



6200 W. Duval Mine Road • P. O. Box 527 • Green Valley, AZ 85622-0527  
(520) 648-8500

December 29, 2006

**CERTIFIED MAIL #7002 1000 0005 6776 4470**  
**RETURN RECEIPT REQUESTED**

Mr. Robert Casey  
Arizona Department of Environmental Quality  
Water Quality Enforcement Unit  
1110 West Washington Street  
Phoenix, Arizona 85007-2935

**Re: Groundwater Monitoring Report, Fourth Quarter 2006**  
**Phelps Dodge Sierrita, Inc. – Mitigation Order on Consent, Docket No. P-50-06**

Dear Mr. Casey:

Phelps Dodge Sierrita, Inc. ("PDSI") submits three copies of the attached Quarterly Groundwater Monitoring Report. This document was prepared by Hydro Geo Chem, Inc. as described in Section 3.3 of the Work Plan.

Please do not hesitate to contact Mr. Stuart Brown at (503) 675-5252 or myself at (520) 648-8857 if you have any question regarding this submittal.

Very Truly Yours,

A handwritten signature in dark ink, appearing to read "Ned Hall", written in a cursive style.

E. L. (Ned) Hall  
Chief Environmental Engineer

Attachment

cc: John Brack, Phelps Dodge Sierrita, Inc.  
Chad Fretz, Phelps Dodge Sierrita, Inc.  
Ray Lazuk, Phelps Dodge Corporation  
Stuart Brown, Bridgewater Group, Inc.

**GROUNDWATER MONITORING REPORT  
FOURTH QUARTER 2006  
TASKS 2.2 AND 2.3 OF AQUIFER CHARACTERIZATION PLAN  
MITIGATION ORDER ON CONSENT DOCKET NO. P-50-06  
PIMA COUNTY, ARIZONA**

Prepared for:

**PHELPS DODGE SIERRITA, INC.**  
6200 West Duval Mine Road  
Green Valley, Arizona 85614

Prepared by:

**HYDRO GEO CHEM, INC.**  
51 West Wetmore Road, Suite 101  
Tucson, Arizona 85705  
(520) 293-1500

December 29, 2006



**GROUNDWATER MONITORING REPORT  
FOURTH QUARTER 2006  
TASKS 2.2 AND 2.3 OF AQUIFER CHARACTERIZATION PLAN  
MITIGATION ORDER ON CONSENT DOCKET NO. P-50-06  
PIMA COUNTY, ARIZONA**

Prepared for:

**PHELPS DODGE SIERRITA, INC.**

6200 West Duval Mine Road  
Green Valley, Arizona 85614

Approved by:

Prepared by:

---

James R. Norris  
Arizona Registered Geologist No. 30842

---

Kimberly A. Garcia  
Environmental Scientist

December 29, 2006





## **TABLE OF CONTENTS**

1.	INTRODUCTION .....	1
1.1	Scope of Groundwater Monitoring .....	1
1.1.1	Groundwater Monitoring for Task 2.2 .....	1
1.1.2	Groundwater Monitoring for Task 2.3 .....	3
2.	GROUNDWATER MONITORING RESULTS .....	5
2.1	Results of Monitoring for Task 2.2 .....	5
2.2	Results of Monitoring for Task 2.3 .....	5
2.3	Quality Assurance/Quality Control Review .....	5
3.	DISCUSSION .....	7
4.	LIMITATIONS .....	9
5.	REFERENCES .....	11

## **TABLES**

1	Summary of Groundwater Monitoring for Fourth Quarter 2006
2	Sulfate Concentrations
3	Groundwater Elevations
4	Results of Depth-Specific Sampling at ESP-1 and MH-12

## **FIGURES**

1	Sulfate Concentration in Groundwater July through December 2006
2	Groundwater Elevations for July through December 2006



## **1. INTRODUCTION**

This data report provides the results of groundwater monitoring conducted in the vicinity of the Phelps Dodge Sierrita, Inc. (PDSI) Tailing Impoundment (PDSTI). Groundwater monitoring was conducted by PDSI pursuant to Tasks 2.2 and 2.3 of the Work Plan to characterize and mitigate sulfate in drinking water supplies in the vicinity of the PDSTI (Hydro Geo Chem, Inc. (HGC), 2006). The Work Plan was submitted to and approved by Arizona Department of Environmental Quality pursuant to Mitigation Order on Consent Docket No. P-50-06. HGC prepared this groundwater monitoring report on behalf of PDSI.

### **1.1 Scope of Groundwater Monitoring**

The scope of groundwater monitoring is described by the Work Plan (Sections 3.3.2 and 3.3.3 and Appendix G of HGC, 2006). Groundwater monitoring for Task 2.2 consists of water elevation measurement and collection of groundwater samples from wells in the vicinity of the PDSTI. Task 2.3 consists of depth-specific groundwater sampling to determine vertical variations of sulfate along the screened interval of selected wells.

#### **1.1.1 Groundwater Monitoring for Task 2.2**

The Work Plan identifies two purposes for Task 2.2 groundwater monitoring: plume monitoring and regional monitoring. Plume monitoring is conducted quarterly at wells proximal to the sulfate plume to track the position of the plume. Regional monitoring will be conducted in

the first and third quarters of 2007 to characterize hydrologic conditions at wells removed from the sulfate plume. The data collected by regional groundwater monitoring will be used to help calibrate the numerical model for sulfate fate and transport. This report presents the results of plume monitoring during the last half of 2006. Pursuant to the Work Plan, sulfate is the only constituent of interest for plume monitoring.

Table 1 lists wells identified for quarterly monitoring. As discussed in the Work Plan, the list of wells contains wells controlled by PDSI and wells controlled by others. PDSI agreed to attempt to contact the owners of wells to obtain access for sampling, although it was acknowledged in the Work Plan that permission to sample some wells might not be obtainable or that some wells might be inappropriate for sampling due to well construction.

In the fourth quarter of 2006, PDSI sampled wells under its control and attempted to access wells controlled by others. Not all wells recommended for quarterly sampling were able to be sampled due to ongoing access negotiations, inability to contact the owner, or determination that the well is inaccessible or inappropriate for monitoring. Table 1 lists wells recommended for quarterly sampling, their availability for sampling in the fourth quarter of 2006, and the status of progress towards sampling. In addition to wells identified for quarterly monitoring, Table 1 includes wells for semiannual monitoring for which information was obtained in the last half of 2006 and included in this report. Table 1 also identifies wells that will be substituted for wells found to be inaccessible.

Groundwater monitoring data was obtained from several sources. PDSI collected and analyzed groundwater samples at wells under its control in November 2006. Data for wells outside of PDSI control were obtained from the following well owners or operators: Community Water Company (CWC), Green Valley Domestic Water Improvement District (GVDWID), and Twin Buttes Properties, Inc. (TBPI). CWC collected and analyzed groundwater samples in December 2006. GVDWID supplied groundwater analytical results for samples collected between August and October 2006. TBPI provided data collected in July 2006 from wells monitored at the Twin Buttes Mine and vicinity, pursuant to a Post Closure Monitoring Program (Haley & Aldrich, 2006).

Groundwater sampling methods used by PDSI are described in the Quality Assurance Project Plan (QAPP) contained in the Work Plan (Appendix E of HGC, 2006). Groundwater data provided by CWC, GVDWID, and TBPI were gathered using the owner/operator's standard sampling and analysis protocols.

#### 1.1.2 Groundwater Monitoring for Task 2.3

Depth-specific groundwater samples were collected at wells ESP-4 and MH-12 during non-pumping conditions. Sampling was conducted on November 10 and 11, 2006 to test the depth-specific sampling method at two wells prior to its use at other wells identified in the Work Plan. The sampling event also served as an opportunity for personnel from BESST Technologies, Inc. to inspect conditions at all the wells scheduled for depth-specific sampling in advance of equipment mobilization for the complete sampling event. Depth-specific samples

were collected and analyzed using the methods described in the QAPP (Appendix E of HGC, 2006). Depth-specific groundwater samples were analyzed for sulfate, chloride, and total dissolved solids.

## **2. GROUNDWATER MONITORING RESULTS**

### **2.1 Results of Monitoring for Task 2.2**

Sulfate concentration and groundwater elevation data for the fourth quarter of 2006<sup>1</sup> are tabulated in Tables 2 and 3, respectively. Figure 1 shows the distribution of sulfate in the wells sampled. Figure 2 shows groundwater elevations. For the purpose of estimating groundwater elevation contours for Figure 2, data from the IW-series wells were not used because the depth to groundwater was measured while the wells were pumping.

### **2.2 Results of Monitoring for Task 2.3**

Table 4 contains the results of analyses of depth-specific groundwater samples from ESP-4 and MH-12 during non-pumping conditions.

### **2.3 Quality Assurance/Quality Control Review**

A Quality Assurance/Quality Control (QA/QC) review of the data collected by PDSI was not completed because there was insufficient time between receipt of sample results and the monitoring report deadline. For that reason, the data reported here will be considered provisional until the QA/QC review is completed. A QA/QC review of the PDSI data for fourth quarter 2006 will be provided in the next quarterly monitoring report along with laboratory reports.

---

<sup>1</sup> The majority of the data in Tables 2 and 3 are for the fourth quarter 2006, although some data were collected in July and August.





### **3. DISCUSSION**

This data report provides the results of groundwater monitoring in the vicinity of the PDSTI for the fourth quarter of 2006. Groundwater monitoring was conducted by PDSI and other well owner/operators. Some data provided by well owner/operators were collected in the third quarter of 2006 and is considered relevant for characterizing current conditions.

Comparison of the sulfate concentrations shown by Figure 1 with those shown in the Work Plan indicates no substantive differences in the plume configuration based on the fourth quarter 2006 data. The results of depth specific sampling at ESP-4 (Table 4) indicate that sulfate concentrations increase by more than an order of magnitude in samples collected below a depth of 750 feet below surface. Depth-specific samples at MH-12 (Table 4) did not show any trend with depth. Additional depth-specific sampling during both pumping and non-pumping conditions will be conducted in 2007.

Quarterly groundwater sampling at wells MH-10, MH-11, and MH-12 was inadvertently left out of the monitoring specification in the Work Plan. Quarterly sampling will include these wells from now on.



#### **4. LIMITATIONS**

The information and conclusions presented in this report are based upon the scope of services and information obtained through the performance of the services, as agreed upon by HGC and the party for whom this report was originally prepared. Results of any investigations, tests, or findings presented in this report apply solely to conditions existing at the time HGC's investigative work was performed and are inherently based on and limited to the available data and the extent of the investigation activities. No representation, warranty, or guarantee, express or implied, is intended or given. HGC makes no representation as to the accuracy or completeness of any information provided by other parties not under contract to HGC to the extent that HGC relied upon that information. This report is expressly for the sole and exclusive use of the party for whom this report was originally prepared and for the particular purpose that it was intended. Reuse of this report, or any portion thereof, for other than its intended purpose, or if modified, or if used by third parties, shall be at the sole risk of the user.



## **5. REFERENCES**

Haley & Aldrich, Inc. 2006. Post Closure Groundwater Monitoring July 2006, Twin Buttes Properties, Inc. Sahuarita, Arizona. September 2006.

Hydro Geo Chem, Inc. (HGC). 2006. Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Phelps Dodge Sierrita Tailing Impoundment, Pima County, Arizona. October 31, 2006.



## TABLES



**TABLE 1**  
**Summary of Groundwater Monitoring for Fourth Quarter 2006**  
**(Sorted by ADWR Registry Number)**

WELLS FOR QUARTERLY MONITORING CONTROLLED BY PDSI								
Well Name	ADWR 55 Registry Number	Owner	Casing or Well Depth (feet)	Work Plan Specification		Monitored in Q3/Q4 2006?	Status	Substitute Well
				Water Level Measurement	Water Quality Sampling			
IW-22	200554	PDSI	590		Q	Yes		
IW-23	200555	PDSI	964		Q	Yes		
IW-24	200556	PDSI	880		Q	No	Pump pulled from well for maintenance	
MH-26A	201527	PDSI	538	Q	Q	Yes		
MH-25A	201528	PDSI	530	Q	Q	Yes		
MH-25C	208426	PDSI	1101	Q	Q	Yes		
MH-26B	208427	PDSI	735	Q	Q	Yes		
MH-26C	208428	PDSI	900	Q	Q	Yes		
MH-25B	208429	PDSI	680	Q	Q	Yes		
IW-11	508235	PDSI	605		Q	Yes		
IW-8	508236	PDSI	783		Q	No	Well out of service for rehabilitation	
IW-10	508237	PDSI	831		Q	Yes		
IW-9	508238	PDSI	853		Q	Yes		
MH-15W	528093	PDSI	466	Q		Yes	Water level measurement only	
MH-15E	528094	PDSI	467	Q		Yes	Water level measurement only	
MH-14	528098	PDSI	561	Q		Yes	Water level measurement only	
MH-16W	528099	PDSI	460	Q		Yes	Water level measurement only	
MH-16E	528100	PDSI	460	Q		Yes	Water level measurement only	
IW-12	545555	PDSI	625		Q	No	Pump pulled from well for maintenance	
IW-14	545557	PDSI	550		Q	Yes		
IW-15	545558	PDSI	548		Q	Yes		
IW-16	545559	PDSI	470		Q	Yes		
IW-17	545560	PDSI	502		Q	Yes		
IW-18	545561	PDSI	508		Q	Yes		
IW-19	545562	PDSI	544		Q	Yes		
IW-20	545563	PDSI	506		Q	Yes		
IW-21	545564	PDSI	620		Q	Yes		
IW-6A	545565	PDSI	492		Q	Yes		
PZ-9	561859	PDSI	230	Q	Q	Yes	Piezometer is dry	
WELLS FOR QUARTERLY MONITORING CONTROLLED BY PDSI								

**TABLE 1**  
**Summary of Groundwater Monitoring for Fourth Quarter 2006**  
**(Sorted by ADWR Registry Number)**

Well Name	ADWR 55 Registry Number	Owner	Casing or Well Depth (feet)	Work Plan Specification		Monitored in Q3/Q4 2006?	Status	Substitute Well
				Water Level Measurement	Water Quality Sampling			
PZ-8	561866	PDSI	280	Q	Q	Yes		
PZ-7	561870	PDSI	155	Q	Q	Yes		
MH-24	563799	PDSI	468	Q		Yes	Water level measurement only	
IW-1	623129	PDSI	855		Q	Yes		
IW-2	623130	PDSI	1035	Q	Q	Yes		
IW-3A	623131	PDSI	1047		Q	Yes		
IW-4	623132	PDSI	946		Q	No	Well out of service for rehabilitation	
IW-5	623133	PDSI	956		Q	No	Well out of service for rehabilitation	
IW-7	623135	PDSI	1050		Q	No	Well permanantly out of service	
MH-1	803629	PDSI	520	Q		Yes	Water level measurement only	
MH-3	803630	PDSI	535	Q		Yes	Water level measurement only	
MH-4	803631	PDSI	540	Q		Yes	Water level measurement only	
MH-5	803632	PDSI	640	Q		Yes	Water level measurement only	
MH-6	803633	PDSI	960	Q		Yes	Water level measurement only	
MH-7	803634	PDSI	1100	Q		Yes	Water level measurement only	
MH-9	803635	PDSI	1400	Q		Yes	Water level measurement only	
MH-10	803636	PDSI	600	Q	Q	Yes		
MH-11	803637	PDSI	820	Q		Yes	Water level measurement only	
MH-12	803638	PDSI	800	Q		Yes	Water level measurement only, See Table 4	
MH-28	903648	PDSI	490	Q	Q	Yes		
MH-29	903649	PDSI	475	Q	Q	Yes		
MH-13A	904071	PDSI	660	Q	Q	Yes		
MH-13B	904072	PDSI	960	Q	Q	Yes		
MH-13C	904073	PDSI	1360	Q	Q	Yes		
MH-30	903884	PDSI	920	Q	Q	Yes		

**TABLE 1**  
**Summary of Groundwater Monitoring for Fourth Quarter 2006**  
**(Sorted by ADWR Registry Number)**

<b>WELLS FOR QUARTERLY MONITORING NOT CONTROLLED BY PDSI</b>								
Well Name	ADWR 55 Registry Number	Owner	Casing or Well Depth (feet)	Work Plan Specification		Monitored in Q3/Q4 2006?	Status	Substitute Well
				Water Level Measurement	Water Quality Sampling			
M-6	87388	TBPI	660	Q	Q	No	Not Available for Monitoring	M-9, 55-501652
M-8	87390	TBPI	660	Q	Q	No	Access being negotiated	
CW-10	207982	CWC	1140	Q	Q	Yes	Data provided by CWC	
SI	208825	GVDWID	650	Q	Q	Yes	Data provided by GVDWID	
M-10	501653	TBPI	1050	Q	Q	Yes	Data provided by TBPI	
CW-7	502546	CWC	1065	Q	Q	No	Well pump being repaired	
Haven Golf	515867	Haven Golf	500	Q	Q	No	Access being negotiated	
CW-8	543600	CWC	1200	Q	Q	No	Well pump being repaired	
CW-9	588121	CWC	1000	Q	Q	Yes	Data provided by CWC	
GV-1	603428	GVDWID	645	Q	Q	Yes	Data provided by GVDWID	
GV-2	603429	GVDWID	560	Q	Q	Yes	Data provided by GVDWID	
NP-2	605898	CWC	515	Q	Q	No	Access being negotiated	
I-10	608525	TBPI	932	Q	Q	No	Unavailable for sampling	I-8, 55-608527
I-9	608526	TBPI	900	Q	Q	No	No power to well, Unavailable for sampling	I-8, 55-608527
Private	611220	Schneiker	495	Q	Q	No	Owner could not be contacted and did not respond to a letter requesting access	
PC Parks	616156	Pima County	500	Q	Q	No	Believed to be the same well as 55-804995	Davis-Monthan, 55-804995
ESP-1	623102	PDSI	1020	Q	Q	Yes		
ESP-2	623103	PDSI	1044	Q	Q	Yes		
ESP-3	623104	PDSI	1043	Q	Q	Yes		
ESP-4	623105	PDSI	1045	Q	Q	Yes	See Table 4	
CW-3	627483	CWC	501	Q	Q	No	Access being negotiated	
CW-6	627485	CWC	840	Q	Q	Yes	Data provided by CWC	
Davis-Monthan	804995	Pima County	600	Q	Q	No	Access being negotiated	
1350	Not Available	TBPI	Not Available	Q	Q	No	Well appropriate for water level measurement only	

**TABLE 1**  
**Summary of Groundwater Monitoring for Fourth Quarter 2006**  
**(Sorted by ADWR Registry Number)**

SUBSTITUTE WELLS FOR QUARTERLY MONITORING FOR WELLS NOT CONTROLLED BY PDSI								
Well Name	ADWR 55 Registry Number	Owner	Casing or Well Depth (feet)	Work Plan Specification		Monitored in Q3/Q4 2006?	Status	Substitute Well
				Water Level Measurement	Water Quality Sampling			
I-8	608527	TBPI	954	Q	Q	No	Access being negotiated	
M-9	501652	TBPI	440	Q	Q	Yes	Data provided by TBPI	

WELLS FOR SEMIANNUAL MONITORING								
Well Name	ADWR 55 Registry Number	Owner	Casing or Well Depth (feet)	Work Plan Specification		Monitored in Q3/Q4 2006?	Status	Substitute Well
				Water Level Measurement	Water Quality Sampling			
M-2	85304	TBPI	647	S	S	Yes	Data provided by TBPI	
ST-7	566940	Las Quintas Serenas Water	922	S	S	Yes	Data provided by TBPI	
ST-6	608530	Las Quintas Serenas Water	837	S	S	Yes	Data provided by TBPI	
ST-5	608531	Las Quintas Serenas Water	533	S	S	Yes	Data provided by TBPI	
S-1	623111	PDSI	783	S	S	Yes		
S-3	623113	PDSI	811	S	S	Yes		
S-4	623114	PDSI	900	S	S	Yes		
S-5	623115	PDSI	800	S	S	Yes		
S-6	623116	PDSI	900	S	S	Yes		
1759	634393	TBPI	650	S	S	Yes	Data provided by TBPI	
1225	634394	TBPI	650	S	S	Yes	Data provided by TBPI	

**NOTES:**

Q = Quarterly, S = Semiannual

PDSI = Phelps Dodge Sierrita, Inc.

TBPI = Twin Buttes Properties, Inc.

CWC = Community Water Company

GVDWID = Green Valley Domestic Water Improvement District

**TABLE 2**  
**Sulfate Concentrations**  
**(Sorted by ADWR Registry Number)**

<b>WELLS FOR QUARTERLY MONITORING CONTROLLED BY PDSI</b>			
<b>Well Name</b>	<b>ADWR 55 Registry Number</b>	<b>Date</b>	<b>Sulfate (mg/L)</b>
IW-22	200554	11/21/2006	1710
IW-23	200555	11/21/2006	1540
MH-26A	201527	11/13/2006	10
MH-25A	201528	11/13/2006	190
MH-25C	208426	11/13/2006	1290
MH-26B	208427	11/13/2006	1560
MH-26C	208428	11/13/2006	730
MH-25B	208429	11/13/2006	1660
IW-11	508235	11/21/2006	1600
IW-10	508237	11/15/2006	1650
IW-9	508238	11/15/2006	1760
MH-15W	528093	12/18/2006	Water Level Monitoring Only
MH-15E	528094	11/10/2006	Water Level Monitoring Only
MH-14	528098	12/18/2006	Water Level Monitoring Only
MH-16W	528099	12/18/2006	Water Level Monitoring Only
MH-16E	528100	12/18/2006	Water Level Monitoring Only
IW-14	545557	11/15/2006	1820
IW-15	545558	11/15/2006	1710
IW-16	545559	11/15/2006	1730
IW-17	545560	11/15/2006	1570
IW-18	545561	11/21/2006	1610
IW-19	545562	11/21/2006	1570
IW-20	545563	11/21/2006	1550
IW-21	545564	11/21/2006	1580

**TABLE 2**  
**Sulfate Concentrations**  
**(Sorted by ADWR Registry Number)**

<b>WELLS FOR QUARTERLY MONITORING CONTROLLED BY PDSI</b>			
<b>Well Name</b>	<b>ADWR 55 Registry Number</b>	<b>Date</b>	<b>Sulfate (mg/L)</b>
IW-6A	545565	11/15/2006	1760
PZ-8	561866	11/14/2006	470
PZ-7	561870	11/16/2006	270
MH-24	563799	11/21/2006	Water Level Monitoring Only
IW-1	623129	11/15/2006	490
IW-2	623130	11/15/2006	100
IW-3A	623131	11/15/2006	1590
MH-1	803629	11/21/2006	Water Level Monitoring Only
MH-3	803630	12/18/2006	Water Level Monitoring Only
MH-4	803631	NA	Water Level Monitoring Only
MH-5	803632	11/21/2006	Water Level Monitoring Only
MH-6	803633	11/14/2006	Water Level Monitoring Only
MH-7	803634	11/21/2006	Water Level Monitoring Only
MH-9	803635	11/8/2006	Water Level Monitoring Only
MH-10	803636	11/8/2006	1330
MH-11	803637	11/9/2006	Water Level Monitoring Only
MH-12	803638	11/13/2006	Water Level Monitoring Only
MH-28	903648	11/14/2006	1860
MH-29	903649	11/14/2006	1640
MH-13A	904071	11/10/2006	1680
MH-13B	904072	11/10/2006	1080
MH-13C	904073	11/10/2006	90
MH-30	903884	11/10/2006	1690

**TABLE 2**  
**Sulfate Concentrations**  
**(Sorted by ADWR Registry Number)**

<b>WELLS FOR QUARTERLY MONITORING NOT CONTROLLED BY PDSI</b>			
<b>Well Name</b>	<b>ADWR 55 Registry Number</b>	<b>DATE</b>	<b>Sulfate (mg/L)</b>
CW-10	207982	12/4/2006	37.2
SI	208825	10/4/2006	5.9
M-10	501653	7/19/2006	66
CW-9	588121	12/4/2006	44.5
GV-1	603428	8/6/2006	41.2
GV-2	603429	8/6/2006	48.6
		10/4/2006	95.3
ESP-1	623102	12/4/2006	262
ESP-2	623103	12/4/2006	29.6
ESP-3	623104	12/4/2006	36.2
ESP-4	623105	11/28/2006	NA
CW-6	627485	12/4/2006	46.2

<b>WELLS FOR SEMIANNUAL MONITORING</b>			
<b>WELL NAME</b>	<b>ADWR 55 Registry Number</b>	<b>DATE</b>	<b>Sulfate (mg/L)</b>
M-2	85304	7/19/2006	490
ST-7	566940	7/21/2006	26
ST-6	608530	7/21/2006	46
ST-5	608531	7/21/2006	32
S-1	623111	11/17/2006	80
S-3	623113	11/17/2006	60
S-4	623114	11/17/2006	70
S-5	623115	11/17/2006	80
S-6	623116	11/17/2006	100
1759	634393	7/19/2006	91
1225	634394	7/19/2006	1200

*Note:*  
*mg/L = milligrams per liter.*

**TABLE 3**  
**Groundwater Elevations**  
**(Sorted by ADWR Registry Number)**

<b>WELLS FOR QUARTERLY MONITORING CONTROLLED BY PDSI</b>					
<b>Well Name</b>	<b>ADWR 55 Registry Number</b>	<b>Date</b>	<b>Groundwater Elevation (ft amsl)</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Groundwater (ft)</b>
IW-22	200554	11/21/2006	2694.9	3128.25	434.75
IW-23	200555	12/16/2006	2635.51	3128.53	544.5
MH-26A	201527	11/13/2006	2575.15	3070.89	495.74
MH-25A	201528	11/13/2006	2602.46	3056.57	454.11
MH-25C	208426	11/13/2006	2602.59	3057.24	454.65
MH-26B	208427	11/13/2006	2577.5	3070.5	493
MH-26C	208428	11/13/2006	2574.66	3069.11	494.45
MH-25B	208429	11/13/2006	2602.86	3058.22	455.36
IW-11	508235	11/21/2006	2696.23	3124.21	429.25
IW-10	508237	11/15/2006	2668.71	3126.65	464.05
IW-9	508238	11/15/2006	2695.53	3099.98	402.72
MH-15W	528093	12/18/2006	2725.52	3116.12	391.3
MH-15E	528094	11/10/2006	2724.87	3110.12	385.25
MH-14	528098	12/18/2006	2723.04	3150.74	427.28
MH-16W	528099	12/18/2006	2752.59	3098.37	346.62
MH-16E	528100	12/18/2006	2752.91	3096.66	344.7
IW-14	545557	11/15/2006	2674.06	3141.55	471.68
IW-15	545558	11/15/2006	2720.23	3146.67	427.27
IW-16	545559	11/15/2006	2748.94	3158.27	409.69
IW-17	545560	11/15/2006	2727.61	3156.51	429.15
IW-18	545561	11/21/2006	2718.27	3167.29	449.02
IW-19	545562	11/21/2006	2701.96	3150.72	418.6
IW-20	545563	11/21/2006	2713.46	3160.7	421.25



**TABLE 3**  
**Groundwater Elevations**  
**(Sorted by ADWR Registry Number)**

<b>WELLS FOR QUARTERLY MONITORING CONTROLLED BY PDSI</b>					
<b>Well Name</b>	<b>ADWR 55 Registry Number</b>	<b>Date</b>	<b>Groundwater Elevation (ft amsl)</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Groundwater (ft)</b>
IW-21	545564	11/21/2006	2715.99	3167.4	424.8
IW-6A	545565	11/15/2006	2707.84	3127.51	425
PZ-8	561866	11/14/2006	3270.84	3477.14	206.3
PZ-7	561870	11/16/2006	3406.67	3546.22	139.55
MH-24	563799	11/21/2006	2730.67	3128.17	397.5
IW-1	623129	12/16/2006	2780.75	3141.7	360.95
IW-2	623130	12/16/2006	2722.29	3098.29	404.3
IW-3A	623131	12/5/2006	2705.03	3117.13	431.8
MH-1	803629	11/21/2006	2733.9	3177.8	443.9
MH-3	803630	12/18/2006	2724.68	3152.38	427.7
MH-4	803631	NA	NA	3142.1	NA
MH-5	803632	11/21/2006	2733.58	3122.8	389.22
MH-6	803633	11/14/2006	2749.33	3130.98	381.65
MH-7	803634	11/21/2006	2750.81	3108.66	357.85
MH-9	803635	11/8/2006	2778.92	3159.5	380.58
MH-10	803636	11/8/2006	2838.25	3184.95	346.7
MH-11	803637	11/9/2006	2670.4	3040.3	369.9
MH-12	803638	11/13/2006	2638.13	3054.07	415.94
MH-28	903648	11/14/2006	2741.08	3142.18	401.1
MH-29	903649	11/14/2006	2745.1	3123.15	378.05
MH-13A	904071	11/10/2006	2698.39	3026.23	327.84
MH-13B	904072	11/10/2006	2694.93	3025.63	330.7
MH-13C	904073	11/10/2006	2693.08	3028.46	335.38
MH-30	903884	11/10/2006	2809.67	3232.45	422.78

**TABLE 3**  
**Groundwater Elevations**  
**(Sorted by ADWR Registry Number)**

<b>WELLS FOR QUARTERLY MONITORING NOT CONTROLLED BY PDSI</b>					
<b>Well Name</b>	<b>ADWR 55 Registry Number</b>	<b>Date</b>	<b>Groundwater Elevation (ft amsl)</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Groundwater (ft)</b>
CW-10	207982	12/4/2006	2681.75	2860 <sup>a</sup>	178.25
SI	208825	10/4/2006	NA	NA	NA
M-9	501652	7/18/2006	2528.30	2971	442.7
M-10	501653	7/18/2006	2531.68	3004.4	472.72
CW-9	588121	12/4/2006	2554.00	2860 <sup>a</sup>	306
GV-1	603428	8/6/2006	NA	NA	NA
GV-2	603429	8/6/2006	NA	NA	NA
		10/4/2006	NA	NA	NA
ESP-1	623102	11/28/2006	2599.68	2951.88	352.2
ESP-2	623103	11/28/2006	2589.06	2931.61	342.55
ESP-3	623104	11/28/2006	2572.41	2932.81	360.4
ESP-4	623105	11/28/2006	3606.41	3955.61	349.2
CW-6	627485	12/4/2006	2607.50	2855 <sup>a</sup>	247.5

<b>WELLS FOR SEMIANNUAL MONITORING NOT CONTROLLED BY PDSI</b>					
<b>Well Name</b>	<b>ADWR 55 Registry Number</b>	<b>Date</b>	<b>Groundwater Elevation (ft amsl)</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Groundwater (ft)</b>
M-2	85304	7/18/2006	2509.42	2993.6	484.18
M-11	501654	7/18/2006	2518.42	2937.54	419.12
1759	634393	7/18/2006	2513.79	2986	472.21
1225	634394	7/18/2006	2521.46	2998.01	476.55

*Notes:*

*ft amsl = feet above mean sea level.*

<sup>a</sup> = *Measuring point elevation estimated from topographic map, no survey data available.*

**TABLE 4**  
**Results of Depth-Specific Sampling at ESP-1 and MH-12**

Sample	Depth	Date	Time	Temperature °C	Conductivity μS/cm	pH SU	Chloride mg/L	TDS mg/L	Sulfate mg/L
ESP-4-400	400	11/10/2006	9:52	21.7	198	8.35	17.8	260	23.0
ESP-4-450	450	11/10/2006	9:23	19.9	190	8.00	17.8	270	26.6
ESP-4-500	500	11/10/2006	8:52	18.4	194	7.88	17.8	260	28.3
ESP-4-550	550	11/10/2006	8:22	16.3	188	6.99	17.9	270	29.8
ESP-4-600	600	11/10/2006	7:53	12.5	192.9	6.47	17.8	270	31.3
ESP-4-650	650	11/9/2006	16:30	25.5	240	8.01	19.3	280	40.9
ESP-4-700	700	11/9/2006	15:58	26.9	257	7.54	19.6	290	52.6
ESP-4-750	750	11/9/2006	15:20	27.7	299	7.20	25.4	350	89.9
ESP-4-800	800	11/9/2006	14:39	28.1	448	7.00	59.2	830	378
ESP-4-850	850	11/9/2006	13:54	28.7	800	7.82	89.9	1500	816
ESP-4-900	900	11/9/2006	13:06	28.7	873	7.93	89.9	1480	812
ESP-4-950	950	11/9/2006	12:10	28.7	1190	6.69	89.5	1470	809

Sample	Depth	Date	Time	Temperature °C	Conductivity μS/cm	pH SU	Chloride mg/L	TDS mg/L	Sulfate mg/L
MH-12-470	470	11/10/2006	14:48	29.1	683	7.56	120	2010	1140
MH-12-500	500	11/10/2006	13:58	28.9	666	7.12	120	2030	1140
MH-12-550	550	11/10/2006	13:31	28.4	588	7.36	120	1910	1140
MH-12-650	650	11/10/2006	12:59	27.5	623	7.49	130	2010	1140
MH-12-700	700	11/10/2006	12:24	27.2	626	7.52	120	2030	1160

*Notes:*

°C = degrees Celsius.

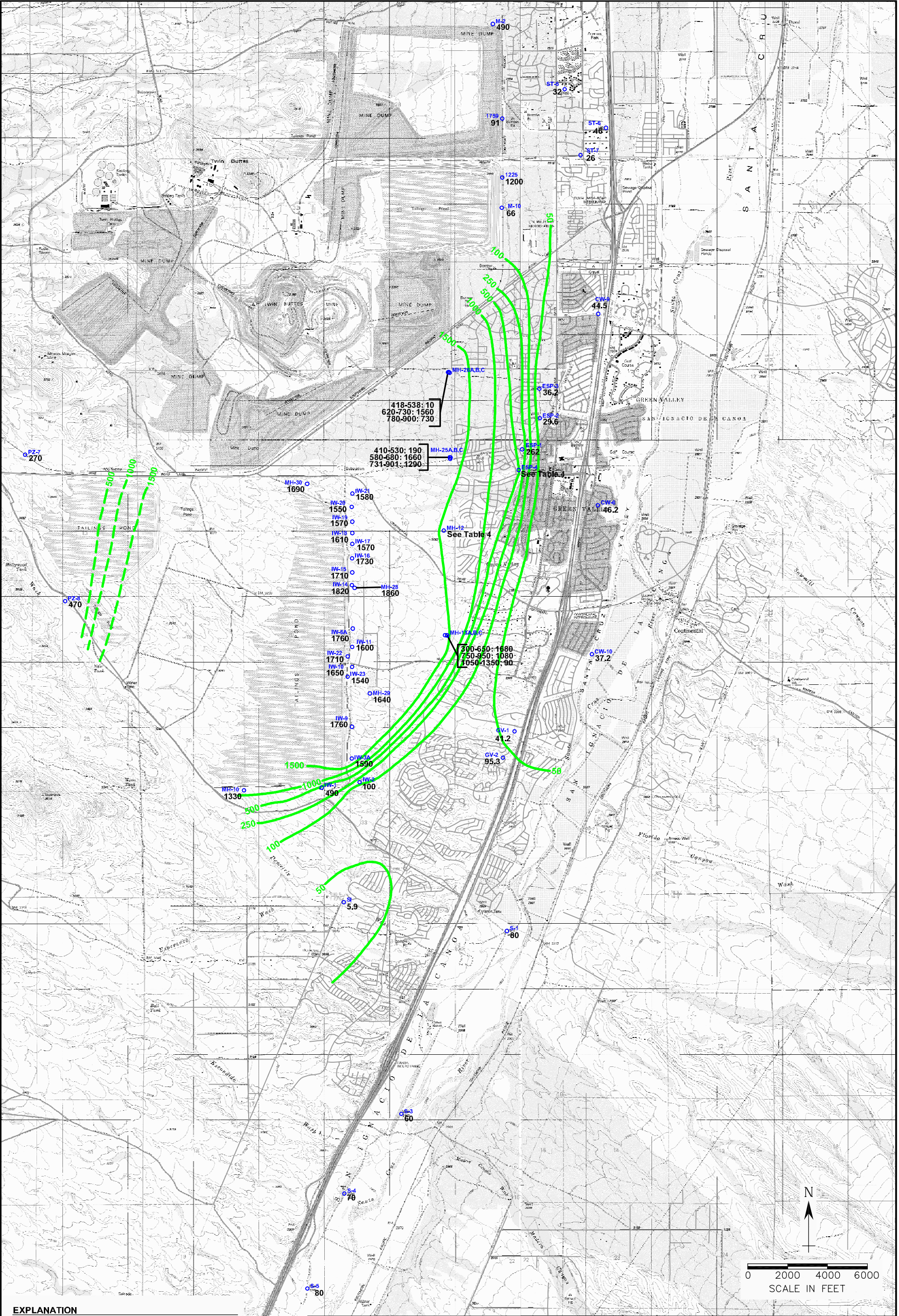
μS/cm = microsiemens per centimeter.

SU = Standard Unit.

mg/L = milligrams per liter.

## FIGURES

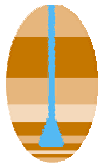




EXPLANATION

- MH-10** WELL LOCATION AND IDENTIFIER
- 1330** SULFATE CONCENTRATION (mg/L)
- ISOCONCENTRATION CONTOUR
- (DASHED WHERE INFERRED)
- WELL NEST**

Screen (ft bgs): Sulfate Concentration (mg/L) **MH-13A,B,C**

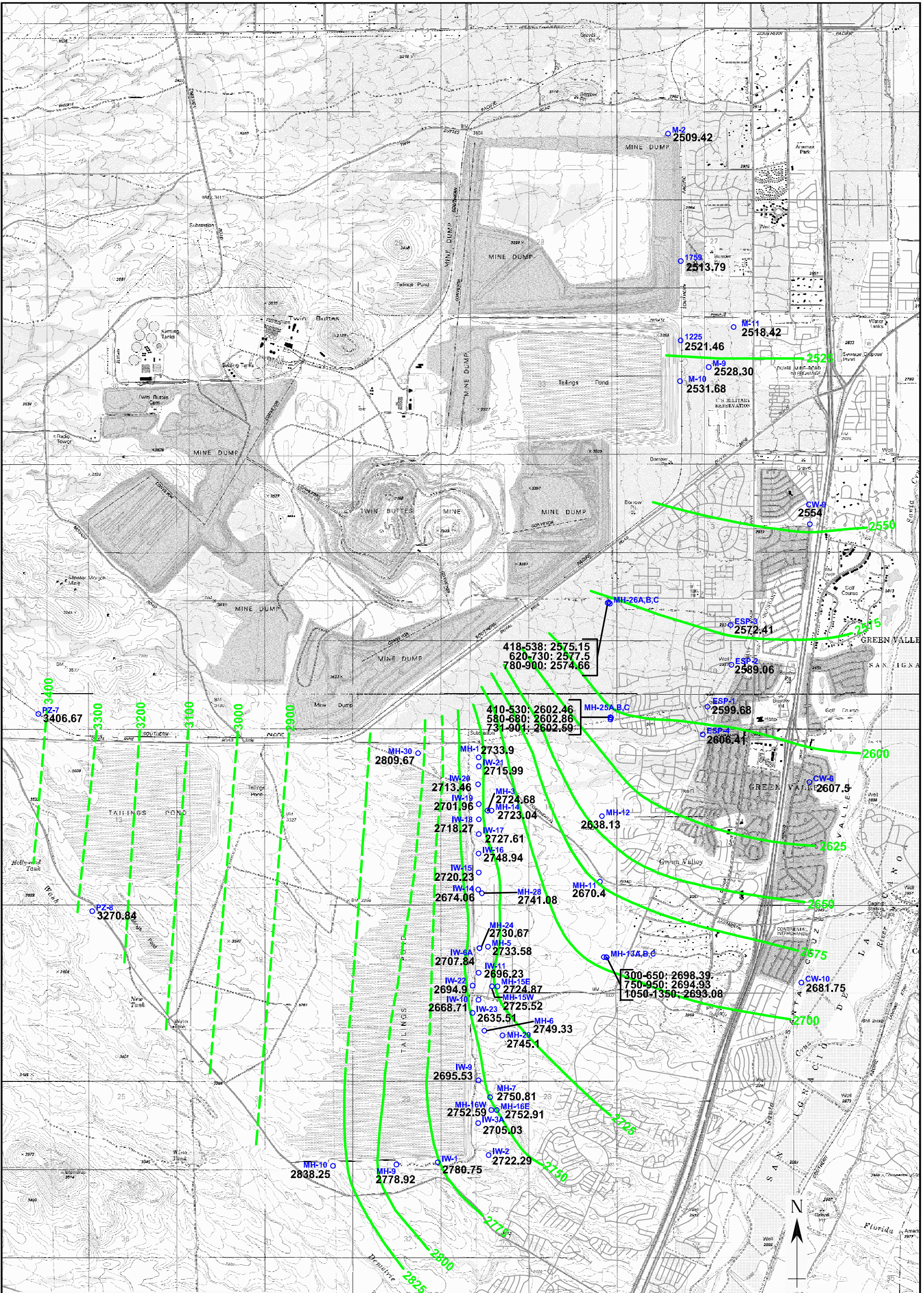


HYDRO  
GEO  
CHEM, INC.

SULFATE CONCENTRATION IN GROUNDWATER  
JULY THROUGH DECEMBER 2006

Approved <b>JRN</b>	Date <b>12/29/06</b>	Revised	Date	Reference: <b>7830076A</b>	FIG: <b>1</b>
------------------------	-------------------------	---------	------	-------------------------------	------------------





**EXPLANATION**

**MH-10**  
WELL LOCATION AND IDENTIFIER  
2838.25  
GROUNDWATER ELEVATION (FT AMSL)  
NA = NOT AVAILABLE

**GROUNDWATER ELEVATION CONTOUR**  
(DASHED WHERE INFERRED)  
NOTE: WATER LEVELS AT IW WELLS WERE COLLECTED WHILE PUMPING AND WERE NOT USED OR CONTOURING.

**WELL NEST**  
Screen (ft bgs): Groundwater Elevation (ft amsl)

HYDRO  
GEO  
CHEM, INC.

**GROUNDWATER ELEVATIONS  
FOR JULY THROUGH DECEMBER 2006**

Approved JRN	Date 12/28/06	Revised	Date	Reference: 7830075A	FIG: 2
-----------------	------------------	---------	------	------------------------	-----------