



APPENDIX D

SOLMINEQ88 Output for Grover Anton Spring

Appendix D

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SAMPLE IDENTIFIER: DWP 13 Grover Anton Spring

PH	EH	TEMP	CATIONS			ANIONS		DIFFERENCE (MEQ/L)	
7.46	9.0000	15.10	ANAL=	3.2399	3.0895	0.1504			
			CALC=	3.1555	3.0049	0.1507			
DENSITY AT INPUT T	TOTAL DISSOLVED SOLIDS (MG/L)	IONIC STRENGTH	ACTIVITY OF WATER	P TOTAL (BARS)	PH2O (BARS)	PCO2 (BARS)			
1.0002	270.38	0.00448	0.9999	1.0000	0.1716E-01	0.4302E-02			

LIST OF AQUEOUS SPECIES

SPECIES	-----ANALYZED-----			-----CALCULATED-----			ACTIVITY	ACTIVITY COEFF.	-LOG10 ACTIVITY
	PPM	MG/L	MOLALITY	PPM	MG/L	MOLALITY			
1 Ca ++	43.9918	44.0000	0.1098E-02	0.4219E+02	0.4220E+02	0.1053E-02	0.8010E-03	0.7608	3.0963
2 Mg ++	3.2994	3.3000	0.1357E-03	0.3146E+01	0.3146E+01	0.1294E-03	0.9947E-04	0.7686	4.0023
3 Na +	15.9970	16.0000	0.6960E-03	0.1595E+02	0.1595E+02	0.6938E-03	0.6464E-03	0.9316	3.1895
4 K +	2.9994	3.0000	0.7673E-04	0.2996E+01	0.2996E+01	0.7663E-04	0.7129E-04	0.9303	4.1470
5 Cl -	12.9976	13.0000	0.3667E-03	0.1300E+02	0.1300E+02	0.3667E-03	0.3411E-03	0.9303	3.4671
6 SO4 --	22.9957	23.0000	0.2394E-03	0.2015E+02	0.2015E+02	0.2098E-03	0.1578E-03	0.7524	3.8018
7 HCO3 -	134.9749	135.0000	0.2213E-02	0.1329E+03	0.1329E+03	0.2178E-02	0.2030E-02	0.9323	2.6924
8 H +				0.3726E-04	0.3727E-04	0.3698E-07	0.3467E-07	0.9377	7.4600
9 OH -				0.2423E-02	0.2424E-02	0.1425E-06	0.1327E-06	0.9310	6.8771
11 H4SiO4				0.4780E+02	0.4780E+02	0.4974E-03	0.6147E-03	1.2359	3.2113
12 SiO2	29.9944	30.0000	0.4993E-03						
15 Ba ++	0.0032	0.0032	0.2330E-07	0.3011E-02	0.3012E-02	0.2193E-07	0.1660E-07	0.7567	7.7800
16 Cu +	0.0023	0.0023	0.3620E-07	0.1947E-02	0.1948E-02	0.3065E-07	0.2850E-07	0.9296	7.5452
28 H2AsO3-	0.0267	0.0267	0.2038E-06	0.2921E-03	0.2922E-03	0.2232E-08	0.2079E-08	0.9316	8.6821
30 F -	0.1500	0.1500	0.7896E-05	0.1492E+00	0.1492E+00	0.7856E-05	0.7313E-05	0.9310	5.1359
31 B(OH)3	1.4297	1.4300	0.2313E-04	0.1408E+01	0.1409E+01	0.2278E-04	0.2280E-04	1.0008	4.6420
49 H3AsO3				0.2538E-01	0.2539E-01	0.2016E-06	0.2018E-06	1.0008	6.6952
51 BaCO3				0.2050E-05	0.2051E-05	0.1039E-10	0.1040E-10	1.0008	10.9830
52 BaHCO3 +				0.1566E-03	0.1567E-03	0.7899E-09	0.7359E-09	0.9316	9.1332
53 BaOH +				0.1126E-08	0.1126E-08	0.7298E-14	0.6809E-14	0.9330	14.1669
54 BaSO4				0.1329E-03	0.1329E-03	0.5694E-09	0.5698E-09	1.0008	9.2443
55 CaCO3				0.2484E+00	0.2484E+00	0.2482E-05	0.2484E-05	1.0008	5.6048
56 CaHCO3 +				0.1831E+01	0.1831E+01	0.1812E-04	0.1693E-04	0.9342	4.7715
57 CaOH +				0.8062E-04	0.8064E-04	0.1413E-08	0.1320E-08	0.9342	8.8795
61 CaSO4				0.3316E+01	0.3317E+01	0.2437E-04	0.2439E-04	1.0008	4.6129

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62	CuCl				0.5172E-03	0.5173E-03	0.5226E-08	0.5230E-08	1.0008	8.2815
63	CuCl2 -				0.4296E-04	0.4296E-04	0.3196E-09	0.2977E-09	0.9316	9.5262
64	CuCl3 --				0.3488E-07	0.3489E-07	0.2054E-12	0.1554E-12	0.7567	12.8085
89	B(OH)4 -				0.2717E-01	0.2718E-01	0.3447E-06	0.3205E-06	0.9297	6.4942
90	H2SiO4--				0.8235E-05	0.8236E-05	0.8753E-10	0.6638E-10	0.7583	10.1780
91	H3SiO4 -				0.1830E+00	0.1831E+00	0.1925E-05	0.1793E-05	0.9316	5.7464
92	HAsO3 --				0.2779E-08	0.2780E-08	0.2140E-13	0.1619E-13	0.7567	13.7907
96	HF				0.6449E-05	0.6450E-05	0.3224E-09	0.3227E-09	1.0008	9.4912
97	H2CO3				0.1138E+02	0.1138E+02	0.1835E-03	0.1836E-03	1.0008	3.7361
98	CO3 --				0.1726E+00	0.1726E+00	0.2877E-05	0.2171E-05	0.7546	5.6634
103	HSO4 -				0.3767E-04	0.3767E-04	0.3881E-09	0.3619E-09	0.9323	9.4414
104	HNO3				0.1380E-08	0.1380E-08	0.2191E-13	0.2192E-13	1.0008	13.6591
113	KCl				0.2146E-03	0.2146E-03	0.2879E-08	0.2881E-08	1.0008	8.5404
114	KCO3 -				0.1859E-03	0.1860E-03	0.1876E-08	0.1748E-08	0.9314	8.7575
115	KHSO4				0.2044E-07	0.2044E-07	0.1501E-12	0.1503E-12	1.0008	12.8232
116	KSO4 -				0.1226E-01	0.1227E-01	0.9076E-07	0.8472E-07	0.9335	7.0720
120	MgCO3				0.1565E-01	0.1565E-01	0.1856E-06	0.1858E-06	1.0008	6.7310
121	MgHCO3 +				0.2044E+00	0.2044E+00	0.2396E-05	0.2232E-05	0.9316	5.6513
122	MgF +				0.1724E-02	0.1725E-02	0.3983E-07	0.3713E-07	0.9323	7.4303
123	MgOH +				0.2185E-03	0.2185E-03	0.5289E-08	0.4945E-08	0.9348	8.3059
124	MgSO4				0.4447E+00	0.4448E+00	0.3696E-05	0.3698E-05	1.0008	5.4320
136	NO3 -	1.4497	1.4500	0.2339E-04	0.1450E+01	0.1450E+01	0.2339E-04	0.2176E-04	0.9303	4.6624
137	NaCl				0.1662E-02	0.1662E-02	0.2844E-07	0.2846E-07	1.0008	7.5457
138	NaCO3 -				0.1405E-02	0.1405E-02	0.1693E-07	0.1581E-07	0.9335	7.8011
139	NaHCO3				0.5473E-01	0.5474E-01	0.6517E-06	0.6522E-06	1.0008	6.1856
140	Na2CO3				0.1507E-07	0.1508E-07	0.1423E-12	0.1424E-12	1.0008	12.8466
142	NaSO4 -				0.1812E+00	0.1812E+00	0.1522E-05	0.1421E-05	0.9335	5.8474
144	NaF				0.2212E-04	0.2213E-04	0.5271E-09	0.5275E-09	1.0008	9.2778
169	UO2 ++	0.0147	0.0147	0.5460E-07	0.6348E-06	0.6349E-06	0.2351E-11	0.1789E-11	0.7608	11.7474
189	UO2OH +				0.1452E-04	0.1452E-04	0.5059E-10	0.4703E-10	0.9296	10.3276
190	UO2(OH)2				0.1863E-03	0.1864E-03	0.6130E-09	0.6135E-09	1.0008	9.2122
191	UO2)2OH2				0.2611E-08	0.2611E-08	0.4549E-14	0.3461E-14	0.7608	14.4608
192	UO2)3OH5				0.5550E-08	0.5551E-08	0.6202E-14	0.5765E-14	0.9296	14.2392
193	UO2)3OH7				0.8536E-09	0.8537E-09	0.9189E-15	0.8555E-15	0.9310	15.0678
194	UO2SO4				0.6817E-07	0.6818E-07	0.1863E-12	0.1864E-12	1.0008	12.7295
195	UO2SO4)2				0.2935E-09	0.2936E-09	0.6353E-15	0.4794E-15	0.7546	15.3193
196	UO2F +				0.6602E-06	0.6603E-06	0.2285E-11	0.2124E-11	0.9296	11.6729
197	UO2F2				0.2633E-07	0.2634E-07	0.8552E-13	0.8558E-13	1.0008	13.0676
198	UO2F3 -				0.7099E-10	0.7100E-10	0.2171E-15	0.2021E-15	0.9310	15.6943
199	UO2F4 --				0.8947E-14	0.8948E-14	0.2586E-19	0.1952E-19	0.7546	19.7096
200	UO2Cl +				0.1695E-07	0.1696E-07	0.5552E-13	0.5161E-13	0.9296	13.2873
201	UH3SiO6+				0.2966E-04	0.2967E-04	0.1119E-09	0.1040E-09	0.9296	9.9828
207	UO2CO3				0.1776E-01	0.1776E-01	0.5382E-07	0.5386E-07	1.0008	7.2687
208	UO2CO3)2				0.6141E-21	0.6142E-21	0.1575E-26	0.1188E-26	0.7546	26.9251
282	CaCl2				0.1465E-05	0.1466E-05	0.1321E-10	0.1322E-10	1.0008	10.8789
284	SiF6 --				0.8911E-28	0.8913E-28	0.6274E-33	0.4747E-33	0.7567	33.3236

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LIST OF MINERALS AND THE SATURATION STATE

PHASE	LOG (AP)	LOG (KT)	LOG (AP/KT)	DELG	PHASE	LOG (AP)	LOG (KT)	LOG (AP/KT)	DELG		
2	AKERMANI	28.142	47.232	-19.090	-25.178	81	NACHOLIT	-5.882	-0.540	-5.342	-7.046
11	ANHYDRIT	-6.898	-4.222	-2.677	-3.530	82	NATRTHRM	-12.042	0.041	-12.083	-15.937
17	ARAGONIT	-8.760	-8.282	-0.477	-0.630	83	NATRON	-12.043	-1.276	-10.767	-14.201
20	BARITE	-11.582	-10.135	-1.446	-1.908	85	NESQUHON	-9.666	-5.084	-4.582	-6.043
22	BRUCITE	-17.757	-11.478	-6.278	-8.281	95	PERICLAS	10.918	22.420	-11.502	-15.170
24	CALCITE	-8.760	-8.431	-0.328	-0.433	99	PORTLAN	-16.851	-5.334	-11.517	-15.190
26	CHALCEDO	-3.211	-3.901	0.690	0.910	100	POTASSI	6.626	86.692	-80.066	-105.602
30	CRYSOTIL	26.330	33.406	-7.076	-9.332	103	QUARTZ	-3.211	-4.052	0.841	1.109
31	C-ENSTAT	7.706	11.804	-4.097	-5.404	110	SEPIOLIT	24.403	32.725	-8.322	-10.977
37	CRISTOBA	-3.211	-3.645	0.434	0.572	111	SILICAAM	-3.211	-2.773	-0.438	-0.578
38	CRISTOBB	-3.211	-3.014	-0.197	-0.260	112	SILICGEL	-3.211	-2.796	-0.415	-0.548
40	DIOPSIDE	16.319	20.421	-4.102	-5.410	118	Na2O	8.541	69.549	-61.008	-80.466
41	DOLOMITE	-18.425	-17.894	-0.531	-0.701	123	SYLVITE	-7.614	0.801	-8.415	-11.099
42	DSORD	-18.425	-16.281	-2.145	-2.829	124	TALC	19.908	22.093	-2.185	-2.882
43	ENSTATIT	7.706	11.987	-4.281	-5.646	125	THENARDI	-10.181	-0.289	-9.892	-13.047
46	FLUORITE	-13.368	-11.085	-2.283	-3.012	126	TREMOLIT	52.546	63.454	-10.908	-14.387
47	FORSTERI	18.624	30.365	-11.741	-15.485	127	TRONA	-17.924	-0.456	-17.469	-23.040
51	GYPSUM	-6.898	-4.596	-2.302	-3.036	130	WITHERIT	-13.443	-8.683	-4.760	-6.278
52	HALITE	-6.657	1.563	-8.220	-10.841	131	WOLLASTO	8.612	13.060	-4.448	-5.867
55	HUNTITE	-37.757	-29.907	-7.849	-10.353	139	Cu2O	-0.170	-2.070	1.900	2.505
56	HYDRMAGN	-50.756	-37.804	-12.952	-17.082	178	RUTHERFO	-17.411	-16.951	-0.459	-0.606
57	HYPHILIT	-10.031	12.279	-22.310	-29.425	186	UO3 (C)	3.173	8.246	-5.073	-6.691
60	KENYATTE	-31.053	-25.000	-6.053	-7.984	187	UO3 (AM)	3.173	10.809	-7.636	-10.072
64	LARNITE	20.436	40.277	-19.841	-26.170	188	UO2 (OH) 2	-25.502	-22.451	-3.050	-4.023
67	LIME	-18.016	33.825	-51.842	-68.376	203	URANOPHA	11.746	17.380	-5.634	-7.431
68	MAGADITE	-18.208	-14.340	-3.868	-5.102	204	SCHOEPIT	-25.502	-23.766	-1.736	-2.289
70	MAGNESIT	-9.666	-7.864	-1.802	-2.376	205	MGUO4	14.090	24.424	-10.334	-13.630
71	MgCl2	-10.936	23.074	-34.011	-44.858	206	CAUO4	14.996	15.684	-0.688	-0.907
73	MERWINIT	39.966	70.776	-30.810	-40.636	207	BAUO4	10.312	18.430	-8.118	-10.707
76	MIRABILT	-10.181	-1.565	-8.616	-11.364	208	UO2F2	-22.019	-7.096	-14.923	-19.683
77	MONTICEL	19.530	31.343	-11.813	-15.581						