



FIRST QUARTER 2013 MONITORING REPORT  
UIC PERMIT AZ396000001 AND APP PERMIT 101704  
FLORENCE COPPER PROJECT, FLORENCE, ARIZONA

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Curis Resources (Arizona) Inc.  
1575 W. Hunt Highway  
Florence, AZ 85132

April 25, 2013



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Ms. Nancy Rumrill  
U.S. Environmental Protection Agency  
Region 9, Ground Water Office, WTR-9  
75 Hawthorne Street  
San Francisco, California 94105-3901

Subject: First Quarter 2013 Monitoring Report  
Underground Injection Control (UIC) Permit Number AZ396000001

Dear Ms. Rumrill:

As you are aware, in February 2010, Curis Resources (Arizona) Inc. (Curis Arizona) purchased all of the assets of Florence Copper and the right to apply for the transfer of its permits to Curis Arizona, including the Aquifer Protection Permit (APP) and the UIC Permit. Curis Arizona submitted a UIC Permit application in March 2011 and, although the permit transfer is not complete, Curis Arizona is assuming the compliance obligations of those permits and is submitting this report in accordance with the reporting requirements of Parts II.G.2.(a) through (j) of the UIC Permit No. AZ396000001 issued by the United States Environmental Protection Agency (USEPA) on May 1, 1997. The Florence Copper Project is also subject to the requirements of APP No. 101704 issued by the Arizona Department of Environmental Quality (ADEQ) on June 9, 1997, and last amended on August 12, 2011.

This report pertains to monitoring activities conducted at the Florence Copper Project from January 1 through March 31, 2013. Copies of records required by Part II.G.1 are maintained at the mine site along with other information that is summarized below.

As you are aware, Florence Copper discontinued hydraulic control of the original pilot test facility on September 1, 2004 in order to conduct groundwater quality tests in accordance with the APP and Part II.I.2 of the UIC Permit. A report of the results has been provided to ADEQ and USEPA for review. The recovery wells have remained off until a plan for further activity can be approved. As a result, no extraction flows or water levels are reported under Sections (b) and (c) below.

**(a) A map showing the current status of the mine.**

Figure 1 shows the current monitoring area, including the Point of Compliance (POC) wells and the well field. Figure 2 shows the approximate layout of the well field and denotes the four well observation well/recovery well pairs.



There are four injection/recovery wells and nine original recovery wells. The four injection wells were later used as recovery wells during the rising of the mine block. Five observation wells were installed to demonstrate net inward hydraulic gradient for the 90 days required by the permit. Solution injection began on October 31, 1997 and ceased on February 8, 1998.

**(b) A table and graph showing daily cumulative injection flows and extraction flows in each active mine block over the reporting period.**

There are currently no active mine blocks. Hydraulic control for the test block was discontinued on September 1, 2004 for purposes of collecting groundwater samples following a 90-day period of no hydraulic control, and remains discontinued for evaluation of results. Accordingly, there are no injection or extraction flows to report.

**(c) A table and graph comparing average daily head in the four observation wells surrounding each active mine block with that of the four adjacent extraction wells.**

There are currently no active mine blocks. Hydraulic control was not required during this reporting period for the test block and water level measurements are not required.

**(d) A table showing POC monitoring wells analytical results and Alert Levels.**

The POC Quarterly Compliance Monitoring Report is included as Attachment 1. The report summarizes the results of groundwater monitoring activities and includes tables of the field parameters and analytical results for the quarterly monitoring parameters. Brown and Caldwell, along with Project personnel, conducted quarterly compliance sampling on February 11 through 19, 2013.

Quarterly parameters were analyzed for 29 of the 31 POC monitoring wells. POC monitoring wells M32-UBF and M33-UBF were dry and could not be sampled.

For the First Quarter 2013, one result exceeded an approved Alert Level (AL). Sulfate in upgradient well M1-GL was 113 milligrams per liter (mg/L), above the AL of 109 mg/L.

Sulfate has exceeded the AL for sulfate in M1-GL since the Third Quarter of 2011. No Aquifer Quality Limit (AQL) has been set for sulfate and there is no established Aquifer Water Quality Standard (AWQS). A report has been submitted demonstrating that the AL exceedance is not related to the permitted mining activities. On May 10, 2012, as part of a six-month summary report of the results for M1-GL, it was stipulated that if there were no AL exceedances of the biennial monitoring parameters for the well, the monitoring frequency of M1-GL would be reduced to quarterly for the indicator suite. All biennial results for M1-GL were below the ALs. Thus, routine quarterly monitoring for the well resumed during the Third Quarter 2012 event.

**(e) Results of the monthly analyses of organic in the injectate**

Organic analyses are not required because no solution was injected during the reporting period.

**(f) Results of monitoring required by 40 CFR 146.33 (b)(1)**

No solution was injected.

**(g) Results of the mechanical integrity tests**

No mechanical integrity test was conducted.

**(h) Results of the annular conductivity monitoring**

Although injection ceased in early 1998, annular conductivity measurements have continued to the present time. A graph showing measurement results for this reporting period is presented in Figure 3. No unusual conditions were noted.

**(i) Well and core hole plugging and abandonment.**

None of the existing wells or core holes were abandoned during the report period.

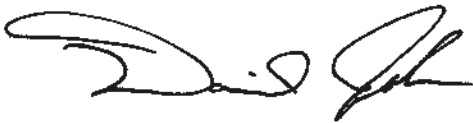
**(j) A summary of closure operations during the reporting period.**

There were no closure operations during the reporting period.

Curis Arizona believes that you will find this report complete and in compliance with all permit conditions. Please contact me at (520) 374-3984 should you have any questions regarding this report.

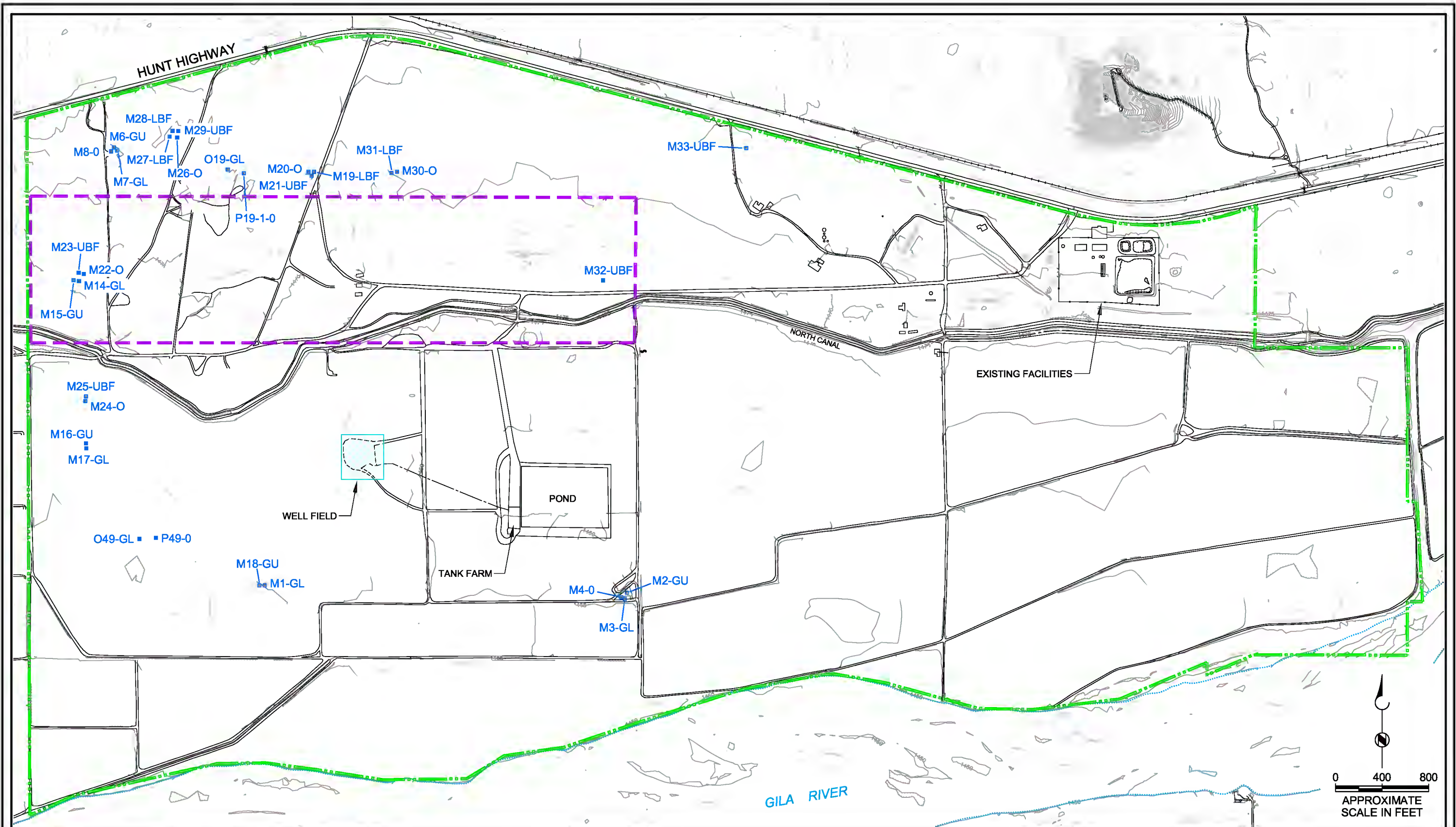
Sincerely,

CURIS RESOURCES (ARIZONA) INC.

A handwritten signature in black ink, appearing to read 'Daniel Johnson', with a stylized flourish at the end.

Daniel Johnson  
Vice President Environment and Technical Services

BAS:cr  
Attachments  
cc: Florence Copper File

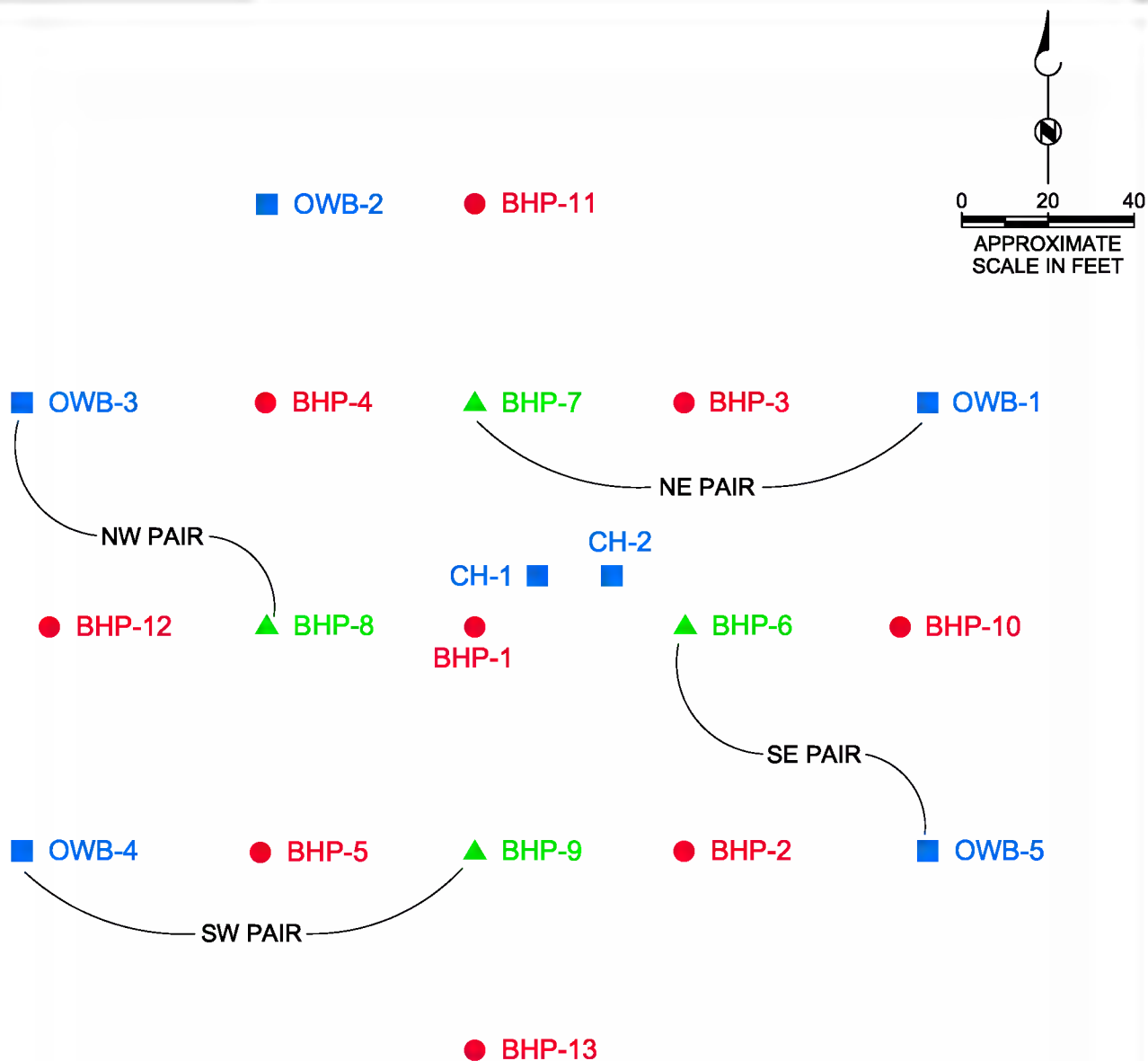


# EXPLANATION

- APPROXIMATE PROPERTY BOUNDARY
- STATE LEASE LAND BOUNDARY
- M3-GL POC MONITORING WELL
- WELL FIELD DETAIL, FIGURE 2

**Brown AND  
Caldwell**

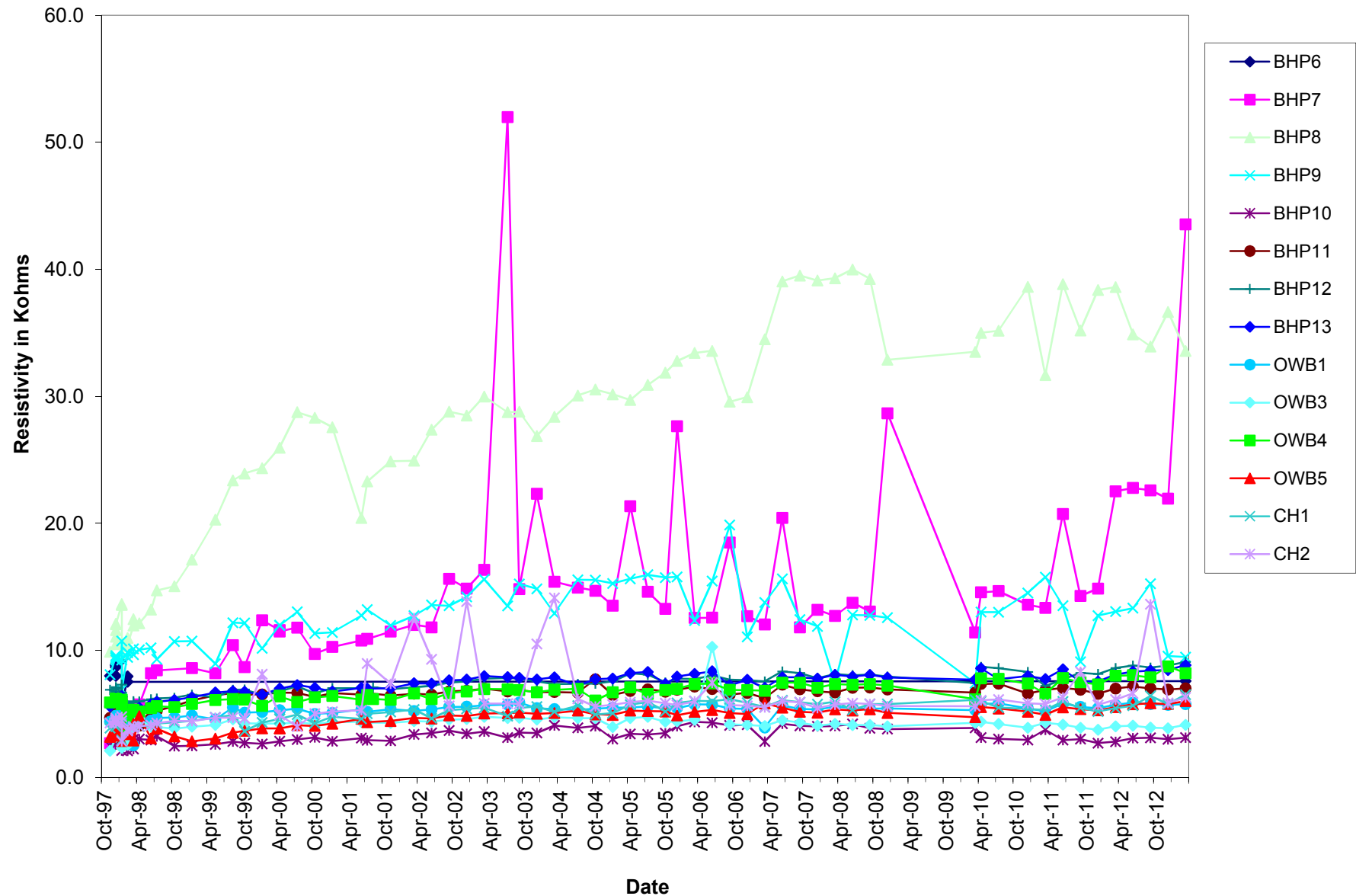
Figure 1  
**MONITORING AREA**  
FLORENCE COPPER PROJECT  
FLORENCE, ARIZONA



### EXPLANATION

- BHP-10 RECOVERY WELL (CURRENTLY INACTIVE)
- OWB-2 OBSERVATION WELL
- ▲ BHP-8 INJECTION / RECOVERY WELL  
(RECOVERY MODE SINCE 1998)

**Figure 3 - Well Field Annular Resistivity**



## ATTACHMENT 1

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### POC Quarterly Compliance Monitoring Report



FLORENCE COPPER PROJECT  
QUARTERLY COMPLIANCE MONITORING REPORT  
FIRST QUARTER 2013



### Sampling Activities

Groundwater sampling at the Florence Copper Project site took place on February 11 through 19, 2013 (First Quarter 2013). Groundwater sampling and analysis was conducted in accordance with the requirements of Aquifer Protection Permit (APP) No. 101704, Section 2.5.3 (Groundwater Monitoring and Sampling Protocols) and Underground Injection Control (UIC) Permit No. AZ396000001 Part II.F.

Quarterly parameters, as listed in Section 4.0 Table 4.5 of the APP, were analyzed from the designated Point of Compliance (POC) wells. The quarterly analytical parameters are magnesium, sulfate, fluoride, and total dissolved solids (TDS) in addition to field pH, temperature, and specific conductance. The monthly samples were analyzed for the same parameters required by quarterly monitoring. The field parameters of dissolved oxygen (DO) and turbidity are also monitored to determine stabilization of wells sampled using low-flow purging methods, but are not reported.

During the First Quarter 2013 sampling event, 29 POC wells were sampled. Two POC wells (M32-UBF and M33-UBF) were dry and could not be sampled. Analyses of the samples were conducted by TestAmerica Laboratories - Phoenix (TestAmerica). Analytical results for the quarterly parameters are provided in Table 1 and field parameters measured during sampling are indicated in Table 2.

The majority of the monitoring well network is equipped with low-flow bladder pumps. Low-flow sampling was conducted in accordance with Section 2.5.3 (Groundwater Monitoring and Sampling Protocols). Wells M22-O, M24-O, O49-GL and P49-O are equipped with stainless-steel electric pumps. The four wells were sampled by purging a minimum of three borehole volumes. No reduced pumping volumes occurred and there were no modified sampling procedures noted.

For the First Quarter 2013, one result exceeded an approved Alert Level (AL). Sulfate in upgradient well M1-GL was 113 milligrams per liter (mg/L), above the AL of 109 mg/L.

Sulfate has exceeded the AL for sulfate in M1-GL since the Third Quarter of 2011. No Aquifer Quality Limit (AQL) has been set for sulfate and there is no established Aquifer Water Quality Standard (AWQS). The quarterly parameters were selected on the basis of theoretical impact by the in-situ process. All four parameters would be expected to increase significantly in the event of groundwater impact by a facility discharge. A general increase in the sulfate concentrations in M1-GL has been observed since 2000. The remaining three indicator parameters are relatively stable and well below the established ALs. The facility has been inactive since the pilot test in 1998, which was performed in a very limited portion of the permitted area. Since M1-GL is an upgradient, background well to this pilot test area, the increased sulfate concentrations cannot be attributed to permitted facility operations.

On May 10, 2012, Curis Resources (Arizona) Inc. (Curis Arizona) submitted a six-month summary report of the results for M1-GL in accordance with Permit Section 2.6.2.3.2.7. A copy of the report was also supplied to the U.S. Environmental Protection Agency (USEPA). In the report it was stipulated that if there were no AL exceedances of the biennial monitoring parameters for the well, the monitoring frequency of M1-GL would be reduced to quarterly for the indicator suite. All biennial results for M1-GL were below the ALs. Thus routine quarterly monitoring for the well resumed during this Third Quarter 2012 event.

As described above, a general increase sulfate concentrations in M1-GL has been observed since 2000. A similar general increase has been observed in sulfate concentrations in M27-LBF since 2000; however there is no sulfate increase in nearby wells M28-LBF which is screened below M27-LBF, or M29-UBF which is screened above M27-LBF. Recently concentrations of magnesium, sulfate, and TDS appear to be increasing in upgradient wells M2-GU, M3-GL, and M4-O. In the upper aquifer, a decreasing trend for magnesium concentrations and an increasing trend for fluoride concentrations were observed from 2000 to 2008, and stabilizing since 2008. Rising concentrations were also observed in upgradient wells M2-GU and M18-GU for magnesium, sulfate, and TDS from 2005 to 2007, and declining somewhat since 2008. Site-wide water levels have declined more than 50 feet in all three aquifer zones since the start of monitoring in 1996, and have been relatively stable or have recovered slightly since 2004.

Of the 25 wells with low-flow pumps, some changes in water quality have been observed, since these pumps were installed. Concentrations of the indicator parameters in M20-O, M26-O, and M28-LFB have decreased on an average basis from 5 percent to 40 percent. Concentrations in M4-O have increased on an average basis from 5 percent to 80 percent. The changes of concentrations are likely related to the change of sampling methodology.

### Contingency Sampling Plans

No contingency sampling plan was required during the First Quarter 2013. No contingency sampling plan is required for the Second Quarter of 2013.

Table 1. Summary of Analytical Results, Quarterly Parameters

Well ID	Sample Date	Magnesium		Sulfate		Fluoride		Total Dissolved Solids	
		Concentration	Alert Level	Concentration	Alert Level	Concentration	Alert Level	Concentration	Alert Level
M1-GL	Feb 15 2013	21	31	113	109	0.7	1.3	670	1028
M2-GU	Feb 14 2013	25	39	138	275	0.67	1.4	880	1496
M3-GL	Feb 14 2013	18	36	108	187	0.6	1.3	610	1157
M4-O	Feb 14 2013	8.1	15	84.8	405	2.0	5.1	520	1072
M6-GU	Feb 11 2013	2.6	5.1	54.9	86	0.54	1.3	340	620
M7-GL	Feb 11 2013	<0.2	1	28.0	82	0.75	1.7	250	464
M8-O	Feb 11 2013	<0.2	1	46.8	122	1.9	3.6	320	609
M14-GL	Feb 13 2013	2.1	23	59.3	144	0.51	1.4	420	874
M15-GU	Feb 13 2013	23	44	81.5	126	0.42	1.2	760	1359
M16-GU	Feb 15 2013	28	52	182	248	0.5	1.1	860	1635
M17-GL	Feb 15 2013	5.7	9.3	75.9	209	0.69	1.6	390	831
M18-GU	Feb 15 2013	23	36	192	288	0.84	1.6	960	1323
M18-GU (Dup)	Feb 15 2013	23	36	193	288	0.83	1.6	970	1323
M19-LBF	Feb 19 2013	11	21	56.4	89	0.42	1	480	794
M20-O	Feb 15 2013	3.5	14	29.4	112	0.77	1.7	350	809
M21-UBF	Feb 19 2013	21	87	157	487	0.87	1.1	870	2867
M22-O	Feb 14 2013	5.5	8.6	55.1	86	0.61	1.3	410	1094
M22-O (Dup)	Feb 14 2013	5.6	8.6	55.1	86	0.59	1.3	430	1094
M23-UBF	Feb 13 2013	30	69	226	411	0.57	1.3	1100	2392
M24-O	Feb 14 2013	9.7	19	735	1364	0.96	2.5	1300	2363
M25-UBF	Feb 14 2013	25	76	196	387	0.62	1.6	950	2683
M26-O	Feb 12 2013	<0.2	1	54.8	105	1.2	3.4	270	556
M27-LBF	Feb 19 2013	30	51	150	179	<0.4	1	1100	1745
M28-LBF	Feb 12 2013	0.79	2.6	17.2	81	0.63	1.6	300	610
M28-LBF (Dup)	Feb 12 2013	0.78	2.6	17.3	81	0.62	1.6	300	610
M29-UBF	Feb 12 2013	27	84	201	465	0.55	1.1	960	2751
M30-O	Feb 19 2013	10	18	62.5	102	0.72	1.6	520	824
M31-LBF	Feb 19 2013	20	46	168	330	0.87	1.3	860	1665
O19-GL	Feb 13 2013	11	17	59.2	99	0.5	1.4	460	770
O49-GL	Feb 12 2013	9.5	18	71.7	159	0.46	1	530	849
P19-1-O	Feb 13 2013	5.7	12	67.3	107	1.4	2.8	460	767
P49-O	Feb 15 2013	3.3	6.2	108	181	0.96	2	460	801
Arizona Aquifer Water Quality Standard									

All Results in Milligrams per Liter (mg/l)

< = Less than the Laboratory Practical Quantitation Limit

**Table 2. Summary of Quarterly Field Parameters**

Well ID	Sample Date	Temperature (°C)	Temperature (°F)	pH	Conductivity (µmhos/cm)
M1-GL	Feb 15 2013	20.2	68.4	7.36	862
M2-GU	Feb 14 2013	19.7	67.5	7.19	1279
M3-GL	Feb 14 2013	20.0	68.0	7.42	896
M4-O	Feb 14 2013	20.4	68.7	7.47	729
M6-GU	Feb 11 2013	20.0	68.0	7.80	634
M7-GL	Feb 11 2013	20.4	68.7	9.10	485
M8-O	Feb 11 2013	21.3	70.3	8.96	552
M14-GL	Feb 13 2013	22.0	71.6	8.29	875
M15-GU	Feb 13 2013	21.8	71.2	7.34	1386
M16-GU	Feb 15 2013	21.6	70.9	7.32	1163
M17-GL	Feb 15 2013	21.6	70.9	8.50	561
M18-GU	Feb 15 2013	20.1	68.2	7.32	1180
M19-LBF	Feb 19 2013	22.7	72.9	7.41	774
M20-O	Feb 15 2013	23.4	74.1	8.58	524
M21-UBF	Feb 19 2013	22.4	72.3	7.22	1278
M22-O	Feb 14 2013	26.3	79.3	7.99	735
M23-UBF	Feb 13 2013	20.6	69.1	7.04	1930
M24-O	Feb 14 2013	29.8	85.6	7.74	2348
M25-UBF	Feb 14 2013	20.4	68.7	7.18	1329
M26-O	Feb 12 2013	22.0	71.6	8.59	602
M27-LBF	Feb 19 2013	22.6	72.7	7.27	1553
M28-LBF	Feb 12 2013	21.3	70.3	8.94	760
M29-UBF	Feb 12 2013	21.9	71.4	7.06	1963
M30-O	Feb 19 2013	22.5	72.5	7.30	797
M31-LBF	Feb 19 2013	22.3	72.1	7.17	1270
O19-GL	Feb 13 2013	22.0	71.6	7.43	880
O49-GL	Feb 12 2013	25.4	77.7	7.60	932
P19-1-O	Feb 13 2013	21.9	71.4	7.36	811
P49-O	Feb 15 2013	26.6	79.9	7.53	636

°C = Degrees Celcius

°F = Degrees Fahrenheit

µmhos/cm = Micromhos per Centimeter