HOMESTAKE
Grants Project

Homestake Mining Company of California

Thomas Wohlford
Closure Manager

16 June 2017

40-8903

ATTN: Mr. Matthew Meyer
Project Manager
Materials Decommissioning Branch
Division of Decommissioning, Uranium Recovery and Waste Programs
Office of Nuclear Materials Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop: T-8F5
Washington, DC 20555

ATTN: Mr. Sairam Appaji
Region VI Superfund Division
1445 Ross Avenue, Suite 1200
6SF-LP
Dallas, TX 75202-2733

ATTN: Mr. Kurt Vollbrecht
Ground Water Quality Bureau
New Mexico Environment Department
PO Box 5469
Santa Fe, NM 87502-5469

ATTN: Mr. Christopher Burrus
New Mexico Office of the State Engineer
5550 San Antonio Drive, N.E.
Albuquerque, NM 87109

RE: Re-Seeding and Irrigation of Former Land Application Areas for Dust Control

Dear Sirs:

Homestake Mining Company of California (HMC) is proposing to re-seed with native vegetation and irrigate during the growing season three of the former land application areas to aid the re-establishment of vegetation to decrease the dust from these areas at the Grants Reclamation Project site. The amount of dust and earth blowing from the non-vegetated areas on the southern portion of the Grants site has generated a number of complaints from local residents who are currently forming a committee to push both HMC and the Village of Milan, who also has some non-vegetated properties to the south, to act on the issue. HMC respectfully requests NRC review and approval of this scope of work.

HMC formally irrigated 120 acres in Section 34 by flood irrigation and 150 acre center pivot in Section 33. Additionally, 24 acres of flood irrigation was performed in Section 33. HMC also irrigated 100 acres by center pivot in Section 28 where the vegetation is reasonably established and not part of this scope of work. These are the former land application areas where HMC formerly used slightly-impacted groundwater to irrigate and grow forage crops such as hay and alfalfa from approximately 2000 to 2012. As part of the NRC Confirmatory Order, HMC is compiling a Land Application Assessment of these areas to be submitted to the NRC by Sep. 25, 2017.

NMSS01

Initially the source of the water and the methods of applying the water will be discussed for each area. The monitoring of the water to demonstrate that it meets compliant water quality criteria (Alluvial Aquifer site standards) will be discussed for each area.

Land Preparation and Re-Seeding:

HMC reached out to a local experienced re-vegetation contractor (Taylor Services) regarding the process of re-seeding sections 33 and 34. Before re-seeding, the areas will be prepared by leveling off the soil piles that have built up due to wind transport to match the surrounding terrain. Dust suppression activities will be performed using a water truck during plowing and earth-work activities. Compliant water from HMC's San Andres Fresh Water Deep Well No. 2 will be used to fill the water truck. To limit the flow of irrigation water, small berms will be constructed at the edge of the irrigation areas as well. Thereafter, the ground will be prepared for the seed mix using a disc plow or other related pre-seeding ground preparation methods. Following ground preparation activities, a seed mixture of vegetation native to the surrounding area will be planted in the areas using the acre-spread rates and depths recommended by the Natural Resources Conservation Service (NRCS). The seed mixture (as recommended by the NRCS) will include the following plant species shown in **Table 1**.

Table 1. NRCS Recommended Native Seed Mix

Species	% of Mix	Seeding Rate (lbs/ac)	Ave. Purity (%)	Aver. Germ. (%)
Alkali Sacaton (Salado)	1%	0.7	95%	70%
Grama, Blue (Hachita)	1%	0.5	70%	60%
Sand Dropseed	1%	0.1	85%	80%
Wheatgrass, Western (Arriba)	15%	9.3	85%	60%
Saltbrush, Fourwing	82%	49.5	80%	80%

Section 34 Flood Area:

The South injection pipeline from the Post Treatment Tank (PTT) runs through the Section 34 area and is proposed to be used as the water source for re-establishing the vegetation in the Section 34 120-acre flood area (See **Photo 1**). The injection pipeline has an existing 6 inch tee near well 943 which can be used as the location for accessing the PTT water.

The use of water is estimated at 180 gallons per minute (gpm) for five days of the week of 5 months or the application of 22.8 million gallons which equates to 2.3 feet of water applied over a four foot width adjacent to each drip line for re-establishing of the vegetation. This would result in the usage of 87.5 acre-feet (ac-ft) of water over five months of application. This may increase the consumptive use of fresh water at the site by 70.0 ac-ft per year while it is being performed but increased flows from the zeolite remediation systems to the PTT may reduce this final consumptive amount from Deep Well No. 2.

The method for application of the water is drip irrigation because it uses less water and applies the water in the direct area of the vegetation. A large distribution of piping is shown on **Figure 1** which requires the addition of over 330,400 feet of drip lines spaced 14 feet apart.

Monitoring of the PTT water would be performed weekly for U, Se, Mo, SO4, TDS and Cl and monthly for all site standards. This higher frequency will demonstrate that the water applied to

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the Section 34 area is compliant and meets all site standards for the alluvial aquifer.

HMC will monitor the irrigation area daily during periods of irrigation to check for broken irrigation lines or signs of ponding water. If ponding is identified, the irrigation flows will be reduced or temporarily shut off to mitigate ponding.

Photo 1. Section 34 120-Acre Former Flood Irrigation Area

Section 33 Center Pivot and Flood Area:

Six of the former South irrigation supply wells in Sections 32 and 33 are proposed to be used to supply the Section 33 watering for re-establishing vegetation in the Section 33 former irrigation areas (see **Figure 2** for the irrigation areas and well locations). These wells should yield a total of approximately 250 gpm of water which equates to 3.6 feet applied over a 2 foot width adjacent to the drip lines, assuming 5 days of usage per week. This would result in the usage of 121 ac-ft of water (39.6 million gallons) over five months of application. This is expected to increase the consumptive use of water at the site by 85 ac-ft per year while it is being performed.

The 150-acre South pivot area will be irrigated using bubbler nozzles on the existing center pivot. Drip lines distributed over the 24 acre flood area (see **Photos 2** and **3**) will used to re-establish the vegetation in the Section 33 flood area. A length of 85,800 feet of drip lines spaced at 13 feet apart will be needed. **Figure 2** shows the supply piping, drip piping, and well locations for the proposed supply wells for these irrigation areas.

Monitoring of the supplied water from these wells would be performed monthly for U, Se, Mo, SO4, TDS and Cl and twice during the year for all site standards. The lower frequency should be adequate to demonstrate that the water applied to the Section 33 area is compliant and meets all site standards for the alluvial aquifer because all of these well water quality is

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significantly below the alluvial site standards (see the attached tabulation of water quality for the proposed supply wells).

Photo 2. Section 33 Former 150-Acre South Center Pivot Area.

Photo 3. Section 33 Former 24-Acre Flood Irrigation Area.

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Thank you for your time and attention on this matter. HMC is submitting this scope of work for NRC review and approval. If you or anyone on your staff has any questions, please contact me at the Grants office at 505.287.4456, extension 34, or call me directly on my cell phone at 505.290.2187.

Respectfully,

Thomas Wohlford
Closure Manager
Homestake Mining Company of California
Office: 505.287.4456 x34 | Cell: 505.290.2187

Copy To:

B. Tsosie, DOE, Grand Junction, Colorado (electronic copy)
M. McCarthy, Barrick, Salt Lake City, Utah (electronic copy)
H. Burns, Barrick, Toronto, Ontario (electronic copy)
C. Burton, Barrick, San Francisco, California (electronic copy)
G. Hoffman, Hydro-Engineering, Casper, Wyoming (electronic copy)

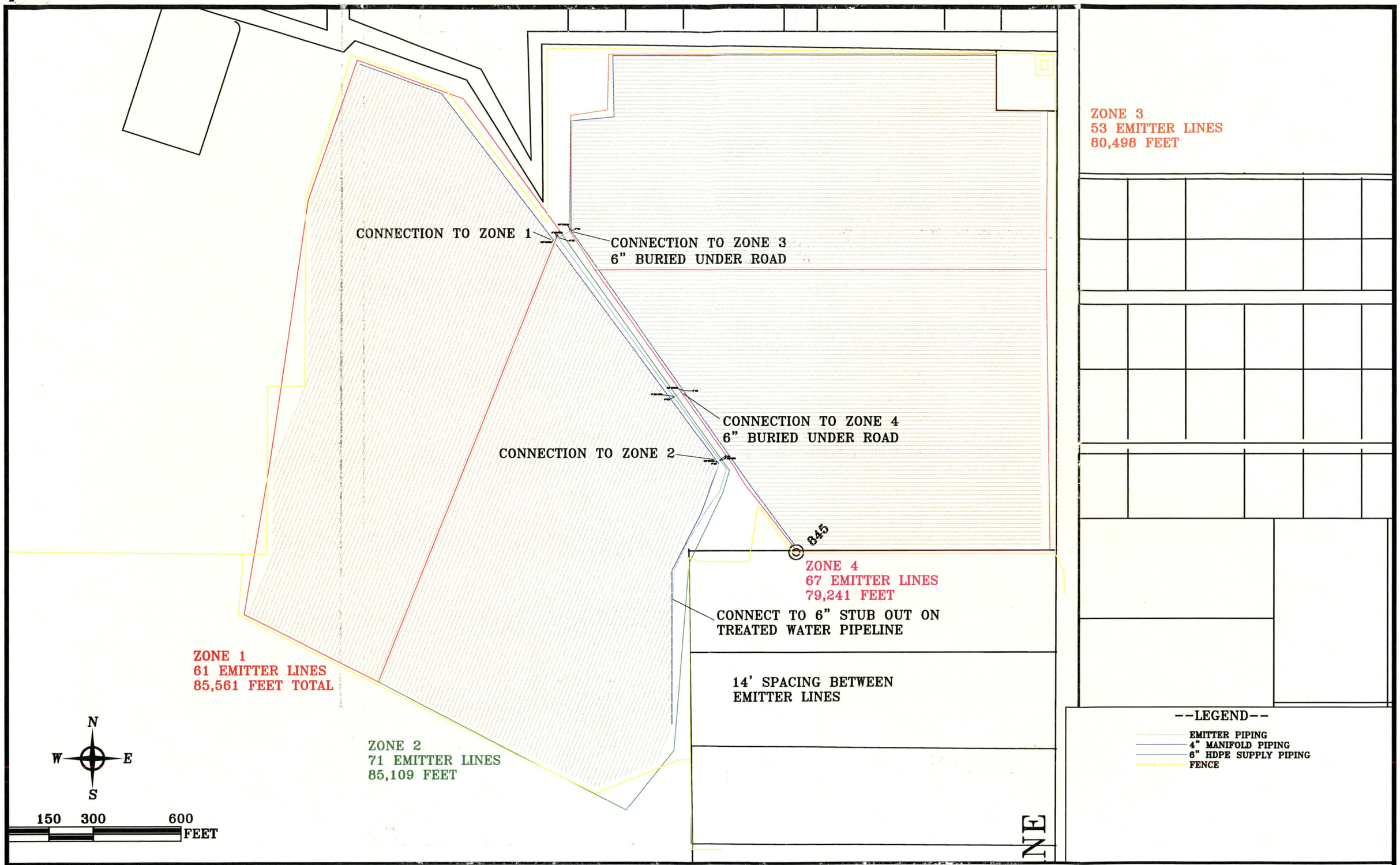

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FIGURE 1. SECTION 34 DRIP IRRIGATION OVERVIEW

WELL 541

4" EXISTING SUPPLY LINE

996

657

8" EXISTING SUPPLY LINE

647

1530' NEW 6" HDPE PIPE
TRENCHED TO CENTER PIVOT

2520' NEW 6" HDPE PIPELINE
WITH 1440' FEET OF TRENCHING

658

649

EXISTING 10" SUPPLY LINE

66 EMITTER LINES
85,600 FEET TOTAL

13' SPACING BETWEEN
EMITTER LINES

N
W E
S

0 200 400 800
FEET

32 33
5 4

--LEGEND--

EMITTER PIPING
4" MANIFOLD PIPING
HDPE SUPPLY PIPING
647 IRRIGATION SUPPLY WELL

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FIGURE 2. SECTION 33 CENTER PIVOT AND DRIP IRRIGATION OVERVIEW

WATER QUALITY ANAYSIS FOR POTENTIAL SECTION 33 TEMPORARY SUPPLY WELLS

Ca Through Ion_Bal

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (micromhos/	Ion_B (ratio)
0541	9/20/2012	ENER	---	---	---	---	---	---	131	640	1500	* 1634	---
	8/8/2013	ENER	---	---	---	---	---	---	156	628	1620	* 2201	---
	7/21/2015	ENER	---	---	---	---	---	---	168	637	1570	* 2179	---
	12/28/2016	ENER	---	---	---	---	---	---	150	635	1480	2028	---
0647	9/20/2012	ENER	---	---	---	---	---	---	140	728	1700	* 1798	---
	2/6/2013	HMC	215	55.4	5.50	210	414	< 5.00	143	733	1730	2280	0.936
	8/8/2013	ENER	---	---	---	---	---	---	129	660	1670	---	---
	8/27/2014	ENER	---	---	---	---	---	---	142	654	1550	* 2100	---
0649	3/13/2012	ENER	213	47.8	5.10	215	321	< 5.00	122	700	1560	* 2115	1.03
	5/9/2012	ENER	---	---	---	---	---	---	---	713	1610	* 2118	---
	7/9/2012	ENER	---	---	---	---	---	---	---	678	1540	* 2144	---
	8/1/2012	ENER	---	---	---	---	---	---	129	727	1570	* 2150	---
	9/20/2012	ENER	---	---	---	---	---	---	102	676	1440	* 1550	---
	2/6/2013	HMC	214	49.6	5.00	207	333	< 5.00	132	728	1580	2128	0.975
	3/6/2013	ENER	---	---	---	---	---	---	---	725	1570	* 2155	---
	8/15/2013	ENER	---	---	---	---	---	---	141	765	1680	---	---
	4/1/2014	ENER	---	---	---	---	---	---	---	813	1850	* 2433	---
	3/4/2015	ENER	283	64.6	5.10	231	373	< 5.00	190	902	1950	* 2567	0.974
	2/22/2016	ENER	245	59.3	5.10	233	359	< 5.00	168	795	1770	2328	1.00
	3/15/2017	ENER	238	56.0	5.00	223	377	< 5.00	151	771	1920	2265	0.987
0657	5/9/2012	ENER	---	---	---	---	---	---	---	727	1740	* 2285	---
	5/13/2013	ENER	---	---	---	---	---	---	---	675	1610	* 2162	---
	8/8/2013	ENER	---	---	---	---	---	---	---	638	1590	---	---
0658	3/13/2012	ENER	144	32.9	4.40	195	285	< 5.00	62.0	524	1190	* 1662	1.06
	7/9/2012	ENER	---	---	---	---	---	---	---	534	1190	* 1650	---
	8/1/2012	ENER	---	---	---	---	---	---	68.0	555	1180	* 1667	---
	8/1/2012	ENER	---	---	---	---	---	---	# 66.0	# 543	# 1190	---	---
	9/20/2012	ENER	---	---	---	---	---	---	71.0	573	1230	* 1329	---

Signifies Quality Control Sample

* Signifies Specific Conductivity from HMC

WATER QUALITY ANAYSIS FOR POTENTIAL SECTION 33 TEMPORARY SUPPLY WELLS

Ca Through Ion_Bal

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (micromhos/	Ion_B (ratio)
0658	11/7/2012	ENER	169	39.6	4.80	215	306	< 5.00	79.0	616	1340	* 1825	1.05
	2/6/2013	HMC	145	33.3	4.40	188	308	< 5.00	73.0	593	1270	1750	0.931
	10/29/2013	ENER	---	---	---	---	---	---	87.0	602	1300	---	---
	2/25/2014	ENER	154	36.7	4.50	189	283	< 5.00	87.0	556	1240	* 1747	1.01
	8/26/2014	ENER	---	---	---	---	---	---	105	600	1350	* 1859	---
	2/19/2015	ENER	198	47.2	5.50	190	357	< 5.00	120	639	1440	* 1977	0.976
	2/21/2017	ENER	181	45.5	4.80	178	365	< 5.00	115	571	1350	---	0.970
	2/21/2017	ENER	---	---	---	---	---	---	---	---	---	1877	---
0996	9/20/2012	ENER	---	---	---	---	---	---	120	655	1550	* 1670	---
	8/8/2013	ENER	---	---	---	---	---	---	134	602	1560	---	---
	12/15/2016	ENER	---	---	---	---	---	---	143	591	1540	2117	---

* Signifies Specific Conductivity from HMC

WATER QUALITY ANAYSIS FOR POTENTIAL SECTION 33 TEMPORARY SUPPLY WELLS

Ph Through Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	Cr (mg/l)	V (mg/l)	Th230 (pCi/l)
0541	9/20/2012	ENER	---	0.116	< 0.0300	0.0300	4.70	---	---	---	---	---
	8/8/2013	ENER	---	0.0975	< 0.0300	0.0260	4.20	---	---	---	---	---
	7/21/2015	ENER	---	0.0963	< 0.0300	0.0220	4.20	---	---	---	---	---
	12/28/2016	ENER	---	0.0946	< 0.0300	0.0270	---	---	---	---	---	---
0647	9/20/2012	ENER	---	0.0466	< 0.0300	0.0440	---	---	---	---	---	---
	2/6/2013	HMC	7.38	0.0456	< 0.0300	0.0520	3.40	0.100	---	---	---	---
	8/8/2013	ENER	---	0.0439	< 0.0300	0.0370	---	---	---	---	---	---
	8/27/2014	ENER	---	0.0429	< 0.0300	0.0300	---	---	---	---	---	---
0649	3/13/2012	ENER	7.45	0.0331	0.0400	0.0370	1.60	-0.0400	---	---	---	---
	5/9/2012	ENER	---	0.0233	< 0.0300	0.0300	---	---	---	---	---	---
	7/9/2012	ENER	---	0.0210	---	0.0350	---	---	---	---	---	---
	8/1/2012	ENER	---	0.0225	< 0.0300	0.0400	---	---	---	---	---	---
	9/20/2012	ENER	---	0.0230	< 0.0300	0.0330	---	---	---	---	---	---
	2/6/2013	HMC	7.37	0.0262	< 0.0300	0.0450	1.70	0.180	---	---	---	---
	3/6/2013	ENER	---	0.0248	0.0500	0.0320	---	---	---	---	---	---
	8/15/2013	ENER	---	0.0239	< 0.0300	0.0370	---	---	---	---	---	---
	4/1/2014	ENER	---	0.0308	< 0.0300	0.0410	---	---	---	---	---	---
	3/4/2015	ENER	7.66	0.0290	< 0.0300	0.0380	3.50	0.190	0.800	< 0.0100	0.0400	---
	2/22/2016	ENER	7.55	0.0302	< 0.0300	0.0360	2.40	3.50	0.700	< 0.0100	0.0800	---
	3/15/2017	ENER	7.52	0.0261	< 0.0300	0.0280	2.90	0.0001	0.0004	< 0.0100	0.0001	---
0657	5/9/2012	ENER	---	0.0592	< 0.0300	0.0350	---	---	---	---	---	---
	5/13/2013	ENER	---	0.0622	< 0.0300	0.0390	---	---	---	---	---	---
	8/8/2013	ENER	---	0.0568	---	0.0360	3.70	---	---	---	---	---
0658	3/13/2012	ENER	7.46	0.0113	< 0.0300	0.0380	2.00	0.0900	---	---	---	---
	7/9/2012	ENER	---	0.0119	---	0.0350	---	---	---	---	---	---
	8/1/2012	ENER	---	0.0101	< 0.0300	0.0400	---	---	---	---	---	---
	8/1/2012	ENER	---	# 0.0103	# < 0.0300	# 0.0420	---	---	---	---	---	---
	9/20/2012	ENER	---	0.0104	< 0.0300	0.0390	---	---	---	---	---	---

Signifies Quality Control Sample

WATER QUALITY ANAYSIS FOR POTENTIAL SECTION 33 TEMPORARY SUPPLY WELLS

Ph Through Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	Cr (mg/l)	V (mg/l)	Th230 (pCi/l)
0658	11/7/2012	ENER	7.65	0.0120	< 0.0300	0.0400	1.90	0.230	---	---	---	---
	2/6/2013	HMC	7.40	0.0110	< 0.0300	0.0400	2.20	0.0200	---	---	---	---
	10/29/2013	ENER	---	0.0102	< 0.0300	0.0340	---	---	---	---	---	---
	2/25/2014	ENER	7.50	0.0098	< 0.0300	0.0310	2.60	0.0600	---	---	---	---
	8/26/2014	ENER	---	0.0128	< 0.0300	0.0350	---	---	---	---	---	---
	2/19/2015	ENER	7.49	0.0192	< 0.0300	0.0330	2.90	1.90	---	---	---	---
	2/21/2017	ENER	7.49	0.0149	< 0.0300	0.0260	3.70	0.0000	0.0000	< 0.0100	0.0000	---
0996	9/20/2012	ENER	---	0.0627	< 0.0300	0.0390	---	---	---	---	---	---
	8/8/2013	ENER	---	0.0793	< 0.0300	0.0310	---	---	---	---	---	---
	12/15/2016	ENER	---	0.0792	< 0.0300	0.0250	---	---	---	---	---	---