries. Because adult tortoises are most likely to be active above ground from February 15 to November 15 and least likely from November 16 to February 14, preconstruction surveys shall be conducted within 48 hours before construction from February 15 to November 15 and will be done within two weeks prior to construction between November 16 and February 14. All potential tortoise burrows in the construction zone, including those not recently used, shall be excavated by an approved biologist at the time of the survey.	Survey work shall occur within 48 hours before construction from February 15 to November 15 and at least 2 weeks prior to construction between November 16 and February 14.	The applicant shall hire a qualified biologist approved by Inyo County Planning Department. The biologist shall excavate burrows as defined in the mitigation measure. The biologist shall prepare a memo to be submitted to the County, BLM, and Navy describing their findings.	Prior to construction.	Review of the report.	Inyo County Planning Department BLM Navy

Table 2-1 *(Continued)*: Pre-Construction Measures

1) MM#	2) Mitigation Measure	3) Implementation Schedule	4) Implementing Action	5) Verification Schedule	6) Method of Verification	7) Monitoring Entity
Boilogy-5	**Tortoise and Ground Squirrel Training.** All construction workers shall participate in a Mohave ground squirrel and desert tortoise education program prior to construction. The program shall include identification, basic biology, general behavior, local distribution, sensitivity to human activities, legal protection, penalties for violating state or federal laws, impact avoidance methods, and reporting requirements. Construction personnel shall be instructed not to handle desert tortoise.	Prior to commencement of construction activities.	The applicant shall hire a qualified biologist approved by Inyo County Planning Department to train construction workers.	Prior to construction.	Inyo County, BLM, and Navy staff shall review and approve of training program.	Inyo County Planning Department BLM Navy
Biology-7	**Biology-7**: The applicant shall purchase replacement land occupied by desert tortoise and Mohave ground squirrel at a ratio of 3 acres for every 1 acre disturbed on the Hay Ranch property (for a total of 18 acres). The replacement land shall be deeded to the CDFG for the Desert Tortoise Preserve. The location of compensation lands shall be approved by the CDFG. The project proponent shall also pay a one-time endowment fee for the long-term management of these lands.	Prior to commencement of construction activities.	The applicant shall work with the CDFG and the Desert Tortoise Preserve to purchase compensation land. The applicant shall supply the final documentation for the purchase and any agreements to the County.	Prior to construction.	Review of final documentation of purchase and agreements.	Inyo County Planning Department
Biology-8	The population of crowned muillas shall be avoided during construction. If the crowned muillas cannot be avoided during construction, a plan shall be prepared for restoration (as well as an attempt at relocation of the individual plant), and seeds of the plant shall be collected. The plan shall include at a minimum; (a) the location of where the plant shall be seeded or replanted, with	If crowned mullias can not be avoided, the plans shall be prepared at least 30 days prior to construction.	The applicant shall hire a qualified biologist approved by the County to prepare the plan and to implement the measures in the plan.	Prior to construction.	Review of plan.	Inyo County Planning Department

Table 2-1 *(Continued)*: Pre-Construction Measures

1) MM#	2) Mitigation Measure	3) Implementation Schedule	4) Implementing Action	5) Verification Schedule	6) Method of Verification	7) Monitoring Entity
	preference for on-site replacement such as over the pipeline route; (b) the plant species and seeding rate; (c) a schematic depicting the replanting or seeding area; (d) the planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on-site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria.					
Biology-9	Thirty days prior to ground-disturbing activities, the site and adjacent areas within a 500 foot buffer zone would be surveyed for burrowing owls and other ground-nesting avian species such as horned lark. Occupied burrows and nests would be avoided during construction. No disturbance would occur within 150 feet of occupied burrows or nests during the nonbreeding season or within 250 feet during the breeding season. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be preserved contiguous with the occupied burrow sites for each pair of breeding burrowing owls (with or without dependent young) or single unpaired resident owl. If, during the nonbreeding season, occupied burrows are unavoidable, burrowing owls in burrows on site and within a 150 foot buffer zone would be passively relocated by a qualified biologist to natural or artificial burrows that are beyond 150	Surveys shall be conducted 30 days qualified biologist, approved prior to construction.	The applicant shall hire a qualified biologist approved by the County to perform the surveys. The biologist shall identify the no-work zones as appropriate and shall relocate owls as appropriate and as defined by the mitigation measure. The biologist shall prepare a report of the results of the survey, including maps showing the areas to be avoided during construction and/or the locations where owls were	Prior to construction.	Review of survey results.	Inyo County Planning Department

Table 2-1 *(Continued)*: Pre-Construction Measures

1) MM#	2) Mitigation Measure	3) Implementation Schedule	4) Implementing Action	5) Verification Schedule	6) Method of Verification	7) Monitoring Entity
	feet from the impact zone and that are contiguous to a minimum of 6.5 acres of foraging habitat for each relocated pair or single bird, following standardized CDFG protocols (CDFG 1995). If they are found during the breeding season, construction would cease until it has been determined by a qualified biologist that the young have fledged and are feeding independent of their parents, at which time the owls would be relocated.		relocated.			
Cultural Resources						
Cultural Resources-1	Prior to commencement of the project, all construction workers shall be trained on critical elements of compliance with the Archaeological Resources Protection Act (ARPA), Native American Graves Repatriation Act (NAGPRA), and the National Historic Preservation Act (NHPA), along with pertinent County requirements and expectations concerning the protection of natural, cultural, and current approved land uses. Training shall be performed by a qualified archaeologist.	Prior to commencement of construction activities.	The applicant shall hire a qualified archaeologist approved by Inyo County Planning Department to train all construction workers.	Prior to construction.	Inyo County, BLM, and Navy staff shall review and approve of training program.	Inyo County Planning Department BLM Navy
Cultural Resources-4	The entire proposed 1.5-acre substation site, and the path to interconnect the substation to the proposed switchyard near the lift pump station, shall be subject to an intensive pedestrian survey for cultural resources, consistent with the previous survey work performed for this project. If resources are found that are potentially eligible for the National Register of Historic Places, the substation site shall be moved to a surveyed area without resources. If	At least 30 days prior to construction.	SCE shall hire a qualified archeologist to perform the survey work. SCE shall prepare detailed plans of the substation site and submit them to the County. Any resources	Prior to construction	Review of the plans and any cultural resource reports.	Inyo County Planning Department California State Historic Preservation Office

Table 2-1 *(Continued)*: Pre-Construction Measures

1) MM#	2) Mitigation Measure	3) Implementation Schedule	4) Implementing Action	5) Verification Schedule	6) Method of Verification	7) Monitoring Entity
	resiting the substation to avoid potentially significant resources is (resources eligible for the NRHP, also known as historic properties) not possible, data recovery shall be accomplished in the context of a detailed research design and in accordance with current professional standards. The plan shall result in the extraction of sufficient volumes of non-redundant archaeological data so as to address important regional research consideration; detailed technical reports shall be prepared to document the findings. The survey and substation siting shall be performed prior to sale of land to Southern California Edison. A Native American monitor shall be present during all survey work.		found shall be handled through the State Historic Preservation Office.			
Cultural Resources-5	The portion of pipeline surrounding the six known sites shall be shifted to the adjacent location within the roadway along Gill Station Coso Road. The following length of pipeline would be shifted for each site. • The entire pipeline area over the site boundaries plus 98 feet (30 meters) on either side of larger sites INY-1863, INY-2125, INY-4413, and CGP-2 • The entire pipeline area over the site boundaries plus 33 feet (10 meters) one either side of smaller sites INY-3406 and CGP-1 The most recent redefined boundary for site INY-1863 as discovered in cultural	The plans shall be revised at least 2 months prior to construction.	The plans shall be revised at least two months prior to construction and submitted to Inyo County Planning Department, the Navy and the BLM for review.	Prior to construction.	The BLM, Navy, and Inyo County Planning Department shall review and approve the plans.	Inyo County Planning Department BLM Navy

Table 2-1 *(Continued)*: Pre-Construction Measures

1) MM#	2) Mitigation Measure	3) Implementation Schedule	4) Implementing Action	5) Verification Schedule	6) Method of Verification	7) Monitoring Entity
	resource surveys performed in July 2007 for the Gill Station Coso Road upgrades project shall be used to relocate the pipeline.					
Cultural Resources-7	Any new monitoring wells and access roads leading to the wells that are in undisturbed areas shall be subject to an intensive pedestrian survey for cultural resources, consistent with the previous survey work performed for this project. If resources are found that are potentially eligible for the National Register of Historic Places, the well and/or road sites shall be moved to a surveyed area without resources. A Native American monitor shall be present during all survey work.	Surveys shall be performed at least 30 days prior to construction.	The applicant shall hire a qualified archaeologist, approved by the County to perform the survey work. The survey results shall be prepared and submitted to the BLM, Navy and the County. The applicant shall hire a Native American monitor.	Prior to construction.	The report and any sites found shall be reviewed with the Navy and BLM archaeologist in the field.	Inyo County Planning Department BLM Navy
Hazards						
Hazards-4	A site-specific Health and Safety Plan shall be prepared to minimize the exposure of workers and the public to potentially hazardous materials during all phases of project construction. The plan shall include, but will not be limited to, appropriate personal protection equipment to be worn, decontamination methods, spill control measures, and emergency preparedness and response. All site workers will be required to attend a mandatory safety meeting to overview the plan before commencing work.	At least 30 days prior to construction.	The applicant shall ensure that the plan is prepared and submitted to the Inyo County Planning Department.	Prior to construction.	The County would review the plan to ensure that it is adequate.	Inyo County Planning Department
Hazards-5	Containment measures for the substation and its associated facilities shall be described in a Spill Prevention,	At least 30 days prior to construction.	The plan shall be prepared by SCE personnel and	Prior to construction.	The County would review the plan to	Inyo County Planning Department

Table 2-1 *(Continued)*: Pre-Construction Measures

1) MM#	2) Mitigation Measure	3) Implementation Schedule	4) Implementing Action	5) Verification Schedule	6) Method of Verification	7) Monitoring Entity
	Control, and Countermeasure (SPCC) Plan. The SPCC plan shall be prepared by Southern California Edison (SCE) upon finalization of the substation design and shall be submitted to Inyo County for review. The SPCC would include standard SCE prevention measures.		submitted to Inyo County Planning Department.		ensure that it is adequate.	
Traffic and Transportation						
Traffic-2	This mitigation measure would only be necessary if the COC decides to use Rose Valley Ranch Road to access the Hay Ranch parcel directly off of Highway 395. If Rose Valley Ranch Road is determined to have an inadequate turning radius for the proposed project usage during the encroachment permit application process, the route shall not be used. If the turning radius is adequate, all other recommendations in the encroachment permit shall be implemented. During project hours, construction signs shall be posted along northbound US 395 between Coso Junction and the northern extent of the Hay Ranch parcel. Signage shall indicate slower construction traffic ahead, and shall be installed in compliance with encroachment permits.	If Rose Valley Ranch Road is to be used, the studies to determine the adequacy of the road would be performed at least 30 days prior to commencement of construction.	The applicant shall hire a qualified engineer to complete the studies necessary for an encroachment permit, if necessary and submit permit application to Caltrans.	Prior to construction.	Review permits from Caltrans.	Inyo County Planning Department Caltrans

Table 2-2: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
Geology, Soils, and Seismicity						
Geology-1	An ***erosion control plan*** shall be prepared and implemented to the satisfaction of CLNAWS and the BLM to mitigate for any potential impact to CLNAWS and BLM lands.	The erosion control plan shall be implemented at all times during construction.	Construction crew members shall implement measures as defined in the plan.	A County monitor shall check that the measure is being implemented once a week during project construction.	Field verification.	Inyo County Planning Department
Biological Resources						
Biology-1	All project vehicles shall be washed down daily at an approved wash down location. Wash down water areas shall be lined to contain all wash-down water and shall not be located within 100 feet of an existing water body. The wash-down water shall be allowed to evapo-rate, and the remaining condensate and liner shall be property disposed of in a landfill. Construction workers shall be made aware of wash-down requirements for personal vehicles used along the construction corridor and of the designated wash down areas.	Vehicles shall be washed down daily.	The wash down location shall be sited away from water courses. Construction workers shall be directed to implement this measure at the end of each work day.	A County monitor shall check that the measure is being implemented once a week during project construction.	Field verification.	Inyo County Planning Department
Biology-3	**Tortoise Fencing and Project Limits.** A tortoise-proof exclusion fence shall be constructed around the proposed project construction area including lay down and stockpile sites in potential tortoise habitat. To further minimize take of desert tortoise habitat, project boundaries shall be staked, and all activities would be restricted to the defined project site.	The project limits shall be maintained and abided by at all times.	Construction workers shall be trained to stay within project limits. The tortoise fencing shall be installed by a qualified biologist. The construction manager shall identify lay down and stockpile areas to be fenced.	A County monitor shall check that workers are staying with in project boundaries and fences are in tact, once a week during construction.	Field verification.	Inyo County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
Biology-4	**Tortoise Monitoring During Construction.** A qualified tortoise biologist shall be on-site during all phases of construction to keep individual desert tortoises out of harm's way. Only tortoises within the construction right-of-way shall be handled and only by the qualified biologist.	A qualified tortoise biologist shall be on-site at all times.	A qualified tortoise biologist shall be hired by the applicant with the approval of the County. The tortoise biologist shall provide a short daily monitoring summary.	A County monitor shall check the monitoring summaries weekly.	Field verification and review of written reports.	Inyo County Planning Department
Biology-6	**Other Construction Measures for Protection of Desert Tortoise.** The following additional measures shall be implemented during construction for the protection of desert tortoise: • If a recently dead or injured desert tortoise is found, the approved biologist shall immediately notify the USFWS and CDFG. • Construction personnel will look for desert tortoises under vehicles and equipment before they are moved. If a desert tortoise is present, the vehicle will not be moved until the tortoise has moved from under the vehicle and out of harm's way, or the approved biologist has relocated the tortoise. • Trash and food items shall be contained in closed containers and regularly removed to reduce the attractiveness of the area to opportunistic predators such as common ravens, coyotes and feral dogs.	This measure shall be implemented at all times during construction.	Construction workers shall be trained to implement these measures as part of their daily routine.	A County monitor shall check that the measure is being implemented once a week during project construction.	Field verification.	Inyo County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
	• Pets will be prohibited from the construction site. • The top 8 inches of removed soil will be salvaged and stockpiled on site. Following construction the salvaged topsoil will be used as final cover over the pipeline. • Following construction, the pipeline corridor will be restored based on the existing approved restoration plan. • Driving off established roads will be prohibited unless required by construction activities. • Vehicle speeds shall not exceed 25 miles per hour through desert tortoise habitat unless otherwise posted.					
Biology-8	The population of crowned muillas shall be avoided during construction. If the crowned muillas cannot be avoided during construction, a plan shall be prepared for restoration (as well as an attempt at relocation of the individual plant), and seeds of the plant shall be collected. The plan shall include at a minimum (a) the location of where the plant shall be seeded or replanted, with preference for on-site replacement such as over the pipeline route; (b) the plant species and seeding rate; (c) a schematic depicting the replanting or seeding area; (d) the planting schedule; (e) a description of the irrigation methodology; (f) measures	If the crowned mullias can be avoided, then they shall be avoided at all times during construction.	The population shall be flagged and workers shall be informed that the flagged areas must be avoided.	A County monitor shall check that the measure is being implemented once a week during project construction.	Field verification.	Inyo County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
	to control exotic vegetation on-site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity.					
Biology-9	Thirty days prior to ground-disturbing activities, the site and adjacent areas within a 500 foot buffer zone would be surveyed for burrowing owls and other ground-nesting avian species such as horned lark. Occupied burrows and nests would be avoided during construction. No disturbance would occur within 150 feet of occupied burrows or nests during the nonbreeding season or within 250 feet during the breeding season. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be preserved contiguous with the occupied burrow sites for each pair of breeding Burrowing Owls (with or without dependent young) or single unpaired resident owl. If, during the non-breeding season, occupied burrows are unavoidable, burrowing owls in burrows on site and within a 150 foot buffer zone would be passively relocated by a qualified biologist to natural or artificial burrows that are beyond 150 feet from the impact zone and that are contiguous to a minimum of 6.5 acres of foraging habitat for each relocated pair or single bird, following standardized CDFG	Occupied burrows shall be avoided throughout construction.	An area of 150 feet during the non-breeding season, or 250 feet during the breeding season around an occupied burrow shall be flagged prior to construction and avoided at all times during construction. If construction crosses from the non-breeding into the breeding season, the flagging shall be expanded from 150 feet to 250 feet at that time. Construction workers shall be informed that the flagged areas must be avoided.	A County monitor shall check that the measure is being implemented once a week during project construction.	Field verification.	Inyo County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
	protocols (CDFG 1995). If they are found during the breeding season, construction would cease until it has been determined by a qualified biologist that the young have fledged and are feeding independent of their parents, at which time the owls would be relocated.					
Cultural Resources						
Cultural Resources-2	Due to the high cultural sensitivity in the project area, a trained archaeologist shall monitor all excavation and construction. A Native American monitor must also be present during excavation. If prehistoric or historic artifacts are discovered during excavation, the monitor shall have the authority to halt all earth moving activities within and around the immediate discovery area until the find can be assessed (as addressed in Cultural Resources-3).	A monitor shall be on-site at all times during construction.	The applicant shall hire a qualified archaeological and Native American monitor to be approved by the County. The monitors shall prepare a daily summary of activities.	A County monitor shall check the monitoring summaries weekly.	Field verification and review of written reports.	Inyo County Planning Department
Cultural Resources-3	In the event that an unanticipated archaeological or historic resource is encountered during construction, work in the immediate vicinity of the find shall be halted until all requirements relating to archaeological discoveries have been satisfied. The field crew supervisor, archaeological, and Native American monitor shall halt ground-disturbing activities in the proximity of the find (100 feet), secure from vandalism or further disturbance a “no work” zone utilizing appropriate flagging, and notify appropriate County, BLM and Navy staff. The qualified professional	As required.	The qualified archaeologist shall stop work, secure the area, notify the County, Navy, and BLM. The archaeologist shall prepare a report detailing the occurrence and submit the report within 1 day to the County.	As required.	The appropriate County personnel would go to the project site upon notification. The County monitor would review the archeologists report.	County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
	archaeologist shall evaluate the find for eligibility for listing in the National Register of Historic Places (NRHP). If the site is determined eligible for the NRHP, the archaeologist shall identify the limits of the resource and clearly delimit the area with flagging. The eligible resources shall be avoided if possible. Only if avoidance is not possible to construct the project (and no other option for resolving adverse effects is available), data recovery shall be accomplished in the context of a detailed research design and in accordance with current professional standards. The plan shall result in the extraction of sufficient volumes of non-redundant archaeological data so as to address important regional research consideration; detailed technical reports shall be prepared to document the findings.		The archaeologist shall work with the BLM and Navy staff to determine the eligibility of the site and methods of securing the site as appropriate, such as 24 hour watch, depending upon the sensitivity of the resource encountered. The archaeological and Native American monitors shall ensure that construction workers do not enter the no-work zone.		The County monitor would verify daily in the field that the site is being avoided until eligibility has been determined and the site cleared by the qualified archaeologist.	
Cultural Resources-6	The limits of the project construction in the vicinity of the six known historic and archaeological sites shall be flagged. No work, equipment staging, or foot traffic shall be allowed outside of the flagged areas. Workers shall be trained (per Cultural Resources-2) of the resource sensitivity in the area and to abide by construction right of way limits.	Areas shall be flagged prior to construction and enforced throughout construction	The archeologist would flag areas prior to construction and ensure that the measure is implemented during construction.	A County monitor shall check the monitoring summaries weekly.	Field verification and review of written reports	Inyo County Planning Department
Cultural Resources-9	In order to minimize impacts to Native Americans, traffic (within a reasonable distance of the religious activity) will be halted during ceremonial and religious observations.	As requested by Native Americans.	The applicant shall contact the Native American tribes and request notification 2 weeks in advance of a religious ceremony or observation. All workers shall be notified of the time and duration for which traffic shall be halted.	The County monitor shall verify that traffic is halted during the times requested.	Field verification.	Inyo County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
			The applicant shall notify the County, BLM, and Navy of the times requested by the Native Americans.			
Cultural Resources-10	In the event of discovery of human remains (or the find consists of bones suspected to be human), the field crew supervisor, archeological monitor, and Native American monitor, under the direction and responsibility of the applicant, shall take immediate steps to secure and protect such remains from vandalism during periods when workers are absent**.** The Inyo County Coroner shall be notified immediately and provided with any information that identifies the remains as Native American. If the remains are determined to be from a prehistoric Native American, or determined to be a Native American from the ethnographic period, the Coroner shall contact the Native American Heritage Commission within 24 hours of being notified of the remains. The NAHC then designates and notifies within 24 hours a Most Likely Descendent (MLD). The MLD has 24 hours to consult and provide recommendations for the treatment or disposition, with proper dignity, of the human remains and grave goods. Human remains shall be preserved in situ if continuation of construction, as determined by the qualified Archaeologist and MLD, will not cause further damage to the remains (this is	As required.	The qualified archaeologist shall stop work, secure the area, notify the County, Navy, and BLM. The archaeologist shall prepare a report detailing the occurrence and submit the report within 1 day to the County. The archaeologist shall notify the coroner and the NAHC within 24 hours of the discovery. The archaeologist, Navy, and BLM staff shall work with the tribes to handle the site. The archaeological and Native American monitors shall ensure that construction workers do not	As required.	The appropriate County personnel would go to the project site upon notification. The County monitor would review the archeologists report. The County monitor would verify daily in the field that the site is being avoided until eligibility has been determined and the site cleared by the qualified archaeologist.	Inyo County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
	the preferred alternative). The remains and artifacts shall be documented and the find location carefully backfilled (with protective geo-fabric if desirable). In the event that human remains or burial-associated items are exposed and cannot be protected from further damage, they shall be exhumed by the qualified archaeologist at the discretion of the MLD and tribes and reburied with the concurrence of the MLD and tribes in a place mutually agreed upon by all parties.		enter the no-work zone.			
Aesthetics						
Aesthetics-1	Construction of the project components on the Hay Ranch property shall be screened with cloth construction fencing. The fencing will be a desert sand or similar neutral color. The fencing will conceal equipment and material piles from sensitive viewers. The temporary fencing shall be removed after construction is complete.	The screening shall be installed just prior to construction and shall remain throughout construction.	Screening shall be chosen prior to construction and installed just prior to construction. The construction manager shall insure that the screening remains during construction and is removed at the end of construction.	A County monitor shall check that the measure is being implemented once a week during project construction.	Field verification.	Inyo County Planning Department
Hazards and Hazardous Materials						
Hazards-1	Smoking shall be prohibited except in designated areas, at least 20 feet from any combustible chemicals/materials and off of dry vegetation.	At all times during construction.	A designated construction area shall be established and all workers informed of that smoking is only allowed in the	A County monitor shall check that the measure is being implemented once a week during project	Field verification.	Inyo County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
			designated area.	construction.		
Hazards-2	All heavy equipment and rubber-tired construction vehicles shall be equipped with fire extinguishers. All rubber-tired construction vehicles shall be equipped with appropriate fire fighting equipment, such as shovels and axes or pulaskis, to aid in the prevention or spread of fires. All construction equipment shall be equipped with the appropriate spark arrestors and functioning mufflers.	At all times during construction.	The construction manager shall vehicles are properly equipped.	A County monitor shall periodically check equipment.	Field verification.	Inyo County Planning Department
Hazards-3	Soldering or welding shall not be performed within 15 feet of dry grass or other natural fuels. An extinguisher shall be available at the project site at all times when welding or performing other activities that can generate sparks.	At all times during construction.	The construction manager shall ensure that workers understand and implement this measure.	A County monitor shall periodically check that this measure is being implemented.	Field verification.	Inyo County Planning Department
Air Quality-1	Prior to excavation for any component of the project, any dry soils shall be watered. Soils shall be monitored and continue to be watered throughout the project if dust begins to generate. Other measures that shall be implemented to minimize dust to meet District Rule 400 and 401 include: • Use, where possible, of water or chemicals for control of dust in the grading of roads or the clearing of land. • Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Adequate contamination methods shall be employed during such	At all times during construction.	Construction workers shall be trained to implement these measures as part of their daily routine.	A County monitor shall periodically check that this measure is being implemented.	Field verification.	Inyo County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
	handling operations. • Use of water, chemicals, chuting, venting, or other precautions to prevent particulate matter from becoming airborne in handling dusty materials to open stockpiles and mobile equipment. All active construction and disturbed areas should be watered at least twice daily. • Maintenance of roadways to a clean condition. • Halting all dust-generating activities if wind gusts exceed 25 mph. • Covering all trucks hauling soil, sand and other loose materials or requiring all trucks to maintain at least two feet of freeboard. • Applying water three times daily, or applying (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. • Hydroseeding or applying (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten calendar days or more). • Enclosing, covering, watering twice daily or applying (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc).					
Air Quality-2	Any project personnel, during both construction and operation, who is required to drive vehicles on unpaved roads shall obey a speed limit of 25	At all times when driving on unpaved roads is required.	Inform workers of speed limit policy.	A County monitor shall periodically check that this measure is being	Field verification.	Inyo County Planning Department

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
	miles per hour (mph).			implemented.		
Traffic and Transportation						
Traffic-1	No construction activities that result in complete blockage of Gill Station Coso Road shall be allowed between the hours of 7 and 9 am and 3 and 5 pm. At other times of the day, traffic flow shall not be ceased for more than 30 minutes. Flagmen shall be utilized as necessary to direct traffic around construction sties during installation of the pipeline on Gill Station Coso Road. The applicant shall coordinate any road closures with the appropriate parties (i.e. fire department, the pumice mines, tribes, and CLNAWS).	At all times during construction.	Workers shall be informed of the measure and the construction manager shall be responsible to ensure that it is being implemented. Flagmen shall be hired as necessary.	A County monitor shall periodically check that this measure is being implemented.	Field verification.	Inyo County Planning Department
Traffic-2	This mitigation measure would only be necessary if the COC decides to use Rose Valley Ranch Road to access the Hay Ranch parcel directly off of Highway 395. If Rose Valley Ranch Road is determined to have an inadequate turning radius for the proposed project usage during the encroachment permit application process, the route shall not be used. If the turning radius is adequate, all other recommendations in the encroachment permit shall be implemented. During project hours, construction signs shall be posted along northbound US 395 between Coso Junction and the northern extent of the Hay Ranch parcel. Signage shall indicate slower construction traffic ahead, and shall be installed in compliance with	If this measure is required, then it would be enforced at all times during construction.	Field crew shall be trained to only use authorized access routes. The construction manager shall ensure that the construction workers understand and implement this measure.	A County monitor shall periodically check that this measure is being implemented.	Field verification.	Inyo County Planning Department Caltrans

Table 2-2 *(Continued)*: Construction Phase Measures

1) MM#	2)Mitigation Measure	3)Implementation Schedule	4)Implementing Action	5)Verification Schedule	6)Method of Verification	7)Monitoring Entity
	encroachment permits.					
Traffic-3	Emergency vehicle access shall be secured at all times along Gill Station Coso Road. The applicant shall provide the US Navy, the pumice mines, and the local fire department with construction schedules prior to project construction of the pipeline along Gill Station Coso Road. The applicant shall also provide maps identifying emergency access around active construction sites, including access around roadway trenching for the three pipeline crossings.	At all times during construction.	Workers shall be informed of the measure and the construction manager shall be responsible to ensure that it is being implemented. The construction manager shall supply the Navy, pumice mines, and the local fire department with construction schedules and maps showing emergency access routes.	A County monitor shall periodically check that this measure is being implemented.	Review of plans and maps. Field verification.	Inyo County Planning Department Local fire department Navy
Traffic-4	The applicant shall regrade and restore any areas of Gill Station Coso Road and US-395 and its ROW that are disturbed by construction including installation of the pipeline and high point tank. The applicant shall take photo documentation of the roadway conditions before construction and after construction and shall provide these photographs to County Public Works upon request.	After construction is complete.	The construction plans shall include the specifications to restore the road to previous conditions or better after construction.	After completion of construction.	The applicant and/or construction manager shall provide Inyo County Public Works Department and the Navy the before and after pictures of the roadway to verify that the condition of the road is acceptable.	Inyo County Planning Department Inyo County Public Works Department Navy

Table 2-3: Operation Phase Mitigation Measures

1) MM#	2) Mitigation Measure	3) Implementation Schedule	4) Implementing Action	5) Verification Schedule	6) Method of Verification	7)Monitoring Entity
Geology, Soils, and Seismicity						
Geology-2	If erosion is seen at the drain points at the water storage tanks, the areas at the tank outlets shall be stabilized with rock rip rap to minimize loss of soil.	Monthly during the rainy season. Apply rip rap if needed.	Check around tanks for erosion. If erosion is found, apply rock rip rap.	Bi-Annually.	Field verification.	Inyo County Planning Department
Cultural Resources						
Cultural Resources-8	No water shall be pumped directly onto the six known cultural resource sites during draining of the project pipeline for maintenance. Water pumped out of the pipeline shall not occur in the vicinity of known cultural resources.	During maintenance that requires draining of the pipeline or tanks.	Flag sensitive areas and inform crew that water must be directed away from those areas. The applicant shall inform the County of any pipeline draining work at least 1 week prior to the work, unless it is an emergency and then the County shall be notified immediately.	During maintenance that requires draining of the pipeline.	Field verification.	Inyo County Planning Department
Cultural Resources						
Air Quality-2	Any project personnel, during both construction and operation, who is required to drive vehicles on unpaved roads shall obey a speed limit of 25 miles per hour (mph).	At all times when driving on unpaved roads is required.	Workers shall be informed of speed limit policy.	As appropriate.	The County shall respond to any complaints.	Inyo County Planning Department

3: HMMP

3.1 Introduction

The reader is advised that the following hydrologic impact monitoring program is based on and contains many references to the hydrology impact analyses contained in the Hay Ranch Water Extraction Project Draft Environmental Impact Report (EIR). The reader is urged to read section 3.2 Hydrology and Water Quality in the EIR prior to reading this hydrologic monitoring and mitigation plan (HMMP).

This monitoring plan has been prepared in order to define monitoring of project activities to prevent potential off-site impacts of the proposed project on groundwater and surface water users in the Rose Valley. This plan also describes the methods to prevent a significant effect to ground and surface water users.

The first section of this plan includes the summary of hydrologic impacts and mitigation, as described in detail in the EIR. The second section of this plan describes the HMMP implementation methods.

This HMMP is designed to:

- Define methods for monitoring changes in groundwater levels throughout the Rose Valley;
- Compare observed changes to predicted changes and adjust model predictions as needed during the early operation of the project before any impact is predicted at Little Lake under the current model assumptions;
- Collect groundwater and surface water level data at Little Lake during the same early stages to develop time-trend water level data on Little Lake and to correlate the groundwater levels to Lake levels;
- Monitor later-stage groundwater and lake level changes as groundwater pumping continues;
- Recalibrate the numerical model developed for the project using data collected during the early stages to check and improve the model's ability to simulate stressed (pumping) conditions and to make predictions of future changes in groundwater levels and lake levels in response to pumping; and
- Facilitate the implementation of the mitigation measures defined in the EIR to avoid or reduce impacts to groundwater levels and lake levels before the impacts become significant.

Groundwater elevations and lake water levels are also influenced by natural factors beyond the effect of this project. These factors include rainfall in Rose Valley, snowfall in the Sierra Nevada Mountains, and seismic events that change the geomorphology of surface hydrological features or subsurface permeability. This monitoring and mitigation plan is not designed to mitigate naturally occurring changes in the hydrological system.

3.2 Summary of Hydrologic Issues

3.2.1 OVERVIEW

The Coso Operating Company, LLC (COC) is seeking a 30-year Conditional Use Permit (CUP No. 2007-003) from the Inyo County Planning Commission for the Coso Hay Ranch Water Extraction and Delivery System project.

The proposed project includes extracting groundwater from two existing wells on the Coso Hay Ranch, LLC property (Hay Ranch) in Rose Valley and delivering the water to the injection well distribution system at the Coso Geothermal Field in the northwest area of the China Lake Naval Air Weapons Station (CLNAWS). The proposed project is needed to provide supplemental injection water to the Coso Geothermal Field to minimize the annual decline in reservoir productivity due to evaporation of geothermal fluids from plant cooling towers. The project location is shown in Figure 3-1.

The Inyo County Planning Department (County) has prepared a Draft EIR pursuant to the California Environmental Quality Act (CEQA) to aid in the decision whether or not to issue the CUP. The Draft EIR assesses the potential impacts of the project on the environment.

Evaluation of the hydrological system within Rose Valley suggests that the project as proposed, which includes groundwater pumping at a rate of 4,839 acre-ft/yr for 30 years, may lower the water table elevation and groundwater flow rates in the valley (see Section 3.2 Hydrology and Water Quality of the EIR). If groundwater levels fall significantly in the southern end of the valley, the groundwater flow and surface water levels in the perennial but manipulated Little Lake may be affected, as well as several local wells. The magnitude of change in groundwater level and flow will vary depending on:

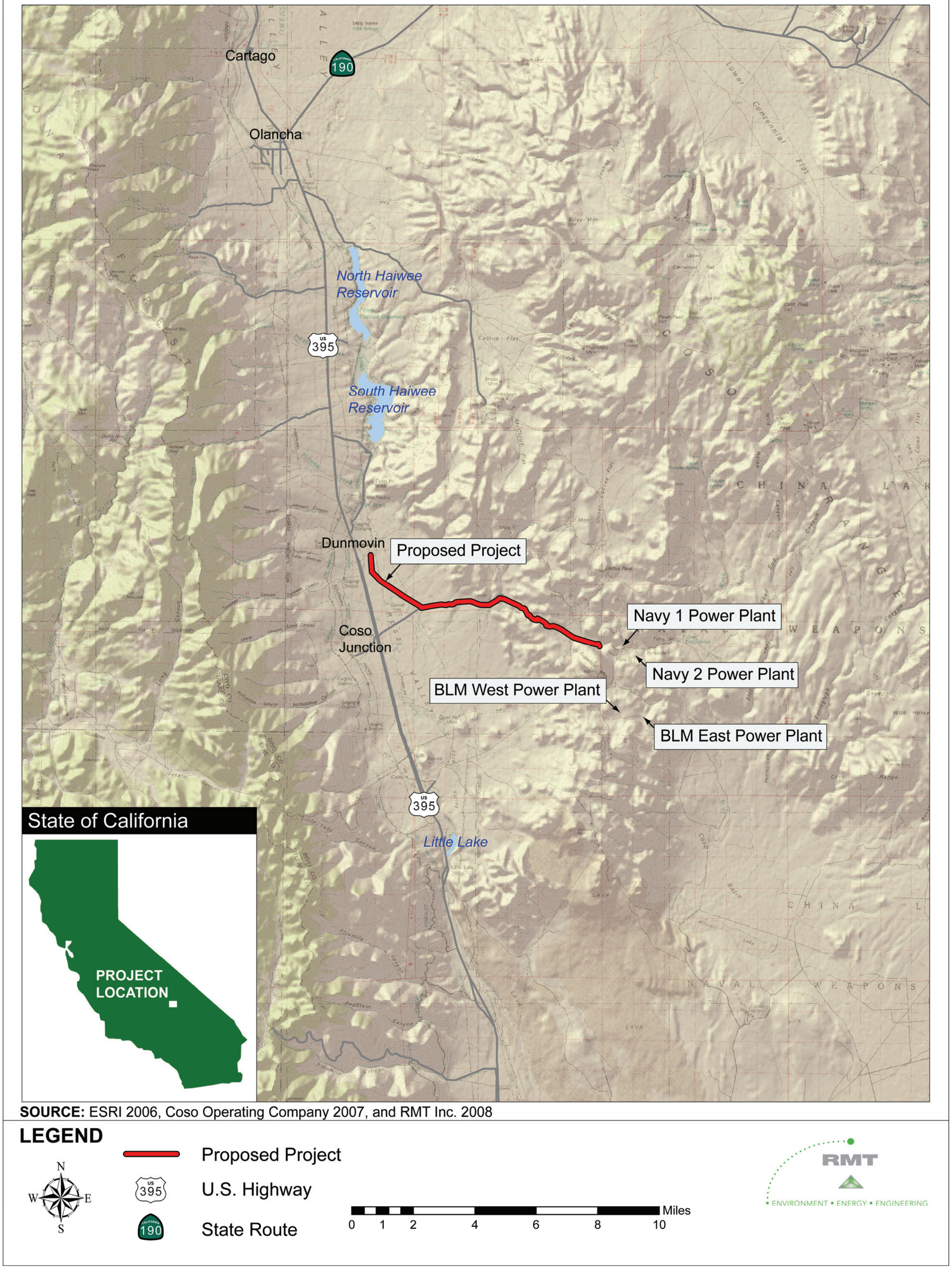
- Distance from the pumped well at Hay Ranch
- Magnitude and duration of pumping
- Manipulations at the Little Lake weir

Predictions of the effects of groundwater extraction associated with the project also depend on various assumptions of aquifer properties, boundary conditions, and aquifer recharge.

3.2.2 PUMPING TEST AND COMPUTER MODELING RESULTS

Many sources of information on local and regional hydrology and geohydrology were used to evaluate aquifer properties and identify groundwater conditions during preparation of the EIR. Consultants for the Coso Operating Company (COC) previously performed short term (24 hour) groundwater pumping tests and conducted computerized hydrologic modeling for the proposed project. These studies have been reviewed and used as appropriate to describe the environmental setting and to analyze the project impacts. During preparation of the project EIR, COC conducted a long-term (14 day) pumping test. Consultants to Inyo County subsequently used the data from the long-term pumping test to evaluate aquifer properties and to recalibrate and refine the computerized hydrologic model developed for COC. The 14-day groundwater pumping test was conducted in the Hay Ranch south well.

Figure 3-1: Project Location



SOURCE: ESRI 2006, Coso Operating Company 2007, and RMT Inc. 2008

Groundwater levels were monitored throughout Rose Valley for a 20-day period before, during, and after the pumping test. In addition, groundwater discharge from the Davis spring at Portuguese Bench was measured during the pumping test. The well pumping lowered groundwater levels up to 0.4 ft in wells at Coso Junction, approximately two miles south of the pumped well, but, not surprisingly given the limited duration of the pumping, it had no discernable effect on groundwater levels in wells on Navy property 5 to 7 miles south of the pumped well, or in a well located at the north end of the Little Lake Ranch property, 8 miles south of the pumped well. Minor changes observed in the groundwater discharge rate from the Davis spring at Portuguese Bench during the test did not appear to be correlated with the pumping test. The pumping test is described in Appendix C1 of the Draft EIR.

The groundwater drawdown data obtained during the pumping test from the Hay Ranch north well and other wells close to Hay Ranch, as well as hydrogeologic information from several sources, were used to recalibrate a computerized groundwater flow model previously developed to evaluate groundwater conditions in Rose Valley (Brown and Caldwell, 2006). The recalibrated groundwater flow model consists of four layers, including one unconfined (water table) layer, and three confined layers. The model was used to analyze potential long-term effects of the proposed groundwater pumping at Hay Ranch.

The results of the groundwater flow modeling indicated that the principal impact in Rose Valley from operation and maintenance of the Hay Ranch groundwater extraction project will be the propagation of groundwater table drawdown off the property as a result of removing groundwater on the Hay Ranch property and transporting it outside the Rose Valley groundwater basin (to the Coso geothermal field). Numerical groundwater flow modeling analysis was conducted to evaluate potential impacts of project operation on groundwater levels in the Rose Valley. The model setup, calibration, and prediction simulations are described in Appendix C2 of the EIR.

The groundwater flow modeling predicts that groundwater table drawdown will increase with time after pumping begins at Hay Ranch. The modeling predicted that less drawdown will be observed farther away from the pumped wells, as expected based on groundwater flow theory. After pumping is stopped, groundwater levels near Hay Ranch will soon begin to rise back to pre-project levels; however, depending on the magnitude and duration of pumping at Hay Ranch, groundwater levels at the south end of the valley may continue to decline in elevation even after pumping at Hay Ranch has stopped before they also begin to rise back to pre-project levels.

Proposed pumping at a rate of 4,839 acre-ft/yr for 30 years is predicted to cause a maximum groundwater table drawdown of:

- 25 to 55 ft in wells in the Dunmovin community and LADWP wells located 1.5 miles north of Hay Ranch
- 20 to 50 ft in wells at Coso Junction 2 miles south of Hay Ranch
- 7 to 20 ft near the Cinder Road Red Hill well 6.5 miles south of Hay Ranch
- 4 to 11 ft at the north end of Little Lake at the south end of the valley, 9 miles south of Hay Ranch

The range in predicted drawdown impacts listed above reflects uncertainty in assumed values for aquifer specific yield. Low specific yield values result in greater and earlier the drawdown, while higher specific yield values result in less drawdown with time and less drawdown farther from the pumped wells. Published values of specific yield (Johnson 1967, Morris and Johnson 1967) range from 2 % for clay to 35 % for well-graded gravels, in unconfined (water table) conditions. Groundwater-yielding sediments encountered in Rose Valley consist primarily of sand and gravel interbedded with clays; most of the groundwater would come from the more readily drainable sand and gravel horizons. Because specific yield could not be determined from the pumping test data, a range of values corresponding to high, medium, and low values of 30, 20 and 10% were used in the project development impact analyses. The model results were particularly sensitive to the value used for specific yield, because that value is a measure of the change in water level in the aquifer per unit of groundwater that is pumped.

Groundwater modeling also indicates that the amount of drawdown is directly related to the amount of withdrawal. For example, assuming 20% specific yield and pumping for 30 years, predicted drawdown at the north end of the Little Lake ranges from approximately 1.2 ft at an extraction rate of 1,500 acre-ft/yr to approximately 3.2 ft at an extraction rate of 4,000 acre-ft/yr. The predicted change in drawdown is roughly linearly proportional to the project pumping rate; that is, pumping at 3,000 acre-ft/yr has roughly twice the impact of pumping at 1,500 acre-ft/yr.

Several springs located in upland portions of Rose Valley including the Davis Spring at Portuguese Bench, and the Tunawee Canyon Spring in Tunawee Canyon, and the Rose Spring near Haiwee Reservoir. They are sustained by mountain-front recharge in the Sierra Nevada Mountains or seepage from Haiwee Reservoir or Owens Valley. These springs are located at significantly higher elevations and are unlikely to be impacted by the project; therefore, they will not be monitored during project operation.

3.2.3 DEFINITION OF SIGNIFICANT IMPACTS TO LITTLE LAKE AND SURFACE WATERS

The EIR identifies that the project would have a significant impact if it would substantially reduce the amount of water available to surface water bodies at Little Lake Ranch and to other areas in the Rose Valley. A substantial reduction in the amount of water available at Little Lake is defined as greater than 10% reduction in water flowing into the surface features at Little Lake.

Defining thresholds of significant effects to the environment by attempting to measure or predict those effects on vegetation around Little Lake Ranch was considered and rejected. The Little Lake area is highly manipulated. Little Lake is a reservoir, whose level is manually controlled. The vegetation surrounding the area south of Little Lake is manipulated by removal of undesirable species, planting of others, and by moving water to various areas where managers intend to promote vegetation. As a result, there is no natural background condition against which to measure effects. Additionally, by moving water around the property, vegetation may be encouraged in areas not currently highly vegetated and discouraged in areas now heavily vegetated if management objectives for the restoration project shift. Therefore, by necessity, it is most appropriate to emphasize measuring impacts to the amount of water that is available to the restoration project, rather than biological indicators.

3.2.4 MITIGATION MEASURES DEFINED IN THE EIR

Summary of Impacts and Mitigation

The existing groundwater model predicts that, with a specific yield value of 10%, the project as proposed (pumping at a rate of 4,839 ac-ft per year for 30 years) would have a significant impact on Little Lake (refer to Section 3.2 Hydrology and Water Quality in the EIR).

In order to prevent a significant impact to Little Lake and surrounding surface waters, water inflow to the lake must not decrease by more than 10% of the baseline flow. Data from Bauer (2002) indicates that the historical groundwater elevation at the north end of Little Lake was consistently 3 feet higher than the lake level; because groundwater flow is proportional to the hydraulic head gradient, a 0.3 foot decrease in the groundwater represent a 10% decrease in gradient, and is estimated to correlate to a 10% reduction in discharge of groundwater to Little Lake.

A maximum of 10% reduction in groundwater inflow to Little Lake (this is currently benchmarked to a drawdown of 0.3 feet in the Little Lake North Dock well) would occur following pumping at Hay Ranch at proposed pumping rates for a period of approximately 1.2 years (see Figure 3-2). The model predicts that this maximum drawdown would occur as much as 30 years after the cessation of pumping at 1.2 years, due to the large distance (9 miles) from the pumping.

Mitigation, therefore, allows initiation of pumping for the project at the proposed project pumping rate, until drawdown trigger levels are reached at one or more monitoring locations throughout the valley (Table 3-1). Model predictions indicate that the trigger levels could be reached with pumping occurring in as little as 1.2 years; however, some conservative assumptions that are built into the model may extend this pumping period considerably longer, if actual decreases in the groundwater level occur more slowly than predicted. The trigger points have been established using the model to prevent a greater than 10% decrease in flows to Little Lake from ever occurring. Monitoring should occur monthly for at least two years, with results reported to the County within 2 weeks of data collection. After two years, if water levels are decreasing more slowly than predicted, the applicant can petition the County to reduce the measurement frequency to quarterly.

Data collection in the first few months to years would lead to a better understanding of the relationship between pumping at Hay Ranch and groundwater table drawdown throughout Rose Valley and at Little Lake. Data to be collected includes: water level data over time to establish background levels; response of water levels to pumping that will be used to evaluate specific yield and hydraulic conductivity; lake level data; groundwater level data adjacent to Little Lake; and other data needed to re-calibrate the groundwater flow model. These and other data that will be collected are specified in Subsection 3.3.3 and Table 3-1. Pumping may continue as long as the project does not result in a significant decrease in groundwater available at Little Lake at any point in time.

Within approximately 1 year of initiation of pumping, or less if trigger levels are reached sooner, the groundwater flow model should be recalibrated to the observed drawdown in groundwater levels, to allow for more accurate estimation of how long the pumping can continue without exceeding drawdown trigger levels and causing a significant reduction in water available to Little Lake, the springs, and wetlands. A qualified person approved by Inyo County Water Department, and provided by the applicant, would evaluate the results of the first year of data collection, would recalibrate the model, and working with the Inyo County Water Department and the applicant would estimate the duration of pumping that would keep impacts below the defined trigger levels. Recalibration of the model would also be necessary later, if pumping continues significantly longer than 1.2 years, as needed and appropriate to help understand the timing and magnitude of future drawdown of groundwater levels throughout the valley. A maximum limit of 10% groundwater inflow reduction to Little Lake has been selected, to avoid a significant effect on Little Lake. The computer groundwater flow model was used to define equivalent maximum acceptable drawdown levels, (maximum water level drawdown values) at various points up the valley that cannot be exceeded at any point in time. Water level drawdowns that were maintained below those maximum acceptable drawdown levels would, based on model results, avoid a depletion of groundwater inflow to Little Lake of more than 10%. The model was used to identify corresponding “trigger levels, water level drawdowns at earlier points in time, that would eventually lead (under continued pumping) to reaching the maximum acceptable drawdown levels, at each monitoring point. Requiring that observed drawdown values over time be kept below these defined trigger levels would provide an early warning system, allowing for the system operations to change, to reduce or stop pumping before maximum acceptable drawdown levels propagated down the valley to Little Lake.

Figure 3-2: Early Pumping Termination (1.2 years) Scenario Results

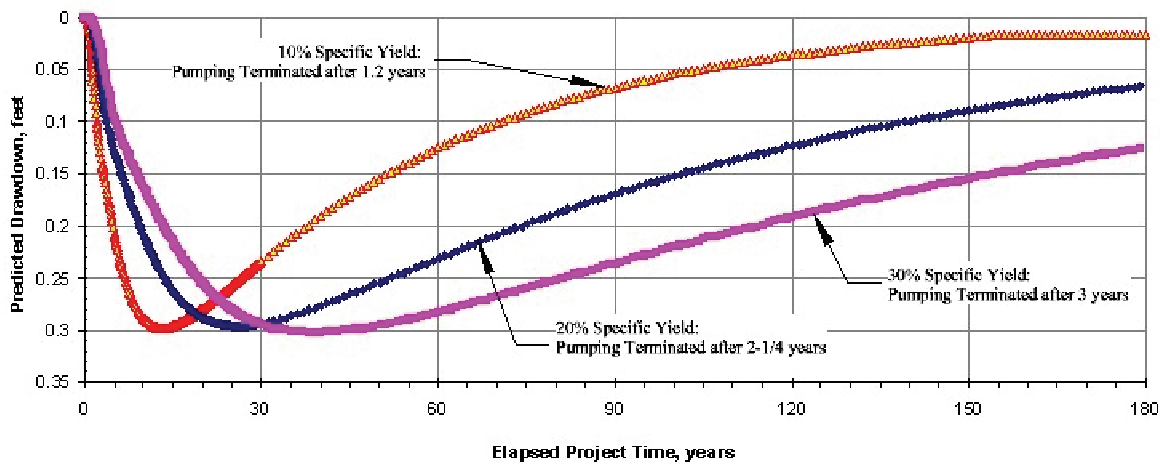


Table 3-1: Drawdown Trigger Levels (in feet)

Project Elapsed Time, years	Dunmovin Area well	Pumice Mine well	Hay Ranch Observa tion well	Coso Ranch North well	Coso Junction #1 well	Navy G-36 well	Navy Lego well	Cinder Road, Red Hill well	Navy 18-28 well	Little Lake Ranch North well
	Distance from Hay Ranch South Well (feet)									
	9,000	*6,100*	*1,300*	*9,700*	*10,900*	*26,000*	*27,300*	*32,000*	*38,000*	*42,600*
0.25	<0.2	0.5	3.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
0.5	0.3	1.3	4.7	0.4	0.3	<0.2	<0.2	<0.2	<0.2	<0.2
0.75	0.7	3.3	8.1	0.9	0.7	<0.2	<0.2	0.2	<0.2	<0.2
1	1.1	5.3	11.5	1.4	1.2	<0.2	<0.2	0.2	<0.2	<0.2
1.2	1.5	6.9	13.2	1.8	1.5	0.2	0.2	0.3	<0.2	<0.2
1.25	1.6	7.1	11.8	1.9	1.6	0.2	0.2	0.3	<0.2	<0.2
1.5	1.9	7	7.9	2.1	1.8	0.2	0.2	0.3	<0.2	<0.2
1.75	2.1	6.5	6.9	2.3	2	0.3	0.3	0.3	<0.2	<0.2
2	32.	6	6.2	2.4	2.1	0.3	0.3	0.4	<0.2	<0.2
3	2.7	4.8	4.8	2.5	2.2	0.5	0.4	0.4	<0.2	0.2
4	2.8	4.1	4	2.5	2.2	0.6	0.6	0.5	0.2	0.3
5	2.7	3.6	3.5	2.4	2.2	0.7	0.7	0.6	0.3	0.3
Maximum Acceptable Drawdown (in feet)	2.8	7.2	13	2.5	2.3	1.1	1.1	0.7	1	0.4
Time to Max drawdown (years since pumping began)	4	1.3	1.2	3	3.5	14.5	15	12	22	13

NOTES

1) For any wells where predicted drawdown is less than or equal to 0.25 feet, actions related to these trigger points shall not be enforced, unless the drawdown seen in these wells is greater than 0.25 feet. Drawdown values of <0.25 feet are difficult to accurately detect.

2) Based on current groundwater flow model results, these maximum drawdown values listed above result from pumping the Hay Ranch production wells at design rates for 1.2 years, with specific yield values of 10%. These maximum acceptable drawdowns can occur several years after pumping at Hay Ranch ceases.

3) With the exception of Hay Ranch, every monitoring point is subject to access approval from the appropriate owner. If approval is not forthcoming, alternative appropriate monitoring points will be established by the County, if necessary.

Exceedance of predicted groundwater drawdowns (**trigger levels**) at two or more locations in Rose Valley, or exceedance of a **maximum acceptable drawdown level** at any location, would be a cause for action as determined by the County, including re-calibration of the model and potential reductions or cessation of pumping. See Table 3-1 for trigger levels and maximum acceptable drawdown levels.

Mitigation Measures from EIR

The following mitigation measures have been defined in the EIR to reduce potentially significant impacts to water users in the Rose Valley. Note that references to Appendix 2 are included in the measures since these measures are taken directly from the EIR. This HMMP is Appendix 2 of the EIR and references are included in the sections of this document.

> **Hydrology-1:** The project applicant shall finalize and implement the Draft Hydrological Monitoring and Mitigation Program (HMMP) included in Appendix 2 [this appendix] of this EIR.
>
> **Hydrology-2:** Mitigation for effects to groundwater wells in Rose Valley shall depend upon the specific characteristics of each well, and the use of the well. The applicant shall use monitoring data and the numerical groundwater flow model described in Appendix C2 to track groundwater levels throughout the valley. The applicant shall work with the County Water Department to identify wells that may be affected by groundwater drawdown as the project progresses. The evaluation of wells depths and uses in the Rose Valley as compared with groundwater drawdown shall be made semi-annually and reported to the Inyo County Water Department. The owner of any wells that may potentially be impacted within the six months after an evaluation shall be contacted by the applicant to assess the need for additional pumping equipment on the well or deepening of the well. The applicant shall be responsible for the cost of equipping or deepening wells that are impacted by groundwater drawdown as a result of the proposed project. The applicant would also bear the costs of any additional energy costs required to pump the wells. The applicant shall also evaluate any wells that are brought to the attention of the applicant by the user to evaluate if groundwater drawdown from the proposed project is impacting the well. If it is determined by the County or by the applicant (using well monitoring data and modeling) that the well in question is being impacted by the proposed project, the applicant shall fund the necessary adjustments to the well to secure the previous uses of the well. Disputes as to the cause of well water drawdown or appropriate corrective measures shall be resolved by the County.
>
> **Hydrology-3:** Monitoring shall occur at a frequency that is sufficient to detect important changes and trends in water levels. Monitoring shall occur monthly, at a minimum, at all monitoring points, following project start-up. The data shall be collected and analyzed by a qualified person approved by Inyo County Water Department and provided by the applicant. Monitoring reports shall be prepared by the applicant and submitted to Inyo County Water Department within 20 days of data collection. After two years, monitoring shall occur quarterly. Reports shall also be provided to a designated recipient at Little Lake Ranch, Inc. A complete list of monitoring locations, parameters, and schedules is presented in Appendix 2 [this appendix], Tables 2-1 and 2-2. Hydrologic monitoring locations are shown on Figure 2-2, in Appendix 2 [this appendix]. Two new monitoring well clusters, each with three wells with screened intervals at three different depths, located approximately 700 feet south of the Hay Ranch North Wells, and 700 feet south of the South Well, respectively, shall be installed by the project applicant, and as approved by the Inyo County Water Department. An additional new water table monitoring well shall be installed by the applicant and as approved by Inyo County Water Department, approximately midway between Coso Junction and the Cinder Road Red Hill well, to provide additional monitoring capability in this area.
>
> The monitoring program also includes reassessment of model-predicted impacts and recalibration of the groundwater model by a qualified person approved by the Inyo Count Water Department, and provided by the applicant. After a period of one year of pumping, observed groundwater level changes shall be compared with predicted groundwater-level

changes in order to assess the accuracy of the model-predicted drawdown. If the observed water level changes at two or more of the selected monitoring points differ from predicted values (trigger levels) at those locations by at least 0.25 feet at any point in time, or a maximum acceptable drawdown is reached at a designated monitoring point, or as judged appropriate by Inyo County Water Department, the model shall be recalibrated and the predicted impacts to groundwater levels re-forecast with the recalibrated model. If the model results change with recalibration, the mitigation strategy shall be updated in response to new forecasts of potential impacts to groundwater, potentially including reducing the duration or rate of pumping, or other mitigation measures as described in the HMMP. Additional recalibration is expected to be needed after one year, as monitoring continues and water level changes are detected farther down Rose Valley. Additional recalibration of the model shall be conducted as appropriate following the criteria outlined above (i.e. if the predicted water level in two or more wells differs from observed water level drawdown by at least 0.25 feet or more, or one or more maximum acceptable drawdown levels in wells all across the valley are exceeded).

Because surface water bodies at the Little Lake Ranch property are likely sensitive to changes in groundwater elevation and groundwater flow rate, the monitoring plan also identifies trigger levels that indicate when a significant impact (defined as a substantial reduction in water to Little Lake) will likely occur unless mitigation measures are implemented to reduce the pumping rate and/or duration of pumping. The plan includes the implementation of mitigation measures (namely, Hydrology-2 and Hydrology-4) to reduce any potentially significant impacts to less than significant levels.

Hydrology-4: The applicant shall be allowed to pump the project at the full proposed pumping rate until a time when and if the predicted groundwater drawdown trigger levels are exceeded at two or more of the designated Rose Valley monitoring points by at least 0.25 feet, or if a maximum acceptable drawdown level is exceeded in any monitoring point.

During the first year, a qualified person, approved by Inyo County Water Department and provided by the applicant, shall conduct the studies described in Hydrology-1 and Appendix 2 of this EIR in order to recalibrate the groundwater model to the early groundwater data. The groundwater model shall be recalibrated in order to more accurately understand the relationship between groundwater pumping, reduction in groundwater elevations across the valley, and availability of water at Little Lake. Pumping rates and duration of pumping shall be determined based on the results of the model and the observed water table drawdown. At no time shall projected results of pumping result in a greater than 10% decrease in groundwater inflow to Little Lake (estimated to be equivalent to a 0.3-foot drawdown in groundwater head at the northern end of Little Lake) unless new data collected in the vicinity of Little Lake indicates that a larger decrease of head would not result in a greater than 10% decrease in groundwater inflow to Little Lake or substantially deplete the water availability to the springs and wetlands.

The revised pumping rate and duration shall be approved by the Inyo County Water Department. The recalibration shall occur within one year after project startup to ensure adequate time is available to make adjustments to the pumping schedule if necessary, to ensure significant impacts do not occur. The model shall be calibrated to the new drawdown data collected since project startup. Based on the results of the recalibrated model, a revised schedule for pumping and revised trigger levels shall be determined that will not be expected to cause a greater than 10% decrease in groundwater inflow to Little Lake. A revised plan for pumping rate and/or duration of pumping shall be submitted with full documentation to the Inyo County Water Department by the end of the first year of pumping. Pumping can continue as long as trigger levels in designated monitoring points that prevent a significant impact are not exceeded, and other signs of substantial impact on surface water bodies (Little Lake, springs, and wetlands) are not observed, as determined by a qualified person approved by Inyo County Water Department provided by the applicant.

An alternative option to minimize impacts to Little Lake could include pumping for one or more years at full scale and model recalibration as prescribed above; however, then reducing pumping to a lesser degree and/or allowing pumping for a longer period of time along with implementing a groundwater diversion plan at Little Lake. The diversion system would include additional pumping from an existing well at the Little Lake Ranch property, if feasible, or construction of a new well. Water would be piped from the well location along existing unpaved roads to the lake where it would be discharged. Water would be withdrawn at the minimum rate necessary to sustain water availability to Little Lake and the lower pond areas. The pumping amount and duration for a water diversion at Little Lake would be determined by a qualified person approved by the Inyo Count Water Department, and provided by the applicant, based on the recalibrated model. The diversion plan is further described in Appendix 2 [this appendix]. Diversion would only be effective and implementable to minimize effects to less than significant levels if it were:

- Feasible given the availability of water at Little Lake and would not result in impacts to existing springs (e.g. Coso Spring)
- Agreed upon with Little Lake Ranch and the applicant
- Funded by the applicant
- Required for a reasonable timeframe (i.e., 20 years) that ensured accountability and funding by the applicant to mitigate all effects

If any of the above criteria are not met, then pumping would be scaled back or terminated based on model recalibration as previously described. If determined feasible, the applicant shall use biological and archaeological monitors during all ground disturbance activities associated with the construction of the augmentation plan components. The applicant shall also be responsible for obtaining any required permits for the diversion plan at the time that it is designed and implemented.

3.2.5 GOALS AND OBJECTIVES OF THIS HMMP

A number of goals and objectives provide the framework for the HMMP, and form the basis for any future decisions regarding the HMMP needed to reflect an evolving understanding of the hydrologic and biologic systems in the Rose Valley and at Little Lake. The HMMP is designed to:

- Establish an understanding of baseline conditions in the hydrologic systems at Little Lake.
- Identify a system for predicting and mitigating for groundwater drawdown in existing wells in the Rose Valley.
- Identify potentially significant impacts to the hydrology at Little Lake as early as possible, by establishing “early-warning” trigger points, based on observed drawdowns in selected monitoring points and other hydrologic parameters. Early-warning trigger points would indicate potential impacts to wetlands and surface waters well in advance of actual, significant impacts.
- Redefine pumping rates and duration of pumping for the long-term project during the period of no effects to Little Lake through recalibration of the groundwater model based on data collected during the early phases of project development.

3.3 HMMP Implementation

3.3.1 HMMP IMPLEMENTATION RESPONSIBILITIES AND SCHEDULE

The monitoring and mitigation described in this HMMP will be performed by COC. COC will report results to the Inyo County Water Department on a monthly basis, and within 20 days of data collection. In addition, COC will submit quarterly and annual reports to the Inyo County Water Department summarizing the changes observed during the year and cumulative changes of the entire monitoring period, including conclusions and recommendations evaluating those changes relative to natural conditions such as rainfall and snowfall, assessing the significance of any changes compared to threshold levels if any, documenting any additional hydrologic modeling or adjustments to model-predicted impacts, and documenting any mitigation measures taken with respect to private wells or changes in Hay Ranch extraction rates. The applicant may request that Inyo County Water Department allow changes in monitoring frequency by presenting hydrologic data to support a reduction in monitoring frequency that would not compromise the ability to monitor the response of the aquifer to pumping. Data will also be provided to a designated contact at Little Lake Ranch, LLC.

3.3.2 INYO COUNTY CODE CHAPTER 18.77 PROTECTIONS

It should also be noted that COC is subject to all regulations as stated in the Inyo County Code, Chapter 18.77.045 and 18.77.055, which allows for the CUP to be challenged at any time if conditions of the permit are not being implemented or pumping is proven to be “causing unreasonable effect on the overall economy or environment of Inyo County.” The permit could be modified or revoked as a result. Conditions of the code also help to minimize the potential for potentially significant impacts associate with the project. The final decision on any modifications to the CUP shall be in compliance with the Inyo County Code.

The Planning Commission may *revoke* the CUP if it finds that the water transfer can not be conducted without having an unreasonable effect on the economy or environment of Inyo County, regardless of the implementation of this HMMP.

3.3.3 MONITORING PHASES

Four distinct monitoring phases will be implemented:

Phase 1: Monitoring System Setup and Supplemental Data Collection

Phase 2: Startup Monitoring and Reporting

Phase 3: Model Recalibration and Redefinition of Pumping Rates and Durations; and,

Phase 4: Ongoing Monitoring, Mitigation, and Reporting

Monitoring system setup consists of several tasks that will be completed concurrent with construction of the project, including the following:

- Installation of two new monitoring well clusters on the Hay Ranch property;
- Installation of one new monitoring well between Coso Ranch and the Cinder Road Red Hill well; and
- Surveying proposed monitoring locations and elevations to establish the baseline conditions.

Startup monitoring comprises monitoring undertaken during the first 1.25 years of operation of the project. Model recalibration would occur within the first year and would be used to determine future pumping rates and duration to minimize impacts to Little Lake. Ongoing monitoring comprises monitoring conducted throughout the life of the project.

Phase 1: Monitoring System Setup and Supplemental Data Collection

Monitoring system setup comprises various tasks designed to:

- Establish monitoring facilities and benchmarks to establish prevailing conditions prior to generating impacts and to establish the monthly baseline levels from which to compare the trigger level drawdown values in Table 2-1;
- Prepare supplemental engineering plans to specify a point of contact and mitigation measures to mitigate impacts to private wells (which may include deepening wells, changing pumping equipment, or compensating well owners for increased electricity costs for pumping);

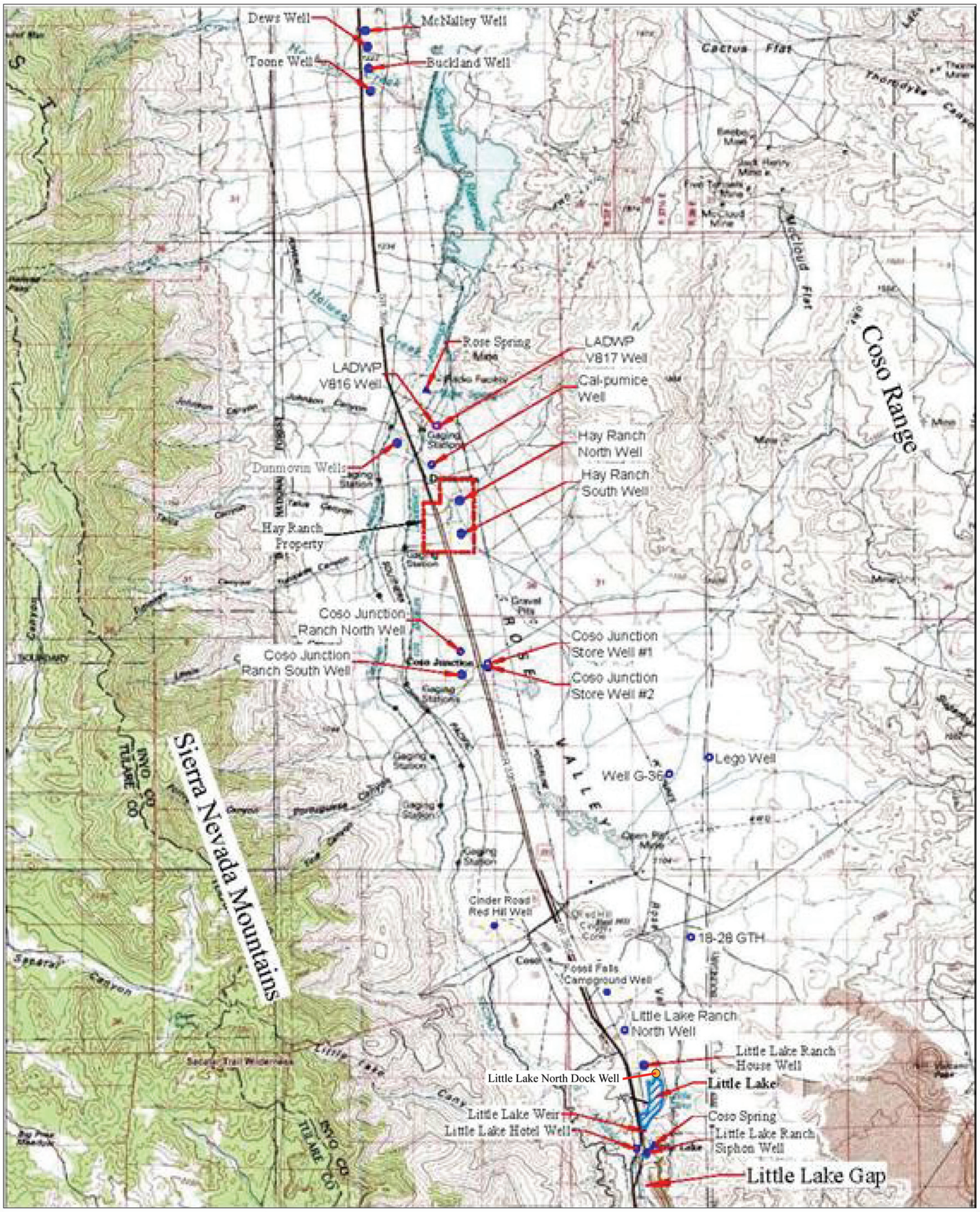
- Collect supplemental data to address data gaps identified during preparation of the EIR, necessary for recalibration of the groundwater model; and
- Conduct supplemental engineering studies to evaluate the feasibility of extracting groundwater on the Little Lake Ranch property to augment water levels in the lake, and preparation of engineering plans to implement water diversion, if pursued at a later date.

Task 1.1: Monitoring System Setup

Monitoring system setup will include the tasks listed below. Existing wells that will be used for monitoring are shown on Figure 3-3. Proposed wells are described in the text, below.

a. Completing two new monitoring well clusters on the Hay Ranch property. The northernmost new well cluster location will be completed approximately 600 to 800 feet south of Hay Ranch North well, between the two existing wells. The second well cluster will be located approximately 600 to 800 feet south of Hay Ranch South well. Each well cluster will consist of: one shallow well screened across the water table, with the screen extending from approximately 10 feet above the current water table to approximately 100 feet below the current water table (i.e., approximately 190 feet to 290 feet bgs); an intermediate depth well screened from approximately 350 to 400 feet below ground surface (bgs); and a deep well screened from approximately 500 to 550 feet bgs.
b. The purpose of the well clusters will be to provide access points for measuring groundwater drawdown on the Hay Ranch property outside of the pumped wells, so that groundwater drawdown at various depths can be assessed and aquifer parameters such as specific yield, storativity, and hydraulic conductivity can be evaluated. Because of well losses, drawdown measurements in the pumped wells themselves do not provide reliable information regarding water table drawdown in the aquifer.
c. Installing one new monitoring well approximately midway between Coso Junction and the Cinder Road Red Hill well. The well should be installed to intersect the water table, with a screen located approximately 10 feet above and 50 feet below the current water table.
d. Establishing access agreements, if possible, to monitor the Red Hill well on Cinder Road, one or more wells in the Dunmovin community, and two or more wells on the west side of Haiwee Reservoir approximately 7 miles south of Olancha (tentatively identified as the McNalley, Toone, Dews, or Buckland wells).
e. Installing pressure transducers and electronic data loggers in the six newly constructed Hay Ranch monitoring wells and the Little Lake North Dock well, to measure groundwater level, and in Little Lake to measure lake level. If the currently unused Little Lake Hotel well is found to be pressurized (artesian) then a pressure gauge should be installed on the well head; otherwise a reference point for manual water level measurements should be established.
f. Installing and calibrating flow measurement weirs at the discharge from Little Lake and at the North Culvert location previously used by Bauer (2002) to measure combined discharge from Little Lake, Coso Spring, the Little Lake siphon well, and the two perennial ponds (P-1 and P-2) on the Little Lake Ranch property.
g. Surveying the locations and casing elevations of wells added to the monitoring network at Hay Ranch, Dunmovin, Enchanted Lake Village, Red Hill, Fossil Falls, Little Lake Hotel, and Little Lake North Dock wells and any other designated monitoring points in Rose Valley where elevations are uncertain. Also, to be surveyed are the locations and elevations of surface water features on the Little Lake Ranch property including a reference point for Little Lake water level; base and adjustment points for Little Lake weir; Coso Spring; the siphon well head and discharge point; ponds P-1 and P-2; and, the North Culvert weir.
h. Evaluating existing well pump depths at Dunmovin, Coso Junction and Red Hill wells. The owners will be contacted to assess current pump depth and performance.

Figure 3-3: Existing Wells that will be used in Hydrologic Monitoring



SOURCE: Geologica 2008

LEGEND

- Spring or Siphon Well
- Pumping Well
- Out-of-Use Well
- Observation Well

N W E S

Approximate Scale in miles

0 1 2

MHA ENVIRONMENTAL CONSULTING An RMT Business

i. Preparation of required and optional supplemental engineering plans primarily consists of two tasks:
   - (Required) Establishment of a private well mitigation plan that would include a single point of contact for each well for resolving issues with respect to possible project impacts on existing private wells in the valley; identifying suitable qualified contractors to address issues such as pump deepening or replacement, or well deepening; putting a process in place to pay for such work.
   - (Optional) Preparation of a groundwater diversion plan for Little Lake capable of providing water to augment water levels in the lake. As discussed in Section 2.1.4, this plan would only be prepared and implemented if Little Lake Ranch agreed to this diversion, adequate groundwater was documented to be available on the Little Lake property, the diversion could be conducted for a reasonable time frame (i.e. no more than 20 years), and the applicant agreed to fund the diversion. This would include an evaluation of existing wells at the Little Lake Ranch property to assess their potential yield, location relative to the lake, pump, piping and electrical needs, and lift requirements. The plan would then include tentative specifications for well construction, if needed, pump, piping, electrical work, controls, and flow meters as well as an assessment of permitting requirements and likely lead times for construction and permitting.

j. Establish background groundwater levels. Establishing a pre-pumping statistical background water level for each designated monitoring point is essential, in order to distinguish between natural seasonal variability versus drawdown caused by pumping associated with the project. Establishing a background for each monitoring point will require pre-pumping measurements to be conducted for a sufficient period of time to encompass normal seasonal variations in water level.

   A minimum of 12 months of water level data will be required to establish the background water level at each monitoring point. For monitoring points with more extensive long-term monitoring data, e.g., the Hay Ranch wells, all groundwater measurements collected to date will be used to evaluate background conditions.

k. The applicant shall conduct statistical evaluation of the background water level data by a qualified person approved by Inyo County Water Department and provided by the applicant. An appropriate statistical method to calculate the background water levels shall be proposed by the applicant, subject to approval by Inyo County. Upon approval, the background water level for each monitoring point shall be calculated by the applicant and presented to Inyo County Water Department for review and approval. It is anticipated that statistical methods similar to those used to calculate background concentrations of naturally occurring chemical constituents at RCRA and CERCLA sites may be applicable.

l. A minimum of 6 months of water level data will be required to establish the background water level at each monitoring point, and it is recommended but not required that 12 months of data be collected. For monitoring points with more extensive long-term monitoring data, e.g., the Hay Ranch wells, all groundwater measurements collected to date will be used to evaluate background conditions.

   The applicant shall conduct statistical evaluation of the background water level data by a qualified person approved by Inyo County Water Department and provided by the applicant. An appropriate statistical method to calculate the background water levels shall be proposed by the applicant, subject to approval by Inyo County. Upon approval, the background water level for each monitoring point shall be calculated by the applicant and presented to Inyo County Water Department for review and approval. It is anticipated that statistical methods similar to those used to calculate background concentrations of naturally occurring chemical constituents at RCRA and CERCLA sites may be applicable.

Task 1.2: Supplemental Data Collection and Evaluation

Supplemental data evaluations comprise the following tasks:

a. Evaluate groundwater levels beneath Little Lake, by installing temporary mini-piezometers to a depth of approximately 3 feet or more beneath Little Lake, at a minimum of four locations (for mini-piezometer and potentiomanometer details, see Wantry, R. and T.C. Winter, 2000). A Simple Device for Measuring Differences in Hydraulic Head Between Surface Water and Shallow Ground Water. U.S. Geological Survey Fact Sheet FS-077-00. June 2000). Measure the water levels relative to lake level, to evaluate the magnitude of the hydraulic gradient into or out of the lake, at four or more locations situated around the lake to obtain a representative evaluation of the hydraulic gradient between Little Lake and the underlying groundwater, prior to startup of the wells at Hay Ranch. Conduct measurements at the same locations for a period of six months prior to startup of the pumping system, to establish the background condition beneath the lake.

b. Depth to bottom and location measured using a hand held GPS unit at approximately 20 locations across Little Lake will be used to develop a preliminary bathymetric survey map.

c. Groundwater samples will be collected at each of the selected monitoring locations in Rose Valley to establish background (pre-pumping) conditions prior to the onset of pumping. The relationship between specific conductivity measured with a hand-held field instrument and total dissolved solids measured in the laboratory (preferably using EPA method 160.1) will also be assessed, for on-going electrical conductivity field measurements to be taken on a quarterly basis (four times/year) at a minimum.

d. Compilation of data on rainfall in Rose Valley (see Coso Hot Spring Monitoring Program 2005-2006, Geologica, 2007) and snow fall in the Sierra Nevada Range for the last 20 years to establish mean values for each and historical trends prior to project startup. These data will be used to assess future changes or trends in the relative level of potential recharge for each monitoring year.

Phase 2: Startup Monitoring and Reporting

Monitoring

The objective of start-up monitoring is to document the response of the aquifer to pumping. Data collected during the start-up monitoring phase will be used to improve estimates of aquifer specific yield, storage coefficients, hydraulic conductivity, and groundwater recharge rates as well as to better understand hydrologic conditions at Little Lake. These monitoring data will be used to validate and/or revise the computerized hydrologic model-predicted impacts long before thresholds of significance are reached. Start-up monitoring will continue for up to two years and includes the locations and parameters identified in Table 3-1 and as defined in Table 3-2, below.

Remedial Actions

The following actions are to be taken based on conditions observed during the first year of project operation:

- If drawdown trigger levels predicted **for any point in time** are exceeded in any of the selected monitoring wells, COC shall verbally report the exceedence to the Inyo County Water Department within 48 hrs, followed by a written report within 7 days.
- If drawdown trigger levels predicted **for any point in time** are exceeded in two or more of the selected monitoring points by at least at least 0.25 feet, COC shall verbally report to the

Water Department within 48 hrs, followed by a written report within 7 days, followed by a re-calibration of the model and recommendation of cessation of pumping or predictions of the duration of pumping that can be sustained without causing a significant reduction in water available to Little Lake, (defined as no greater than 10% reduction in groundwater inflow); if appropriate, the Applicant may petition the County for permission to continue pumping for a

Table 3-2: Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Groundwater Level, Extraction				
Hay Ranch North and Hay Ranch South wells	Total Groundwater Extracted	Daily	Pumpage not to exceed 4,839 acre-ft per year (13.25 acre-ft per day)	Reduce or discontinue pumping.
Six New Hay Ranch Observation wells (2 nests of 3 wells)	Groundwater Elevation	Measured hourly at a minimum using dedicated pressure transducer with data downloaded and plotted weekly for the first 3 months, then monthly. Supplement with manual measurements weekly for the first three months, then monthly. Hourly collection of data may be reduced to once every 4 hours, if appropriate and approved by Inyo County, as demonstrated by the analysis.	Deviation of observed drawdown in two or more wells is at least 0.25 feet more than predicted trigger level value at any time beyond 4 months.	Alert County. County evaluates whether reduced pumping is appropriate prior to model recalibration. If appropriate, recalibrate model within one month and reassess impact to Little Lake.
			Groundwater level decline in two or more wells exceeding updated model predicted drawdown trigger levels by more than 0.25 feet in any quarterly data collection and monitoring period	Alert County. County to determine if decreased pumping is necessary immediately. Increase monitoring frequency to weekly for one month to confirm observation. Include results as part of quarterly data submittal. Recalibrate model within one month.
			Maximum acceptable drawdown level from Table C4-1 exceeded	Pumping ceases until the model is recalibrated and will re-start only if it can be shown that pumping can continue at a rate that will maintain water levels at Little Lake Ranch.

Table 3-2 (*Continued)*: Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Pumice Mine well	Groundwater Elevation	Monthly for first two years, then quarterly	Deviation of observed drawdown at least 0.25 feet from predicted trigger level value at any time beyond the first quarter in two or more wells	Alert County. Recalibrate model within one month. Reassess potential impact to Little Lake. County to evaluate whether reduction in pumping is warranted.
LADWP V816			Groundwater level decline exceeding updated model predicted drawdown trigger levels by more than 0.25 feet in any well in any quarterly data collection and monitoring period	Alert County. Increase monitoring frequency to weekly for one month to confirm observations. Include results as part of quarterly data submittal. Recalibrate model within one month. County to evaluate whether and when a reduction in pumping is warranted.
Dunmovin well				
Coso Junction #1, Coso Ranch North Well				
Lego well				
Well G-36				
Well 18-28				
Fossil Falls Campground well. New well to be located between Coso Jnc and Cinder Road Red Hill well				
Cinder Road, Red Hill well				
			Maximum acceptable drawdown level from Table C4-1 exceeded	Pumping ceases until the model is recalibrated and will re-start only if it can be shown that pumping can continue at a rate that will maintain water levels at Little Lake Ranch.
Little Lake Ranch North well	Groundwater Elevation	Monthly for first two years, then quarterly	Deviation of observed drawdown at least 0.25 feet more than predicted value at any time beyond the first quarter	Revise trigger level based on Little Lake hydrology study Reduce or cease pumping at Hay Ranch at the direction of the County. Augment flow to Little Lake in accordance with EIR Section 3.2.3 (Hydrology-3) and implement the Augmentation Plan to maintain

Table 3-2 (*Continued*): Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
				groundwater level above trigger level
			Groundwater level decline exceeding updated model predicted drawdown by more than 50% in the well in any quarterly data collection and monitoring period	Alert County. Increase monitoring frequency to weekly for one month to confirm observations. Include results as part of quarterly data submittal. Recalibrate model within one month. County to evaluate whether and when a reduction in pumping is warranted. .
			Maximum acceptable drawdown level from Table C4-1 exceeded	Pumping ceases until the model is recalibrated and will re-start only if it can be shown that pumping can continue at a rate that will maintain water levels at Little Lake Ranch.
At least two of McNalley, Toone, Dews, or Buckland wells located west of Haiwee Reservoir	Groundwater Elevation	Monthly for first two years, then quarterly	N/A. Information used to update model	N/A
Haiwee Reservoir	Stage level	Request average weekly values from LADWP	N/A. Information used to update model	N/A
LADWP Aqueduct	Flow rate			
Little Lake Hydrology				
Little Lake Hotel Well and Little Lake North Dock well	Groundwater Elevation (or closed well pressure)	Measured hourly using dedicated pressure transducer with data downloaded and plotted weekly for the first 2 months, then monthly. Hourly collection of data may be reduced to once every 4 hours, if appropriate and approved by Inyo County, as demonstrated by the analysis.	No threshold applied, Information used to update model and trigger levels.	N/A
Little Lake	Lake Water Level Elevation			
Little Lake Weir	Little Lake Weir Discharge and Weir Height(1)			
Little Lake North Culvert Weir	Little Lake System Discharge Rate			

Table 3-2 (*Continued)*: Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Groundwater beneath Little Lake (minimum of four locations)	Groundwater elevation relative to lake	Monthly for 6 months after startup; then Quarterly		
Little Lake Ranch Pond P1	Occurrence of Siphon Well Discharge	Weekly by visual inspection; discontinue at end of baseline monitoring period		
Little Lake	Major operational changes	Request quarterly reporting of any major operational changes to lake level or groundwater pumping on property.	1 ft or more change in lake level or groundwater pumping on property in excess of 100 gpm daily average	None applicable. Data to be used for model updates, if needed, and for evaluating basin wide groundwater level responses in quarterly data submittal
Groundwater Quality				
Hay Ranch North and Hay Ranch South wells	Specific Conductivity/TDS	Quarterly	TDS increase to 2,000 mg/L or greater	Increase monitoring frequency to monthly for 3 months and monitor 18-28, G-36; evaluate basin wide response and determine whether reduction in pumping or supply of alternative water source is warranted
Coso Junction #2, Little Lake Ranch North well	Specific Conductivity/TDS	Quarterly	TDS increase to 1,500 mg/L or greater	Increase monitoring frequency to monthly for 3 months and monitor 18-28, G-36; evaluate basin wide response and determine whether reduction in pumping or supply of alternative water source is warranted
Well Yield				
Dunmovin wells, Coso Junction wells, Red Hill well, Fossil Falls Campground well	Well Yield	Quarterly	Decrease in yield of 25% or more from pre-startup levels	Mitigate well impacts per EIR Section 3.2.3 (Hydrology-2) and the Private Well Mitigation Plan
Precipitation Recharge				

Table 3-2 (*Continued)*: Hydrologic Monitoring Parameter Summary Rose Valley Hydrologic Monitoring and Mitigation Program

Monitored Location (1)	Parameters Monitored	Monitoring Frequency	Threshold Requiring Action	Action if Threshold Exceeded
Little Lake Canyon Precipitation Gauge	Precipitation totals	Daily using continuous recorder	No threshold applicable. Use data to identify basin groundwater level response (west side vs. east side) and mountain vs. valley precipitation for future numerical model updates	Recalibrate model and reassess impact to Little Lake
Haiwee Reservoir Precipitation Gauge				
(1) With the exception of Hay Ranch, every monitoring point is subject to access approval from the appropriate owner. If approval is not forthcoming, alternative appropriate monitoring points will be established by Inyo County if necessary.				

specified duration. The County will evaluate the report and data, and will make a determination as to whether continued operation is appropriate.

- If predicted **maximum acceptable drawdown trigger levels** are exceeded in any of the selected monitoring points located at least 9,000 feet from both Hay Ranch production wells, COC shall: verbally report to the Water Department within 48 hrs; followed by a written report within 4 days; followed by a suspension of pumping within 7 days pending re-calibration of the model; and recommend either cessation of pumping or make predictions of the duration of pumping that can be sustained without causing a significant reduction in water available to Little Lake, (defined as no greater than 10% reduction in groundwater inflow), to be conducted within 4 weeks of the observation of the exceedance. The County will evaluate the report and data, and will make a determination as to whether continued operation is appropriate.
- If measured drawdown values in all monitoring locations at all times within first year of project pumping, match predicted drawdown plots to within 25% or less but are generally below the predicted values, then COC must stop pumping at 1.2 years. However, they may recalibrate the model before cessation of pumping and use available data collected to date, to petition for a presumably small extension to pumping. The County will evaluate the report and data, and will make a determination as to whether continued operation is appropriate.
- If monitoring data collected during the first year show that a majority of monitoring points record drawdowns consistently lower than predicted, then Coso can recalibrate the Hydrology Model and make new predictions of the acceptable duration of pumping which will be summarized in a report provided to the County. Evaluation and correction of background levels for each well shall be conducted to account for natural variation and to separate effects of pumping from natural effects. The County will evaluate the report and data, and will make a determination as to whether continued operation is appropriate.

The proponent will prepare monthly reports within 20 days of data collection. The monthly reports will include the calculated drawdown amounts for each well monitored. Any well that exceeds its predicted drawdown from the baseline level for the specific month monitored, will be highlighted in the report.

Quarterly reports for submittal to the Inyo County Water Department during the startup monitoring period will also be required. The reports will include tabular summaries and electronic data packages for all monitoring data, and graphical presentations including at a minimum, the following:

- Quarterly groundwater elevation contour maps;
- Quarterly total dissolved solids (TDS) or electrical conductivity contour maps;
- Time versus water level measured in monitoring wells and Little Lake; and
- Time versus Hay Ranch pumping rate, Little Lake discharge, and flow measured at the North Culvert on the Little Lake Ranch property.

The quarterly reports will also discuss any issues such as unexpected drawdown, reduced yield or flow identified with private wells or springs in the valley, or Little Lake. Any measures taken or proposed to mitigate these issues shall be discussed. At the end of the first and succeeding years of operation, if any, the proponent will prepare an annual monitoring report summarizing the findings of the quarterly monitoring reports and evaluating the following:

a. Annual groundwater extraction from Hay Ranch wells;
b. Calculated groundwater table drawdown as measured in designated wells that are monitored in the valley;
c. Evidence for impact to spring discharge and/or surface water flows at Little Lake;
d. Evidence for adverse impacts to water quality based on measured specific conductivity or TDS in springs and well waters;
e. Trends in precipitation data to establish relative “wetness” of the first year of the project based on annual Rose Valley rainfall and Sierra snow fall that might impact recharge, groundwater levels, or spring flow in the valley;
f. Seismic events, major storms, or other unusual events as applicable;
g. Comparison of groundwater levels in wells monitored near Haiwee Reservoir to water levels in wells at the north end of Rose Valley to reevaluate the fixed northern groundwater flow boundary in the numerical model;
h. Reevaluation of the specific yield, storage coefficients, hydraulic conductivity, and groundwater recharge rates of the aquifer and comparison to values used in the numerical model.
i. Evaluation of the observed relationship between Little Lake water elevation and groundwater elevation (or pressure) in Little Lake North and/or Little Lake Hotel wells; and
j. The results of the re-calibration of the model during the first year, and any subsequent re-calibrations, shall be discussed in the annual report.

Phase 3: Model Recalibration and Redefinition of Pumping Rates and Duration

Model Recalibration

Based on the data collected in Phase 2, the numerical groundwater flow model will be recalibrated by a qualified person approved by Inyo County Water Department and provided by the applicant after six to 12 months of data have been collected. The model recalibration effort will include consideration of the following:

- Estimation of aquifer specific yield, storage coefficients, recharge through model boundaries, and any needed changes to the hydraulic conductivity distribution within the model grid to more accurately simulate the actual aquifer response to prolonged pumping at Hay Ranch.

- Evaluation of hydrologic data obtained from baseline studies and monitoring at Little Lake Ranch to reassess the trigger levels for groundwater impacts on Little Lake. Evaluation of the magnitude of the hydraulic gradient from the underlying groundwater into Little Lake.
- Evaluation of correlation between seasonal groundwater level changes at the south end of Owens Valley and groundwater elevation changes in Rose Valley and any other factors deemed significant to reassess the magnitude of groundwater underflow from Owens Valley and/or seepage from Haiwee Reservoir.
- Assessment of precipitation monitoring data to identify basin groundwater level response (west side vs. east side) and mountain vs. valley precipitation.
- Reassessment of geothermal water upwelling rate, which is currently neglected in the model, based on the observed response of wells (G-36 and 18-28) completed on Navy property.

The timeframe for recalibrating the numerical model should be accelerated if observed levels of well drawdown exceed model-predicted drawdown in two or more monitoring points by greater than 0.25 feet over predicted drawdown values, within the first six to eight months of pumping; otherwise recalibration should be conducted between eight and 12 months of project operation. The recalibrated model shall be used to reassess projected impacts to groundwater inflow to Little Lake based on the maximum acceptable drawdown trigger level at Little Lake.

The maximum acceptable drawdown trigger level at Little Lake, set at 10% reduction in groundwater inflow to the lake, is estimated to be equivalent to a drawdown of 0.3 feet in the groundwater at the northern end of Little Lake; this may be revised based on new measurements of pre-pumping groundwater levels near the lake, and on new lake level data. ***Any revisions to trigger levels must be set such that Little Lake surface waters will never experience a greater than 10% reduction in inflow as a result of the proposed project.***

The recalibrated model will be used to evaluate whether, based on a more accurate simulation of hydraulic conditions in the Rose Valley, project pumping can continue to 1.2 years or longer. The recalibrated model shall also be used to establish new trigger levels for each of the monitoring wells listed in Table 2-1. The new trigger levels will be incorporated into an addendum to this plan, and again, must meet the criteria that Little Lake surface waters will not ever experience a greater than 10% reduction in inflow as a result of the proposed project. The recalibrated model and any modifications to trigger levels must be reviewed and approved by the Inyo County Water Department.

Redefinition of Pumping Rates and Duration

Pumping rates and duration will be redefined by a qualified person approved by Inyo County Water Department provided by the applicant prior to the 1 year project benchmark. Pumping will not be allowed to proceed beyond the initial year operation period until revised pumping rates and duration are approved by the Water Department.

The revised pumping rates and duration will be set to reduce potentially significant impacts to less than significant levels for the duration of the project until the period of maximum drawdown levels has passed at Little Lake.

Modeling conducted for the EIR indicated the groundwater table at Little Lake could continue to decline as a result of pumping the Hay Ranch wells for up to 30 years after termination of pumping before beginning to rise back to pre-project levels. Consequently, the analysis of revised pumping rates and duration should consider when the maximum groundwater table drawdown will occur, and how much drawdown will occur, to ensure that Little Lake never experiences a greater than 10% decrease in groundwater flow as a result of the proposed project.

Phase 4: Ongoing Monitoring, Reporting, and Mitigation Implementation

Groundwater and surface water monitoring will continue to be conducted during the subsequent years of groundwater production from Hay Ranch, according to Tables 2-1 and 2-2, above.

Groundwater Monitoring and Mitigation Implementation

Groundwater monitoring includes the monitoring of groundwater pumping rates at Hay Ranch, water elevations in designated non-pumped wells through out the valley, specific conductivity and/or TDS, and water levels and pumping rates in pumped wells within the valley as listed in Table 2-1. Groundwater elevations will be compared to the model-predicted levels annually. The need for recalibrating the numerical groundwater flow model should be reviewed for every year of Hay Ranch well pumping (or more frequently if trigger levels are exceeded, as noted previously) to ensure the accuracy of predictions of future water level drawdown.

Groundwater levels in private pumped wells will be monitored using depth to groundwater measurements from designated monitoring points located throughout the valley. When the static groundwater elevation appears to be within 20 feet of the bottom of the well or the well yield is observed to be reduced and further investigation indicates that the water level has dropped too low for an effective pump depth, the well will be remediated by COC by setting the pump deeper, and potentially deepening the well. Some wells may require more powerful pumps to compensate for lower water levels. Mitigation of impacts to private wells will be implemented as described in the Private Well Mitigation Plan, established during the 2 year setup phase (previously described).

Groundwater elevations in Little Lake Ranch well, Little Lake Hotel well, and the North Dock well, and Little Lake water levels and Little Lake discharge rates will be monitored to ensure that trigger levels are not reached for the duration of the project, as determined in Phase 3 Model Recalibration and Redefinition of Pumping Rates and Duration. Mitigation in terms of reduced pumping rates or duration of pumping and/or implementation of a groundwater diversion plan would be implemented as described in Phase 3.

Surface Water Monitoring and Mitigation

Although surface water monitoring will include the Coso Spring and Little Lake, threshold levels triggering mitigation will be focused on Little Lake. The lake water elevation, lake discharge and specific conductivity, spring discharge and specific conductivity, and occurrence of siphon well discharge will be monitored.

If agreed upon by the County, COC, and Little Lake Ranch and determined to be feasible as defined in mitigation measure Hydrology-3, a Little Lake water diversion plan will be developed during project start-up and implemented based on trigger levels throughout the valley. The water diversion plan will include additional pumping from one or more of the existing wells at the Little Lake Ranch property, if feasible, or construction of a new well. Water will be piped from the well location to the lake where it shall be discharged. Water will be withdrawn at the minimum rate necessary to maintain lake water levels and surface water flows for maintenance of existing plant communities on the property or at the level indicated with updated modeling results.

The applicant will use biological and archaeological monitors during all ground disturbance activities associated with the construction of the augmentation plan components. The applicant will also be responsible for obtaining any required permits for the augmentation plan at the time that it is designed and implemented. The applicant will also be responsible for financing the augmentation plan for the duration that it is determined needed.

Ongoing Reporting

During the Ongoing Monitoring Phase, COC will continue to prepare monthly and quarterly reports.

An annual report will also be prepared for submittal to the Inyo County Water Department. If the Inyo County Water Department approves groundwater extraction at Hay Ranch beyond the initial year, the proponent may petition Inyo County to reduce the reporting frequency for interim reports (i.e. monthly reports). The annual reports will include tabular and graphical summaries of all monitoring data as discussed under Phase 1: Startup Monitoring. The monitoring reports will also discuss any issues identified with respect to potential impacts to private wells in the valley, such as reduced yield or other problems, and will discuss any measures taken to mitigate these issues. On an annual basis, the proponent will prepare an annual monitoring report summarizing the findings of the quarterly monitoring reports and evaluating the following:

- Annual groundwater extraction from Hay Ranch wells;
- Calculated groundwater table drawdown in wells in the valley and comparison to groundwater drawdown trigger levels;
- Evidence for impact to spring discharge and/or surface water flows at Little Lake;
- Evidence for adverse impacts to water quality based on measured specific conductivity or TDS in springs and well waters;
- Trends in precipitation data that might impact recharge, groundwater levels, or spring flow in the valley; and
- Seismic events, major storms, or other unusual events as applicable.

Based on these analyses, the annual reports will discuss the need for mitigating impacts to Little Lake, if any, and discuss any recommended changes to the monitoring plan including monitoring frequency, parameters, or locations.