EXHIBIT A

Additional Mitigation Projects Developed by the MOU Ad Hoc Group

September 2008

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Executive Summary for the Additional Mitigation Projects Developed by the MOU Ad Hoc Group

Background

In 1997, a Memorandum of Understanding (MOU) signed by the City of Los Angeles Department of Water and Power (LADWP), County of Inyo, California Department of Fish and Game, California State Lands Commission, Sierra Club, Owens Valley Committee, and Carla Scheidlinger took effect upon the discharge of a writ of mandate issued by the Third District Court of Appeal in 1972. The MOU resolved a number of outstanding issues surrounding the California Environmental Quality Act requirements for the 1991 EIR, *Water from the Owens Valley to Supply the Second Los Angeles Aqueduct (EIR)*.

Section III.A. of the 1997 MOU identifies *Additional Commitments* that include studies, evaluations and commitments to specific issues. One of the issues brought forward in the MOU in Section III.A.3. is *Additional Mitigation* that requires a total of 1,600 acre-feet of water per year to be supplied by Los Angeles Department of Water and Power (LADWP). This water is to be used for the implementation of on-site mitigation measures at Hines Springs that were identified in the 1991 EIR and on-site or off-site mitigation that is in addition to the mitigation measures identified in the EIR for impacts at Fish Springs, Big and Little Seely Springs and Big and Little Blackrock Springs.

The Consultants, Ecosystem Sciences, Incorporated (ESI), under the direction of LADWP and Inyo County (County), were to determine the water requirements of the mitigation measure at Hines Springs and to evaluate opportunities to use any remaining water in the implementation of on-site and/or off-site mitigation. Based on the evaluation, the Consultants were to recommend reasonable and feasible on-site and/or off-site mitigation measures, including the implementation of the1991 EIR mitigation measures at Hines Springs. Projects recommended by these studies and evaluations were to be presented to the Board of Water and Power Commissioners for approval and implementation as soon as possible after their completion. These mitigation measures are to be implemented by LADWP and maintained by LADWP and/or Inyo County.

A number of representatives from the Parties were dissatisfied with the Consultants draft plans. On February 21, 2006, an Ad Hoc group consisting of representatives from the Parties and ranching interests met to discuss alternatives to the draft plans.

The Ad Hoc group operated with a consensus-based approach as a means of recognizing all parties' interests. The group recognizes that this is an informal process based on the common needs of each entity, and that solutions need to be acceptable to the entire Ad Hoc group. All parties recognize that the decision for acceptance or rejection rests with governing boards, management, or members of their organizations.

The Ad Hoc group has met on a regular basis. This group has developed a set of projects that they believe would fulfill the commitment in the MOU that LADWP provide 1,600 acre-feet of water per year for the Hines Spring mitigation measure and additional mitigation The following

projects have been conceptually agreed to by the Ad Hoc group with the water allocation noted for each individual project.

Project	Annual Water Allotment (acre-feet)
Freeman Creek	215
Hines Springs Well 355	240
Hines Springs Aberdeen Ditch	145
North of Mazourka Canyon	300
Homestead	300
Well 368	150
Diaz Lake	250
Warren Lake	To be determined annually
TOTAL	1600

PROJECT SYNOPSIS'

Freeman Creek

The project involves the diversion of Freeman Creek into ancestral washes to create a diverse riparian corridor. Sub-irrigation may create small wetlands in depressions in an existing pasture. Small seeps are expected to become established after initiation of the project. Sub-irrigation of an earthen reservoir should create shallow marsh habitat. In addition, water will be provided to the ranch lessee to improve pasture forage and expand an existing pasture. The project is expected to benefit species that utilize riparian and wetland habitats.

Hines Springs Well 355

Mitigation at Hines Springs was identified in the 1991 EIR. Mitigation Measure 10-14 states, "The Hines Spring vent and its surroundings will receive on site mitigation. Water will be supplied to the area from an existing, but unused well at the site" (Well 355). "As a result, approximately one to two acres will either have ponded water or riparian vegetation. Riparian trees and a selection of riparian herbaceous species will be planted on the banks. The area will be fenced."

The project involves running water from Well 355 through a pipeline into a portion of the historic spring vent channel. A ten acre exclosure will be built around the project.

The project will create and enhance riparian, aquatic and spring habitat types. In addition, sub-irrigation of pasture/meadow will enhance livestock grazing opportunities.

As this project may not fully comply with the obligation of the 1991 EIR and the 1997 MOU because the mitigation requirement of one to two acres of ponded water or riparian vegetation may not be met with the volume of water pumped from W355, the Board of Water and Power Commissioners will have to approve modifications of the mitigation measure identified in the 1991 EIR related to Hines Springs.

Hines Springs Aberdeen Ditch

This project involves running water from an existing diversion on Aberdeen Ditch, through a French drain or other suitable fish barrier, into a pipeline to a portion of the historic spring vent channel.

The project will create and enhance riparian, aquatic and spring habitat types. In addition, sub-irrigation of pasture/meadow will enhance livestock grazing opportunities.

North of Mazourka Canyon Road

This project involves the utilization of the water provided by flowing well V008 and the installation and utilization of water from a new flowing well. The water from the flowing wells will be piped to an outflow channel and will follow existing natural drainage features, flowing through two ponds and terminating west of the Owens River.

The project will create spring and riparian habitat. In addition, a stock watering location will be provided as part of this project.

Homestead

This project involves the utilization of the water provided by flowing multiple completion well T774-T777 and the installation and utilization of water from a new flowing well in the location of Well 044A. The water from flowing multiple completion well T774-T777 will be piped to an existing channel with a natural gradient towards an approximately one-acre pond. Water from the new artesian well will flow through an existing channel to the same one-acre pond and from the pond into two outflow channels.

The project will create riparian, wetland and spring habitats and improve the existing alkali meadow. This will benefit riparian dependent bird and mammal species. Fish, waterfowl and invertebrate species will benefit from the one-acre pond. In addition, a stock watering location will be provided as part of this project.

Well 368

This project involves augmenting the flow at F368 which currently supports Owens Valley pupfish, a state and federally listed native fish. This will be accomplished by drilling a new flowing well north of flowing well F368. Water will be piped to within 25 meters of flowing well F368 and then will flow in an open ditch to the current water source.

This project will create and maintain riparian, aquatic and spring habitats. It also provides augmentation and redundancy in the water source at well F368 that supports the Owens Valley pupfish.

Diaz Lake

This project involves supplying water from the Los Angeles Aqueduct to a 75 acre lake that is an Inyo County recreation facility. The project will provide a secure water supply for Diaz Lake and reduce the dependence on pumping conducted by Inyo County to supply the lake.

This project will reduce pumping by Inyo County in the Bairs-Georges Wellfield.

Warren Lake

This project will consist of releasing water from the Big Pine Canal into an existing ditch that will carry water to the Warren Lake playa. This project will not receive water every year but will serve to balance the annual 1600 acre-foot water commitment.

This project will create readily utilized shallow-water habitat for shorebirds and waterfowl. The availability of shallow-water habitat is dependent on rainfall. Therefore, this project may provide shallow-water habitat in dry years depending on the amount and timing of water releases.

PROJECT DESCRIPTIONS

FREEMAN CREEK

Introduction

The 1997 Memorandum of Understanding (MOU) between the City of Los Angeles Department of Water and Power (LADWP), Inyo County, Sierra Club, Owens Valley Committee, California Department of Fish and Game, and California State Lands Commission included a provision to provide a total of 1600 acre feet/year (AFY) for constructing mitigation projects in the Owens Valley. MOU party representatives and LADWP lessees have met in a series of informal meetings to develop a list of projects to fulfill the MOU requirement. Staff from LADWP and Inyo County prepared conceptual plans for certain projects. This plan describes the site conditions, water supply, water conveyances, and potential benefits for the Freeman Creek project.

The goal for the Freeman Creek project is to divert the creek into ancestral channels to create riparian habitat. The channels include Freeman Creek Wash and a small portion of Keough's Wash east of old Highway 395. Water reaching the lower end of the channels will be managed to benefit irrigated pasture and meadows and to prevent return flows into the LADWP aqueduct system.

This plan was guided by input from several sources. Primary consideration was given to the general concept of the project and project evaluation criteria set by the Ad Hoc Committee. Concerns and recommendations raised during field visits and interviews with interested parties, experts, and Ad Hoc Committee members were incorporated.

Project Objectives

1. Divert Freeman Creek into ancestral washes to create a diverse riparian corridor.
2. Provide water to lessee to increase pasture forage and to expand existing pasture.
3. Manage project to comply with existing agreements, minimize invasive species, control mosquitoes, and prevent return flows to the LADWP aqueduct system.

Project Area

The project area is located in T.8S R.33 E., sections 8 and 17. It is approximately 7.5 miles southwest of Bishop and one mile south of the Old Wilkerson housing development. The project area and proposed water course are shown in Figures 1 and 2.

Two LADWP leases occur within the project area. Keough's Hot Spring was leased to Brown's Supply for a commercial resort in 1998. The project is located downstream of the resort and is not expected to affect the lessee. The remainder of the project area is leased to Yribarren Ranch for pasture.

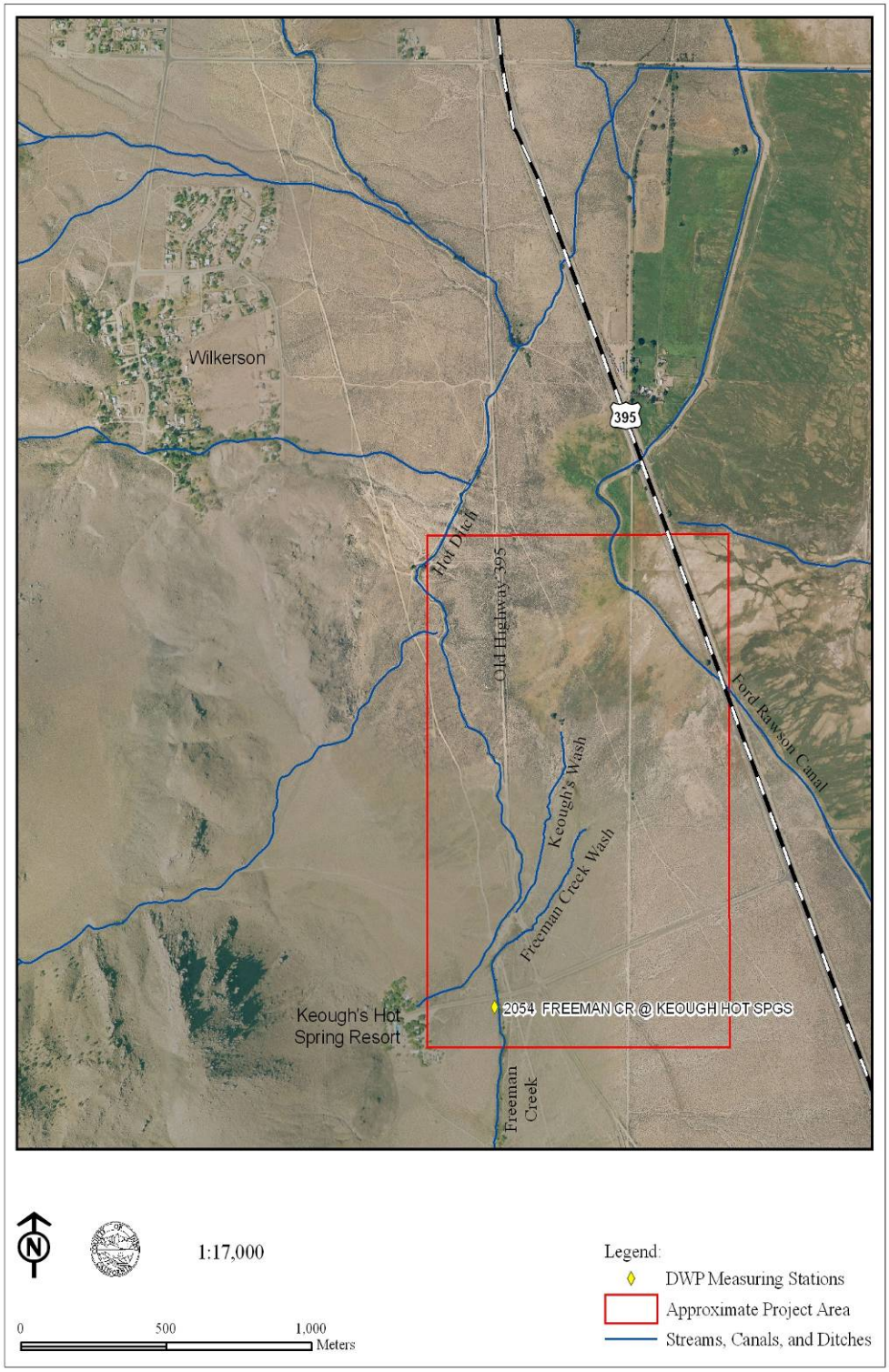

Figure 1. Geography of the Project Area. Some of the water courses shown are currently dry.

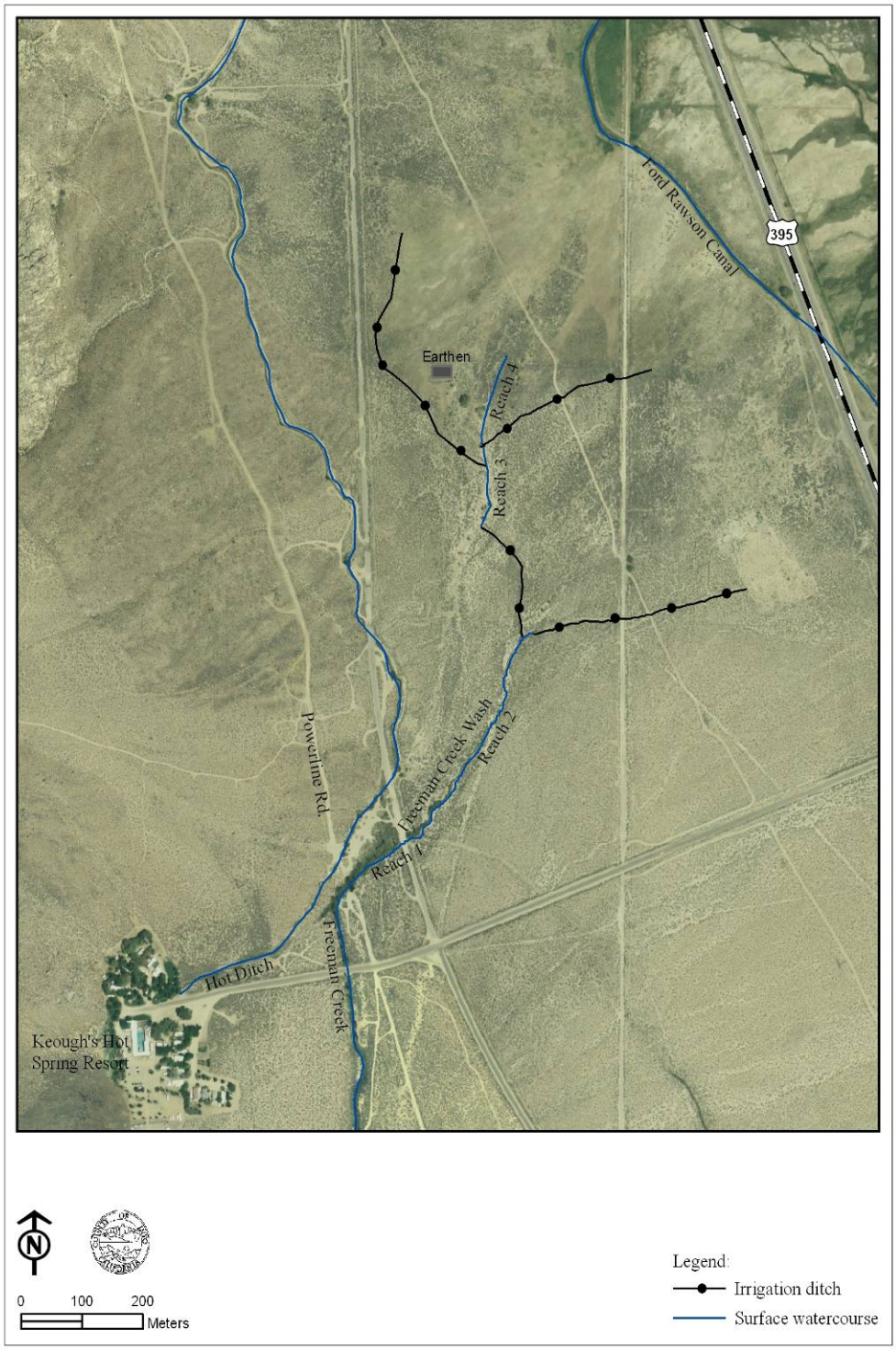

Figure 2. Map of the Proposed Diversion Point, Reaches Along the Water Course, and Irrigation Ditches. Actual alignment of ditches will depend on topography and lessee preference.

Table 1. Distribution of Annual Runoff Year (ROY) Totals Measured at STAID 2054 on Freeman Creek , 1972-2004

ROY Flow (ac-ft)	Frequency
<100	12
100-200	6
200-300	6
300-400	4
400-500	2
500-600	2
>600	1

Geology and Soils

The project area was mapped as predominately Cartago gravelly loamy coarse sand, 5-30% slopes and Cartago gravelly loamy sand, 0-2% slopes including the entire proposed water courses and irrigated pasture. The Cartago soil (sandy, mixed, thermic Xeric Torriorthents) is widespread on alluvial fans on the west side of the Owens Valley. It has weakly developed horizons in sandy (not bouldery) parent materials and often has lenses of gravelly material in the lower profile (Tallyn, 2002). The Cartago series does not have horizons that restrict vertical water movement although inclusions of dissimilar soils with layers of low permeability may occur in the map unit. The soils do not present obvious limitations to the project. The gravelly sandy soils in the project area and within the proposed water courses have high infiltration rates, but should provide favorable substrate for aquatic habitat.

Investigations of the subsurface stratigraphy of the alluvial fan in the project area have not been conducted. Anecdotal evidence from diversion of Freeman Creek into Keough's and Freeman Creek Washes suggest that infiltration on the fan produced seeps lower in the landscape distant from the main surface water route (Ron Yribarren, personal communication). The stratigraphy of alluvial fans commonly includes discontinuous layers of variable hydraulic conductivity that promote and conduct lateral flow. The level of effort to characterize the subsoil stratigraphy that exerts control on local hydrology of the project area is beyond the scope of this project.

Water Supply

Flow in Freeman Creek is measured in a flume (STAID 2054) just south of the road to Keough's Resort. Average annual flow in Freeman Creek is 214 AFY (excludes years with partial data). In most years, Freeman Creek runoff provides less than 200 AF, but the distribution is highly skewed with the highest values two or three times greater than typical annual flows (Table 1). In some summer months, the creek flow is near zero suggesting lower or all reaches of the project may be dry periodically.

Variable flow is desirable to maintain a healthy riparian corridor. The variability in water used by this project, however, translates into variable annual quantities of water provided to fulfill the MOU commitment. For planning purposes, the water allocated for this project will be assumed to be 215 AFY. If the average creek flow is relatively well characterized and stable, the water supplied for all projects in the long term should vary around the scheduled releases (1600 AFY total).

Water Quality

There are no water quality data from Freeman Creek, but presumably it has water quality similar to other small creeks emanating from the Sierra Nevada with dilute, neutral to slightly alkaline pH, and predominately calcium-sodium-bicarbonate chemistry (Pretti and Stewart, 2002; Inyo County/Los Angeles, 2005). Water quality of Freeman Creek should not limit the establishment of riparian vegetation.

Vegetation and Habitat

The 1984-87 LADWP vegetation inventory included the entire project area. Keough's and Freeman Creek Washes occur in vegetation parcel PLC165, big sagebrush scrub. The area of existing pasture at the terminus of the water courses was mapped as alkali meadow dominated by phreatophytic grasses (PLC158, and PLC162), but PLC158 obviously contains significant inclusions of big sagebrush scrub in the northern half of the parcel. The lowest lying portion of the project area adjacent to Ford Rawson canal was mapped as rush sedge meadow (PLC157). Cover and species composition data are available at LADWP and Inyo County.

The 1984-87 vegetation inventory was mapped at a scale too small to separate the vegetation along the new water course. A portion of the project area was included in the vegetation map prepared during the ESI spring and seep inventory. See Table 2 for a summary of ESI (2001) results. Riparian vegetation occurred along Freeman Creek west of the old highway.

A preliminary vegetation map (base map scale 1:2667) of the new water course and pasture was constructed on two site visits from June 16-19, 2006. The map base was 2000 digital aerial photos although 2005 IKONOS images were consulted as well. Map units were based on the modified Holland classification used in the Inyo/Los Angles Water Agreement though no quantitative transect data were collected (Figure 3). Miscellaneous areas and washes were also delineated.

The majority of Freeman Creek Wash traverses big sagebrush scrub (BSS).
Reach 1 (295 linear feet) supports a narrow strip riparian vegetation comprised primarily of *Salix* (3 species), forbs, and *Populus* similar to the riparian vegetation described by ESI (Table 2). The vegetation adjacent to the highway became established between 1968 and 1981 based on air photos, and has slowly expanded down the channel. Reach 2, (990 linear feet including the ditch connecting to Keough's Wash) is predominately BSS (ARTR) with a continuous narrow strip of *Salix lasiolepis* with interspersed cottonwood individuals lining the small channel in the wash. The riparian vegetation became established after Freeman Creek was directed through the wash in the early 2000's (Ronny Yribarren, personal communication). The water course connecting Reach 2 and 3 (in Keough's Wash) is not well defined and supports upland vegetation and a few grass species. Reach 3 contains scattered young cottonwood and ARTR in an incised channel (Figure 4). Reach 4 is not incised and flow divides into several small rivulets through a mixed vegetation assemblage of *Artemisia tridentata*, *Sporobolus airoides*, *Populus fremontii*, and *Chrysothamnus nauseous* at the edge of the pasture (Figure 5).

Table 2. Plant Species Identified for Three Habitat Types Mapped by ESI (2001)

ESI Habitat type	Species	Cover (%)
Water⊥	open water	80
	Salix exigua	10
	Salix lasiolepis	5
	Typha domingensis	5
	Juncus balticus	5
	Distichlis spicata	3
	Helianthus annua	3
	Sporobolus airoides	2
Other species noted <1% cover: *Populus fremontii, Cicuta douglasii, Melilotus alba, Epilobium ciliatum, Juncus spp. Eleocharis parishii, Polypogon monspeliensis, Lythrum californica, Gnapalium luteo-album*,		
Riparian shrub	*Salix lasiolepis*	30
	Salix exigua	25
	open water	10
	Populus fremontii	10
	Salix laevigata	5
	Robinia pseudoacacia	5
	bare ground	15
Other species noted <1% cover: *Cicuta douglasii, Melilotus alba, Epilobium ciliatum, Mimulus guttatus, Epipactis gigantea, Mentha arvensis, Euthamia occidentalis, Stachys album, Juncus spp. Eleocharis parishii, Lythrum californica, Sporobolus airoides, Oenothera elata, Fimbristylis thermalis.*		
Upland	*Artemisia tridentata tridentata*	45
	Chrysothamnus nauseosus	10
	Ephedra nevadensis	2
	Ericameria cooperi	2
	Grayia spinosa	2
	Atriplex canescens	1
	bare ground	30
Other species noted <1% cover: *Bromus tectorum, Eriastrum densifolium, Vulpia octoflora, Eriogonum maculatum, Centrostegia thruberi, Nama demissum, Tetradymia axillaris, Achnatherum hymenoides, Eriogonum fasciculatum, Hymenoclea salsola, Helianthus annua, Schismus arabicus, Crypthanta micrantha, Castilleja angustifolia, Lianthus aureus, Coleogyne ramosissima, Chorizanthe brevicornu, Eriophyllum wallacei, Purshia tridentata, Mirabilis bigelovii, Linanthus demissum, Datisca glomerata, Mimulus cardinalis, Juncus torreyi, Xanthium strumarium, Conyza canadensis, Muhlenbergia asperfolia.*		

⊥: Cover values sum to greater than 100%

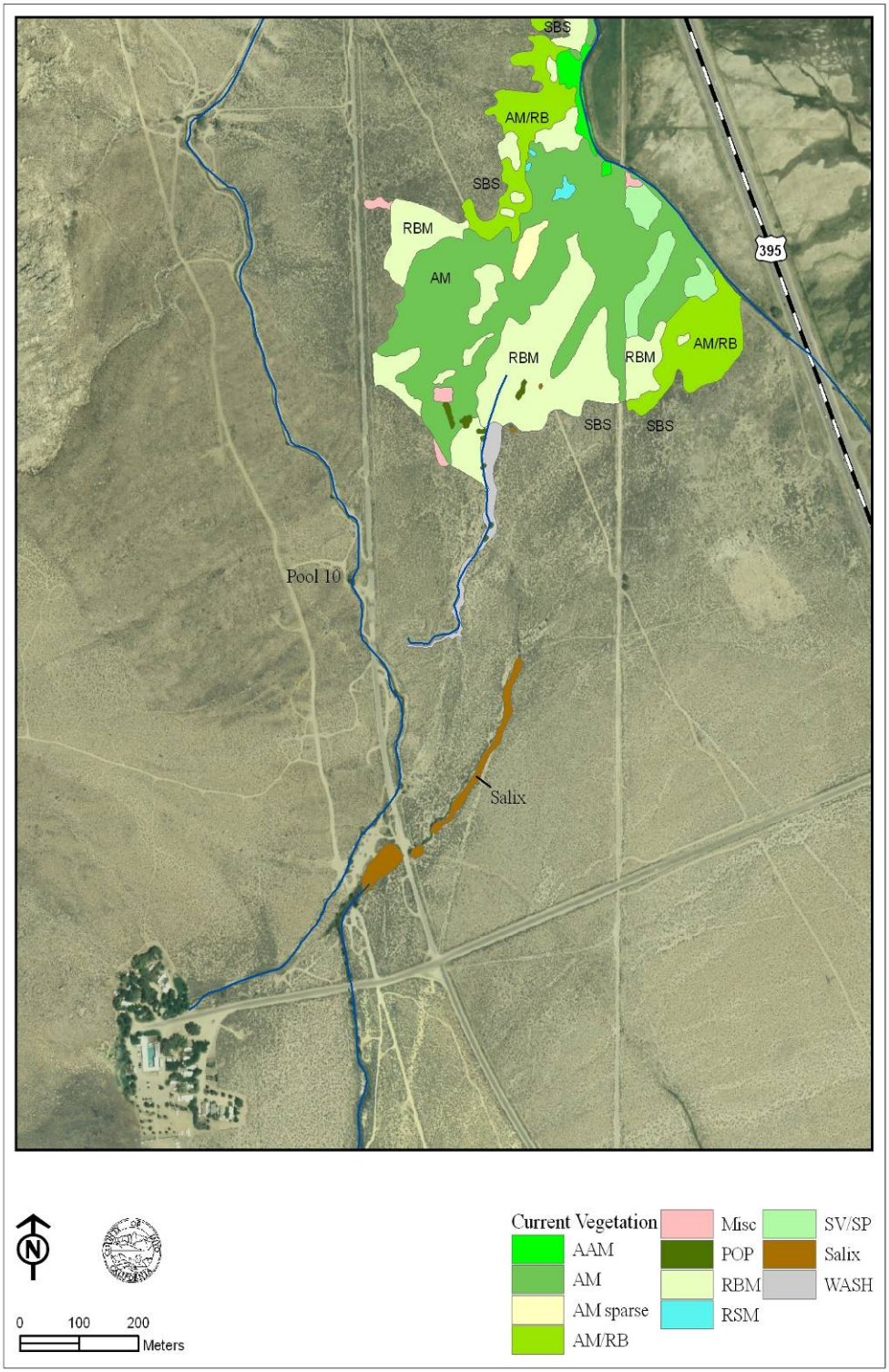

Figure 3. Current Vegetation Communities

Figure 4. Reach 3 in Keough's Wash. Water enters this reach from Reach 2 via a small ditch just to the left of the lower cottonwood tree in the photo.

The pasture is predominantly alkali meadow (AM) dominated by *Distichlis spicata, Juncus balticus,* and *Sporobolus airoides*. Small depressions within the alkali meadow support rush/sedge meadow that are potential seeps as the water levels rise after the project is implemented. In lower lying portions of the alkali meadow, *Anemopsis californica* becomes dominant or co-dominant with *Distichlis spicata*. These areas are visible on the imagery and were delineated as a different mapping phase of alkali meadow (AAM). One area with sparse *Distichlis spicata* was identified. The alkali meadow grades into rabbitbrush scrub (RBS) on the upslope edges of the unit. A transition area with scattered *Chrysothamnus nauseous* also was delineated as a mapping phase of AM (AM/RB). Individual Populus and Salix were identified as well. Upland areas were mapped as BSS. Often the boundary between BSS/AM/RBS was abrupt for *Artemisia tridentata* but diffuse for *Sporobolus airoides* and less commonly, *Distichlis spicata*. The portion of the BSS unit with grass understory was relatively narrow, noncontiguous, and not readily identified on the photo base. This plant assemblage was included in the BSS unit which should be interpreted as having a grass understory where it abuts AM or RBM.

Invasive species may present a threat to the long term viability of a mitigation project because of their ability to displace native species and low habitat value. Small patches of *Salsola* spp. and *Bassia hyssopifolia* occur within the pasture. A few *Tamarix ramosissima* individuals (less than 10) were observed in the project area. A small population of *Lepidium latifolium* was noted along Hot Ditch downstream from the project. *Bromus tectorum* is a small component of the upland plant communities. A more systematic weed survey will be conducted before initiation of the project, but the relatively few weeds observed in the project area thus far during field visits is promising.

Figure 5. View of Reach 4 of Keough's Wash. Photo is looking west along the ditch leading to the western edge of the pasture. The large cottonwoods generally follow a distributary in this reach.

One plant species observed by ESI, *Fimbristylis thermalis*, is a CNPS List 2 species. The precise location was not recorded, but it probably was along the upper section Hot Ditch west of old U.S. 395. The species is rare, threatened or endangered in California but is more common elsewhere. No activities are slated to occur at Hot Ditch precluding impacts to this species.

Fauna

A systematic survey of fauna in the project area was beyond the scope of this plan. However, several bird species were observed during field visits including killdeer, mocking bird, common raven, magpie, meadowlark, red shafted flicker, Northern harrier, and red tailed hawk. Mammals and reptiles observed included: western fence lizard, jackrabbit, cottontail, fox, and ground squirrel. ESI observed white throated swift, Say's phoebe, Northern rough-winged swallow, and brewer's blackbird during two visits in 1998. This is not an exhaustive list of species utilizing existing habitat in the project area.

Freeman's Creek and Keough's Washes are dry. ESI surveyed the portion of Freeman Creek west of the old highway because Hot Ditch was dry during their field visits. Presumably, bird, mammal, and reptile species they observed occurred in the riparian corridor along Freeman Creek. ESI did not observe gastropod species in their kicknet samples.

Miscellaneous or Point Features

Freeman Creek Wash and adjacent defunct ditches and rivulets contain several standing and downed snags of cottonwood and willow trees. These landscape elements will remain in place to provide additional habitat diversity except where they represent an obvious obstruction to flow. Most of the project area was used for irrigated agriculture historically. A rectangular earthen reservoir constructed before the 1920's is located near the terminus of the wash. It filled by sub irrigation when Freeman Creek water was diverted in the early 2000's, (Mr. Ron Yribarren, personal communication) and will be an additional feature of this project. Several cottonwood seedlings became established in an abandoned gravel pit east of the wash when irrigation water was supplied in the past to the pit. The junction of Reach 2 and an existing ditch will be refurbished to allow the pit to be included in the irrigation operations.

Project Description

Freeman Creek is a small perennial stream originating in the Sierra Nevada. The creek above the STAID 2054 is not part of this project. Below the flume, the creek flows to a point just west of the old highway where it is partially diverted into Hot Ditch. A berm will be constructed to prevent flows into Hot Ditch, and Freeman Creek will be allowed to flow through an existing culvert under the highway into an ancestral wash. The intent was to utilize natural washes to minimize construction and mimic a naturally functioning system as much as possible.

Vehicle traffic along a power line access trail has destroyed parts of the original channel west of the old highway causing the creek flows to disperse over a wider area. Regular trail maintenance to remove trees was observed in March 2007; all trees for a few yards on either side of the trail have been cut. The channel and trail may be restored and a culvert may be installed to permit vehicle traffic across the creek without repeated damage to the channel. Approximately 30 feet downstream of the power line trail, the creek divides into two channels. A northern branch makes its way into Hot Ditch. The southern branch eventually flows into the culvert under the highway and down Freeman Creek Wash. Water has been flowing under the old highway at least since 2006 without planned diversions. The channel below the culvert will be diverted into the southern branch of the creek. As a further precaution against flows rejoining Hot Ditch via the north channel, the channel will be bermed where it enters Hot Ditch next to the old highway, and an existing dry channel connecting the two branches will be deepened. The connecting channel is dry presently because the northern branch has downcut below the junction. The berm will be relatively easy to remove to divert Freeman Creek into Hot Ditch and shut off water to the project if necessary.

Reaches 1 and 2 of Freeman Creek Wash, east of the old highway, are incised and have a gradient of approximately 2.5%. The primary distinction between the two reaches is the age and quantity of the riparian vegetation. The wash becomes unconfined approximately 1640 linear feet from the old highway where the channel joins with several small ditches that transport water east into an abandoned gravel pit and west into lower reaches of Keough's Wash. Water flows between Reach 2 and 3 in small ditches or by overland flow. The route is not well defined but field inspection and air photo interpretation suggests flow follows a small ditch shown in Figure 2. A ditch lower on the landscape, however, may also intercept the flow and transport it to Keough's Wash. If the lower ditch is the primary water course, the majority of Reach 3 will be bypassed. Reach 3 consists of the incised portion of Keough's Wash (Figure 4). It is approximately 270 feet long and ends at the junction with an irrigation ditch leading west of the main channel. The average gradient of Reach 3 is approximately 3%, and the substrate is predominately very coarse sand. Flow in Reach 4 divides into several other small rivulets as it enters the pasture. The gradient of this reach is approximately 1.5%.

The last component of the water conveyances of this project consist of irrigation ditches to allow efficient distribution of water and prevent flow into Ford-Rawson canal. Ditches leading east of the water course will be used primarily in years of higher runoff to distribute water effectively to prevent excess irrigation in western portions of the pasture and to prevent flows into Ford Rawson canal. Water below the incised portions of Freeman Creek and Keough's Washes will be made available to the lessee who will have primary discretion where and how to distribute water to increase pasture/alkali meadow habitat. This will allow the lessee to cycle irrigation water between the eastern and western portions of the existing pasture. Providing irrigation water creates an economic incentive for the lessee to assist long-term management of this project and to expand alkali meadow/pasture habitat.

The quantity of water that will be available for irrigation is uncertain because of the unknown water balance of Freeman Creek Wash and Keough's Wash once flows are re-established. Anecdotal evidence from diversion of Freeman Creek suggests sufficient water will reach the pasture to improve pasture conditions. Those diversions were able to reach the extreme western edge of the AM pasture, and flooding mortality of shrubs where irrigation water flowed is evident in the 2000 and 2005 imagery. Once riparian vegetation has become established, however, evapotranspiration will limit or possibly eliminate water available for irrigation except for some months during the winter.

Active revegetation efforts may be employed to establish a trajectory leading to a diverse plant community. Early intervention to establish vegetation may be necessary to promote bank stabilization. *Salix* spp. and the forbs and grasses identified by ESI during the spring and seep survey are presently recruiting without intervention. *Populus fremontii* and *Salix laevigata* recruited naturally in Reach 1 between 1968 and 1981 based on air photo interpretation. The predominant species in Reach 2 is *Salix lasiolepis* which naturally established after the diversion of Freeman Creek into the wash in the early 2000's.

Livestock grazing can reduce the effectiveness of measures to re-establish native vegetation. The project area has been managed for pasture by Ron Yribarren for many years, and the alkali meadow has relatively high cover of native phreatophytic grass species with few weeds. The boundary between shrub and grass-dominated communities has fluctuated across the landscape based on air photo interpretation which probably reflects the manipulation of irrigation. Individual cottonwood trees that became established in the early 2000's as a result of diversion of Freeman Creek appear vigorous and thriving although several near the pasture have been highlined by cattle. Willows established during the same period and more recently are still present. The anecdotal evidence indicates that *Populus fremontii* and willow species can be established and persist with the current grazing management. No fences will be constructed.

A weed survey of the project area will be completed to identify additional populations of weeds. That information will be used to design an eradication program for *Lepidium latifolium* and *Tamarisk ramosissima* and other State of California A-rated invasive species.

Implementation Plan

A timeline for project implementation is given below.

Year 1. Repair channel and power line trail where it crosses on Freeman Creek and install culvert if necessary. Reconstruct channel below the culvert if necessary to remove the point where flows diverge and direct flow only into the branch leading to the Freeman Creek Wash. Construct berm to prevent flow into Hot Ditch. Refurbish and extend one irrigation ditch water west from the bottom of Reach 3 and the junction of Reach 2 and ditch leading east of Freeman Creek Wash.

Begin diversions from Freeman Creek in winter. Observe the project area to note problems. Some erosion is expected because the washes have accumulated sand for decades and are not in equilibrium with the new hydrology. Observations that could trigger intervention to reduce or shut off flows include: flooding mortality of existing recruits, invasion by non-natives, creation of excessive mosquito habitat, or inability to effectively distribute irrigation water to prevent flows from reaching Ford-Rawson Canal.

Conduct annual monitoring. A weed eradication program will be conducted in the project area. The timing of the weed treatment will be tailored to accommodate the most effective season to treat the target species. The goal for the initial weed control will be complete removal of State of California A-rated invasive species. Presently, populations of these species in the project area are small making this goal attainable.

Years 2-4. Conduct annual monitoring and reporting.

Potential Management Measures

- Active revegetation with riparian or wetland species
- Adjust grazing management and fencing (determined in consultation with the lessee)
- Weed treatment
- Temporary interruption of flow by diversion into Hot Ditch

Possible Environmental Benefits
Types of Habitat

The type of habitat that could be created in the project area was estimated based on the portion of Freeman Creek within the project area and anecdotal evidence of vegetation changes the last time water was diverted from Freeman Creek. The riparian area along Freeman Creek consists of a narrow strip of riparian scrub with an abrupt boundary with upland big sagebrush scrub. The riparian strip consists primarily of willow species with lower cover of cottonwood, birch, and herbaceous forbs. It is expected that the riparian corridors supplied with water by this project will be similar (Figure 6).

Water courses in this project have heterogeneous channel characteristics that should structure and diversify the hydrologic habitats created without intervention. Reaches 1, 2, and 3 will consist of a small meandering channel within a larger incised channel. Habitats include coarse sandy substrate, sand bars, small channel, sub-irrigated terrace, and natural debris obstructions. The 2-3% gradient should prevent invasion of shallow marsh species like *Typha* spp. or rushes. *Typha* spp. prefer fine textured substrate and slow flow velocity. Development of shallow marsh species within the channel would not be a favorable characteristic because it slows the water velocity and promotes development of mucky/fine substrate. The area between

Reach 2 and 3 and in Reach 4 consists of small distributary channels that should promote establishment of herbaceous species adjacent to flowing water. Flows in these areas may be intermittent depending on water management and cycling of water to maximize irrigation efficiency or for mosquito control.

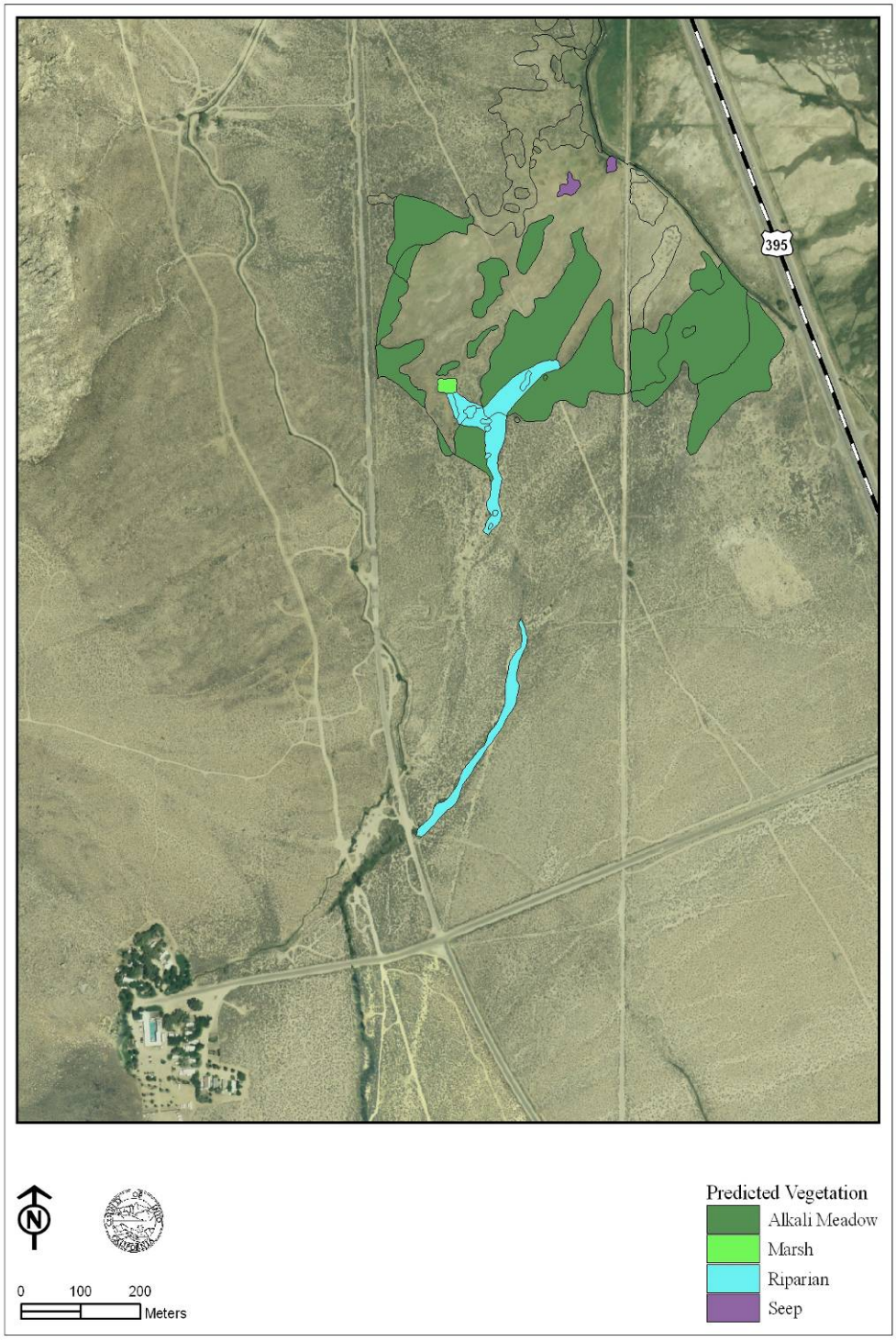

Figure 6. Possible New Habitat Created in the Project Area. The particular areas of shrub- meadow converted to meadow will depend on the route of irrigation water.

Water from Freeman Creek will terminate at an existing irrigated/sub irrigated alkali meadow. The additional water delivered to this area should improve existing forage, and at the discretion of the lessee will be used to expand pasture beyond present margins. Sub-irrigation may create small wetlands in depressions in the existing pasture. Small seeps were reactivated when creek water was diverted into these lower portions of the project area in recent years. These seeps and possibly others would be expected to become established soon after initiation of the project.

Flow through Keough's Wash and ditches to irrigate the western edge of the pasture should sub irrigate the earthen reservoir and create shallow marsh habitat. This would increase the overall diversity of habitat created by this project. The reservoir is approximately 0.18 acre and three feet deep and is predominately vegetated with *Distichlis spicata*. Surface water connection with the earthen reservoir should be avoided.

No improvement (or degradation) in water quality is expected. This project consists of diverting water from a creek into an ancestral wash terminating at irrigated pastures or wetlands.

Wildlife and Fish Species

Several species could benefit from this project. Cottonwood and willow riparian corridor could provide habitat for yellow warbler, and yellow-breasted chat which inhabit open canopy willow patches. Migrant bird species that may benefit from the project include willow flycatcher, several sparrows, and least Bell's vireo. Least bittern may benefit if emergent wetland vegetation form in the earthen reservoir. Least bittern requires open water interspersed with dense emergent cover which may not form in the relatively flat bottomed dugout. Yellow headed and red-wing blackbirds would likely take advantage of any emergent vegetation created in the reservoir or seeps in depressions within the pasture. Bat species also benefit from riparian corridors and the food source they provide.

Potential Impacts

The proposed project includes stream alteration (repair), possible installation of a culvert, removal of non-native plant species, and construction of new small ditches. The decision whether to install a culvert and repair Freeman Creek channel has not been finalized, pending additional information and recommendations from LADWP staff. The culvert installation and repair of the stream channel may require acquisition of a §1602 Lake and Stream Alteration Agreement. The §1602 Agreement would describe best management practices for the construction activities. Engineered designs of culvert installation and earthwork needed to repair the power line trail if necessary will be prepared by LADWP. Irrigation and possible creation of 0.18 acre of marsh and small seeps in the pasture may increase the effort required for mosquito control. The project will be evaluated as required by CEQA.

Consistency with Ad Hoc Project Evaluation Criteria

1. Project will not require modification of the MOU, Stipulation and Order or 1991 EIR
2. No new wells will be required.
3. Consultants will be employed as agreed to by the MOU parties.
4. Sum of estimated costs for all the projects were not available to compare with the ESI final report costs.
5. This project is reasonable and feasible.
6. This project should provide net environmental benefits.
7. This project is doable.
8. No fencing is planned.
9. This project could increase the acreage of alkali meadow (at least 20 acres) and could provide a consistent water supply to current sub irrigated pasture to increase available forage.
10. Riparian habitat created as part of this project could be included in a habitat conservation plan.
11. It is not known whether nonnative fish species occur in the water source. Irrigation will be managed to prevent surface water connection with Ford Rawson canal where *Gambusia* is known to occur.
12. The separation from Hot Ditch will consist of a simple berm that can be easily removed to permit shut-off of flows east of the old highway if necessary. Irrigation management could rotate water around the pasture to provide for drying periods for mosquito control.
13. Not applicable.
14. Not applicable.
15. Water management will not be based on aquatic habitat surveys
16. Not applicable
17. Not applicable.
18. This project will require no agency maintenance, but the project will include periodic qualitative monitoring to identify impacts of recreational use on the berm and to monitor flow condition of the culvert.
19. This project will be monitored.
20. The entire Freeman Creek flow will be utilized by this project. It is not possible for this project to be a buffer project to utilize additional water provided by LADWP in some years to fulfill the MOU commitment.

REFERENCES

ESI. 2001. Lower Owens River Project Springs and Seeps Inventory, Phase I. Report submitted to Los Angeles Department of Water and Power and Inyo County Water Department.

Pretti, V.A. and B.W. Stewart. 2002. Solute sources and chemical weathering in the Owens Lake watershed, eastern California. Water Resources Res. vol. 38 10.1029/2001WR000370.

Inyo County/Los Angeles, 2005. Inyo/LA Geochemical Cooperative Study Final Report, March 2005.

Tallyn, E.F. 2002. Survey of Benton-Owens Valley Area, California, Parts of Inyo and Mono Counties. USDA-NRCS.

HINES SPRING WELL 355

Project Location

The Hines Spring site is located east of Hwy 395, north of Goodale Road and Aberdeen Ditch, just south of Taboose Creek in the Blackrock area. The project is located approximately 13 miles south of Big Pine and 13 miles north of Independence (T11S, R34 E, Section 11). The area is leased to Mr. Dennis Winchester of the Cottonwood Pack Station.

Project Components

The Hines Spring Well 355 project is associated with the historic spring vent area and utilizes approximately 0.34 cfs (240 AF/yr) pumped from well 355 as a water source. The 1991 EIR (Mitigation Measure 10-14 pg 10-62) stated that "The Hines Spring vent and its surroundings will receive on site mitigation. Water will be supplied to the area from an existing, but unused LADWP well at the site" (Well 355). "As a result, approximately one to two acres will either have ponded water or riparian vegetation. Riparian trees and a selection of riparian herbaceous species will be planted on the banks. The area will be fenced." The EIR further states that "Hines Spring will serve as a research project on how to re-establish a damaged aquatic habitat and surrounding marshland."

Goals

The goal of this project and the Hines Spring Aberdeen Ditch project is the creation of at least one to two acres of ponded water or wetland/riparian vegetation in order to meet the 1991 EIR mitigation goal. The projects will restore flows to a portion of the spring channel system and an adjacent playa like area which will facilitate the re-establishment of riparian, aquatic, and spring habitats, and sub-irrigation of pasture/meadow.

However, soil infiltration tests conducted in 2007 suggest that the very permeable underlying basalt may restrict the amount of surface spreading at this site. The release points for the two Hines Spring projects were therefore moved to the southwest from the spring vent (which lies at the edge of an extensive basalt outcrop) in an effort to minimize the potential for excessive infiltration. However, with basalt underlyng the project area the amount of water spreading and subsequent development of riparian, aquatic, and spring habitats cannot be accurately predicted. The two projects could potentially not meet the goal of one to two acres of ponded water or riparian vegetation or they could potentially greatly exceed that amount.

Given the uncertainty in the amount of habitat that may develop in the two Hines Spring projects and that the source of one is not from well 355 as specified in the 1991 EIR mitigation measure, it may be necessary to modify the 1991 EIR to accommodate these projects.

Description

Well 355 will be equipped with a pump with a capacity of 153 gallons per minute (240 AF/yr). A six inch diameter pipeline 150 meters (495 feet) long will be run from the well in a southeasterly direction into a portion of the historic spring vent channel that flows northeasterly, then southward onto a playa like area (Figure 7). An area/velocity (A/V) or other appropriate flow meter will be installed at the outflow end of the pipe to measure water delivery to the site. A ten acre exclosure will be built around the project. There will be no surface water connection to the Hines Spring Aberdeen Ditch project.

Plantings of riparian trees and a selection of riparian herbaceous species will be conducted along the channel using utilizing seeds from nearby sources hand collected and distributed.

Upland areas disturbed during infiltration testing and implementation of this project will be mitigated as a final phase of the project.

The fence location for the project will be determined after the first year of the project so that the project area can be better delineated.

Data Needs

None

Project Benefits/Impacts

Expected environmental benefits are the creation and enhancement of riparian, aquatic, and spring habitat types. Additional benefits include sub-irrigation of pasture/meadow for enhanced livestock grazing opportunities.

Potential exists for the establishment or increase in non-native plants such as salt cedar, and Russian thistle as a result of the project. Early detection and treatment of noxious weeds will effectively eliminate this potential impact. No treatment is proposed for Russian thistle or Bassia.

Adaptive Management

Adaptive management tools that may be utilized to facilitate the successful completion of this project include water and land management activities. A number of water management options are available. A control structure will be built into the channel at the point where water is diverted from the channel onto the playa. Water delivery could be alternated between the channel that flows northeast and the playa area if tule management becomes an issue. This could also work if undesirable aquatic fauna became established. This would also allow the project to be extended to the northeast, if in time the soils become less permeable and the volume of water spreads further than anticipated. The project could also be expanded southward in the historic channel with the removal of a berm.

Land management activities may include changes in livestock grazing, invasive species treatment, and plantings. A number of livestock grazing changes would be possible if it were determined that grazing is impacting the success of the project. The exclosure fencing will include a number of gates that could be opened to allow limited grazing. Additional options may include temporary exclosures in conjunction with seeding, planting, or pole plantings in areas outside the main exclosure that could be moved as necessary to facilitate establishment of additional riparian species. The attached figure illustrates the conceptual plan, including possible expansion areas for the Hines Spring Well 355 Project.

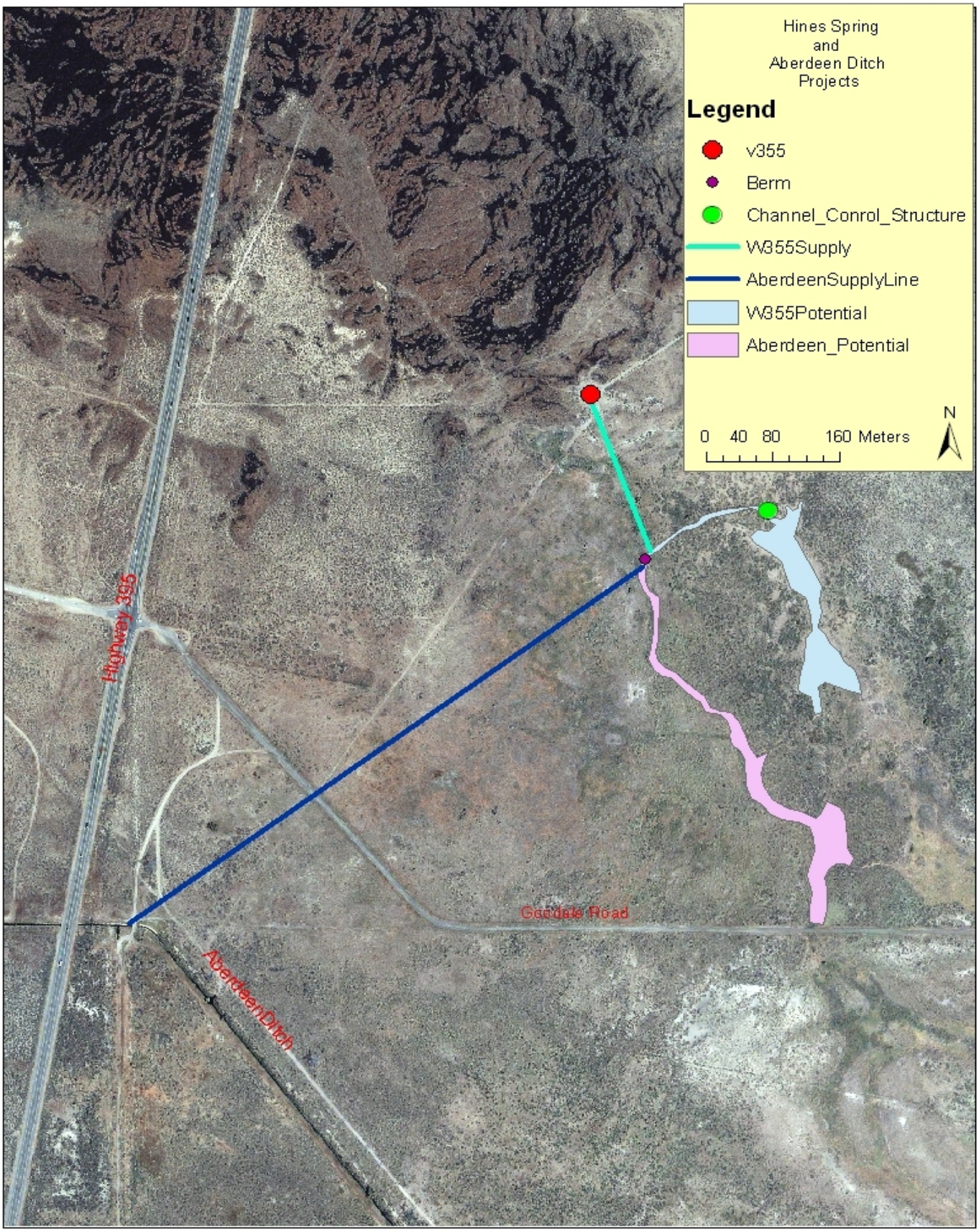

Figure 7. Hines Spring Well 355 and Aberdeen Ditch Projects.

HINES SPRINGS ABERDEEN DITCH

Project Location

The Hines/Aberdeen Ditch site is located east of Hwy 395, south of Goodale Road in the Blackrock area. The project is located approximately 13 miles south of Big Pine and 13 miles north of Independence (T11S, R34 E, Section 11). The area is leased to Mr. Dennis Winchester of the Cottonwood Pack Station.

Project Components

The Hines/Aberdeen Ditch Project carries water from the Aberdeen Ditch approximately ¾ of a mile to the historic Hines Spring channel.

Goals

The goals of this project are the development of riparian, aquatic, and spring habitats, and sub-irrigation of pasture/meadow as described in the Hines Spring Well 355 project.

Description

An existing diversion structure on Aberdeen ditch will be modified to divert 0.2 cfs (145 AF/yr) from the ditch through a french drain or other suitable fish barrier, into a four inch diameter pipeline. The 2,500 foot long pipeline will run from the diversion to the channel area (Figure 8.). Water from the ditch will flow southward in a historic spring channel (Figure 8) and will be kept separate from the surface flows released from the Hines Spring Well 355 project. An area/velocity or other appropriate flow meter will be installed at the outflow to measure water delivery to the site.

The fence location for the project will be determined after the first year of the project so that the project area can be better delineated.

Data Needs

None

Project Benefits/Impacts

Expected environmental benefits are the creation and enhancement of riparian, aquatic, and spring habitat types. Additional benefits include sub-irrigation of pasture/meadow for enhanced livestock grazing opportunities. Potential exists for the establishment or increase in non-native plants such as salt cedar, and Russian thistle as a result of the project. Early detection and treatment will effectively eliminate this potential impact.

Adaptive Management

Adaptive management tools that may be utilized to facilitate the successful completion of this project include water and land management activities. Land management activities may include changes in livestock grazing, invasive species treatment, and plantings. A number of livestock grazing changes would be possible if it were determined that grazing is impacting the success of the project. Options may include temporary exclosures that could be moved as necessary, creation of a larger pasture that could be grazed during a different portion of the year, or supplementation of livestock away from the area. Seeding, planting, or pole plantings could be utilized to facilitate recovery of the site.

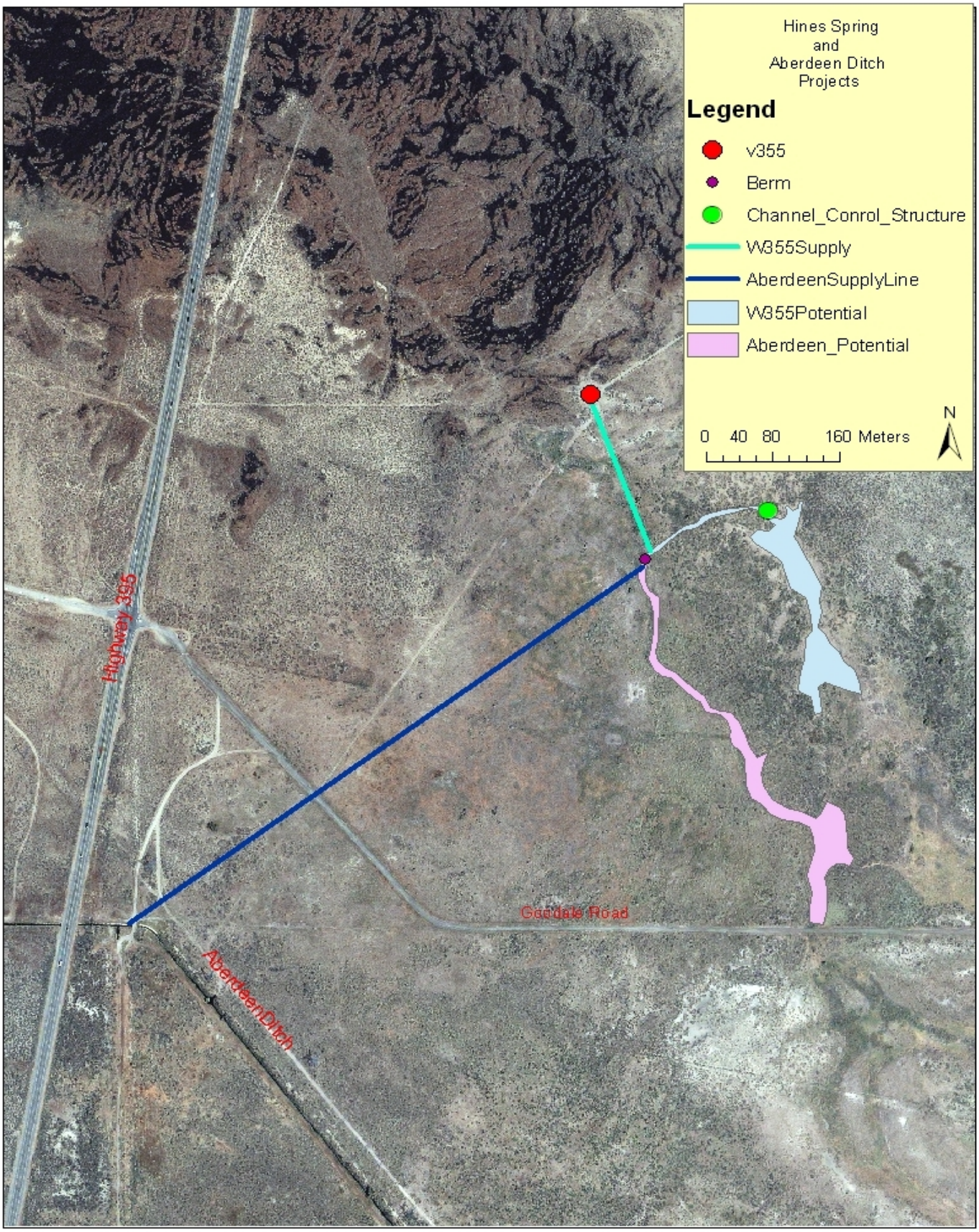

Figure 8. Hines Spring Well 355 and Aberdeen Ditch Projects.

NORTH OF MAZOURKA CANYON ROAD

Project Location
Well site V008 is located 0.5 miles north of Mazourka Canyon Road, west of SCE powerline in the SE ¼ of Section 15, T13S R35E.

Lessee and Operations
Mark Lacey
Winter grazing November through June

Current Conditions

V008 was installed in conjunction with the LADWP/ICWD Cooperative Drawdown Study. At that time it was pump-equipped and the outflow drained SE towards the Owens Valley fault. These natural drainage features are the same as those that would contain the spring mitigation flows. After the drawdown study the well flowed in varying amounts by artesian pressure through valves or bullet holes. According to the lessee, the resulting wetted area never migrated very far from the well due to emergent vegetation and infiltration. It has been utilized as a cattle supplement and watering site and as a result, there is a high concentration of nutrients and disturbance at this location.

The project area is located in vegetation parcel Independence 96 which is classified as a Nevada Saltbush Scrub community. Depth to Water at the site is shallow (3.4 feet on 5-5-2006).

Project Description

Develop artesian well site V008 and another nearby new artesian well to create physical conditions and habitat types consistent with Owens Valley springs. The project would consist of a flowing well piped to an outflow channel east of the SCE powerline road. From that point a riparian/alkali meadow reach will follow existing drainage features, and terminate at a pond habitat west of Owens Valley Fault at well F045A (Figure 9.).

The second component of the project will consist of a second artesian well to the north of the outflow channel. Flow from this well will be piped to the outflow from V008 so that the channel can continue below the pond, across the Owens Valley fault to an existing sag pond, and eastward towards a terrace on the Owens River.

Habitat Requirements

The creation of physical and habitat conditions comparable to spring-like conditions will require an isolated, fenced artesian well head. The mitigation well could be isolated from non-native aquatic animal species with a structure or structures between the lower and upper reaches. The outflow channel east of the spring habitat could be experimental in design to determine the best fit for grazing and human management, channel configuration, and riparian restoration potential.

Goals and Objectives
- Create a functional spring habitat at an artesian well source
- Create spring outflow channel and riparian habitat based on available water flow
- Channel outflow into pond habitat at F045A
- Construct a stock watering location via a solar pump at a monitoring well immediately north of well V008
- Maintain and monitor outflow channel habitat for proper functioning condition and sustainability.

Measures

1. Pipe artesian flow east of the powerline via a 10-inch diameter pipe
2. Connect riparian channel to ephemeral pond site at 045A
3. Dig a narrower, deeper channel within current channel features as necessary to prevent ponding of outflow
4. Plant willows and other riparian species along channel if needed. Pond at 045A is currently vegetated with mature willow trees
5. Install a culvert pipe to allow for access to well 406T (near F045A)
6. Remove saltcedar and Russian olive trees from vicinity by cutting at ground level and applying herbicide immediately to stump

Lessee Requirements

- No top to bottom fencing of entire project
- Stock watering location near well site
- Suggests fencing a paddock south and west of project towards aqueduct for seasonal cattle management. (Mark Lacey, personal communication)
- Suggests burning this paddock to restore meadow habitat
- Weed control

Fencing

- Required at wellhead and pipe outlet for habitat protection
- Intermediate, temporary, or seasonal exclosures along the riparian outflow channel. Adapt as necessary
- Fence pond habitat at 045A if necessary

Water Use

- 150 AFY from V008 and an additional 150 AFY from a new well = 300AFY
- Install solar pump and trough for stock water
- Source: Artesian well V008, approximately 0.5 cfs
- Point of release: Artesian flow piped east of SCE road and released into existing outflow channel
- Point of terminus: Sag pond on the bench west of Owens River
- Measurement: Construct weir east of powerline road below confluence of both well channels

Weed Control Measures Needed

- Remove existing saltcedar and Russian olive from vicinity.
- Remove bassia and Russian thistle from channel by hoeing and or grazing as necessary until native vegetation is dominant
- Monitor seasonally for Lepidium and other invasives

Constraints

- Amount of flow may not be sufficient to create a sustainable outflow channel from the wellhead to 045A.
- Gradient: Topography may limit the areal extent of the riparian reach. There is approximately 11 feet of drop from the well site to 045A pond.
- Channel shape: The current drainages are wide and shallow. The flows available may result in a highly vegetated, emergent, shallow, warm water habitat.
- EC – soil may require flushing period before desirable wetland/riparian species can occupy site

Options

- Retrofit existing wellhead with a T and valve system. Construct a stock watering trough near current watering site, pipe rest of flow east of powerline road to begin project
- If enough flow is available, continue outflow channel beyond pond through culvert across O.V.fault/Billy Lake Road into fault sag-pond and east towards Owens River
- Construct a gradient drop or structure at the terminus pond to prevent upstream migration of non-native aquatic species into the artesian channel
- Remove exclosure fencing at IC1, north of well to simplify range management

Labor/Equipment Required

- Fencing
- Manual or mechanical channel work to direct flow
- Further channel modification may be required if existing drainages are too wide and shallow for the available flow resulting in an emergent/meadow habitat. A more narrow and deep channel may be dug to encourage the development of a defined riparian channel.
- Backhoe to dig a channel into 045A depression
- Backhoe or “ditch-witch” type excavator to create a deeper channel
- Saltcedar and Russian olive control at initiation of project, followed by annual monitoring and maintenance

Future Sustainability/Maintenance Needs
Vegetation management

- Native, desirable – fencing, grazing, channel modification
- Possible periodic removal of emergent aquatic vegetation
- Non-native – removal, grazing, habitat modification (channel, flow)

Grazing Management

- Fence upper outflow channel east of powerline road
- Intermittent exclosures or seasonal (spring) fencing in middle reaches to determine grazing influences
- Fence pond habitat at 045A as necessary

Recreation Management

- Protect and sign unfenced reaches for OHV use
- Minimize roads or trails along watercourse

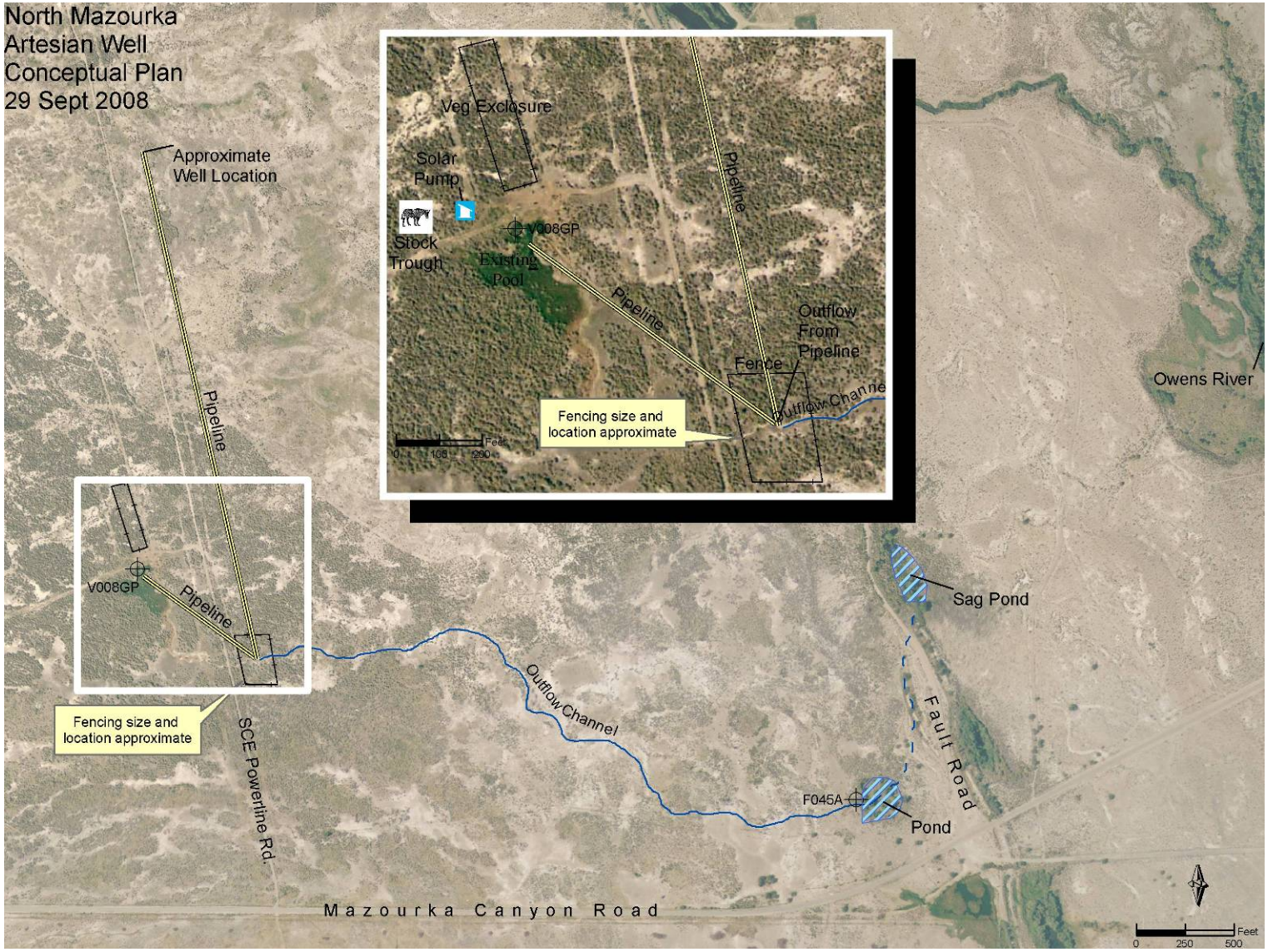

Figure 9. North of Mazourka Canyon Road.

HOMESTEAD

Project Location

The Homestead Project is located approximately 4 miles ESE or Independence, California in the SW ¼ of Section 24, T13S, R 35E. The site is less than a mile south of Mazourka Canyon Road, just west of the Lower Owens River, and east of the Stevens Ditch Canal. The site is known as the Well 044A location (see attached figure).

Project Components

The project consists of drilling a new artesian well located at Well 044A and capping and piping the flows from an existing multiple completion artesian Wells T774-T777, in order to create 3860 ft of spring channels, approximately 1.0 acre of pond, and possibly provide irrigation and a stock water trough for the lessee. Additionally, prior to any release of water, Russian olive and saltcedar, found on site will be removed by cutting and spraying herbicide on the stumps of the plants and then burning the slash on site.

Current Conditions

The project area was mapped by LADWP in 1984-87 as an Alkali Meadow, that consists of saltgrass (*Distichlis spicata*), alkali sacaton (*Sporobolus airoides*), Baltic rush (*Juncus balticus*) and rabbit brush (*Ericameria nauseosus*). The invasive species located on site are saltcedar (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*). Around Well 044A there are also tree willow (*Salix laevigata, Salix gooddingii*) and cottonwood (*Populus fremontii*).

Currently, water leaks from the Stevens Ditch and multiple completion artesian Wells T774-T777. The vandalized multiple completion Wells T774-T777 were scheduled to be capped before this area was selected as a project site. These wells support vegetation on the northern portion of the site. Once theses wells are capped vegetation will have to rely on sub irrigation from the fault line or the water that leaks from the Stevens Ditch when it is filled. The southern portion of the site is an old homestead with an existing road that leads to Well 044A. An old spring channel leads east from Well 044A and splits into several other channels. The pond area is currently dry but it has outlets located on the north and south ends. These outlets form channels that head east towards the Owens River Road where there is an old culvert that spills into the Owens River flood plain.

Goals

The goal of this project is to utilize water from a new artesian well to be installed near artesian Well 044A and from existing multiple completion artesian Wells T774-T777 to create spring like habitat at the old homestead site. The spring habitat will increase the amount and diversity of vegetation cover, along with increasing the amount of wildlife and waterfowl in the area while providing the lessee with a consistent source of stock water.

Project Description

This project has been selected by the Ad Hoc group as a component of the annual 1600 acre-foot water commitment under the provision of the MOU. Currently the estimated amount of water available for the project will be 300 acre-feet (0.4 cfs daily) on an annual basis. This amount of water has been based on the current flow reads at multiple completion artesian Wells T774-T777 (see attachment). Water delivery for the project is expected to be consistent using this data. Hydrologic analysis indicates there is sufficient head to drill artesian wells within 2000

feet of each other. However, water delivery may vary due to seasonal changes and adaptive management of the project site.

Well 044A is located on the southern portion of the project site. It has very little flow due to a collapsed or clogged casing. The plan is to drill a new artesian well near the old well site producing an estimated 150 acre-feet (0.2 cfs daily) of water on an annual basis. Water will flow southeast down what will be called the Main Spring Channel (464 feet) to an approximately 1-acre pond. A diversion will be built 200 feet downstream on the Main Spring Channel in order to divert excess water to the south. The 1-acre pond area has two existing out flow channels identified as the North Spring Channel (488 feet) and South Spring channel (433 feet). The pond and spring channels will lie directly east and down slope of the well allowing the natural gradient to be used for water delivery. Construction of a water diversion structure in line with the main spring channel is also proposed in order to spread any excess water to the south for irrigation.

Multiple completion artesian Wells T774-T777 are located northwest of the project site along Mazourka Canyon Road. These wells currently produce approximately150 acre-feet (0.2 cfs daily) of water on an annual basis. These wells will be capped placing the water in a buried 2-inch PVC pipe that will head southeast approximately 770 feet to a stock water trough (6 foot diameter).

The trough will be plumbed with a on/off valve and float by putting a tee in the main 2-inch PVC artesian pipeline. This will allow the flows to remain constant and continue on for another 770 feet to a valve box located on the west side of the Stevens Ditch Canal. The valve box will allow the flow to be regulated before it enters a 6-inch pipe. The 6-inch pipe will flow to an existing channel that will be called the Stevens Ditch Channel. The Stevens Ditch Channel will then flow 1314 feet southeast to the 1-acre pond, which lies southeast and down slope allowing the natural gradient to convey the water (Figure 10.).

Data Needs

No data will be required to implement this project. The alignment of the pipeline from multiple completion Well T774-T777 will be surveyed.

Project Benefit/Impacts

The Homestead project will provide riparian/spring habitat and improve the alkali meadow that currently exists. It is anticipated that approximately 3860 feet of spring channel will be created, that will benefit riparian dependent birds and mammal species. Fish, invertebrate species and waterfowl may also benefit from the 1-acre pond.

Impacts anticipated for drilling the new artesian well consists of clearing an (150 foot x 150 foot) area if needed. The area is sparsely vegetated so it may not need to be cleared. Also, there will be some minor grading to the existing road to get the drill rig into the site. The spring channels that already exist need some minor repairs and redirection to allow flows to reach the 1-acre pond and south irrigation areas. The impacts will be minor consisting of tracks from a backhoe and spreading of some dirt piles.

The installation of the pipeline from multiple completion artesian Wells T774-T777 requires capping the well, and plumbing a 2” PVC pipe to the well cap. A 12-inch deep trench will be dug using a ditch witch approximately 1540 foot long. The 6-foot diameter stock water trough will be located (770feet) down the pipeline path having an inlet and outlet to allow water to flow through

the trough and continue on to the valve box. Vegetation along the pipeline path is sparse and shouldn't need major clearing. There is an existing road nearby allowing crews to travel by foot along the pipeline. There will need to be access for a truck or backhoe to install the trough, but with the existing road, impacts will be minimal. The construction of the valve box and installation of the 6-inch pipe will be minimal since they are located at the Stevens Ditch Canal in a previously disturbed area.

Temporary excavation impacts for all project channels will be offset by the establishment of spring and alkali meadow habitat. There are no sensitive species in the project area, and there will be no fencing involved. Cultural resources will also be addressed if any are found.

It also must be noted that by capping the vandalized multiple completion artesian Wells T774-T777 the existing pond will be eliminated and the surrounding area may dry up. The capping of these wells to eliminate uncontrolled flow was planned prior to the decision to include the site as a project for the 1600 acre-foot provision of the MOU. There is a chance that the surrounding area will continue to be sub-irrigated due to the location of the fault line, but this is not likely and there is no data to support this assumption.

Adaptive Management

Management changes will have to be made throughout the implementation of the project. These management changes will consist of flow regulation, grazing management, and recreation management. Flow regulation will be changed, if needed, to prevent any excess water from reaching the Owens River. This water will be the irrigation water that will be sent south or east out of the Main Spring Channel. Grazing and recreation management will not change unless there is a negative impact to the project area.

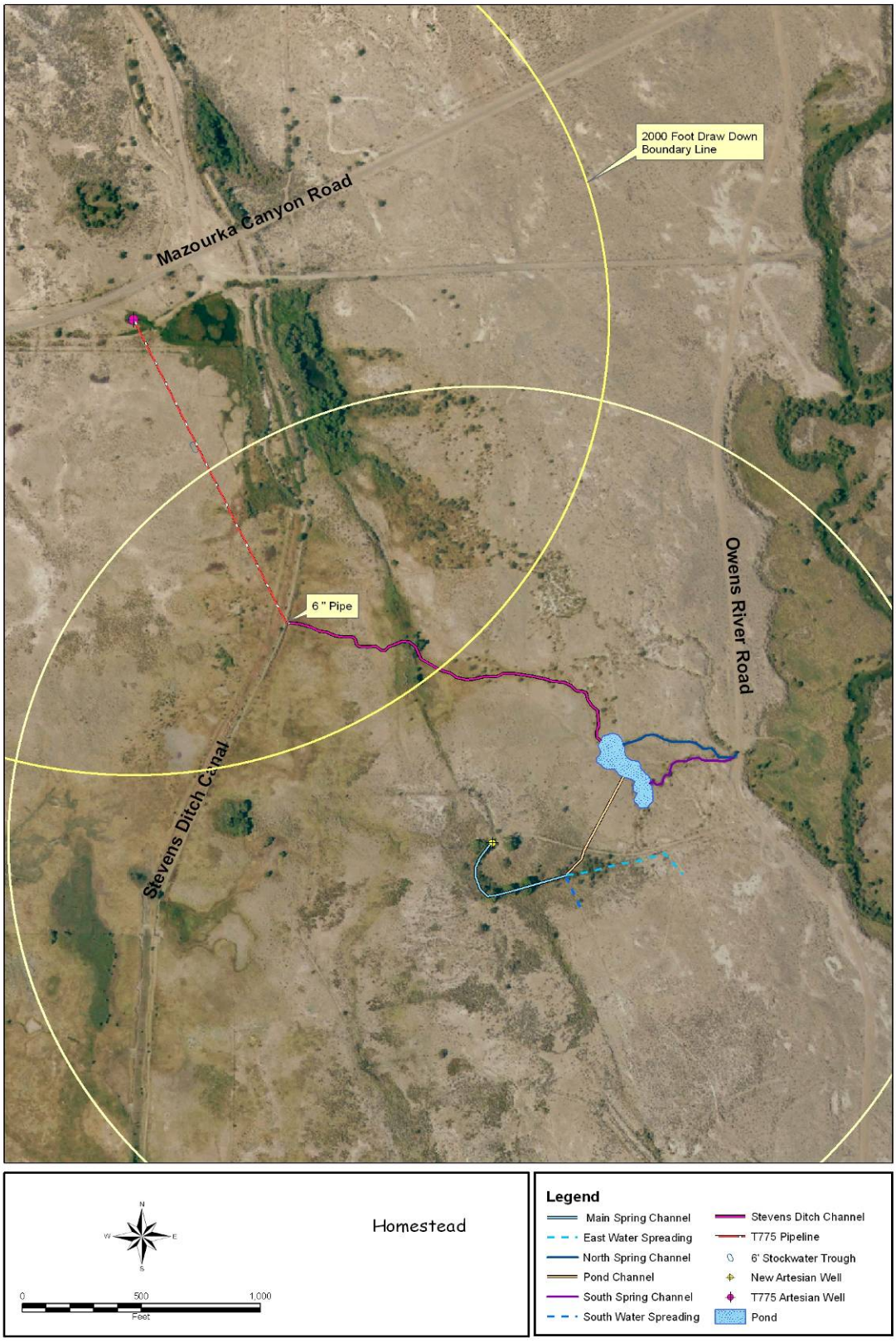

Figure 10. Homestead Project

WELL 368

Project Location

Flowing Well F368 is located approximately 4 miles south of Independence, west of the Owens River and adjacent to the 1872 earthquake fault line in Township 8 South, Range 34 East, in the southwest quarter of section 8.

Project components

This project will consist of augmenting the amount of water flowing to artesian well F368 by installing a flowing well to the north and piping the water to a drainage that leads to the habitat maintained by well F368.

Goals

The goal of this project is to create and enhance spring and riparian habitat, while maintaining or improving conditions for an existing population of endangered Owens pupfish. Another complementary goal is to provide redundancy in water supply to the existing habitat in the event that well F368 fails. This project will also create a stock watering area in the vicinity to allow more flexible livestock management by Lacey Livestock (lessee).

Current conditions

Well F368 is located in parcel BEE016/IND165; the parcel is mapped as Desert Greasewood Scrub. Artesian well F368 was drilled in 1978 to 200 feet and screened between 150 and 180 feet. It currently flows at approximately 0.1 cubic feet per second, roughly the same when it was drilled. The aquatic habitat maintained by this flow has decreased in recent years, likely from changes in water course due to emergent vegetation development. Since 1986 the aquatic habitat has supported a population of Owens pupfish (*Cyprinodon radiosus*).

Description

A flowing well will be drilled north of well F368. An analysis was conducted using data from a multi-completion well that indicates that even with historic fluctuations, there is sufficient head in the deep aquifer, east of Independence and west of the Owens Valley fault, that allow installation of flowing wells as close as 2,000 feet apart.

To minimize the effect of the radius of influence of the new artesian on the current artesian well it will be drilled at least 2,000 feet away (indicated on figure 11). The well will be drilled to approximately 500 feet which should be enough to draw from the deep aquifer in the area. The water will be piped along a six-inch diameter pipeline to a small drainage to the north of well F368. This pipeline will roughly follow the Owens River road south towards well F368 (Figure 2). The pipeline will be buried to a depth of approximately 1 foot. The water will then flow out of the pipeline for 25 meters in a southwesterly direction along an abandoned road alignment, joining the existing channel about 55 meters downstream of the current well. An area/velocity or other appropriate measuring device will be installed at the end of the pipeline in order to measure water delivered to the site. The new channel bed should be prepared by ditching it to an approximate depth of 0.3 meters and width of less than one meter. This supplemental water will create spring habitat both in the new channel, and augment existing habitat downstream of the confluence.

A cattle trough with a float to regulate flow will be installed adjacent to the new artesian well

where a portion of the water will be diverted off for cattle watering. The majority of the area

around well F368 is currently fenced. This will facilitate livestock management to accomplish goals for aquatic and riparian habitat.

Data Needs

The exact route of the pipeline under Owens River road conveying water from the new artesian well should be surveyed for proper alignment.

Project Benefits and Impacts

Expected benefits are the creation and maintenance of riparian, aquatic and spring habitat. Additional benefits include the creation of an off-river cattle watering area. Another benefit will be the augmentation and redundancy in the water source at F368 that supports the C. radiosus population.

There is a potential for invasive species to invade new riparian habitat such as tamarisk and Russian olive. There will be disturbance due to the installation of the pipeline carrying water from the new artesian well. This area will be susceptible to establishment of invasive species and take native species time to recolonize the disturbed area. Most of this pipeline will be installed under the Owens River road to minimize disturbance of native vegetation. Early detection and treatment of invasive species will be necessary to mitigate this impact.

Adaptive Management

If native spring obligate species are not being maintained and improved, various measures may be recommended by CDFG to improve recruitment. If invasive or undesirable species are invading various control measures may be implemented, such as herbicide treatment or hand removal. If recruitment of woody species riparian or wetland species is not occurring planting, seeding, or other measures may be implemented to facilitate recruitment.

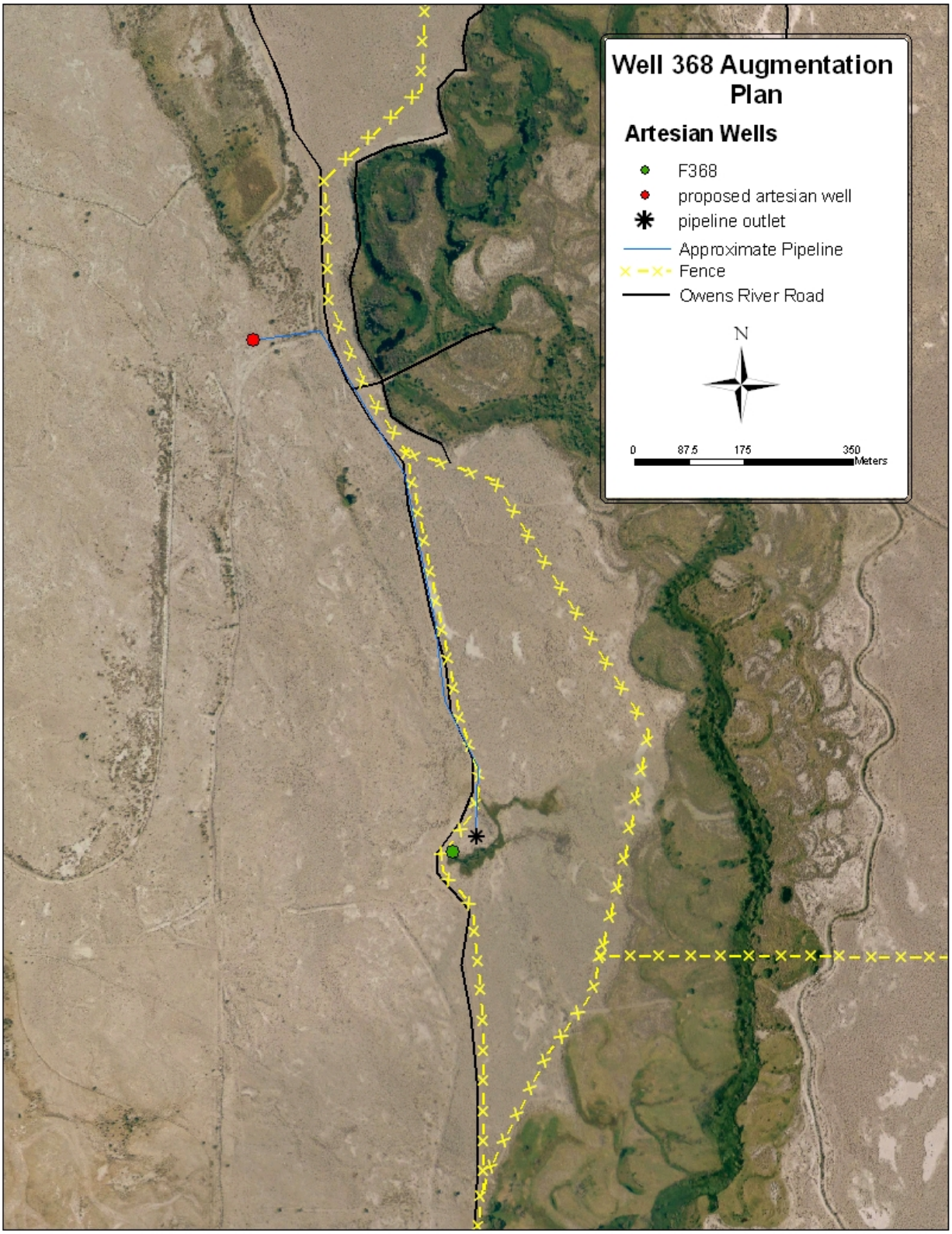

Figure 11. Well 368 Project Fences

DIAZ LAKE MITIGATION PROJECT

Introduction

The 1997 Memorandum of Understanding (MOU) between the City of Los Angeles Department of Water and Power (LADWP), Inyo County, Sierra Club, Owens Valley Committee, California Department of Fish and Game, and California State Lands Commission included a provision to provide a total of 1600 acre feet/year (AFY) for constructing mitigation projects in the Owens Valley. MOU party representatives and LADWP lessees have met in a series of informal meetings to develop a list of projects to fulfill the MOU requirement. Staff from LADWP and Inyo County prepared conceptual plans for certain projects. This plan describes the site conditions, water supply, water conveyances, and potential benefits for the Diaz Lake project.

The Diaz Lake project will provide a secure water supply for Diaz Lake and reduce the dependence on pumping conducted by Inyo County to supply the lake. LADWP will provide up to 250 AFY from the Los Angeles Aqueduct to Diaz Lake. The primary benefit of this project is reduced pumping by Inyo County in the Bairs-George wellfield to provide water for Diaz Lake.

Project area

Diaz Lake is an approximately 75 acre lake located primarily in T.16S R.36 E., section 10 with smaller portions in the surrounding sections. The project area and infrastructure related to this project are shown in Figure 1. The property is leased from LADWP by Inyo County for a park and campground.

Water Supply

Natural input to Diaz Lake is limited to groundwater discharge and precipitation. The lake has no natural outlet and losses occur primarily through ET. Water is released to Little Diaz Lake during periods of high runoff. Water is supplied to the lake from the LAA through the Diaz Lake spillgate (STAID 86). Planned releases to the lake occur when requested by Inyo County or when necessary to manage LAA flows. Average total diversion for the period 1991-2006 is 367 AFY. Average quantity released for recreational uses for the same period is 200 AFY. According to the lease agreement with LADWP, the County pumps well 82 in the Bairs-George wellfield and deposit water into the LAA to replace water diverted from the LAA to maintain the lake level. According to the Inyo County Parks and Recreation Department the current capacity of the well is 192 AFY.

Implementation

The amount of water allocated for this project will be 250 AFY. This project requires no additional infrastructure or monitoring devices to be constructed. The lease agreement will be revised to reflect the additional water supply commitments and accounting requirements of this project. Inyo County Parks and Recreation staff will make written requests to LADWP for water releases for this project. The amount of water delivered to Diaz Lake will be based on the change in lake volume during the release of water as determined by the change in stage (staff gage reads) and the Diaz Lake area-capacity curve. Water requested by the County and delivered to the lake in excess of 250 AFY will be replaced with water pumped from Well 82. Inyo County will be responsible for well 82 operations in accordance with the lease agreement. If less than 250 AFY is delivered to Diaz Lake, the shortfall will not be carried over to subsequent years, but will be released to Warren Lake. At the end of the runoff year, if the

County has requested less than 250 AFY and LADWP has provided 250 AFY or more for any reason, the obligation to supply this project for that year shall be considered met. Once LADWP's obligation to provide 250 AFY has been met, whether from operational releases or releases at the County's request, the County may request and receive additional releases, and the water shall be replaced with pumped water from well 82.

Monitoring and Reporting Methods

LADWP will be responsible for measuring the lake stage before and after releases from the Aqueduct, and well 082 pumping. Inyo County Parks and Recreation will maintain records of requests for Diaz Lake water releases. All water accounting data will be presented in the LADWP Owens Valley annual report.

Consistency with Ad Hoc Project Evaluation Criteria

1. This project will not require modification of the MOU, Stipulation and Order or 1991 EIR
2. No new wells will be required.
3. No consultants will be required.
4. Estimated costs for this project should be negligible.
5. This project is reasonable and feasible.
6. This project should provide net environmental benefits by reducing the pumping conducted in the Bairs-George wellfield from well 82. Pumping from other wellfields to replace water that cannot be replaced with well 82 alone due to its low capacity will also decrease.
7. This project is doable.
8. No fencing is planned.
9. Inyo County will secure a stable water source for its lease.
10. Wetlands on the edge of Diaz Lake could be included in a habitat conservation plan.
11. Water diversion source and destination will not differ from past practices and introduction of nonnative fish species due to this project is not a concern.
12. The Diaz Lake spillgate can be shut off.
13. Not applicable.
14. Not applicable.
15. Water management will not be based on aquatic habitat surveys
16. Diaz Lake is a closed basin below the elevation of the LAA.
17. Not applicable.
18. This project will require no additional agency maintenance
19. This project will be monitored to account for water released to the lake.
20. It is possible for this project to be a buffer project to utilize additional water provided by LADWP in some years to fulfill the MOU commitment, but that option is not contemplated at this time.

Figure 12. Geography of the project area. Locations of the Diaz Lake staff gauge and flume on diversion from LAA indicated.

WARREN LAKE

Project Location

Warren Lake is located in T.9S. R.33E, Section 2, approximately 3 miles northwest of the town of Big Pine, east of County Road and west of Highway 395. Big Pine Canal runs west of the project site (Figure 13).

Project Components

The project will consist of releasing water from the Big Pine Canal into an existing ditch that will carry water to the Warren Lake playa.

Current Conditions

The vegetation on the west edge of the playa was mapped by LADWP in 1984-87 as Rush/Sedge Meadow dominated by Yerba mansa (*Anemopsis californica*), Baltic rush (*Juncus balticus*), carex (*Carex* sp.) and saltgrass (*Distichlis spicata*) and Alkali Meadow composed of sacaton (*Sporobolus airoides*), saltgrass, and rabbitbrush (*Ericameria nauseosus*). East of the playa the vegetation was mapped as Desert Sink composed of greasewood (*Sarcobatus vermiculatus*), saltgrass, rabbitbrush and sacaton (Figure 14).

The site is characterized by a playa that fills with water intermittently. When the playa is covered with water, waterfowl and shorebirds utilize this shallow-water habitat for feeding and nesting. The playa has often overflowed to Klondike Lake during wet years.

Goals

The goal of this project is to increase shorebird, waterfowl and wildlife habitat at Warren Lake by providing additional water to the site. The project may increase wet meadow and seasonal wetland habitats depending on the water supply. When water is provided, shallow-water habitat for shorebird and waterfowl foraging will be created. Shorebirds and waterfowl may nest at Warren Lake as a result of this project if the timing and duration of the water releases are appropriate.

Project Description

This project has been selected by the *Ad Hoc* Group to serve to balance the annual 1600 acre-foot water commitment for this provision of the MOU. The amount of water dedicated to this project may not be consistent from year to year, as it will vary according to the uses at the primary project sites. In addition, the water delivered to the site may be discontinued or increased in the future as adaptive management decisions are made at the primary project sites.

Warren Lake will receive water diverted from Big Pine Canal. An existing diversion structure and ditch will be utilized to carry water from the Big Pine Canal to the project site. Minor modifications may be required at the point of diversion. In addition, the ditch may need to be cleaned. A flow meter will need to be installed at the diversion structure to quantify the amount of water provided to the project.

This area is leased by 4J Cattle Company. No fencing or changes to normal operations are required for the success of this project.

Saltcedar was present in the vicinity of Warren Lake during the vegetation mapping of 1984-87. In addition, pepperweed has been treated in the vicinity of the project. If these species are located in or near the project, they will be controlled using the appropriate methodology.

Data Needs

The only information needed for this project is an evaluation of the diversion from the Big Pine Canal and of the ditch that carries the water to the site. A site visit was conducted on May 22, 2007 to evaluate the water delivery needs of the project. A measuring device, most likely a flume, will need to be installed. In addition, controls for water level will need to be placed in the Big Pine Canal to provide optimum flow into the diversion.

Project Benefits/Impacts

This project will create shallow-water habitat for shorebirds and waterfowl. This type of habitat is readily utilized by these birds when available. The availability of shallow-water habitats in the playas of the Owens Valley is usually dependent on rainfall conditions. As a consequence, these playas are not flooded annually. This project may provide shallow-water habitat even in dry years depending on the amount and timing of the water supplied to the area.

Saltcedar and pepperweed are known to occur in the area. There could be an increase in these invasive species because of the project. As noted above, these plants will be controlled using appropriate methods.

Depending on the timing of releases and the season of inundation, mosquitoes could increase as a result of the project. Warren Lake is close to the community of Big Pine. If mosquitoes increase because of the project, this could impact the residents of Big Pine. Mosquito Abatement routinely monitors and treats this area, as needed, to control populations of this vector.

Monitoring

The water supply for this project may not be provided annually and, when receiving water, will not be consistent from year to year but will vary to balance the annual 1600 acre-foot water commitment. Monitoring described in the “Monitoring” section will be conducted when the Warren Lake Project is provided with water.

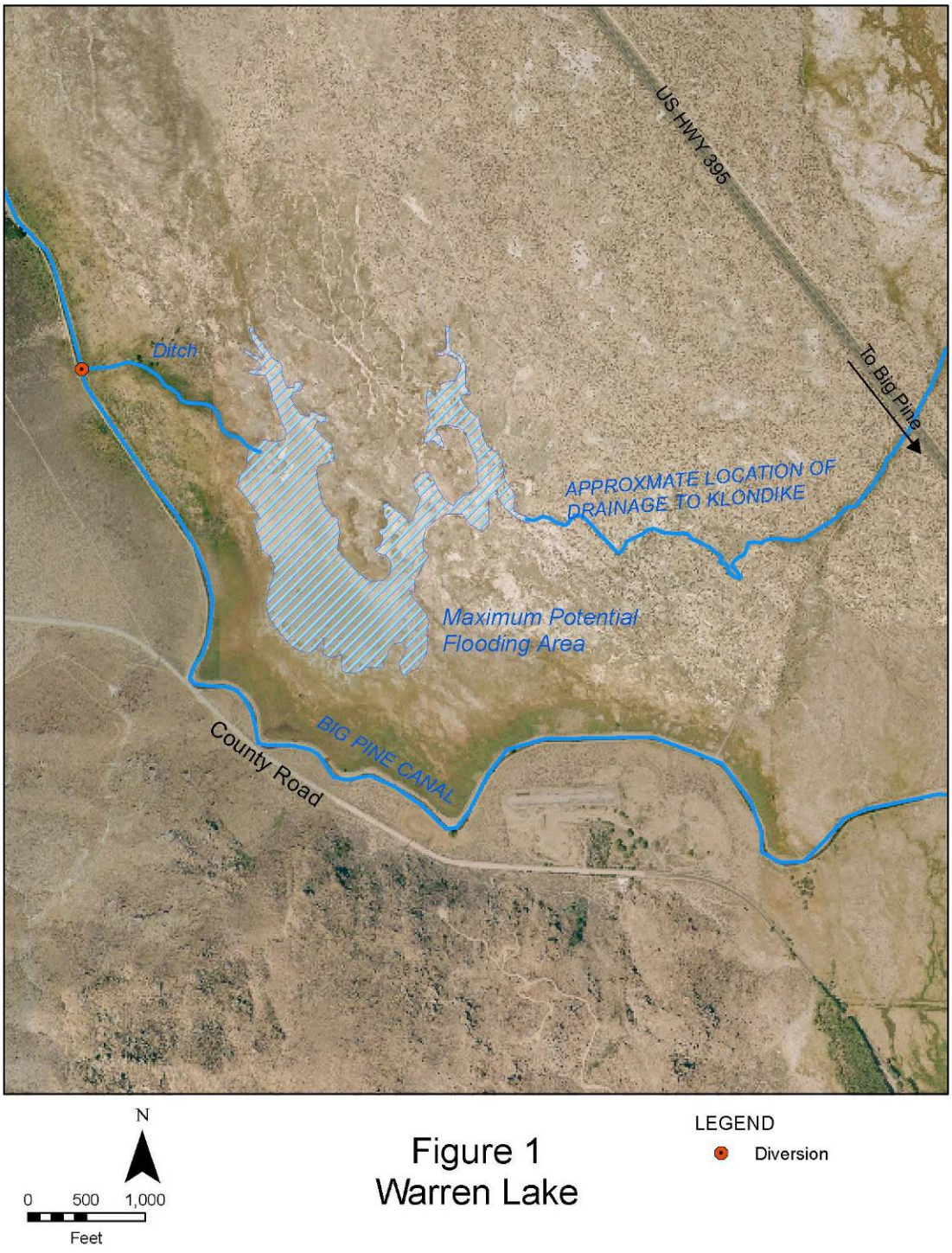

Figure 11. Warren Lake

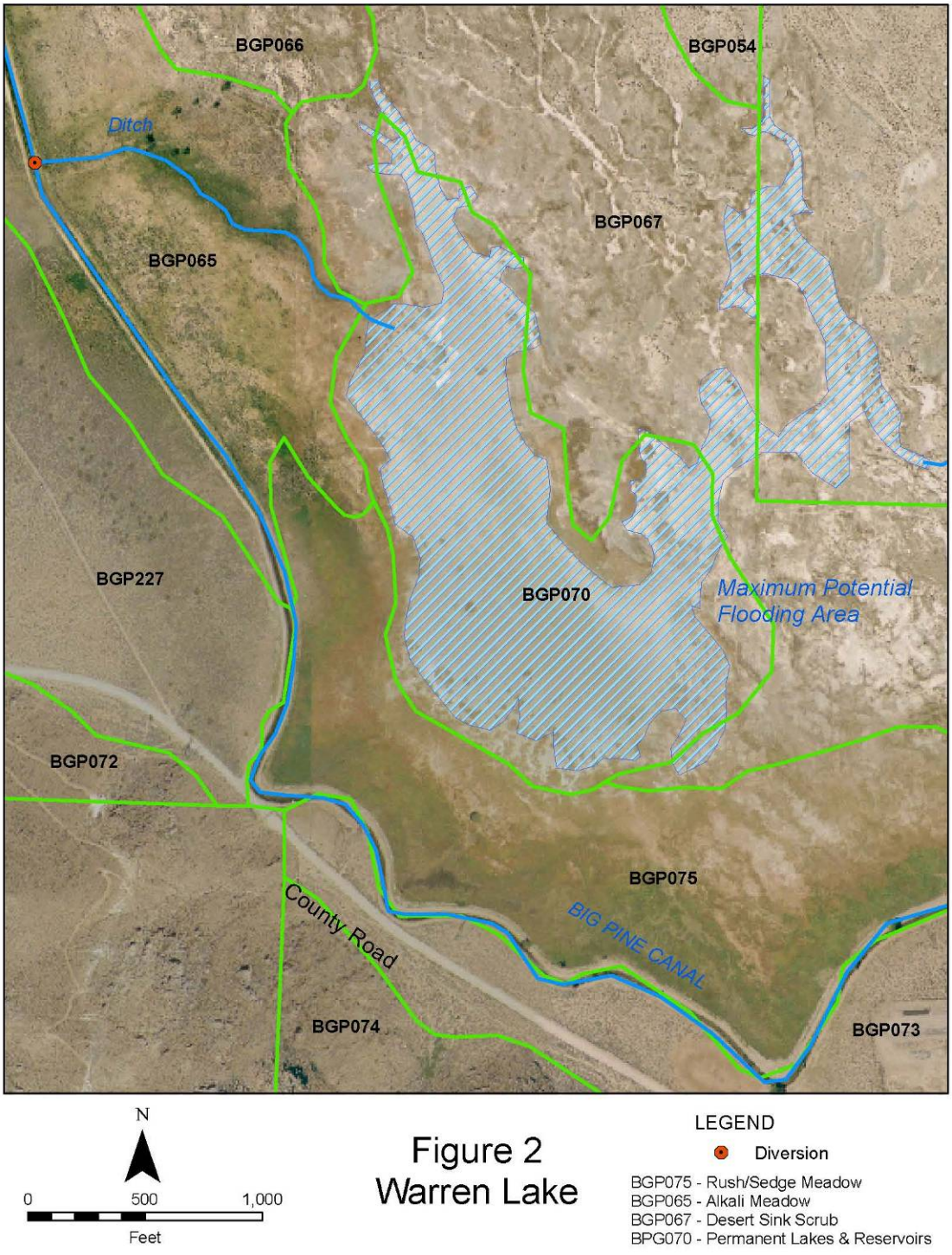

Figure 12. Warren Lake

FIVE YEAR MONITORING FRAMEWORK FOR 1600 AF PROJECTS

Monitoring responsibilities to be determined by Technical Group

Flow Measurement: *monthly*
Rapid assessment by walking project: *peak of growing season annually; then at end of season if modifications had been implemented*

- Map extent of project using remote sensing for water spread and plant communities. Acquisition of remote image costs not to exceed $1200/year to be funded from Cooperative Study, or other source.
- Survey for plant species and communities and map extent of:
    - Invasive or undesirable species: recommend control method if necessary
    - Native and desirable (spring obligate) species: recommend measures to improve recruitment if necessary
- Conduct photo points, and mark and label them
- Note recruitment of woody species (riparian/wetland obligates): decide if planting or other measures are needed to facilitate recruitment

Assess fence condition, and the need for additional fences, and recommend repairs and/or modifications if necessary: *annually*

Assess survival of plantings, and recommend additions if necessary: *annually*

Determine if goals have been met: *at five-year evaluation*

This monitoring effort is the minimum required, and may be augmented if desired during the first five years of the project.

An annual report will be prepared by LADWP and/or Inyo County for the project, and provided for review by incorporation in the annual Owens Valley report as required by the MOU. Recommendations for adaptive management and water use may be made at this time.

CDFG will annually survey for spring/seep obligates (invertebrates and others; invasives/undesirables and native/desirable) and recommend measures to improve. Laboratory support that may come from Cooperative Study, or another source, not to exceed $3000/year: annually

After five years, review project success, monitoring schedule, and water use; and make recommendations for project modifications. The five-year report will be submitted to all MOU parties' governing boards for review.