

**FIRST QUARTER 2009  
GROUNDWATER MONITORING REPORT**

**TASKS 1.0 AND 2.2 OF AQUIFER CHARACTERIZATION PLAN  
MITIGATION ORDER ON CONSENT DOCKET NO. P-121-07  
COCHISE COUNTY, ARIZONA**

Prepared for:

**FREEPORT-MCMORAN  
COPPER QUEEN BRANCH**

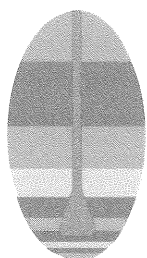
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April 14, 2009



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*Environmental Science & Technology*

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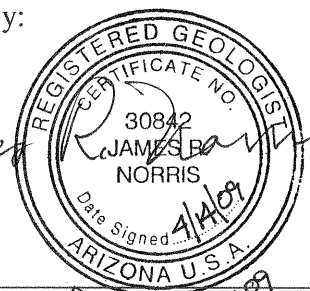
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April 14, 2009



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## **1. INTRODUCTION**

This data report provides the results of groundwater monitoring conducted in the first quarter of 2009 in the vicinity of the Freeport-McMoRan Copper Queen Branch (CQB) pursuant to the Mitigation Order on Consent Docket No. P-121-07 (MO). Groundwater monitoring was conducted by CQB for Tasks 1.0 and 2.2 of the Work Plan (Hydro Geo Chem, Inc. [HGC], 2008a) to characterize sulfate in the vicinity of the Concentrator Tailing Storage Area (CTSA). Pursuant to the MO, the Work Plan was submitted to Arizona Department of Environmental Quality (ADEQ) on December 17, 2007 (ADEQ, 2007). CQB initiated water sampling prior to work plan approval while ADEQ was commenting on the Work Plan and CQB was responding to their comments. Revision 1 of the Work Plan was submitted to ADEQ on July 3, 2008 and ADEQ approved the Work Plan on August 3, 2008. HGC prepared this groundwater monitoring report on behalf of CQB.

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

The scope of the groundwater monitoring program is described in Sections 3.2, 3.3.2 and 3.3.3 of the Work Plan (HGC, 2008a). This report presents the results of groundwater monitoring conducted in the first quarter of 2009 for Tasks 1.0 and 2.2 of the Work Plan. Groundwater monitoring for Task 1.0 consisted of identifying private drinking water supply wells and public water supply system wells within one mile downgradient and crossgradient of the outer edge of the sulfate plume. Groundwater monitoring for Task 2.2 consisted of water elevation measurement and collection of groundwater samples from wells in the vicinity of the



CTSA. Figure 1 presents a generalized geologic map of the study area and well locations where data were collected during this reporting period.

On March 5, 2009 a measuring point elevation survey was completed by Arizona Land Specialists, Inc. (ALS) for two private wells that had a measurable water level. A copy of the survey report completed by ALS is included as Appendix A.1.

## **1.2 Groundwater Monitoring for Task 1.0**

Task 1.0 of the Work Plan consisted of a well inventory to identify and sample potential private drinking water supply wells and public water supply systems located one mile downgradient and crossgradient of the sulfate plume from the CTSA and within the footprint of the plume. Samples for drinking water supply wells are analyzed for sulfate. The results of the initial sampling of drinking water supply wells were reported in the well inventory report (HGC, 2008b). Ongoing quarterly monitoring of drinking water supply wells and monthly monitoring for sulfate trend analysis at SCHWARTZ and NWC-04, within one mile of the plume is conducted as described in Section 4 of the Work Plan. Table 1 and Section 2 present wells sampled for the well inventory and the results of groundwater monitoring for Task 1.0, respectively.

### **1.3 Groundwater Monitoring for Task 2.2**

The Work Plan identifies two purposes for the groundwater monitoring program required in Task 2.2: regional monitoring and plume monitoring. Regional monitoring was set on a semiannual basis during the first and third quarters of 2008 to characterize regional hydrologic conditions and any seasonality in water elevations. Samples for regional monitoring were analyzed for a suite of major element constituents to characterize general water quality conditions in addition to sulfate. Regional monitoring was completed in the third quarter 2008.

Plume monitoring is conducted quarterly at wells that are proximal to the sulfate plume in order to track the plume's location in the aquifer. Samples for plume monitoring are analyzed for sulfate only. Table 1 lists wells identified in the Work Plan for plume monitoring, their availability for sampling in the first quarter of 2009, and their sampling status.

Pursuant to the Work Plan, HGC and CQB contacted owners of wells identified for sampling in the Work Plan in order to obtain access for sampling. As described in Table 1, not all owners responded to the request for sampling and not all wells were suitable for sampling and water level measurements. In many cases, alternate wells were identified in lieu of wells that were unsuitable for sampling.

In the first quarter of 2009, HGC collected groundwater samples at wells identified for groundwater monitoring in Table 1. Groundwater sampling and analysis methods used by HGC are described in the Quality Assurance Project Plan (QAPP) contained in Appendix F of the

Work Plan (HGC, 2008a). Results of groundwater monitoring for Task 2.2 are presented in Section 2.

## **2. GROUNDWATER MONITORING RESULTS**

### **2.1 Results of Monitoring for Tasks 1.0 and 2.2**

Analytical results and groundwater elevation data for the first quarter of 2009 are tabulated in Table 2. Figure 2 shows the concentrations of dissolved sulfate in the wells sampled in the first quarter of 2009. The highest sulfate concentration measured at co-located wells was used for concentration contouring. Figure 3 shows groundwater elevations in the first quarter of 2009. Groundwater elevations were calculated using the depth to water measurements made under static (nonpumping) conditions for all wells shown.

### **2.2 Quality Assurance/Quality Control Review**

Pursuant to Section 6.4 of the QAPP, a data verification report was prepared for quality assurance and quality control purposes. The data verification report and analytical laboratory reports for data collected by HGC during the first quarter of 2009 are included in Appendix A and Appendix B, respectively. Copies of groundwater sampling forms for samples collected by HGC are in Appendix C.

As determined by the analytical data verification review, all data for samples collected in the first quarter of 2009 by HGC are of acceptable quality for use in the aquifer characterization being conducted pursuant to the Work Plan.



### **3. DISCUSSION**

This data report provides the results of groundwater monitoring conducted within the vicinity of the CTSA for the first quarter of 2009. During the first quarter 2009, groundwater samples were collected from 80 plume monitoring and well inventory wells, and depth to water measurements were collected at 77 wells as presented in Table 1.

Groundwater samples and water level measurements could not be collected from all the wells identified in the Work Plan for a variety of reasons, including owner limitations on access, unsuitable well construction, inability to contact the owner, obstruction in well, or a well no longer existing. The specific reason(s) for not sampling these wells are provided in Table 1. In some cases, alternate wells were identified and sampled as described in Table 1. Overall, groundwater monitoring conducted during the first quarter of 2009 is deemed to have met the objectives of monitoring drinking water supply wells within one mile of the plume, identifying the location of the sulfate plume, and providing potentiometric data in the vicinity of the plume.

#### **3.1 Hydrogeologic Setting**

Water quality samples have been collected from wells completed in three principal water-bearing units in the area: basin fill, undifferentiated Bisbee Group, and Glance Conglomerate. Figure 1 shows that the undifferentiated Bisbee Group and Glance Conglomerate outcrop on the east side of the study area. The undifferentiated Bisbee Group consists, from youngest to oldest, of the Cintura Formation, Upper Mural Limestone, Lower Mural Limestone and Morita

Formation. The undifferentiated Bisbee Group consists of mudstone, siltstone and sandstone with the exception of the Upper Mural Limestone.

The Glance Conglomerate is a polymictic conglomerate with a silty to sandy matrix. The undifferentiated Bisbee Group and Glance Conglomerate are indurated bedrock. The basin fill unconformably overlies the bedrock units and consists of unconsolidated sand and gravel except in zones of cemented caliche. The bedrock units are believed to be transected by at least three principal faults in the vicinity of the plume; the northeast trending Black Gap fault, the northwest trending Abrigo and La Bellota faults. East of the Black Gap fault the basin fill is largely unsaturated and groundwater occurs in the undifferentiated Bisbee Group and Glance Conglomerate. West of the Black Gap fault the basin fill is saturated and comprises a key aquifer overlying the undifferentiated Bisbee Group. The results of monitoring need to be considered in the context of the hydrogeologic setting of the study area to interpret the apparent spatial distribution of sulfate and the patterns of groundwater elevation. Table 4 includes the well completion depth, screen interval, and screened lithology of wells sampled.

### **3.2 Sulfate Distribution**

The results of groundwater monitoring show the lateral and vertical extent of the sulfate plume in the study area as defined by the 250 mg/L sulfate concentration contour. The distribution of sulfate can appear complex in plan maps because the sulfate plume is three dimensional and plume water can be underlain or overlain by groundwater with lower sulfate

concentrations. The lateral and vertical distributions of sulfate are discussed on the following pages.

### 3.2.1 Lateral Distribution of Sulfate

Figure 2 is a contour map showing the areal distribution of sulfate in the first quarter 2009. The sulfate concentration contours on Figure 2 are inferred based on the maximum sulfate concentration at locations where closely spaced wells display different concentrations.

Based on the sulfate concentration data the sulfate plume extends to the southwest from the vicinity of the former evaporation pond to the vicinity of Naco and to the south to the vicinity of Bisbee Junction. The groundwater monitoring data indicate that the sulfate plume extends over an area of approximately 2.8 miles by 3.9 miles and is contained primarily in the basin fill and undifferentiated Bisbee Group except near the former evaporation pond where wells in the Glance Conglomerate have sulfate concentrations greater than 250 mg/L. West of the Black Gap fault the sulfate plume is contained primarily within the basin fill. East of the fault, where the basin fill is largely unsaturated, the sulfate plume is within the undifferentiated Bisbee Group and Glance Conglomerate.

### 3.2.2 Vertical Distribution of Sulfate

Evaluation of the vertical distribution of sulfate is based on sampling data for wells located in close proximity but completed with screened intervals at different elevations in the



aquifer or in different aquifer units. Two patterns are observed with respect to the vertical distribution of sulfate. First, some wells completed in the uppermost few tens of feet of the basin fill aquifer have lower concentrations than wells completed at deeper portions of the basin fill or bedrock. Second, the sulfate plume in certain areas is observed to be underlain by groundwater with lower concentrations of sulfate. Examples of the vertical distribution of sulfate are discussed below.

An example of lower concentration water in shallow basin fill overlying higher concentration water is at co-located wells BMO-2008-6B and BMO-2008-6M on the west end of the study area where sulfate concentrations are one order of magnitude higher in the undifferentiated Bisbee Group than the basin fill. Well BMO-2008-6M screened from 350 to 440 ft bgs completed in the Bisbee Group reported a sulfate concentration of 193 mg/L and BMO-2008-6B screened from 195 to 255 ft bgs completed in basin fill had a sulfate concentration of 54.3 mg/L.

Stratification of the sulfate plume between basin fill and underlying undifferentiated Bisbee Group is displayed in several wells along the northeast to southwest axis of the plume. Sulfate concentrations in the basin fill wells HOBAN, FRANCO, COB MW-1 and BMO-2008-8B were 580 mg/L, 740 mg/L, 750 mg/L and 1570 mg/L, respectively (Figure 4). Sulfate concentrations in undifferentiated Bisbee Group wells GARNER 635, TM-19A, BMO-2008-7M and BMO-2008M were 37.4 mg/L, 66.2 mg/L, 27.6 mg/L and 149 mg/L, respectively. These data indicate that the underlying undifferentiated Bisbee Group exhibits sulfate concentrations approximately an order of magnitude lower than concentrations in the basin fill at those

locations. A similar relationship was observed in all four 2008 sampling events (HGC, 2008c, 2008d and 2009).

Stratification of sulfate is also present at wells BF-01 and TM-02A west of the former evaporation pond. Well BF-01 is completed to a depth of 400 ft bgs and is screened across the basin fill and undifferentiated Bisbee Group; although the water levels collected indicate that the basin fill is probably unsaturated. BF-01 had a sulfate concentration of 1330 mg/L while TM-02A, located approximately 500 feet south of BF-01 and screened from 825 to 925 ft bgs in the Bisbee Group and Glance Conglomerate had a sulfate concentration of 20.3 mg/L. The sulfate concentrations in the Glance Conglomerate at TM-02A are approximately two orders of magnitude lower than those in the overlying undifferentiated Bisbee Group at that location.

In the first quarter 2009, sulfate concentrations also decrease with depth in the vicinity of co-located wells BMO-2008-10GU and BMO-2008-10GL screened at different depths in the Glance Conglomerate located south of the Abrigo fault and east of the Black Gap fault in the north central portion of the study area. BMO-2008-10GU was completed at a total depth of 449 feet below ground surface (ft bgs) and screened from 340 to 440 ft bgs while BMO-2008-10GL was completed at 810 ft bgs and screened from 700 to 800 ft bgs. The BMO-2008-10GU sample represents groundwater approximately 360 feet deeper in the Glance Conglomerate than the BMO-2008-10GL sample. Sulfate concentrations in BMO-2008-10GU and BMO-2008-10GL were 1740 mg/L and 1180 mg/L, respectively, in the first quarter of 2009 (Figure 2). These data indicate that sulfate concentrations were stratified with the lower concentration at greater depths in the Glance Conglomerate at this location.

### 3.3 Groundwater Elevation

Groundwater elevations are shown on Figures 3. In general, groundwater elevations decrease from north to south east of the Black Gap fault in the region between the Bisbee Municipal Airport and Bisbee Junction, and from east to west across the central portion of the study area west of the Black Gap fault. Comparison of the first quarter 2009 water elevations with those observed in previous quarters indicates about a 0.56 foot increase in the average groundwater elevations and only minor differences in the apparent groundwater flow directions indicated by water level data.

The water level relationships are relatively complex due to the multiple hydrostratigraphic units monitored and the complicated structural geology of the area. The apparent hydraulic gradient is steeper east of the Black Gap fault where groundwater is in bedrock units of the undifferentiated Bisbee Group and Glance Conglomerate than is the hydraulic gradient west of the fault where groundwater elevation measurements are primarily from wells in basin fill. The higher hydraulic gradient is probably due to a lower average hydraulic conductivity in the bedrock compared to basin fill. The apparent groundwater flow direction east of the Black Gap fault is southerly to the vicinity of Bisbee Junction and then westerly. Convergent groundwater flow is suggested by the V-shaped contours in the vicinity of Bisbee Junction. West of the Black Gap fault, the apparent hydraulic gradient is shallower than east of the fault and the apparent groundwater flow direction is westerly. In the vicinity of the Turquoise Valley Golf Course (TVI 713) and along Purdy Lane there are apparent groundwater depressions most likely associated with groundwater pumping.

The relationship between water levels east and west of the Black Gap fault is uncertain due to the different apparent hydraulic gradients and groundwater flow directions and the variability of water level data east of the Black Gap fault. The variability of water levels east of the Black Gap fault is indicated by the large differences in water elevation (sometimes up to several hundred feet) between wells in relatively close proximity to one another. This variability in water elevation is evident in the Bisbee Junction area and possibly, east of the former evaporation pond. At Bisbee Junction, water levels range from 4394 feet above mean sea level (ft amsl) at FLEMING to 4604 ft amsl at DODSON and STEPHENS. East of the former evaporation pond, water levels at the BIMA, SUNBELT and NOTEMAN wells range from 4448 to 4473 ft amsl. These water levels are significantly lower than wells BMO-2008-1G, COB-WL, and SWAN to the east which range from 4686 to 4773 ft amsl. The water levels at BIMA, SUNBELT, and NOTEMAN are similar to the water level at BMO-2008-10GU to the west which is at 4503 ft amsl. The BIMA, SUNBELT, and NOTEMAN wells may be in bedrock that has a good hydraulic connection to bedrock at BMO-2008-10GU, but not the bedrock to the east and south.

The variability of water elevations east of the Black Gap fault indicates that the hydraulic properties of the bedrock are heterogeneous and that certain portions of the bedrock may not be hydraulically connected. The heterogeneity in hydraulic properties in bedrock is probably due to the restriction of groundwater flow to permeable features such as permeable beds, bedding planes, or fracture systems within bedrock which are not uniformly distributed throughout the area. A factor that may contribute to the apparent variability in water levels is that drawdown

due to pumping in domestic wells in the low permeability bedrock could create zones of depressed water elevations that do not recover rapidly after pumping ceases.

The water level elevations in co-located wells screened at different depths in basin fill and the undifferentiated Bisbee Group vary by less than five feet in the west part of the study area. In the northeast part of the study area the water level varies over 225 feet at co-located wells BMO-2008-10GU and BMO-2008-10GL, screened at different depths in the Gance Conglomerate.

Anomalous low water elevations are also observed west of the Black Gap fault at the SRC, BURKE, BMO-2008-11G, and GL-03 wells in the northwest portion of the study area. According to well driller logs, SRC and BURKE are screened in a shale bedrock, and BMO-2008-11G and GL-03 are screened in the Gance Conglomerate all at depths greater than 600 ft bgs. The water level in SRC, BURKE, BMO-2008-11G, and GL-03 are anomalously low compared to the levels in wells completed in basin fill and/or undifferentiated Bisbee Group to the south. The existing data suggest that SRC, BURKE, BMO-2008-11G, and GL-03 are within a hydrostratigraphic unit with a poor hydraulic connection to the aquifers to the south.

Although complex, the water level data provide important information on the direction and magnitude of hydraulic gradients which control the direction and movement of the sulfate plume. The results also display the effects of aquifer heterogeneities that need to be accounted for in the site conceptual model.

#### 4. REFERENCES

- Arizona Department of Environmental Quality. 2007. Mitigation Order on Consent, Docket No. P-121-07, In the Matter of: Phelps Dodge Corporation, Copper Queen Branch, located at 36 West Highway 92, Bisbee, Arizona, ADEQ Identification Number 100531. November 14, 2007.
- Hydro Geo Chem, Inc. (HGC). 2008a. Revision 1, Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Concentrator Tailing Storage Area, Cochise County, Arizona. July 3, 2008.
- HGC. 2008b. Well Inventory Report, Task 1.0 of Aquifer Characterization Plan for Mitigation Order on Consent No. P-121-07, Cochise County, Arizona. July 28, 2008.
- HGC. 2008c. First and Second Quarters 2008, Groundwater Monitoring Report, Task 2.2 of Aquifer Characterization Plan, Mitigation Order on Consent Docket No. P-121-07, Cochise County, Arizona. July 30, 2008.
- HGC. 2008d. Third Quarter 2008, Groundwater Monitoring Report, Tasks 1.0, 2.2 and 2.3 of Aquifer Characterization Plan, Mitigation Order on Consent Docket No. P-121-07, Cochise County, Arizona. October 27, 2008.
- HGC. 2009. Fourth Quarter 2008, Groundwater Monitoring Report, Tasks 1.0, 2.2 and 2.3 of Aquifer Characterization Plan, Mitigation Order on Consent Docket No. P-121-07, Cochise County, Arizona. January 23, 2009.



## **TABLES**



**TABLE 1**  
**Summary of Groundwater Monitoring First Quarter 2009**

Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
ANDERSON	613396	Anderson	Well Inventory	236	YES	YES	Water quality sample collected in January 2009
AWC-02	616586	Arizona Water Company	Plume	330	NO	YES	Water quality sample collected in March 2009
AWC-03	616585	Arizona Water Company	Plume	269	NO	YES	Water quality sample collected in March 2009; turbine running during site visit, unable to collect static water level
AWC-04	616584	Arizona Water Company	Plume	250	NO	YES	Water quality sample collected in March 2009
AWC-05	590620	Arizona Water Company	Plume	1183	NO	YES	Water quality sample collected in March 2009; turbine running during site visit, unable to collect static water level
BANKS 986	647986	Banks	Well Inventory	435	NO	YES	Water quality sample collected in January 2009; unable to collect water level due to obstruction
BANKS 987	647987	Banks	Well Inventory	339	YES	NO	Well identified for water level measurements only
BARTON 010	085010	Barton	Plume	300	NO	NO	Dry
BARTON 919	644919	Barton	Plume	130	YES	NO	Well not operational; identified for water level measurements only
BF-01	539783	Copper Queen Branch	Plume	400	YES	YES	Water quality sample collected in February 2009
BIMA	577927	Bisbee Municipal Airport, LLC	Plume	465	YES	YES	Water quality sample collected in January 2009
BLOMMER	633472	Blommer	Well Inventory	380	NO	NO	Owner declined further participation in monitoring program
BMO-2008-1G	909474	Copper Queen Branch	Plume	310	YES	YES	Water quality sample collected in February 2009
BMO-2008-3B	909147	Copper Queen Branch	Plume	260	YES	YES	Water quality sample collected in February 2009
BMO-2008-4B	910096	Copper Queen Branch	Plume	610	YES	YES	Water quality sample collected in February 2009
BMO-2008-5B	909653	Copper Queen Branch	Plume	285	YES	YES	Water quality sample collected in February 2009
BMO-2008-5M	909552	Copper Queen Branch	Plume	450	YES	YES	Water quality sample collected in February 2009
BMO-2008-6B	909146	Copper Queen Branch	Plume	265	YES	YES	Water quality sample collected in February 2009
BMO-2008-6M	909019	Copper Queen Branch	Plume	450	YES	YES	Water quality sample collected in February 2009
BMO-2008-7M	908794	Copper Queen Branch	Plume	670	YES	YES	Water quality sample collected in February 2009
BMO-2008-8B	910097	Copper Queen Branch	Plume	480	YES	YES	Water quality sample collected in February 2009
BMO-2008-8M	909711	Copper Queen Branch	Plume	1210	YES	YES	Water quality sample collected in February 2009
BMO-2008-9M	909255	Copper Queen Branch	Plume	775	YES	YES	Water quality sample collected in February 2009
BMO-2008-10GU	909272	Copper Queen Branch	Plume	449	YES	YES	Water quality sample collected in February 2009
BMO-2008-10GL	909435	Copper Queen Branch	Plume	810	YES	YES	Water quality sample collected in February 2009
BMO-2008-11G	909434	Copper Queen Branch	Plume	760	YES	YES	Water quality sample collected in February 2009
BMO-2008-13B	909551	Copper Queen Branch	Plume	474	YES	YES	Water quality sample collected in February 2009
BMO-2008-13M	909760	Copper Queen Branch	Plume	1030	YES	YES	Water quality sample collected in February 2009
BULLARD	602134	Bullard	Plume	300	NO	NO	Well not operational; unable to collect water level due to obstruction
BURKE	212268	Burke	Plume	781	YES	YES	Water quality sample collected in February 2009
CAMPBELL	215509	Campbell	Well Inventory	350	NO	NO	Well identified for water level measurements only; unable to collect water level due to obstruction
CHAMBERS	629807	Chambers	Well Inventory	245	NO	YES	Water quality samples collected in January 2009; no access to well casing for water level measurement
COB MW-1	903992	City of Bisbee	Plume	420	YES	YES	Water quality sample collected in February 2009
COB MW-2	903984	City of Bisbee	Plume	170	YES	YES	Water quality sample collected in February 2009
COB MW-3	906823	City of Bisbee	Plume	269	YES	YES	Water quality sample collected in February 2009

**TABLE 1**  
**Summary of Groundwater Monitoring First Quarter 2009**

Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
COB WL	593116	City of Bisbee	Plume	150	YES	YES	Water quality sample collected in February 2009
COB WL ABND	570012	City of Bisbee	Regional	148	NO	NO	Well Abandoned
COLLINS <sup>1</sup>	565260	Collins	Well Inventory	320	YES	YES	Water quality sample collected in February 2009
CONNOR	516399	Connor	Regional	220	NO	NO	Well Abandoned
COOPER	623564	Cooper, Teresa	Plume	325	NO	YES	Water quality samples collected in January 2009; unable to collect water level due to obstruction
COOPER C	637069	Cooper, Charles	Plume	220	YES	YES	Water quality sample collected in January 2009
CROWLEY	510298	Crowley	Plume	788	NO	NO	Dry
DODSON	644927	Dodson	Plume	200	YES	YES	Water quality sample collected in January 2009
DOUGLASS 791	592791	Douglass	Well Inventory	200	YES	NO	Well not operational; identified for water level measurements only
DOUGLASS 792	529792	Douglass	Well Inventory	200	YES	NO	Well not operational; identified for water level measurements only
DURAZO	NR	Durazo	Well Inventory	ND	NO	YES	Water quality samples collected in February 2009; no access to well casing for water level measurement
EAST	599796	East	Well Inventory	125	YES	YES	Water quality sample collected in January 2009
EPPELE 641	805641	Eppele	Well Inventory	265	YES	YES	Water quality sample collected in January 2009
FLEMING	218386	Fleming	Well Inventory	400	YES	NO	Well installed February 2009 not operational; identified for water level measurement only
FRANCO	500101	Franco	Well Inventory	200	NO	YES	Water quality sample collected in January 2009; unable to collect water level measurement due to obstruction
FULTZ	212447	Fultz	Well Inventory	300	YES	YES	Water quality sample collected in January 2009
GALLANT	502527	Gallant	Regional	190	YES	NO	Well identified for water level measurements only
GARNER 557	558557	Garner	Plume	300	YES	NO	Well identified for water level measurements only
GARNER 635	587635	Garner	Plume	680	YES	YES	Water quality sample collected in January 2009
GGOOSE 546	628546	Gallopig Goose Properties	Plume	430	NO	NO	Well not operational, unable to collect water level due to obstruction
GGOOSE 547	628547	Gallopig Goose Properties	Plume	800	YES	YES	Water quality sample collected in February 2009
GL-03	539782	Copper Queen Branch	Plume	820	YES	YES	Water quality sample collected in February 2009
GOAR RANCH	610695	Goar	Well Inventory	250	YES	NO	Well identified for water level measurement only
GREGG	630852	Gregg	Plume	ND	NO	NO	Dry
HOBAN	805290	Hoban	Well Inventory	316	YES	YES	Water quality sample collected in January 2009
HOWARD	NR	Howard	Well Inventory	200	YES	YES	Water quality sample collected in January 2009
HULL 584	606854	Hull	Plume	25	NO	NO	Unable to locate well
KEEFER	209744	Keefer	Well Inventory	245	YES	YES	Water quality sample collected in January 2009
MCCONNELL 265	539265	McConnell, Virginia	Well Inventory	216	YES	YES	Water quality sample collected in January 2009
METZLER	35-71891	Metzler	Well Inventory	351	YES	YES	Water quality sample collected in February 2009
MILLER 340	641340	Miller	Plume	200	NO	NO	Dry
MILLER 341	641341	Miller	Plume	100	NO	NO	Dry
MILLER 342	641342	Miller	Regional	200	NO	NO	Dry
MINOR 317	063317	Minor	Well Inventory	155	NO	NO	New owner declined participation

**TABLE 1**  
**Summary of Groundwater Monitoring First Quarter 2009**

Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
MOORE	538847	Moore	Well Inventory	220	NO	YES	Water quality sample collected in January 2009; unable to collect water level, sounder diameter too large for access port
MOROYOQUI	647847	Moroyoqui	Well Inventory	280	NO	NO	Dry
NESS	509127	Ness	Well Inventory	812	YES	YES	Water quality sample collected in January 2009
NOTEMAN	212483	Noteman	Well Inventory	400	YES	YES	Water quality sample collected in January 2009
NWC 04 CAP	627685	Naco Water Company	Plume	379	NO	NO	Well Capped
NWC-01	627682	ND	Regional	215	NO	NO	Naco Water Company sold well, personnel communication with NWC 2008
NWC-02	562944	Naco Water Company	Plume	312	NO	YES	Water quality sample collected in February 2009; turbine running during site visit, unable to collect static water level
NWC-03	203321	Naco Water Company	Plume	312	NO	YES	Water quality sample collected in February 2009; turbine running during site visit, unable to collect static water level
NWC-03 CAP	627684	Naco Water Company	Plume	179	YES	NO	Well identified for water level measurements only
NWC-04	551849	Naco Water Company	Well Inventory and Sulfate Trend	795	NO	YES	Water quality sample collected in February 2009; turbine running during site visit, unable to collect static water level
NWC-05	627696	ND	Plume	175	NO	NO	Naco Water Company sold well, personnel communication with NWC 2008
NWC-06	575700	Naco Water Company	Well Inventory	410	NO	YES	Water quality sample collected in February 2009; turbine running during site visit, unable to collect static water level
OSBORN	643436	Osborn	Plume	258	YES	YES	Water quality sample collected in January 2009
PALMER	578819	Palmer	Well Inventory	220	NO	YES	Water quality sample collected in January 2009; no access to well casing for water level measurement
PANAGAKOS	35-76413	Panagakos	Well Inventory	200	YES	YES	Water quality sample collected in January 2009
PARRA	576415	Parra	Plume	355	YES	YES	Water quality sample collected in February 2009
PIONKE	613395	Pionke	Well Inventory	300	YES	YES	Water quality sample collected in January 2009
POOL	509518	Pool	Well Inventory	313	YES	YES	Water quality sample collected in February 2009
POWER	624535	Power	Regional	100	YES	NO	Well identified for water level measurements only
RAMIREZ	216425	Ramirez	Well Inventory	300	YES	YES	Water quality sample collected in January 2009
RAY	803772	Ray	Well Inventory	100	YES	YES	Water quality sample collected in January 2009
ROGERS 803	641803	Rogers, Ernest D	Plume	140	YES	YES	Water quality sample collected in February 2009
ROGERS E	216018	Rogers, Ernest M	Well Inventory	290	YES	YES	Water quality sample collected in February 2009
RUIZ	531770	Ruiz	Well Inventory	312	YES	YES	Water quality sample collected in February 2009
SCHWARTZ	210865	Schwartz	Well Inventory and Sulfate Trend	305	YES	YES	Water quality sample collected in January 2009
SRC	211345	Specialty Restaurants Corporation, Inc.	Regional	965	YES	NO	Well identified for water level measurement only
STEPHENS	808560	Stephens	Well Inventory	NR	YES	NO	Well identified for water level measurement only
SUNBELT	201531	Sunbelt Marketing, Inc.	Plume	380	YES	NO	Well identified for water level measurement only
SWAN	NR	Swan, Alan	Well Inventory	NR	YES	YES	Water quality sample collected in January 2009
TM-02	522573	Copper Queen Branch	Plume	640	NO	NO	Pump intake above water level; unable to collect water level due to obstruction
TM-02A	522574	Copper Queen Branch	Plume	925	YES	YES	Water quality sample collected in February 2009
TM-03	522575	Copper Queen Branch	Plume	200	YES	YES	Water quality sample collected in February 2009
TM-05 MILLER	522694	Miller	Regional	160	NO	NO	Dry
TM-06 MILLER	522695	Miller	Plume	200	YES	YES	Water quality sample collected in February 2009

**TABLE 1**  
**Summary of Groundwater Monitoring First Quarter 2009**

Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
TM-07	522576	Copper Queen Branch	Plume	350	NO	YES	Water quality sample collected in February 2009; unable to collect water level due to obstruction
TM-08 SWAN	522817	Swan, George	Regional	817	NO	NO	Owner declined further participation in monitoring program
TM-10 USBP	522696	U.S. Border Patrol	Plume	290	NO	NO	Owner declined participation in monitoring program
TM-11 PIONKE	522815	Pionke	Plume	160	NO	NO	Dry
TM-12 MILLER	522697	Miller	Regional	175	NO	NO	Dry
TM-13 MILLER	522698	Miller	Plume	200	NO	NO	Dry
TM-14 NELSON	522816	Nelson	Regional	215	NO	NO	Dry
TM-15 MILLER	522699	Miller	Well Inventory	325	YES	YES	Water quality sample collected in February 2009
TM-16	522578	Copper Queen Branch	Plume	115	YES	YES	Water quality sample collected in February 2009
TM-17	522700	Copper Queen Branch	Plume	200	NO	NO	Dry
TM-19	522581	Copper Queen Branch	Plume	210	NO	NO	Dry
TM-19A	522580	Copper Queen Branch	Plume	700	YES	YES	Water quality sample collected in February 2009
TM-41	562555	Copper Queen Branch	Plume	210	NO	NO	Dry
TM-42	562554	Copper Queen Branch	Plume	250	YES	YES	Water quality sample collected in February 2009
TM-43	564729	Copper Queen Branch	Regional	830	NO	NO	Regional monitoring
TM-43A	564726	Copper Queen Branch	Regional	215	NO	NO	Regional monitoring
TM-43B	565004	Copper Queen Branch	Regional	215	NO	NO	Regional monitoring
TM-45	564728	Copper Queen Branch	Regional	520	NO	NO	Dry
TVI 236	802236	Turquoise Valley, Inc.	Plume	222	YES	YES	Water quality sample collected in February 2009
TVI 713	567713	Turquoise Valley, Inc.	Well Inventory	200	YES	NO	Well identified for water level measurements only
TVI 875	568875	Turquoise Valley, Inc.	Plume	330	NO	YES	Water quality sample collected in February 2009, no access to well casing for water level measurement
WALKER	200393	Walker	Regional	120	YES	NO	Well identified for water level measurements only
WEED	544535	Weed	Plume	320	NO	YES	Water quality sample collected in February 2009; no access to well casing for water level measurement
WEISKOPF	641802	Weiskopf	Plume	200	YES	YES	Water quality sample collected in February 2009
ZANDER	205126	Zander	Well Inventory	280	YES	YES	Water quality sample collected in February 2009

**Notes:**

ADWR = Arizona Department of Water Resources

BIMA = Bisbee Municipal Airport

ft amsl = feet above mean sea level

NA = Not Applicable

ND = No Data

NR = No Record

35-71891 = ADWR 35 Database

<sup>1</sup> former owner ENGLUND



**TABLE 2**  
**Compilation of Analytical Results**  
**For Inorganic Analytes and Field Parameters**

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved	Chloride, dissolved	Fluoride, dissolved	Nitrate as N, dissolved	Nitrate/Nitrite as N, dissolved	Nitrite as N, dissolved	Calcium, dissolved	Magnesium, dissolved	Potassium, dissolved	Sodium, dissolved	Bicarbonate as CaCO3	Carbonate as CaCO3	Hydroxide as CaCO3	Total Alkalinity	Residue, Filterable (TDS) @ 180°C	TDS (calculated)	TDS Ratio (measured/calculated)	Sum of Anions (meq/L)	Sum of Cations (meq/L)	Cation-Anion Balance (%)
BMO-2008-6M	909019	07/10/08	M	22.1	702	182	16	0.3	1.98	1.98	<0.01	104	17.9	3.60	32.5	144	9	<2	153	480	460	1.04	7.4	8.1	4.5
BMO-2008-6M	909019	11/04/08	7.33	21.8	621	199	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-6M	909019	02/20/09	7.11	22.0	702	193	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-7M	908794	07/14/08	7.63	25.2	500	31.4	10.4	0.3	1.55	1.55	<0.01	32.4	11.4	2.70	60.8	188	13	<2	201	290	282	1.03	5.1	5.3	1.9
BMO-2008-7M	908794	11/06/08	7.53	22.6	380	34.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-7M	908794	02/18/09	7.31	23.3	452	27.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-8B	910097	12/05/08	6.47	20.1	2480	1890	80	0.1	2.91	2.93	0.02	529	195	14.4	46.4	630	<2	<2	630	3080	3150	0.98	54.7	44.9	-9.8
BMO-2008-8B	910097	02/19/09	6.19	21.0	2958	1570	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-8M	909711	12/09/08	7.16	23.4	852	197	13	0.3	1.78	1.78	<0.01	89	43.0	5.80	64.9	260	<2	<2	260	640	576	1.11	9.8	11.0	5.8
BMO-2008-8M	909711	02/19/09	7.27	23.5	758	147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-8M DUP	909711	02/19/09	7.27	23.5	758	149	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-9M	909255	08/08/08	7.72	25.7	415	47.3	14	0.10	1.90	1.93	0.03	28.0	17.8	3.4	64.6	193	6	<2	199	320	306	1.05	5.5	5.7	1.8
BMO-2008-9M	909255	11/05/08	7.89	21.4	444	54.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-9M	909255	02/26/09	7.71	24.5	482	28.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-10GU	909272	08/04/08	6.41	23.6	3660	2210	60	<2	0.13	0.16	<0.01	649	311	15.3	37.6	984	<2	<2	984	3810	3870	0.98	67.8	60.0	-6.1
BMO-2008-10GU	909272	11/05/08	6.15	20.2	3343	1890	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-10GU	909272	02/25/09	5.96	22.7	3426	1740	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-10GL	909435	08/20/08	6.22	29.5	2924	1320	30.0	<2	<0.02	<0.02	<0.01	579	167	10.5	90.5	870	<2	<2	870	2970	2720	1.09	46.0	46.9	1.0
BMO-2008-10GL	909435	11/05/08	6.47	25.3	2573	1290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-10GL	909435	02/25/09	6.34	26.8	2646	1180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-11G	909434	08/22/08	8.02	28.2	359	14.2	2.8	0.2	0.56	0.56	<0.01	10.7	5.1	1.7	64.2	149	14	<2	163	220	205	1.07	3.6	3.8	2.7
BMO-2008-11G	909434	11/12/08	7.96	24.2	257	13.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-11G	909434	02/26/09	7.92	25.1	319	12.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-13B	909551	10/03/08	6.49	21.6	2180	980	23	<0.2	1.92	1.92	<0.01	420	79.8	6.8	53.0	347	<2	<2	347	2040	1780	1.15	28.3	30.1	3.1
BMO-2008-13B	909551	02/17/09	6.51	20.9	1941	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BMO-2008-13M	909760	12/03/08	7.73	24.1	1463	494	20	0.7	0.02	0.02	<0.01	35.1	13.2	3.4	286	259	3	<2	262	970	1010	0.96	16.2	15.5	-2.2
BMO-2008-13M	909760	02/17/09	8.21	22.7	1340	441	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BURKE	212268	02/07/08	7.17	23.0	411	29.5	31.8	0.3	1.83	1.83	<0.01	62.3	22.8	2.8	26.0	212	<2	<2	212	360	311	1.16	5.9	6.2	2.5
BURKE	212268	04/22/08	7.13	27.0	423	26	11	0.2	2.88	2.88	<0.01	52.1	22.0	2.3	16.9	191	<2	<2	191	260	260	-	-	-	-
BURKE	212268	08/05/08	7.06	26.8	496	21.9	10	0.2	2.81	2.85	<0.01	52.5	22.3	2.3	16.1	187	<2	<2	187	260	250	1.04	4.6	5.2	6.1
BURKE	212268	10/20/08	7.57	26.0	466	20.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BURKE	212268	02/11/09	7.23	25.0	363	23.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CAMPBELL	215509	02/05/08	7.87	18.3	823	211	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHAMBERS	629807	03/06/08	7.73	17.8	408	7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHAMBERS	629807	05/05/08	7.15	22.1	421	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHAMBERS	629807	07/14/08	7.43	23.2	434	5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHAMBERS	629807	10/15/08	7.41	22.5	420	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHAMBERS	629807	01/27/09	7.57	21.5	312	5.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB MW-1	903992	02/22/08	6.93	21.2	1401	720	19.8	0.3	2.33	2.33	<0.01	257.0	64.5	7.7	56.5	206	11	<2	217	1360	1270	1.07	20.2	20.8	1.5
COB MW-1	903992	05/20/08	6.88	22.0	2050	980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB MW-1	903992	07/30/08	6.88	21.7	1780	730	19.8	0.1	2.50	2.50	<0.01	273	69.3	8.0	58.9	223	<2	<2	223	1500	1300	1.15	20.5	22.1	3.8
COB MW-1	903992	10/23/08	6.95	21.2	1690	750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB MW-1	903992	02/12/09	6.92	21.1	1313	750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB MW-2	903984	02/22/08	7.28	20.2	417	41	19.4	0.3	6.49	6.49	<0.01	66.4	9.0	2.1	25.5	156	12	<2	168	340	298	1.14	5.2	5.2	0.0
COB MW-2	903984	05/20/08	7.32	21.2	490	40.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB MW-2	903984	07/30/08	7.34	20.8	511	37.6	19.9	<0.1	6.80	6.80	<0.01	66.3	9.0	2.1	26.6	158	<2	<2	158	330	286	1.15	4.9	5.2	3.0
COB MW-2	903984	10/23/08	7.36	20.3	498	34.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB MW-2	903984	02/12/09	7.35	20.2	379	35.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB MW-3	906823	02/28/08	7.39	21.0	416	57.8	16.2	0.2	2.0	2.0	<0.01	62.2	8.9	2.2	25.5	159	<2	<2	159	300	277	1.08	5.0	5.0	0.0
COB MW-3	906823	03/27/08	-	-	-	57.7	16.5	0.301	-	2.04	-	-	9.13	2.65	25.0	158	158	<10	176	332	-	-	-	-	-
COB MW-3	906823	04/30/08	-	-	-	37.0	14.5	0.12	-	2.05	-	62.8	8.87	3.13	24.1	184	<10	<10	184	68	-	-	-	-	-
COB MW-3	906823	05/20/08	7.56	22.3	473	35.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB MW-3	906823	07/24/08	-	-	-	64.9	16.4	0.354	-	2.03	-	61.1	-	2.13	21.9	176	<10	<10	176	318	-	-	-	-	-
COB MW-3	906823	07/30/08	7.64	22.3	541	67.3	16.1	0.2	2.41	2.41	<0.01	66.1	9.2	2.4	26.5	149	<2	<2	149	320	288	1.11	5.0	5.2	2.0
COB MW-3	906823	10/09/08	-	-	-	52.5	17.0	0.463	-	1.83	-	60.7	8.55	2.68	23.1	162	<10	<10	162	355	-	-	-	-	-
COB MW-3	906823	10/23/08	7.43	20.8	507	76.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB MW-3	906823	02/12/09	7.35	21.1	432	112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB WL	593116	02/22/08	6.99	20.6	919	90	106	0.3	3.91	3.91	<0.01	128	34.3	7.2	47.8	269	11	<2	280	650	603	1.08	10.8	11.5	3.1
COB WL	593116	03/24/08	-	-	-	98.2	101	0.305	-	3.55	-	-	-	9.62	56.6	308	<10	<10	308	657	-	-	-	-	-
COB WL	593116	04/28/08	-	-	-	98.7	106.0	0.274	-	3.49	-	-	36.3	9.5	59.6	308	<10	<10	308	743	-	-	-	-	-
COB WL	593116	05/20/08	7.30	21.9	1053	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB WL	593116	07/30/08	7.17	22.0	1098	97.1	1																		

**TABLE 2**  
**Compilation of Analytical Results**  
**For Inorganic Analytes and Field Parameters**

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved	Chloride, dissolved	Fluoride, dissolved	Nitrate as N, dissolved	Nitrate/Nitrite as N, dissolved	Nitrite as N, dissolved	Calcium, dissolved	Magnesium, dissolved	Potassium, dissolved	Sodium, dissolved	Bicarbonate as CaCO3	Carbonate as CaCO3	Hydroxide as CaCO3	Total Alkalinity	Residue, Filterable (TDS) @ 180°C	TDS (calculated)	TDS Ratio (measured/calculated)	Sum of Anions (meq/L)	Sum of Cations (meq/L)	Cation-Anion Balance (%)
COOPER	623564	02/14/08	7.02	20.8	1892	33	17.5	0.3	2.82	2.82	<0.01	47.9	13.8	2.2	25.3	154	9	<2	163	270	254	1.06	4.6	4.7	1.1
COOPER	623564	05/14/08	8.08	22.1	419	34.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COOPER	623564	07/31/08	7.81	28.4	455	33.7	16.9	0.2	2.68	2.68	<0.01	48.9	13.3	2.1	24.6	150	7	<2	157	260	249	1.04	4.5	4.6	1.1
COOPER	623564	10/20/08	8.44	24.7	448	31.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COOPER	623564	02/11/09	7.32	19.2	333	34.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COOPER C	637069	03/20/08	6.93	21.3	2081	990	49	<0.1	3.09	3.10	0.01	393	59.8	6.0	45.0	229	<2	<2	229	1810	1690	1.07	27.0	26.7	0.6
COOPER C	637069	05/05/08	6.78	22.4	2139	990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COOPER C	637069	07/15/08	6.86	22.3	2162	1040	46.5	<0.1	3.24	3.24	<0.01	386	58.8	5.8	43.3	235	<2	<2	235	1860	1740	1.07	28.1	26.2	-3.5
COOPER C DUP	637069	07/15/08	6.86	22.3	2162	960	46.4	0.1	3.25	3.25	<0.01	398	61.7	6.1	46.2	234	<2	<2	234	1860	1670	1.11	26.4	27.2	1.5
COOPER C	637069	10/16/08	6.80	21.4	2078	1020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COOPER C	637069	01/27/09	6.92	20.5	1489	950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DODSON	644927	02/20/08	7.61	17.3	857	54	129	0.3	10.70	10.70	<0.01	111	37.5	12.3	41.2	252	14	<2	266	590	598	0.99	10.8	10.8	0.0
DODSON	644927	05/12/08	7.11	21.1	1118	34.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DODSON	644927	07/24/08	7.25	21.6	1233	49.3	160	0.2	13.1	13.1	<0.01	124	43.3	13.7	51.3	223	12	<2	235	740	646	1.15	11.2	12.4	5.1
DODSON	644927	10/13/08	7.15	20.5	1095	56.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DODSON	644927	01/22/09	7.20	20.4	892	51.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DURAZO	NR	02/10/09	7.22	18.8	848	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAST	599796	02/08/08	7.45	19.9	423	10.6	31.2	0.4	6.3	6.3	<0.01	59.9	24.3	2.5	31.6	227	<2	<2	227	320	325	0.98	6.1	6.4	2.4
EAST	599796	05/14/08	7.31	20.9	595	14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAST	599796	07/23/08	7.34	20.8	605	11.8	33.3	0.4	6.10	6.10	<0.01	59.5	24.4	2.4	31.4	217	6	<2	223	350	326	1.07	6.0	6.4	3.2
EAST	599796	10/14/08	7.33	20.3	531	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAST	599796	01/20/09	7.33	20.0	482	12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EN-02	NA	10/21/08	7.24	22.5	361	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EN-03	NA	10/21/08	7.39	23.9	346	8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EN-05	NA	10/21/08	7.43	22.4	391	6.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EN-06	NA	10/21/08	7.35	22.5	349	9.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPPELE 641	805641	03/11/08	7.98	21.4	646	21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPPELE 641	805641	05/12/08	7.21	21.7	667	24.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPPELE 641	805641	07/21/08	7.49	23.9	605	19.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPPELE 641	805641	10/14/08	7.56	20.4	642	21.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPPELE 641	805641	01/21/09	7.6	21.1	500	22.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FRANCO	500101	02/06/08	7.47	19.6	1301	670	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FRANCO	500101	05/05/08	6.93	23.1	1557	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FRANCO	500101	07/14/08	7.00	22.7	1586	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FRANCO	500101	10/15/08	7.20	20.5	1560	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FRANCO	500101	01/22/09	7.19	20.1	1178	740	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FULTZ	212447	02/27/08	6.76	21.1	1827	152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FULTZ 1	212447	04/21/08	6.74	22.0	1739	137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FULTZ 1	212447	05/14/08	6.88	22.3	1532	131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FULTZ 1	212447	06/23/08	6.74	22.0	1788	111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FULTZ 1	212447	07/29/08	6.74	22.2	1989	152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FULTZ 1	212447	08/28/08	M	21.6	1889	137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FULTZ 1	212447	09/23/08	6.82	21.9	1821	137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FULTZ	212447	10/22/08	6.80	21.4	1940	145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FULTZ	212447	01/21/09	6.74	21.2	1481	82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GALLANT	502527	02/11/08	7.46	20.2	604	17.9	12.7	0.2	3.0	3.04	<0.01	106	15.9	4.3	25.6	344	<2	<2	344	400	402	1.00	7.8	7.8	0.0
GALLANT	502527	07/23/08	7.26	21.2	925	20.9	56.9	0.1	19.2	19.2	<0.01	138	19.8	4.8	29.6	303	<2	<2	303	560	537	1.04	9.4	9.9	2.6
GARNER 557	558557	02/21/08	6.70	20.9	822	123	14.3	0.2	1.70	1.70	<0.01	62.2	10.2	2.5	58.1	171	13	<2	184	420	394	1.07	6.7	6.5	-1.5
GARNER 635	587635	02/04/08	7.61	22.7	479	37.8	13.7	0.2	1.68	1.69	0.01	39.2	8.2	2.8	65.0	182	<2	<2	182	290	284	1.02	4.9	5.5	5.8
GARNER 635	587635	05/05/08	7.26	24.9	468	35.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GARNER 635	587635	07/15/08	7.63	25.6	480	37.4	13.5	0.2	1.92	1.92	<0.01	37.6	7.8	2.5	60.2	163	16	<2	179	300	281	1.07	4.0	5.2	4.0
GARNER 635	587635	10/15/08	7.65	24.1	472	36.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GARNER 635	587635	01/28/09	7.69	23.4	368	37.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GGOOSE 547	628547	05/21/08	7.08	22.7	856	199	37.1	0.1	7.14	7.14	<0.01	113	32.9	5.5	25.6	194	<2	<2	194	600	561	1.07	9.6	9.6	0.0
GGOOSE 547	628547	08/15/08	7.02	24.8	915	178	35.4	0.1	8.90	8.90	<0.01	117	32.4	5.6	25.4	187	<2	<2	187	590	545	1.08	9.1	9.7	3.2
GGOOSE 547	628547	10/29/08	7.27	22.6	897	216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GGOOSE 547	628547	02/24/09	7.06	23.8	851	186	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GL 03	539782	03/04/08	7.43	25.7	417	20.3	20.3	<0.1	0.75	0.77	0.02	46.7	22.8	2.6	18.7	192	<2	<2	192	260	250	1.04	4.8	5.1	3.0
GL 03	539782	05/22/08	7.06	25.3	647	43.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GL 03	539782	08/04/08	7.10	26.8	673	36.1	21.4	<0.1	0.60	0.62	0.02	68.7	38.9	3.4	19.5	278	<2	<2	278	400	358	1.12	6.9	7.5	4.2
GL 03	539782	11/12/08	7.21	25.2	478	34.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GL 03	539782	02/26/09	7.05	26.5	603	54.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HOBAN	805290	02/27/08	6.93	22.1	1359	510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HOBAN	805290	05/07/08	6.88	22.3	1532	670	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HOBAN	805290	07/14/08	6.88	23.1	1719	690	-																		







**TABLE 2**  
**Compilation of Analytical Results**  
**For Inorganic Analytes and Field Parameters**

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved	Chloride, dissolved	Fluoride, dissolved	Nitrate as N, dissolved	Nitrate/Nitrite as N, dissolved	Nitrite as N, dissolved	Calcium, dissolved	Magnesium, dissolved	Potassium, dissolved	Sodium, dissolved	Bicarbonate as CaCO3	Carbonate as CaCO3	Hydroxide as CaCO3	Total Alkalinity	Residue, Filterable (TDS) @ 180°C	TDS (calculated)	TDS Ratio (measured/calculated)	Sum of Anions (meq/L)	Sum of Cations (meq/L)	Cation-Anion Balance (%)
TM-15 MILLER	522699	02/27/08	7.66	21.9	344	14	7.1	0.4	1.56	1.56	<0.01	32.9	18.0	2.0	32.4	181	2	<2	183	220	224	0.98	4.2	4.6	4.5
TM-15 MILLER	522699	05/23/08	7.54	22.1	371	14.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-15 MILLER	522699	08/05/08	7.42	23.3	413	13.7	7.0	0.3	1.99	1.99	<0.01	29.8	18.9	2.0	32.0	173	<2	<2	174	210	216	0.97	4.1	4.5	4.7
TM-15 MILLER	522699	10/28/08	7.63	22.6	387	18.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-15 MILLER DUP	522699	10/28/08	7.63	22.6	387	18.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-15 MILLER	522699	02/26/09	7.57	22.0	373	14.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-16	522578	03/05/08	7.17	20.6	1351	497	28.9	<0.1	6.80	6.90	<0.01	225	51.7	13.4	30.7	205	<2	<2	205	1030	1000	1.03	15.8	17.2	4.2
TM-16	522578	05/22/08	7.05	20.5	1304	522	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-16	522578	08/06/08	6.67	20.9	1410	466	28.1	<0.1	8.07	8.07	<0.01	215	52.7	13.3	30.0	191	<2	<2	191	1070	955	1.12	15.0	16.7	5.4
TM-16	522578	11/05/08	7.14	19.8	1162	547	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-16	522578	02/20/09	6.90	21.1	1292	492	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-19A	522581	03/06/08	8.02	22.2	240	56.1	15.4	0.1	0.26	0.26	<0.01	37.9	11.6	3.0	57.7	119	19	<2	138	280	273	1.03	4.3	5.4	11.3
TM-19A	522581	05/22/08	7.36	24.0	501	64.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-19A	522581	08/06/08	7.32	22.6	494	55.3	15.4	0.1	0.09	0.09	<0.01	37.3	10.8	2.9	53.0	153	5	<2	158	270	272	0.99	4.7	5.1	4.1
TM-19A	522581	11/18/08	7.79	24.3	365	66.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-19A	522581	03/03/09	7.41	24.5	489	66.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-42	562554	03/05/08	7.10	20.8	1342	482	27	0.2	6.55	6.55	<0.01	185	55.8	10.4	37.9	186	<2	<2	186	980	939	1.04	15.1	15.8	2.3
TM-42	562554	05/22/08	7.05	21.4	1270	483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-42	562554	08/06/08	6.69	22.0	1388	467	27.3	0.2	7.20	7.20	<0.01	191	60.7	10.1	38.7	208	<2	<2	208	1010	952	1.04	15.3	16.5	3.8
TM-42	562554	11/06/08	6.90	21.0	1025	477	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-42	562554	02/18/09	6.72	22.3	1245	429	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TM-43	564729	03/03/08	8.57	21.0	341	2.1	7.7	0.3	0.04	0.04	<0.01	10.1	5.7	2.2	79.4	197	20	<2	217	250	246	1.02	4.6	4.5	-1.1
TM-43	564729	08/04/08	8.14	25.7	436	<5	12.0	<1	0.25	0.25	<0.01	10.4	5.8	2.0	79.7	174	12	<2	186	270	227	1.19	4.0	4.5	5.9
TM-43A	564726	03/03/08	6.17	19.9	2788	1420	31	<0.2	0.99	0.99	<0.01	570	181	4.5	42.1	713	<2	<2	713	3000	2680	1.19	45.0	45.0	0.3
TM-43A	564726	08/04/08	6.03	21.6	3149	1320	30.0	<0.2	1.31	1.31	<0.01	577	188	4.7	40.5	658	<2	<2	658	2950	2560	1.15	41.8	46.2	5.0
TM-43B	565004	03/03/08	6.79	20.6	514	0.7	5	<0.1	0.05	0.06	0.01	54.6	23.8	2.9	47.9	338	<2	<2	338	350	338	1.04	6.9	6.8	-0.7
TM-43B	565004	08/05/08	6.89	21.0	507	31.8	4.7	<0.1	0.03	0.03	<0.01	47.5	21.5	2.6	44.9	231	<2	<2	231	300	292	1.03	5.4	6.1	6.1
TM-43B DUP	565004	08/05/08	6.89	21.0	507	32.5	4.7	<0.1	0.11	0.11	<0.01	47.9	21.7	2.5	44.9	234	<2	<2	234	310	295	1.05	5.5	6.2	6.0
TVI 236	802236	03/20/08	7.48	20.0	488	31.3	26	0.1	3.90	3.93	0.03	70.5	9.3	1.9	25.6	178	<2	<2	178	310	289	1.07	5.2	5.4	1.9
TVI 236	802236	05/07/08	7.13	20.4	494	32.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TVI 236	802236	07/15/08	7.39	21.9	532	37.6	23.5	0.2	3.46	3.46	<0.01	70.4	9.3	1.8	26.3	161	11	<2	173	310	292	1.06	5.1	5.4	2.9
TVI 236	802236	10/15/08	7.45	22.3	490	36.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TVI 236	802236	02/11/09	7.32	20.1	391	27.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TVI 875	568875	02/21/08	7.28	21.1	739	244	20.1	0.2	2.99	2.99	<0.01	120	16.1	2.9	41.1	161	11	<2	172	630	565	1.12	9.3	9.2	-0.5
TVI 875	568875	05/07/08	7.09	21.2	833	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TVI 875	568875	07/15/08	7.27	22.4	925	274	20.2	0.2	3.0	3.0	<0.01	131	17.4	2.8	39.6	148	11	<2	160	640.0	598	1.07	9.7	9.7	0.0
TVI 875	568875	10/15/08	7.26	22.1	878	245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TVI 875	568875	02/11/09	7.20	20.7	738	312	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UN-02	NA	10/14/08	7.63	22.6	356	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UN-03	NA	10/14/08	7.59	22.1	356	6.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UN-04	NA	10/14/08	7.39	21.4	376	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UN-05	NA	10/14/08	7.44	22.8	351	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WALKER	200393	02/13/08	7.05	20.2	650	20	4	0.2	2.26	2.26	<0.01	117	14.4	3.6	14.3	355	<2	<2	355	440	396	1.11	7.8	7.7	-0.6
WALKER	200393	07/23/08	7.25	20.7	740	45.4	37.8	0.3	7.24	7.24	<0.01	89	27.9	2.9	28.6	250	7	<2	257	450	421	1.07	7.6	8.0	2.6
WEED	544535	02/14/08	7.74	21.7	323	11.1	9	-	1.72	1.72	<0.02	35.6	14.5	2.2	30.0	162	5	<2	168	230	212	1.08	3.9	4.3	4.9
WEED	544535	05/15/08	7.22	22.7	365	12.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WEED	544535	07/30/08	7.42	32.0	407	11.5	10.1	0.3	1.92	1.92	<0.01	34.1	13.6	2.2	29.4	163	2	<2	165	230	209	1.10	3.9	4.1	2.5
WEED	544535	10/20/08	8.10	31.6	405	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WEED	544535	02/13/09	7.66	21.0	303	12.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WEISKOPF	641802	02/15/08	7.48	20.0	1072	500	33.1	0.2	4.74	4.74	<0.01	218	31.4	4.3	35.7	177	<2	<2	177	1010	950	1.06	15.3	15.2	-0.3
WEISKOPF	641802	05/07/08	7.10	21.8	1251	483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WEISKOPF	641802	07/16/08	7.07	22.2	1399	560	26.0	0.1	4.29	4.29	<0.01	248	34.3	4.4	38.6	170	3	<2	173	1060	1040	1.0	16.3	17.0	2.1
WEISKOPF	641802	10/28/08	6.98	20.8	1401	602	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WEISKOPF	641802	01/29/09	6.79	20.7	1014	503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZANDER	205126	02/04/08	7.24	19.7	392	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZANDER	205126	05/06/08	7.26	21.2	404	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZANDER	205126	07/16/08	6.92	22.9	441	6.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZANDER	205126	10/28/08	7.40	21.2	415	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZANDER	205126	02/10/09	7.5	20.4	317	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:  
All units are in milligrams per liter (mg/L) unless otherwise noted  
deg C = degrees Celsius  
meq/l = milliequivalent per liter  
EN = Ejido Naco, Sonora, Mexico  
M = pH Meter Malfunction  
NA = Not Applicable  
NR = No Record  
- = Not Analyzed  
ND = No Data  
SC = Specific Conductance  
SU = Standard Units  
TDS = Total Dissolved Solids  
UN = Urbano Naco, Sonora, Mexico  
µS/cm = microsiemens per centimeter  
<sup>1</sup> Verified drinking water supply well, sample collected for sulfate trend analysis for interim action evaluation

**TABLE 3**  
**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
ANDERSON	613396	601134.729	3468816.065	03/20/08	4580.34	145.46	4434.88
ANDERSON	613396	601134.729	3468816.065	05/05/08	4580.34	145.84	4434.50
ANDERSON	613396	601134.729	3468816.065	07/14/08	4580.34	146.16	4434.18
ANDERSON	613396	601134.729	3468816.065	10/15/08	4580.34	146.21	4434.13
ANDERSON	613396	601134.729	3468816.065	01/27/09	4580.34	145.97	4434.37
AWC-02 <sup>2</sup>	616586	598907.911	3468549.357	04/08/08	4547.64	116	4431.64
AWC-02	616586	598907.911	3468549.357	08/27/08	4547.64	121.12	4426.52
AWC-02 <sup>3</sup>	616586	598907.911	3468549.357	Oct-08	4547.64	115	4432.64
AWC-03 <sup>2</sup>	616585	599090.322	3468681.898	04/08/08	4539.52	112	4427.52
AWC-03	616585	599090.322	3468681.898	08/27/08	4539.52	119.40	4420.12
AWC-03 <sup>3</sup>	616585	599090.322	3468681.898	Oct-08	4539.52	106	4433.52
AWC-04 <sup>2</sup>	616584	598949.929	3468717.084	04/08/08	4540.48	108	4432.48
AWC-04	616584	598949.929	3468717.084	08/18/08	4540.48	112.56	4427.92
AWC-04 <sup>3</sup>	616584	598949.929	3468717.084	Oct-08	4540.48	111.31	4429.17
AWC-05 <sup>2</sup>	590620	599269.904	3468541.692	04/08/08	4542.51	284	4258.51
AWC-05	590620	599269.904	3468541.692	08/27/08	4542.51	299.65	4242.86
AWC-05 <sup>3</sup>	590620	599269.904	3468541.692	Oct-08	4542.51	284	4258.51
BANKS 987	647987	606981.921	3469206.175	02/27/08	4648.18	208.00	4440.18
BANKS 987	647987	606981.921	3469206.175	05/12/08	4648.18	216.30	4431.88
BANKS 987	647987	606981.921	3469206.175	07/21/08	4648.18	228.95	4419.23
BANKS 987	647987	606981.921	3469206.175	10/13/08	4648.18	228.20	4419.98
BANKS 987	647987	606981.921	3469206.175	01/21/09	4648.18	206.64	4441.54
BARTON 010	085010	606201.084	3469047.469	05/12/08	4688.95	227.50	4461.45
BARTON 010	085010	606201.084	3469047.469	07/23/08	4688.95	276.06	4412.89
BARTON 010	085010	606201.084	3469047.469	10/16/08	4688.95	Dry	<4372
BARTON 010	085010	606201.084	3469047.469	03/11/09	4688.95	Dry	<4372
BARTON 919	644919	606243.850	3469076.689	05/12/08	4692.36	113.71	4578.65
BARTON 919	644919	606243.850	3469076.689	07/23/08	4692.36	113.56	4578.80
BARTON 919	644919	606243.850	3469076.689	10/16/08	4692.36	113.20	4579.16
BARTON 919	644919	606243.850	3469076.689	03/11/09	4692.36	112.92	4579.44
BF-01	539783	604169.077	3472151.593	03/04/08	4835.23	348.99	4486.24
BF-01	539783	604169.077	3472151.593	05/23/08	4835.23	348.80	4486.43
BF-01	539783	604169.077	3472151.593	08/05/08	4835.23	348.66	4486.57
BF-01	539783	604169.077	3472151.593	11/05/08	4835.23	348.94	4486.29
BF-01	539783	604169.077	3472151.593	02/20/09	4835.23	348.78	4486.45

**TABLE 3**  
**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
BIMA	577927	606001.245	3471852.804	05/13/08	4802.05	367.31	4434.74
BIMA	577927	606001.245	3471852.804	08/18/08	4802.05	370.24	4431.81
BIMA	577927	606001.245	3471852.804	10/23/08	4802.05	353.96	4448.09
BIMA	577927	606001.245	3471852.804	01/20/09	4802.05	353.07	4448.98
BLOMMER	633472	602725.876	3471529.090	10/22/08	4753.69	300.78	4452.91
BMO-2008-1G	909474	606467.681	3471723.644	08/27/08	4805.10	62.05	4743.05
BMO-2008-1G	909474	606467.681	3471723.644	11/11/08	4805.10	60.95	4744.15
BMO-2008-1G	909474	606467.681	3471723.644	02/25/09	4805.10	61.43	4743.67
BMO-2008-3B	909147	602012.923	3467919.582	07/18/08	4583.97	138.05	4445.92
BMO-2008-3B	909147	602012.923	3467919.582	11/04/08	4583.97	137.95	4446.02
BMO-2008-3B	909147	602012.923	3467919.582	02/19/09	4583.97	138.19	4445.78
BMO-2008-4B	910096	601099.405	3468383.430	12/11/08	4573.17	130.77	4442.40
BMO-2008-4B	910096	601099.405	3468383.430	02/18/09	4573.17	130.58	4442.59
BMO-2008-5B	909653	600438.159	3468994.715	09/30/08	4585.10	145.10	4440.00
BMO-2008-5B	909653	600438.159	3468994.715	02/18/09	4585.10	144.35	4440.75
BMO-2008-5M	909552	600445.071	3468994.282	10/02/08	4585.02	146.65	4438.37
BMO-2008-5M	909552	600445.071	3468994.282	02/18/09	4585.02	145.97	4439.05
BMO-2008-6B	909146	600366.523	3469820.644	07/16/08	4627.44	190.13	4437.31
BMO-2008-6B	909146	600366.523	3469820.644	11/04/08	4627.44	190.23	4437.21
BMO-2008-6B	909146	600366.523	3469820.644	02/19/09	4627.44	189.71	4437.73
BMO-2008-6M	909019	600367.943	3469813.885	07/10/08	4626.90	191.63	4435.27
BMO-2008-6M	909019	600367.943	3469813.885	11/04/08	4626.90	190.25	4436.65
BMO-2008-6M	909019	600367.943	3469813.885	02/20/09	4626.90	190.70	4436.20
BMO-2008-7M	908794	603099.165	3470029.283	07/14/08	4688.33	238.31	4450.02
BMO-2008-7M	908794	603099.165	3470029.283	11/06/08	4688.33	239.69	4448.64
BMO-2008-7M	908794	603099.165	3470029.283	02/18/09	4688.33	238.90	4449.43
BMO-2008-8B	910097	604171.347	3471141.719	12/05/08	4753.25	297.94	4455.31
BMO-2008-8B	910097	604171.347	3471141.719	02/19/09	4753.25	297.63	4455.62
BMO-2008-8M	909711	604167.912	3471127.902	12/09/08	4752.45	299.79	4452.66
BMO-2008-8M	909711	604167.912	3471127.902	02/19/09	4752.45	298.32	4454.13
BMO-2008-9M	909255	604668.669	3471121.675	08/08/08	4762.61	287.17	4475.44
BMO-2008-9M	909255	604668.669	3471121.675	11/05/08	4762.61	287.65	4474.96
BMO-2008-9M	909255	604668.669	3471121.675	02/26/09	4762.61	285.65	4476.96
BMO-2008-10GU	909272	605267.551	3471731.866	08/04/08	4793.45	299.28	4494.17
BMO-2008-10GU	909272	605267.551	3471731.866	11/05/08	4793.45	295.89	4497.56

**TABLE 3**  
**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
BMO-2008-10GU	909272	605267.551	3471731.866	02/25/09	4793.45	289.84	4503.61
BMO-2008-10GL	909435	605264.072	3471702.043	08/20/08	4792.21	521.75	4270.46
BMO-2008-10GL	909435	605264.072	3471702.043	11/05/08	4792.21	520.50	4271.71
BMO-2008-10GL	909435	605264.072	3471702.043	02/25/09	4792.21	516.72	4275.49
BMO-2008-11G	909434	603800.995	3472626.482	08/22/08	4844.67	577.76	4266.91
BMO-2008-11G	909434	603800.995	3472626.482	11/12/08	4844.67	576.80	4267.87
BMO-2008-11G	909434	603800.995	3472626.482	02/26/09	4844.67	575.91	4268.76
BMO-2008-13B	909551	601657.612	3470076.358	10/03/08	4649.21	206.42	4442.79
BMO-2008-13B	909551	601657.612	3470076.358	02/17/09	4649.21	206.11	4443.10
BMO-2008-13M	909760	601650.495	3470040.455	12/03/08	4647.15	206.00	4441.15
BMO-2008-13M	909760	601650.495	3470040.455	02/17/09	4647.15	208.74	4438.41
BURKE	212268	602230.087	3473029.816	04/22/08	4856.30	606.55	4249.75
BURKE	212268	602230.087	3473029.816	08/05/08	4856.30	605.86	4250.44
BURKE	212268	602230.087	3473029.816	10/28/08	4856.30	604.88	4251.42
BURKE	212268	602230.087	3473029.816	02/19/09	4856.30	603.91	4252.39
CAMPBELL	215509	606420.836	3469320.340	02/05/08	4694.29	180.60	4513.69
CAMPBELL	215509	606420.836	3469320.340	05/13/08	4694.29	181.80	4512.49
CAMPBELL	215509	606420.836	3469320.340	10/16/08	4694.29	200.00	4494.29
COB MW-1	903992	603153.259	3469889.889	02/22/08	4683.26	232.47	4450.79
COB MW-1	903992	603153.259	3469889.889	05/20/08	4683.26	233.12	4450.14
COB MW-1	903992	603153.259	3469889.889	07/30/08	4683.26	233.37	4449.89
COB MW-1	903992	603153.259	3469889.889	10/23/08	4683.26	233.62	4449.64
COB MW-1	903992	603153.259	3469889.889	02/12/09	4683.26	234.05	4449.21
COB MW-2	903984	600973.257	3468114.836	02/22/08	4566.21	122.85	4443.36
COB MW-2	903984	600973.257	3468114.836	05/20/08	4566.21	123.00	4443.21
COB MW-2	903984	600973.257	3468114.836	07/30/08	4566.21	123.53	4442.68
COB MW-2	903984	600973.257	3468114.836	10/23/08	4566.21	124.02	4442.19
COB MW-2	903984	600973.257	3468114.836	02/12/09	4566.21	123.39	4442.82
COB MW-3	906823	599169.225	3468726.000	02/28/08	4538.63	120.84	4417.79
COB MW-3	906823	599169.225	3468726.000	05/20/08	4538.63	125.00	4413.63
COB MW-3	906823	599169.225	3468726.000	07/30/08	4538.63	118.50	4420.13
COB MW-3	906823	599169.225	3468726.000	10/23/08	4538.63	117.93	4420.70
COB MW-3	906823	599169.225	3468726.000	02/12/09	4538.63	110.91	4427.72
COB WL	593116	606357.506	3472502.012	02/22/08	4832.06	56.50	4775.56
COB WL	593116	606357.506	3472502.012	05/20/08	4832.06	57.50	4774.56

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**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
COB WL	593116	606357.506	3472502.012	07/30/08	4832.06	58.64	4773.42
COB WL	593116	606357.506	3472502.012	10/23/08	4832.06	58.76	4773.30
COB WL	593116	606357.506	3472502.012	02/12/09	4832.06	58.89	4773.17
COLLINS	565260	602551.286	3471341.335	02/12/08	4733.72	289.47	4444.25
COLLINS	565260	602551.286	3471341.335	05/29/08	4733.72	288.53	4445.19
COLLINS	565260	602551.286	3471341.335	07/31/08	4733.72	290.08	4443.64
COLLINS	565260	602551.286	3471341.335	10/20/08	4733.72	290.15	4443.57
COLLINS	565260	602551.286	3471341.335	02/11/09	4733.72	290.71	4443.01
COOPER C	637069	601349.987	3468913.011	03/04/08	4595.06	155.08	4439.98
COOPER C	637069	601349.987	3468913.011	05/05/08	4595.06	155.34	4439.72
COOPER C	637069	601349.987	3468913.011	07/15/08	4595.06	156.01	4439.05
COOPER C	637069	601349.987	3468913.011	10/16/08	4595.06	155.85	4439.21
COOPER C	637069	601349.987	3468913.011	01/27/09	4595.06	155.62	4439.44
DODSON	644927	605594.560	3469063.772	05/12/08	4686.34	81.38	4604.96
DODSON	644927	605594.560	3469063.772	07/24/08	4686.34	82.20	4604.14
DODSON	644927	605594.560	3469063.772	10/13/08	4686.34	81.82	4604.52
DODSON	644927	605594.560	3469063.772	01/22/09	4686.34	82.33	4604.01
DOUGLASS 791	592791	607632.993	3470222.677	02/13/08	4703.27	22.11	4681.16
DOUGLASS 791	592791	607632.993	3470222.677	05/13/08	4703.27	24.60	4678.67
DOUGLASS 791	592791	607632.993	3470222.677	07/22/08	4703.27	27.00	4676.27
DOUGLASS 791	592791	607632.993	3470222.677	10/16/08	4703.27	23.60	4679.67
DOUGLASS 791	592791	607632.993	3470222.677	01/19/09	4703.27	26.51	4676.76
DOUGLASS 792	592792	607607.541	3469829.115	02/13/08	4681.73	87.76	4593.97
DOUGLASS 792	592792	607607.541	3469829.115	05/13/08	4681.73	87.21	4594.52
DOUGLASS 792	592792	607607.541	3469829.115	07/22/08	4681.73	86.90	4594.83
DOUGLASS 792	592792	607607.541	3469829.115	10/16/08	4681.73	86.45	4595.28
DOUGLASS 792	592792	607607.541	3469829.115	01/20/09	4681.73	86.26	4595.47
EAST	599796	607076.365	3468712.215	02/08/08	4626.01	50.20	4575.81
EAST	599796	607076.365	3468712.215	05/14/08	4626.01	52.45	4573.56
EAST	599796	607076.365	3468712.215	07/23/08	4626.01	52.16	4573.85
EAST	599796	607076.365	3468712.215	10/14/08	4626.01	52.19	4573.82
EAST	599796	607076.365	3468712.215	01/20/09	4626.01	50.52	4575.49
EPPELE 641	805641	607165.354	3469229.942	03/11/08	4642.86	29.52	4613.34
EPPELE 641	805641	607165.354	3469229.942	05/12/08	4642.86	30.64	4612.22
EPPELE 641	805641	607165.354	3469229.942	07/21/08	4642.86	25.59	4617.27

**TABLE 3**  
**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
EPPELE 641	805641	607165.354	3469229.942	10/14/08	4642.86	24.53	4618.33
EPPELE 641	805641	607165.354	3469229.942	01/21/09	4642.86	27.35	4615.51
FLEMING	218386	605565.701	3469342.523	02/18/09	4693.68	299.30	4394.38
FULTZ	212447	607153.306	3469063.892	10/22/08	4642.92	40.59	4602.33
FULTZ	212447	607153.306	3469063.892	01/21/09	4642.92	40.66	4602.26
GALLANT	502527	607769.640	3468524.363	02/11/08	4599.58	28.32	4571.26
GALLANT	502527	607769.640	3468524.363	07/23/08	4599.58	33.05	4566.53
GALLANT	502527	607769.640	3468524.363	10/16/08	4599.58	30.70	4568.88
GALLANT	502527	607769.640	3468524.363	03/03/09	4599.58	31.59	4567.99
GARNER 557	558557	602659.240	3468962.415	02/21/08	4626.44	191.05	4435.39
GARNER 557	558557	602659.240	3468962.415	05/05/08	4626.44	191.28	4435.16
GARNER 557	558557	602659.240	3468962.415	07/15/08	4626.44	191.44	4435.00
GARNER 557	558557	602659.240	3468962.415	10/16/08	4626.44	191.83	4434.61
GARNER 557	558557	602659.240	3468962.415	01/28/09	4626.44	191.92	4434.52
GARNER 635	587635	602665.352	3468967.902	02/04/08	4628.29	193.20	4435.09
GARNER 635	587635	602665.352	3468967.902	05/05/08	4628.29	195.90	4432.39
GARNER 635	587635	602665.352	3468967.902	07/15/08	4628.29	193.58	4434.71
GARNER 635	587635	602665.352	3468967.902	10/15/08	4628.29	194.35	4433.94
GARNER 635	587635	602665.352	3468967.902	01/28/09	4628.29	194.80	4433.49
GGOOSE 547	628547	606256.657	3469820.260	05/21/08	4717.11	220.91	4496.20
GGOOSE 547	628547	606256.657	3469820.260	08/15/08	4717.11	238.48	4478.63
GGOOSE 547	628547	606256.657	3469820.260	10/29/08	4717.11	235.90	4481.21
GGOOSE 547	628547	606256.657	3469820.260	02/24/09	4717.11	236.13	4480.98
GL-03	539782	604386.940	3473747.943	05/22/08	4924.31	660.15	4264.16
GL-03	539782	604386.940	3473747.943	08/04/08	4924.31	659.79	4264.52
GL-03	539782	604386.940	3473747.943	12/02/08	4924.31	658.25	4266.06
GL-03	539782	604386.940	3473747.943	02/26/09	4924.31	658.62	4265.69
GOAR RANCH	610695	602454.751	3468892.471	02/21/08	4631.13	183.90	4447.23
GOAR RANCH	610695	602454.751	3468892.471	05/05/08	4631.13	188.11	4443.02
GOAR RANCH	610695	602454.751	3468892.471	07/16/08	4631.13	184.41	4446.72
GOAR RANCH	610695	602454.751	3468892.471	10/22/08	4631.13	184.68	4446.45
GOAR RANCH	610695	602454.751	3468892.471	01/27/09	4631.13	184.87	4446.26
HOBAN	805290	601705.848	3468880.329	02/27/08	4597.21	163.05	4434.16
HOBAN	805290	601705.848	3468880.329	05/07/08	4597.21	163.28	4433.93
HOBAN	805290	601705.848	3468880.329	07/14/08	4597.21	163.87	4433.34

**TABLE 3**  
**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
HOBAN	805290	601705.848	3468880.329	10/16/08	4597.21	163.95	4433.26
HOBAN	805290	601705.848	3468880.329	01/28/09	4597.21	163.82	4433.39
HOWARD	NR	601281.936	3468768.622	03/04/08	4589.70	150.10	4439.60
HOWARD	NR	601281.936	3468768.622	05/08/08	4589.70	150.70	4439.00
HOWARD	NR	601281.936	3468768.622	07/14/08	4589.70	150.91	4438.79
HOWARD	NR	601281.936	3468768.622	10/15/08	4589.70	151.12	4438.58
HOWARD	NR	601281.936	3468768.622	10/15/08	4589.70	150.67	4439.03
HOWARD	NR	601281.936	3468768.622	01/28/09	4589.70	150.67	4439.03
KEEFER	209744	599879.175	3468119.015	02/06/08	4572.03	134.67	4437.36
KEEFER	209744	599879.175	3468119.015	05/06/08	4572.03	135.28	4436.75
KEEFER	209744	599879.175	3468119.015	07/16/08	4572.03	136.24	4435.79
KEEFER	209744	599879.175	3468119.015	10/28/08	4572.03	135.87	4436.16
KEEFER	209744	599879.175	3468119.015	01/28/09	4572.03	134.88	4437.15
MCCONNELL 265	539265	601463.094	3468840.139	02/20/08	4600.70	156.15	4444.55
MCCONNELL 265	539265	601463.094	3468840.139	05/06/08	4600.70	156.40	4444.30
MCCONNELL 265	539265	601463.094	3468840.139	07/15/08	4600.70	157.07	4443.63
MCCONNELL 265	539265	601463.094	3468840.139	11/19/08	4600.70	157.17	4443.53
MCCONNELL 265	539265	601463.094	3468840.139	01/28/09	4600.70	156.70	4444.00
METZLER	35-71891	602091.308	3471381.176	03/05/08	4728.53	288.30	4440.23
METZLER	35-71891	602091.308	3471381.176	05/15/08	4728.53	286.53	4442.00
METZLER	35-71891	602091.308	3471381.176	07/31/08	4728.53	286.82	4441.71
METZLER	35-71891	602091.308	3471381.176	10/20/08	4728.53	287.09	4441.44
METZLER	35-71891	602091.308	3471381.176	02/11/09	4728.53	287.74	4440.79
MINOR 317	633317	601172.150	3468568.043	02/12/08	4578.86	135.30	4443.56
NESS	509127	607866.391	3471419.494	07/24/08	4761.23	557.90	4203.33
NESS	509127	607866.391	3471419.494	10/16/08	4761.23	549.30	4211.93
NESS	509127	607866.391	3471419.494	02/25/09	4761.23	536.40	4224.83
NOTEMAN	212483	606053.800	3471576.400	05/13/08	4800.68	339.77	4460.91
NOTEMAN	212483	606053.800	3471576.400	08/27/08	4800.68	344.34	4456.34
NOTEMAN	212483	606053.800	3471576.400	11/22/08	4800.68	322.26	4478.42
NOTEMAN	212483	606053.800	3471576.400	02/25/09	4800.68	327.54	4473.14
NWC-02	562944	600241.741	3476722.828	10/27/08	4600.44	160.51	4439.93
NWC-03	203321	601153.857	3468350.838	11/03/08	4574.99	131.48	4443.51
NWC-03 CAP	627684	601153	3468350	02/02/09	4572	130.03	4441.97
NWC-04	551849	605829.808	3469071.959	12/02/08	4690.77	352.11	4338.66



**TABLE 3**  
**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
OSBORN	643436	607031.823	3470270.548	05/13/08	4711.95	68.65	4643.30
OSBORN	643436	607031.823	3470270.548	08/05/08	4711.95	69.53	4642.42
OSBORN	643436	607031.823	3470270.548	10/16/08	4711.95	69.83	4642.12
OSBORN	643436	607031.823	3470270.548	01/20/09	4711.95	69.23	4642.72
PANAGAKOS	35-76413	605304.234	3469323.140	01/22/09	4691.40	155.28	4536.12
PARRA	576415	602170.716	3471263.549	05/15/08	4727.21	279.78	4447.43
PARRA	576415	602170.716	3471263.549	08/18/08	4727.21	280.06	4447.15
PARRA	576415	602170.716	3471263.549	11/03/08	4727.21	280.39	4446.82
PARRA	576415	602170.716	3471263.549	02/13/09	4727.21	280.75	4446.46
PIONKE	613395	601045.471	3468960.981	07/17/08	4592.13	149.88	4442.25
PIONKE	613395	601045.471	3468960.981	11/03/08	4592.13	150.99	4441.14
PIONKE	613395	601045.471	3468960.981	02/25/09	4592.13	149.68	4442.45
POOL	509518	599683.603	3470013.823	02/20/08	4639.09	204.22	4434.87
POOL	509518	599683.603	3470013.823	05/19/08	4639.09	204.72	4434.37
POOL	509518	599683.603	3470013.823	07/31/08	4639.09	205.56	4433.53
POOL	509518	599683.603	3470013.823	10/21/08	4639.09	205.06	4434.03
POOL	509518	599683.603	3470013.823	02/13/09	4639.09	204.74	4434.35
POWER	624535	608379.424	3472738.941	02/12/08	4840.37	42.30	4798.07
POWER	624535	608379.424	3472738.941	07/22/08	4840.37	42.82	4797.55
POWER	624535	608379.424	3472738.941	10/21/08	4840.37	32.66	4807.71
POWER	624535	608379.424	3472738.941	03/03/09	4840.37	44.31	4796.06
RAMIREZ	216425	599730.649	3467584.363	10/27/08	4596.61	159.45	4437.16
RAMIREZ	216425	599730.649	3467584.363	01/29/09	4596.61	158.74	4437.87
RAY	803772	607083.422	3469195.147	02/15/08	4647.91	40.85	4607.06
RAY	803772	607083.422	3469195.147	05/13/08	4647.91	43.82	4604.09
RAY	803772	607083.422	3469195.147	07/29/08	4647.91	45.25	4602.66
RAY	803772	607083.422	3469195.147	10/22/08	4647.91	44.54	4603.37
RAY	803772	607083.422	3469195.147	01/20/09	4647.91	44.31	4603.60
ROGERS E	216018	600449.648	3467636.029	07/17/08	4590.66	149.65	4441.01
ROGERS E	216018	600449.648	3467636.029	11/03/08	4590.66	150.15	4440.51
ROGERS E	216018	600449.648	3467636.029	02/10/09	4590.66	149.02	4441.64
ROGERS 803	641803	600977.690	3468417.386	02/07/08	4579.02	129.85	4449.17
ROGERS 803	641803	600977.690	3468417.386	07/29/08	4579.02	131.86	4447.16
ROGERS 803	641803	600977.690	3468417.386	10/22/08	4579.02	132.08	4446.94
ROGERS 803	641803	600977.690	3468417.386	02/10/09	4579.02	130.62	4448.40

**TABLE 3**  
**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
RUIZ	531770	602857.357	3471424.219	02/05/08	4735.18	293.29	4441.89
RUIZ	531770	602857.357	3471424.219	05/15/08	4735.18	293.57	4441.61
RUIZ	531770	602857.357	3471424.219	07/30/08	4735.18	293.86	4441.32
RUIZ	531770	602857.357	3471424.219	10/20/08	4735.18	294.18	4441.00
RUIZ	531770	602857.357	3471424.219	02/12/09	4735.18	294.62	4440.56
SCHWARTZ	210865	600811.529	3468268.057	02/08/08	4551.58	121.80	4429.78
SCHWARTZ	210865	600811.529	3468268.057	05/19/08	4551.58	123.49	4428.09
SCHWARTZ	210865	600811.529	3468268.057	07/29/08	4551.58	122.64	4428.94
SCHWARTZ	210865	600811.529	3468268.057	10/22/08	4551.58	123.39	4428.19
SCHWARTZ	210865	600811.529	3468268.057	01/29/09	4551.58	122.87	4428.71
SRC	211345	599723.300	3472505.400	04/23/08	4807.37	541.10	4266.27
SRC	211345	599723.300	3472505.400	08/05/08	4807.37	543.70	4263.67
SRC	211345	599723.300	3472505.400	10/16/08	4807.37	545.15	4262.22
SRC	211345	599723.300	3472505.400	02/26/09	4807.37	543.83	4263.54
STEPHENS	808560	606981.766	3469072.799	05/13/08	4651.22	44.94	4606.28
STEPHENS	808560	606981.766	3469072.799	08/05/08	4651.22	46.61	4604.61
STEPHENS	808560	606981.766	3469072.799	10/16/08	4651.22	46.60	4604.62
STEPHENS	808560	606981.766	3469072.799	01/21/09	4651.22	47.19	4604.03
SUNBELT	201531	605998.250	3471735.149	02/06/08	4806.52	352.10	4454.42
SUNBELT	201531	605998.250	3471735.149	05/15/08	4806.52	358.97	4447.55
SUNBELT	201531	605998.250	3471735.149	08/05/08	4806.52	Dry	<4426
SUNBELT	201531	605998.250	3471735.149	10/16/08	4806.52	347.00	4459.52
SUNBELT	201531	605998.250	3471735.149	01/21/09	4806.52	344.78	4461.74
SWAN	NR	607378.547	3470648.298	02/13/08	4716.59	26.50	4690.09
SWAN	NR	607378.547	3470648.298	05/14/08	4716.59	30.69	4685.90
SWAN	NR	607378.547	3470648.298	07/24/08	4716.59	32.06	4684.53
SWAN	NR	607378.547	3470648.298	10/16/08	4716.59	27.53	4689.06
SWAN	NR	607378.547	3470648.298	01/20/09	4716.59	29.77	4686.82
TM-02A	522574	604152.059	3472008.794	03/04/08	4808.43	346.62	4461.81
TM-02A	522574	604152.059	3472008.794	05/23/08	4808.43	346.16	4462.27
TM-02A	522574	604152.059	3472008.794	08/15/08	4808.43	353.91	4454.52
TM-02A	522574	604152.059	3472008.794	10/30/08	4808.43	349.45	4458.98
TM-02A	522574	604152.059	3472008.794	02/24/09	4808.43	348.64	4459.79
TM-03	522575	606366.130	3473711.046	03/12/08	4897.85	127.14	4770.71
TM-03	522575	606366.130	3473711.046	05/20/08	4897.85	127.40	4770.45

**TABLE 3**  
**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
TM-03	522575	606366.130	3473711.046	08/06/08	4897.85	128.02	4769.83
TM-03	522575	606366.130	3473711.046	11/12/08	4897.85	128.00	4769.85
TM-03	522575	606366.130	3473711.046	02/26/09	4897.85	126.94	4770.91
TM-06 MILLER	522695	606055.975	3468376.658	02/26/08	4707.88	158.78	4549.10
TM-06 MILLER	522695	606055.975	3468376.658	05/20/08	4707.88	158.76	4549.12
TM-06 MILLER	522695	606055.975	3468376.658	08/04/08	4707.88	158.80	4549.08
TM-06 MILLER	522695	606055.975	3468376.658	10/29/08	4707.88	158.85	4549.03
TM-06 MILLER	522695	606055.975	3468376.658	02/16/09	4707.88	159.28	4548.60
TM-14 NELSON	522816	599624.302	3470111.613	02/08/08	4643.48	211.79	4431.69
TM-14 NELSON	522816	599624.302	3470111.613	07/16/08	4643.48	Dry	<4433
TM-15 MILLER	522699	599617.331	3471427.504	02/26/09	4729.26	295.11	4434.15
TM-16	522578	605588.075	3469842.199	03/05/08	4717.71	81.00	4636.71
TM-16	522578	605588.075	3469842.199	05/22/08	4717.71	81.24	4636.47
TM-16	522578	605588.075	3469842.199	08/06/08	4717.71	81.65	4636.06
TM-16	522578	605588.075	3469842.199	11/05/08	4717.71	81.75	4635.96
TM-16	522578	605588.075	3469842.199	02/26/09	4717.71	81.88	4635.83
TM-19A	522581	602458.710	3469197.426	03/06/08	4645.87	199.85	4446.02
TM-19A	522581	602458.710	3469197.426	05/22/08	4645.87	199.50	4446.37
TM-19A	522581	602458.710	3469197.426	08/06/08	4645.87	199.19	4446.68
TM-19A	522581	602458.710	3469197.426	11/18/08	4645.87	199.46	4446.41
TM-19A	522581	602458.710	3469197.426	03/03/09	4645.87	199.81	4446.06
TM-42	562554	603698.271	3469104.903	03/05/08	4666.67	211.04	4455.63
TM-42	562554	603698.271	3469104.903	05/22/08	4666.67	210.98	4455.69
TM-42	562554	603698.271	3469104.903	08/06/08	4666.67	211.55	4455.12
TM-42	562554	603698.271	3469104.903	11/06/08	4666.67	207.05	4459.62
TM-42	562554	603698.271	3469104.903	02/18/09	4666.67	212.31	4454.36
TM-43	564729	605365.062	3474670.811	03/03/08	4971.44	149.05	4822.39
TM-43	564729	605365.062	3474670.811	08/04/08	4971.44	148.70	4822.74
TM-43	564729	605365.062	3474670.811	10/30/08	4971.44	148.72	4822.72
TM-43A	564726	605358.451	3474661.168	03/03/08	4969.95	133.71	4836.24
TM-43A	564726	605358.451	3474661.168	08/04/08	4969.95	133.71	4836.24
TM-43A	564726	605358.451	3474661.168	10/30/08	4969.95	133.46	4836.49
TM-43B	565004	605814.018	3474379.892	03/03/08	4922.18	64.00	4858.18
TM-43B	565004	605814.018	3474379.892	08/05/08	4922.18	65.21	4856.97
TM-43B	565004	605814.018	3474379.892	10/30/08	4922.18	62.89	4859.29

**TABLE 3**  
**Compilation of Groundwater Elevation Data**

Well Name	ADWR 55 Registry No.	UTM East	UTM North	Date	Measuring Point Elevation <sup>1</sup> (ft amsl)	Depth To Water (feet)	Groundwater Elevation (ft amsl)
TVI 236	802236	600552.215	3467978.431	05/07/08	4561.98	123.30	4438.68
TVI 236	802236	600552.215	3467978.431	07/15/08	4561.98	121.55	4440.43
TVI 236	802236	600552.215	3467978.431	10/15/08	4561.98	122.35	4439.63
TVI 236	802236	600552.215	3467978.431	02/11/09	4561.98	121.28	4440.70
TVI 713	567713	600729.095	3468412.946	05/07/08	4567.22	127.10	4440.12
TVI 713	567713	600729.095	3468412.946	07/14/08	4567.22	126.30	4440.92
TVI 713	567713	600729.095	3468412.946	10/15/08	4567.22	130.00	4437.22
TVI 713	567713	600729.095	3468412.946	02/11/09	4567.22	149.87	4417.35
WALKER	200393	607564.689	3468577.472	02/13/08	4601.55	25.20	4576.35
WALKER	200393	607564.689	3468577.472	07/23/08	4601.55	42.65	4558.90
WALKER	200393	607564.689	3468577.472	10/21/08	4601.55	47.18	4554.37
WALKER	200393	607564.689	3468577.472	03/03/09	4601.55	28.19	4573.36
WEISKOPF	641802	601154.951	3468658.855	02/15/08	4586.89	143.31	4443.58
WEISKOPF	641802	601154.951	3468658.855	05/07/08	4586.89	143.90	4442.99
WEISKOPF	641802	601154.951	3468658.855	07/16/08	4586.89	144.22	4442.67
WEISKOPF	641802	601154.951	3468658.855	10/28/08	4586.89	145.81	4441.08
WEISKOPF	641802	601154.951	3468658.855	01/29/09	4586.89	143.99	4442.90
ZANDER	205126	599678.880	3467998.486	02/04/08	4580.94	144.85	4436.09
ZANDER	205126	599678.880	3467998.486	05/06/08	4580.94	145.33	4435.61
ZANDER	205126	599678.880	3467998.486	07/16/08	4580.94	146.40	4434.54
ZANDER	205126	599678.880	3467998.486	10/28/08	4580.94	146.01	4434.93
ZANDER	205126	599678.880	3467998.486	02/10/09	4580.94	144.83	4436.11

**Notes:**

*UTM = Universal Transverse Mercator Zone 12, North American Datum 1983 (NAD83)*

*ft amsl = feet above mean sea level*

*NA = Not Applicable*

*NR = No Record*

<sup>1</sup> *Survey Source: Hydro Geo Chem, Inc. (measuring point elevation = top of well casing)*

<sup>2</sup> *Measuring point elevation for third quarter 2008 changed to reflect well survey completed in September 2008*

<sup>3</sup> *Depth to Water measurement provided by Arizona Water Company*

**TABLE 4**  
**Well Completion Depth, Screen Interval and Screened Lithology**

Well Name	ADWR 55 Registry No.	Top of Casing Elevation (ft amsl)	Casing Depth (ft bgs)	Screen Interval (ft bgs)	Screened Formation Lithology	Depth to Bedrock (ft bgs)	Comment
ANDERSON	613396	4580.34	236	ND	QTbf	ND	No Log
AWC-02	616585	4547.64	330	100-215	QTbf	NA	Geologic Log
AWC-03	616585	4539.52	269	83-269	QTbf	NA	Geologic Log
AWC-04	590620	4540.38	250	ND	QTbf	NA	Geologic Log
AWC-05	590620	4542.51	1183	163-603 623-1163	UBG / Volcanics	400	Geologic Log
BANKS 986	647986	ND	445	ND	UBG <sup>2</sup>	31	No Log
BANKS 987	647987	4648.18	339	ND	UBG <sup>2</sup>	ND	No Log
BARTON 010	085010	4688.95	300	180-300	UBG <sup>2,3</sup>	ND	Geologic Log
BARTON 919	644919	4692.36	130	ND	QTbf <sup>2</sup>	NA	Geologic Log
BF-01	539783	4835.23	400	325-385	QTbf / UBG	350	Geologic Log
BIMA	577927	4802.05	465	345-465	UBG <sup>2,3</sup>	ND	Red Rock, Red Shale
BLOMMER	633472	4753.69	380	ND	UBG <sup>2</sup>	245	No Log
BMO-2008-1G	909474	4805.10	310	180-300	Kg	50	Geologic Log
BMO-2008-3B	909147	4583.97	260	150-250	QTbf	470	Geologic Log
BMO-2008-4B	910096	4573.17	610	500-600	QTbf	636	Geologic Log
BMO-2008-5B	909653	4585.10	285	140-280	QTbf	NA	Geologic Log
BMO-2008-5M	909552	4585.02	450	340-440	UBG	290	Geologic Log
BMO-2008-6B	909146	4627.44	265	195-255	QTbf	NA	Geologic Log
BMO-2008-6M	909019	4626.90	450	340-440	UBG	240	Geologic Log
BMO-2008-7M	908794	4688.33	670	560-660	UBG	490	Geologic Log
BMO-2008-8B	910097	4753.25	480	370-470	QTbf	NA	Geologic Log
BMO-2008-8M	909711	4752.45	1210	1100-1200	UBG	495	Geologic Log
BMO-2008-9M	909255	4762.61	775	665-765	UBG	130	Geologic Log
BMO-2008-10GU	909272	4793.45	449	239-439	Kg	130	Geologic Log
BMO-2008-10GL	909435	4792.21	810	700-800	Kg	110	Geologic Log
BMO-2008-11G	909434	4844.67	760	650-750	Kg	240	Geologic Log
BMO-2008-13B	909551	4649.21	474	264-464	QTbf	520	Geologic Log
BMO-2008-13M	909760	4647.15	1030	920-1020	UBG	520	Geologic Log
BULLARD	602134	4730 <sup>3</sup>	300	215-300	QTbf	NA	No Log
BURKE	212268	4856.30	781	661-781	UBG	150	Red shale
CAMPBELL	215509	4694.29	350	20-350	UBG <sup>2,3</sup>	ND	No Log
CHAMBERS	629807	ND	245	ND	QTbf	NA	No Log
COB MW-1	903992	4883.26	420	350-410	QTbf	NA	Geologic Log
COB MW-2	903984	4566.21	170	92-152	QTbf	NA	Geologic Log
COB MW-3	906823	4538.63	269	83-269	QTbf	NA	Geologic Log
COB WL	593116	4832.06	150	90-150	UBG <sup>2,3</sup>	36	Geologic Log
COLLINS	565260	4733.72	320	260-320	UBG <sup>2</sup>	ND	Conglomerate
COOPER	623564	ND	325	ND	QTbf	NA	No Log
COOPER C	637069	4595.06	220	ND	QTbf	NA	No Log
DODSON	644927	4686.34	200	ND	UBG	ND	No Log
DOUGLASS 791	592791	4703.27	200	0-200	Kg <sup>2,3</sup>	4	Conglomerate
DOUGLASS 792	529792	4681.73	200	0-200	Kg <sup>2,3</sup>	4	Conglomerate
EAST	599796	4626.01	125	85-125	UBG <sup>2</sup>	20	Geologic Log
EPPELE 641	805641	4642.86	265	ND	UBG <sup>2</sup>	ND	Geologic Log
FLEMING	218386	4693.68	400	ND	ND	ND	No Log

**TABLE 4**  
**Well Completion Depth, Screen Interval and Screened Lithology**

Well Name	ADWR 55 Registry No.	Top of Casing Elevation (ft amsl)	Casing Depth (ft bgs)	Screen Interval (ft bgs)	Screened Formation Lithology	Depth to Bedrock (ft bgs)	Comment
FRANCO	500101	4620.51 <sup>3</sup>	200	180-200	QTbf	NA	Geologic Log
FULTZ	212447	4642.92	300	200-300	UBG <sup>2,3</sup>	10	Sand, Volcanic
GALLANT	502527	4599.58	190	40-60 80-140	UBG <sup>2,3</sup>	5	Brown and Red Sandstone
GARNER 557	558557	4626.44	300	180-300	QTbf	NA	Geologic Log
GARNER 635	587635	4628.29	680	580-660	UBG	540	Geologic Log
GGOOSE 546	628546	4700.51 <sup>3</sup>	430	ND	UBG <sup>2</sup>	ND	No Log
GGOOSE 547	628547	4717.11	800	ND	UBG <sup>2</sup>	ND	No Log
GL-03	539782	4924.31	820	780-820	Kg <sup>3</sup>	175	Geologic Log
GOAR RANCH	610695	4631.13	250	ND	QTbf	NA	No Log
HOBAN	805290	4597.21	316	ND	QTbf	NA	No Log
HOWARD	NR	4589.70	200	ND	QTbf	NA	No ADWR Record
KEEFER	209744	4572.03	245	185-245	QTbf	NA	Geologic Log
MCCONNELL 265	539265	4600.7	216	174-216	QTbf	NA	Geologic Log
METZLER	35-71891	4728.53	351	245-345	UBG <sup>2</sup>	ND	No Log
MINOR 317	063317	4578.86	155	ND	QTbf	NA	No Log
MOORE	538847	ND	220	180-220	QTbf	NA	Geologic Log
MOROYOQUI	647847	ND	285	ND	ND	ND	No Log
NESS	509127	4761.23	812	20-812 <sup>5</sup>	UBG	20	Limestone, Shale and Sandstone
NOTEMAN	212483	4800.68	400	0-400	UBG <sup>2</sup>	ND	No Log
NSD-02	527587	4527 <sup>5</sup>	120	75-115	QTbf	NA	Geologic Log
NSD-03	527586	4515 <sup>5</sup>	100	55-95	QTbf	NA	Geologic Log
NWC-01	627682	ND	215	ND	QTbf	NA	Geologic Log
NWC-02	562944	4600.06	312	212-312	QTbf	NA	Geologic Log
NWC-03	203321	4574.99	312	252-312	QTbf	NA	Geologic Log
NWC-04	551849	4690.77	795	540-580 755/795	UBG	NA	Geologic Log
NWC-05	627696	4687.71	175	ND	QTbf	NA	Geologic Log
NWC-06	575700	4592.50	410	180-340	QTbf	NA	Geologic Log
OSBORN	643436	4711.95	258	122-258	Kg	150	Geologic Log
PALMER	578819	ND	220	200-220	UBG <sup>2,3</sup>	80	Geologic Log
PANAGAKOS	35-76413	4691.4	200	141-200	UBG <sup>2,3</sup>	NA	Geologic Log
PARRA	576415	4727.21	355	255-355	UBG <sup>2</sup>	ND	Gravel, Rock, Sand, Clay
PIONKE	613395	4592.13	300	ND	QTbf	NA	No Log
POOL	509518	4639.09	313	213-300	QTbf	NA	Geologic Log
POWER	624535	4840.37	100	60-99	UBG <sup>2</sup>	ND	No Log
RAMIREZ	216425	4596.61	300	250-300	QTbf	NA	No Log
RAY	803772	4647.91	100	ND	UBG 2	ND	No Log
ROGERS 803	641803	4579.02	140	ND	QTbf <sup>1</sup>	NA	No Log
ROGERS E	216018	4590.66	290	240-285	QTbf <sup>1</sup>	NA	Brown Rock
RUIZ	531770	4735.18	312	252-312	QTbf / UBG	265	Reddish Brown Sedimentary
SCHWARTZ	210865	4551.58	305	260-305	QTbf	NA	Geologic Log
SRC	211345	4810.12	965	845-965	UBG <sup>2</sup>	500	Red Shale
STEPHENS	808560	4651.22	ND	ND	UBG / Kg <sup>2</sup>	ND	No ADWR Record
SUNBELT	201531	4806.52	380	300-380	UBG / Kg <sup>2</sup>	2	Red Clay and Conglomerate
SWAN	NR	4716.59	NR	NR	Kg <sup>2</sup>	ND	No ADWR Record
TM-02A	522574	4808.43	925	825-925	Kg <sup>3</sup>	345	Geologic Log

**TABLE 4**  
**Well Completion Depth, Screen Interval and Screened Lithology**

Well Name	ADWR 55 Registry No.	Top of Casing Elevation (ft amsl)	Casing Depth (ft bgs)	Screen Interval (ft bgs)	Screened Formation Lithology	Depth to Bedrock (ft bgs)	Comment
TM-03	522575	4897.85	200	150-200	Kg	32	Geologic Log
TM-05 MILLER	522694	4598.06 <sup>3</sup>	160	120-160	QTbf <sup>3,4</sup>	NA	Geologic Log
TM-06 MILLER	522695	4707.88	200	150-200	UBG <sup>4,5</sup>	15	Geologic Log
TM-07	522576	4768.93 <sup>3</sup>	350	259-349	UBG <sup>4,5</sup>	195	Geologic Log
TM-08 SWAN	522817	4725.44	817	757-817	Kg <sup>3</sup>	60	Geologic Log
TM-11 PIONKE	522815	4573.1 <sup>3</sup>	160	99-159	QTbf <sup>3,4</sup>	NA	Geologic Log
TM-12 MILLER	522697	4589.44 <sup>3</sup>	175	121-171	QTbf <sup>3,4</sup>	NA	Geologic Log
TM-13 MILLER	522698	4617.29 <sup>3</sup>	200	140-200	QTbf <sup>3,4</sup>	NA	Geologic Log
TM-14 NELSON	522816	4643.48	215	165-215	QTbf <sup>3,4</sup>	NA	Geologic Log
TM-15 MILLER	522699	4729.26	325	260-320	UBG <sup>4,5</sup>	220	Geologic Log
TM-16	522578	4717.71	115	65-115	UBG <sup>3,4,5</sup>	40	Geologic Log
TM-19A	522581	4645.87	700	585-695	UBG <sup>2,3</sup>	535	Geologic Log
TM-41	562555	4774.58	210	145-200	UBG <sup>4</sup>	95	Geologic Log
TM-42	562554	4666.67	250	180-240	UBG <sup>4</sup>	65	Geologic Log
TM-43	564729	4971.44	830	720-800	UBG <sup>4</sup>	170	Geologic Log
TM-43A	564726	4969.95	215	130-190	QTbf / UBG <sup>2</sup>	150	Geologic Log
TM-43B	565004	4922.18	215	150-190	UBG <sup>4</sup>	80	Geologic Log
TVI 236	802236	4561.98	222	ND	QTbf	NA	No Log
TVI 713	567713	4567.22	200	80-144	QTbf <sup>1</sup>	NA	Geologic Log
TVI 875	568875	ND	330	166-320	QTbf	NA	Geologic Log
WALKER	200393	4601.55	120	80-100	UBG <sup>2,3</sup>	18	Geologic Log
WEED	544535	4675 <sup>3</sup>	320	280-320	UBG / Kg	270	Geologic Log
WEISKOPF	641802	4586.89	200	ND	QTbf <sup>1</sup>	NA	No Log
ZANDER	205126	4580.94	280	220-260	QTbf	NA	Geologic Log

**Notes:**

ADWR = Arizona Department of Water Resources

ft amsl = feet above mean sea level

ft bgs = feet below ground surface

QTbf = Quaternary-Tertiary basin fill

UBG = Undifferentiated Bisbee Group (Cretaceous Cintura Formation, Upper Mural Limestone, Lower Mural Limestone and Morita Formation)

Kg = Cretaceous Glance Conglomerate

ND = No Data

NA = Not Applicable

NR = No Record

<sup>1</sup> Formation estimated based on well completion depth and lithology of nearby wells

<sup>2</sup> Based on Well Depth and Geology Map, Hayes and Landis (1964)

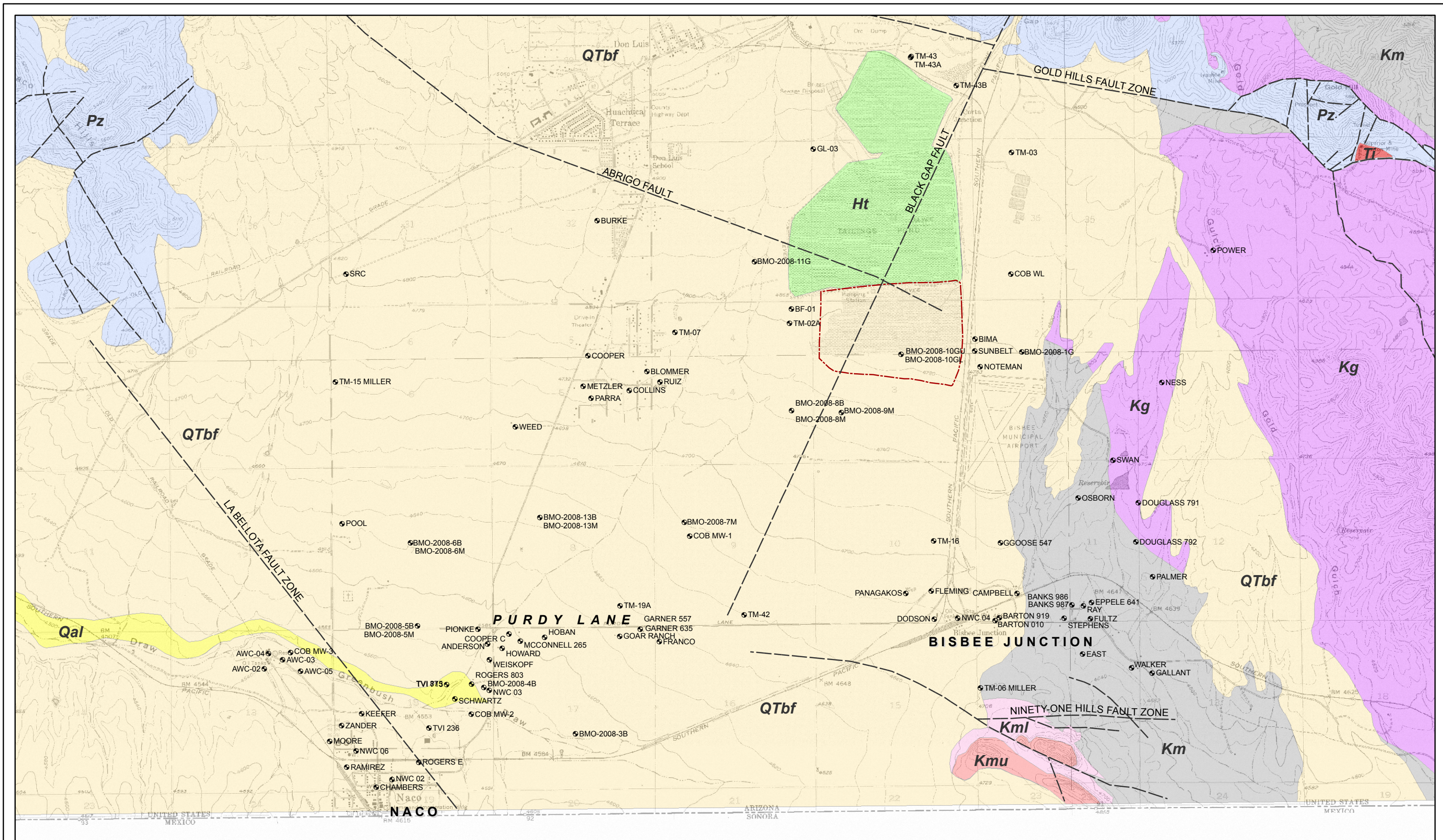
<sup>3</sup> Based on Well Drillers Report to ADWR (1994)

<sup>4</sup> Based on Geologic Log in Phelps Dodge, Aquifer Protection Permit Application, Cochise County, Arizona. (1990)

<sup>5</sup> Open hole

## **FIGURES**

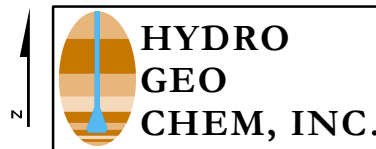




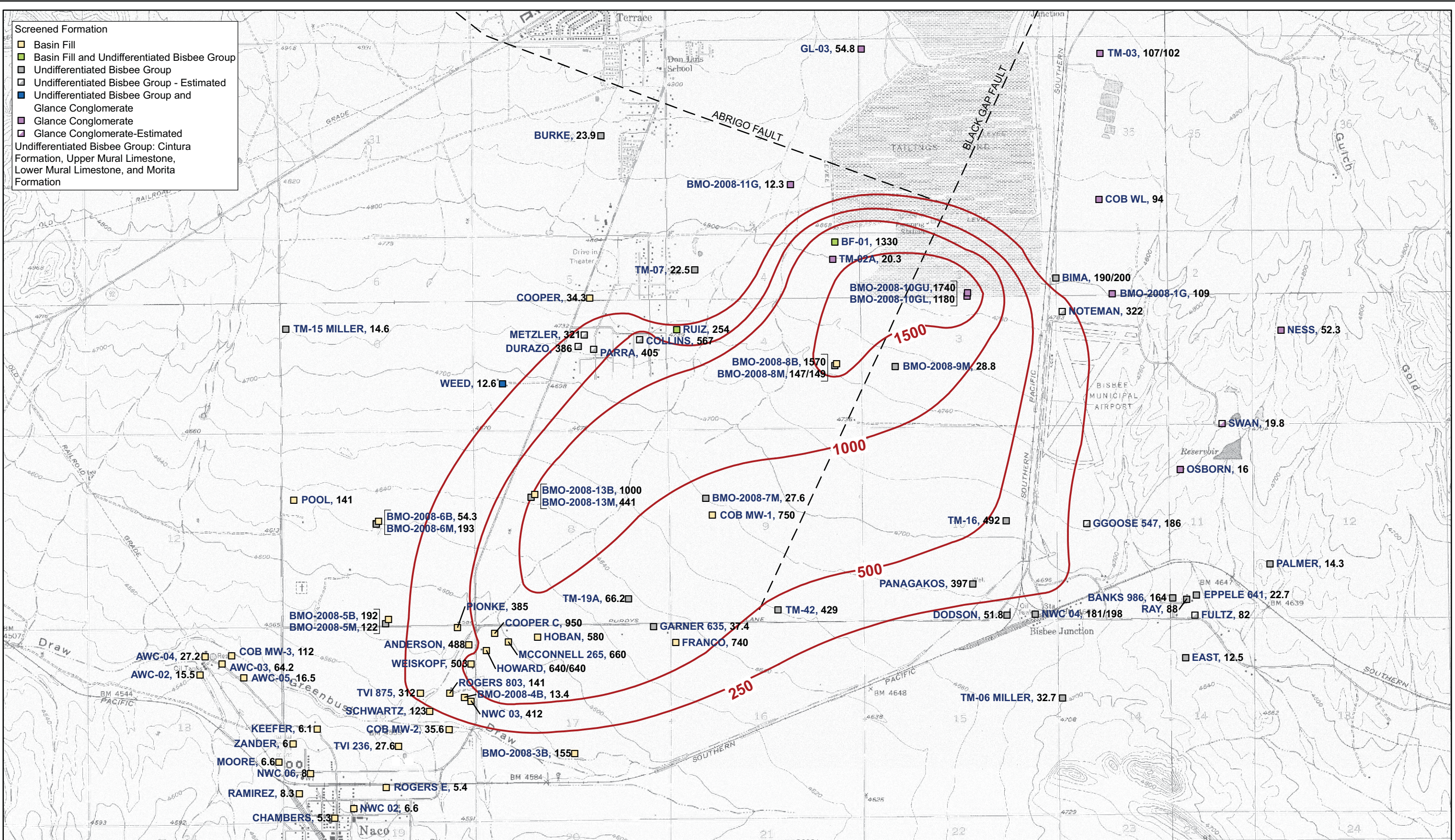
Legend		Recent Alluvium		Undifferentiated Bisbee Group	
●	Well ID	Ht	Holocene Tailings	Kmu	Upper Mural Limestone
---	Faults	Qal	Quaternary Alluvium	Kml	Lower Mural Limestone
▭	Former Evaporation Ponds	QTbf	Quaternary - Tertiary Basin Fill	Km	Morita Formation
		Red Rock Complex		Kg	Glance Conglomerate
		Ti	Tertiary Intrusive	Pz	Paleozoic Sedimentary Formations, Undifferentiated



PROJECTION:  
UTM Zone 12 NAD83



GENERALIZED GEOLOGY AND WELL LOCATIONS					
Approved	Date	Author	Date	File Name	Figure
DRS	04/10/09	AMC	04/10/09	8720178G	1

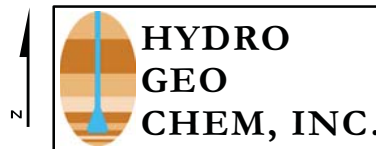
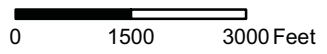


- Screened Formation**
- Basin Fill
  - Basin Fill and Undifferentiated Bisbee Group
  - Undifferentiated Bisbee Group
  - Undifferentiated Bisbee Group - Estimated
  - Undifferentiated Bisbee Group and Glance Conglomerate
  - Glance Conglomerate
  - Glance Conglomerate-Estimated
  - Undifferentiated Bisbee Group: Cintura Formation, Upper Mural Limestone, Lower Mural Limestone, and Morita Formation

**Legend**  
 ■ **TM-19A, 66.3** Well ID, Sulfate Concentration (mg/L)  
 (Duplicate results separated by "/")

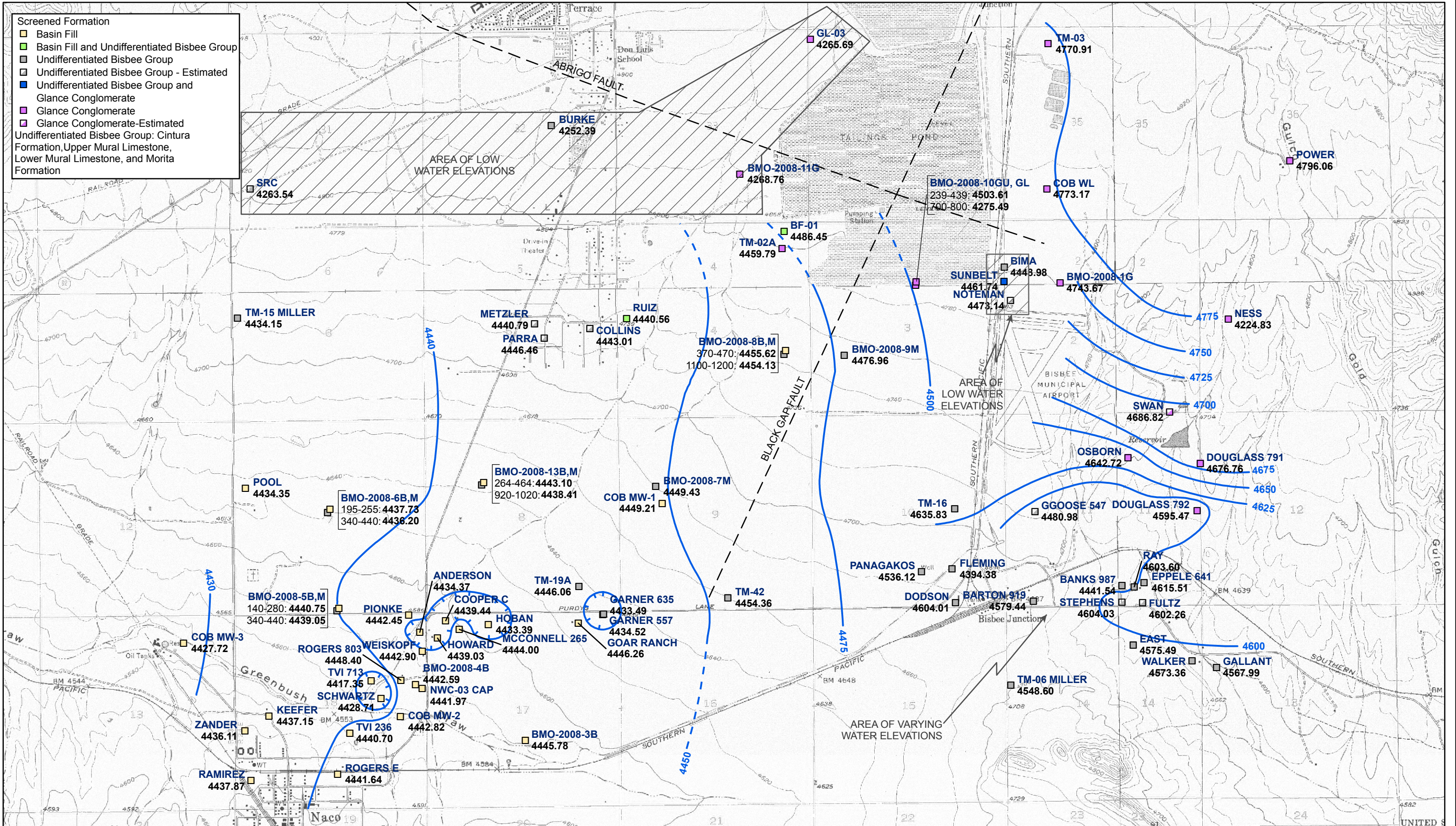
— 250 — Sulfate Isoline (mg/L)  
 - - - - - Faults (inferred)

PROJECTION:  
 UTM Zone 12 NAD83



**SULFATE CONCENTRATIONS IN GROUNDWATER  
 FIRST QUARTER 2009**

Approved	Date	Author	Date	File Name	Figure
DRS	04/10/09	AMC	04/10/09	8720181G	2

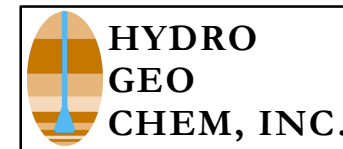


- Screened Formation**
- Basin Fill
  - Basin Fill and Undifferentiated Bisbee Group
  - Undifferentiated Bisbee Group
  - Undifferentiated Bisbee Group - Estimated
  - Undifferentiated Bisbee Group and Glance Conglomerate
  - Glance Conglomerate
  - Glance Conglomerate-Estimated
  - Undifferentiated Bisbee Group: Cintura Formation, Upper Mural Limestone, Lower Mural Limestone, and Morita Formation

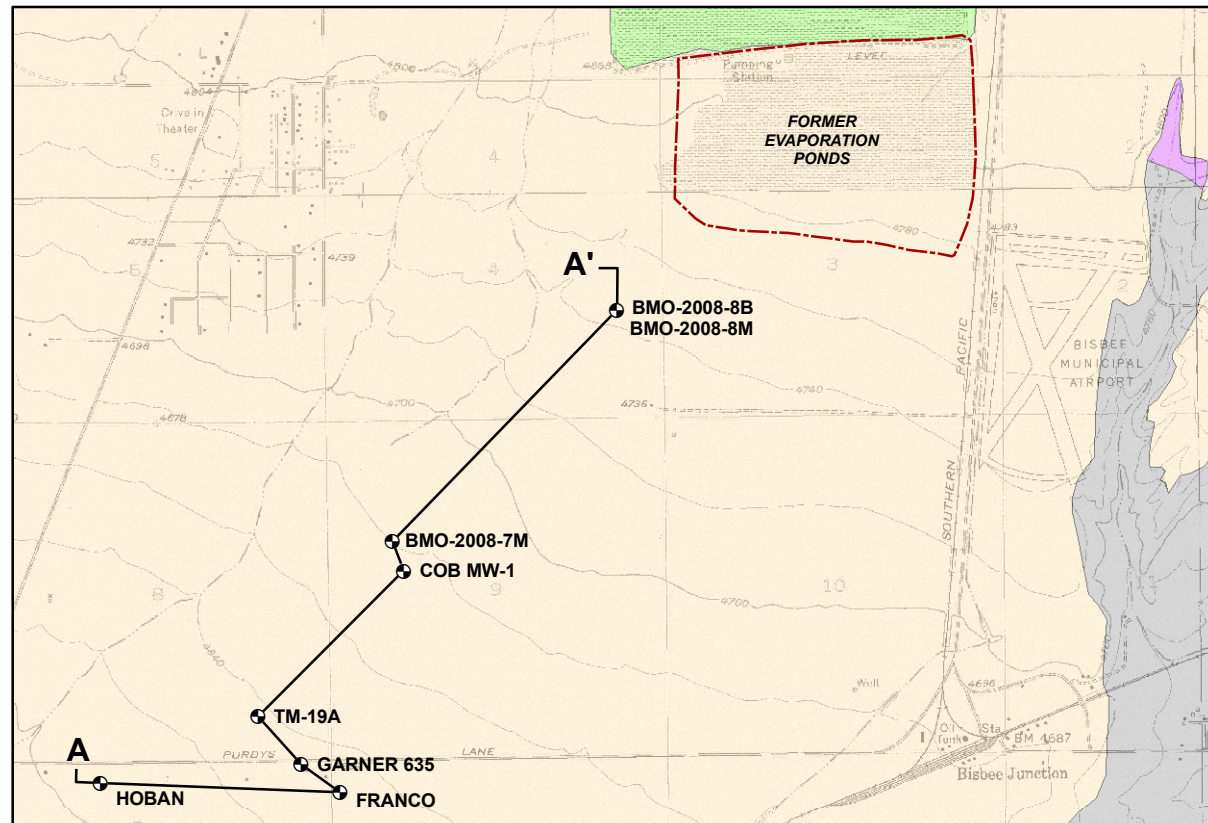
- Legend**
- Well ID
  - Groundwater Elevation (ft amsl)
  - Groundwater Elevation Contours (dashed where inferred)
  - Groundwater Depression
  - Faults (inferred)
  - Co-located Wells
  - Well ID
  - Screen (ft bgs): Water Elevation (ft amsl)

PROJECTION: UTM Zone 12 NAD83

0 1500 3000 Feet

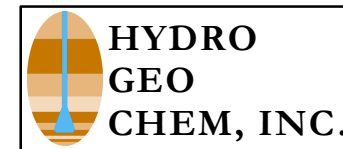
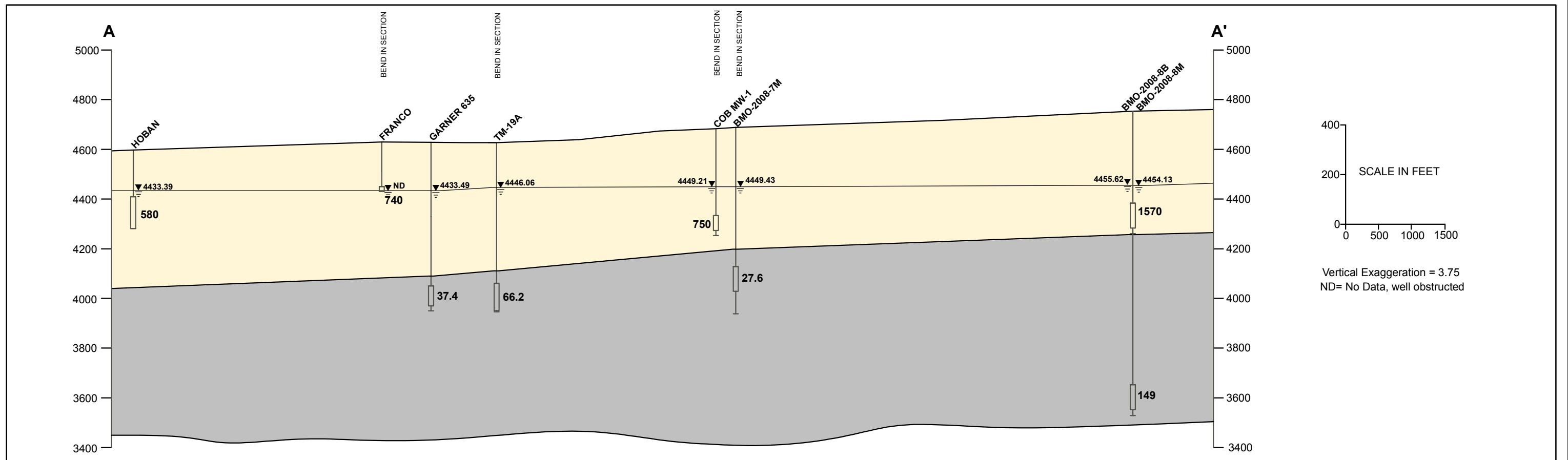
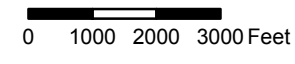
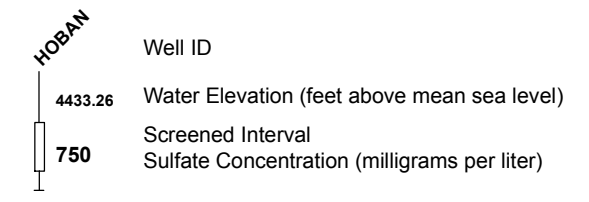


GROUNDWATER ELEVATIONS FIRST QUARTER 2009					
Approved	Date	Author	Date	File Name	Figure
DRS	04/14/09	AMC	04/14/09	8720179G	3



**Legend**

- Well Location
  - Approximate Water Table
  - Holocene Tailings
  - Quaternary - Tertiary Basin Fill
  - Undifferentiated Bisbee Group
  - Cretaceous Glance Conglomerate
- Undifferentiated Bisbee Group: Cintura Formation, Upper Mural Limestone, Lower Mural Limestone and Morita Formation



CROSS SECTION A-A'					
SULFATE STRATIFICATION BETWEEN BASIN FILL AND UNDIFFERENTIATED BISBEE GROUP					
Approved	Date	Author	Date	File Name	Figure
DRS	04/09/09	DRS	04/09/09	8720180G	4

**APPENDIX A**

**FIRST QUARTER 2009  
DATA VERIFICATION REPORT**

**APPENDIX A**  
**FIRST QUARTER 2009**  
**DATA VERIFICATION REPORT**

Prepared for:

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April 14, 2009



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A.1 ACZ Project ID and Associated Wells

### **APPENDIX**

A.1 Arizona Land Specialists, Inc. Well Survey

## 1. INTRODUCTION

This report summarizes the data verification review of groundwater samples collected and analyzed during the first quarter 2009 (Q1-2009) by Hydro Geo Chem, Inc. (HGC) pursuant to Mitigation Order on Consent Docket No. P-121-07 (MO) (ADEQ, 2007). HGC collected groundwater samples from wells identified in Tasks 1.0 and 2.2 of the Work Plan (HGC, 2008a). All analytical results for groundwater samples collected for this project during the first quarter of 2009 were provided to HGC by ACZ Laboratories, Inc. (ACZ) for preparation of the Q1-2009 Groundwater Monitoring Report.

Quality assurance (QA) and quality control (QC) procedures are specified in the *Quality Assurance Project Plan for Aquifer Characterization Plan (QAPP)* (Appendix F of HGC, 2008a) for field sampling, chain-of-custody (COC) documentation, laboratory analysis, and reporting. This report reviews field sampling for samples collected by HGC. Additionally, sample handling and laboratory QA/QC data are evaluated according to the data quality indicators (DQIs) given in the QAPP.

Appendix C of the main text contains laboratory reports for Q1-2009 samples collected by HGC including COC forms, laboratory correspondence, QC summaries, data qualifiers, and any case narratives. The Q1-2009 analytical results for all 83 samples collected by HGC are contained in 13 reports having the ACZ Project numbers identified in Table A.1.

The results of the internal QA/QC tests performed by ACZ are presented with the laboratory reports included in Appendix B. Based on the results of surrogate spike recoveries, matrix spike/recovery and matrix spike duplicate tests, ACZ did not advise HGC of any modifications that should be made regarding the usability and data validation status of the laboratory test results.

## 2. HGC FIELD OPERATIONS

Field operations for this project consisted of the following for all monitoring wells sampled by HGC:

- Static water level measurement,
- Well purging,
- Collection of water quality field parameters (pH in standard units [SU], specific conductance [SC] in microsiemens per centimeter [ $\mu\text{S}/\text{cm}$ ], and temperature in degrees Celsius [ $^{\circ}\text{C}$ ]),
- Collection of groundwater samples for water quality analysis,
- Collection of groundwater quality assurance and quality control samples, and
- Equipment decontamination.

Documentation of the field activities was evaluated for quality assurance and has been deemed to have met the documentation requirements stated in the QAPP.

### 2.1 Water Level Monitoring

Static water level measurements were attempted at each well that was sampled and at all wells where water level monitoring was conducted by HGC. Water levels were measured while the well pump was off however, it was not always possible to ascertain from the well owners how long the pump had been off. Before measuring the water level at each well, the battery on the water level indicator was checked and the sensitivity level was adjusted, if necessary. Each measurement was collected and verified by measuring the depth to water multiple times in order to obtain a consistent reading and accurate measurement.

## 2.2 Groundwater Sampling

During this monitoring period groundwater samples were collected from wells designated for sampling for Task 1.0 (well inventory) and Task 2.2 (groundwater monitoring) of the Work Plan. More detailed information regarding the wells sampled for water quality and water level measurements is listed in Table 1 of the main text.

### 2.2.1 Pre-Sampling Field Activities

On each day of sampling, the pH<sup>1</sup> and SC<sup>2</sup> multipurpose probe was calibrated. In addition, the water level indicator was checked for a signal, which indicates a working meter and sufficient battery strength. On each day where sampling extended for more than half a day, a mid-day calibration check was performed on the pH and SC probe to ensure accurate measurement. In addition to calibrating the instruments each day, measures were taken to 1) properly decontaminate field equipment, 2) ensure the appropriate storage and transport temperature of the samples, and 3) document activities related to the collection of groundwater samples as part of this project. These objectives were met by 1) replenishing or obtaining supplies of deionized water and ice daily, 2) use of the proper preservative and sample collection containers, 3) properly packing the samples on ice during field activities, 4) using deionized water to properly decontaminate field equipment prior to the start of sampling each day and after sampling at each well, and 5) obtaining the appropriate field notebook in order to document field activities related to the groundwater monitoring program.

---

<sup>1</sup> Field pH meter was calibrated using a two point calibration and pH buffers 4 and 7

<sup>2</sup> Field SC meter was calibrated using a standard stock solution of 1413  $\mu\text{S}/\text{cm}$

### 2.2.2 Well Purging, Field Measurements, and Sample Collection

Ideally, three wetted casing volumes were purged from each well prior to sampling. However, when three casing volumes could not be purged, this information was noted on the groundwater sampling form (Appendix C) at each well for which this was the case. Purge water was discharged to the ground surface.

Field measurements were collected at varying intervals during well purging at each well where a water quality sample was collected. Field parameters were monitored until a consistent measurement was obtained.

During this monitoring period, filtered groundwater samples were collected for analysis from 83 plume monitor wells. Groundwater samples were collected by filtering the sample into a 250 mL bottle using clean filtration apparatus and one unused, disposable 0.45-micron filter. All bottles were provided by ACZ. Bottles were checked for the correct preservative and maintained in a clean and secure work area, until used in the field.

### 2.2.3 Post-Sampling Field Activities

Post sampling field activities consisted of equipment decontamination, sample storage, and sample shipping. Field equipment that comes into contact with the sample was decontaminated using a small amount of Alconox<sup>®</sup> detergent and deionized water. After washing, the equipment was rinsed thoroughly with deionized water.

After sample collection, samples from each well were placed into a plastic bag and stored on ice until they could be packed securely for shipping to ACZ. In addition, each set of samples collected from each well was individually bagged (without ice) to prevent the label from getting soaked with water and rubbing off or becoming illegible.

### **2.3 Well Survey**

On March 5, 2009 a measuring point elevation survey was completed for the newly installed private well FLEMING and private well PANAGAKOS. The survey was conducted by Arizona Land Specialists, Inc. These data are shown in Table 3 and Figure 2 of the main report. A copy of the survey report is included as Appendix A.1.

### 3. SAMPLE HANDLING

All samples collected by HGC were shipped to ACZ for analysis. COC documentation accompanied all samples submitted and included the sample name, collection date and time. COCs contained in laboratory reports included the date and time the samples were received by ACZ. As noted on the analytical data reports from ACZ, all of the sample bottles were received intact, properly preserved, and in good condition.

The temperature of the following shipping container (identified by its laboratory login number) exceeded 4 °C upon receipt at the laboratory.

<b>ACZ Project ID</b>	<b>Sample Collection Date</b>	<b>Sample Relinquished Date</b>	<b>Sample Received Date by ACZ</b>	<b>Temperature Upon Receipt (°C)</b>
L74103	01/22/09	01/22/09	01/23/09	4.7
L74591	02/23/09	02/24/09	02/26/09	4.5
L74686	03/03/09	03/03/09	03/04/09	4.9

As noted in the above table, the samples were shipped within one day of sample collection, and the time between sample collection and receipt of samples by ACZ was one to two days. These temperature exceedances are not considered to have a significant impact on the analytical results pertaining to the sulfate analysis for these samples.





## **4. LABORATORY QUALITY CONTROL**

As specified in the QAPP, laboratory QC was maintained for all analyses through proper licensure, the use of approved analytical methods, QC measurements, appropriate turn-around-time for analysis (timeliness), method detection limits (MDLs), and practical quantitation limits (PQLs). Each of these controls is discussed in the following subsections.

The review of laboratory QC included a review to identify any qualified data and an assessment to determine their significance. Additionally, the laboratory QC summaries were reviewed to verify that results met QA criteria.

### **4.1 Licensure**

ACZ is licensed with the Arizona Department of Health Services (license number AZ0102) and is accredited in accordance with the National Environmental Laboratory Accreditation Conference.

### **4.2 Analytical Methods**

The following U.S. Environmental Protection Agency (EPA) method was used for sulfate analysis during this monitoring period:

- EPA 300.0 (Ion-Chromatography)

### 4.3 Method Detection Limits (MDLs) and Practical Quantification Limits (PQLs)

The MDL and PQL of the analytical method used by ACZ are shown in the following table. The MDL for analyses of samples was equal to or less than the target MDL identified in the QAPP.

Method	MDL (mg/L)	PQL (mg/L)	Target MDL <sup>1</sup> (mg/L)
EPA 300.0	0.5	3	10

mg/L = milligrams per liter

<sup>1</sup> Target MDL from Table F.2 of QAPP

### 4.4 Timeliness

All samples submitted for sulfate analysis were analyzed within the twenty-eight day holding time specified by EPA Method 300.

### 4.5 Quality Control Measurements

The following QC samples were prepared and analyzed:

- Calibration blanks and calibration verification standards
- Analytical spike samples
- Laboratory duplicate samples
- Field blank samples

#### 4.5.1 Calibration Blanks, and Calibration Verification Standards

Results from the analyses of the initial calibration blanks and initial calibration verification standards conducted by EPA Method 300.0 also were reviewed. The results of each initial calibration blank analyzed showed no detections of the target analyte. All analytical results for the initial calibration verification standards and laboratory fortified blanks that were analyzed showed percent recoveries that were within the acceptance criteria specified by the ACZ QA plan and the QAPP.

#### 4.5.2 Analytical Spike

Analytical spike samples also were analyzed for the EPA Method 300.0. Spike recoveries for most analytes were within the range of acceptability based on the acceptance criteria set by ACZ. Instances in which analytical spike recoveries were low were qualified with an “M2” flag. However, in each case the method control sample recoveries were acceptable.

#### 4.5.3 Laboratory Duplicate Samples

Analyses of laboratory duplicate samples were also reviewed as part of this quality data verification report. Field duplicate samples are discussed in Section 5.1. The RPDs for most laboratory duplicate samples were within 20 percent, which is the tolerance range set by the laboratory. In many instances, the data were qualified with an “RA” flag indicating that the RPD was not used for data validation because the sample concentration was less than ten times the MDL, which is too low for accurate evaluation according to ACZ. In all cases where the RPD

could be calculated, the results met QA criteria and demonstrate an appropriate level of precision in laboratory analysis of these samples.

#### 4.5.4 Field Blank Samples

During the first quarter of 2009 ten field blank samples were collected. Five field blank samples using unfiltered deionized water (FB012009, FB012809, FB021209, FB021909, and FB022609) and five equipment blanks using filtered deionized water (EQB012109, EQB012809, EQB021209, EQB021909, and EQB022609). Samples were collected in the field and submitted along with other samples to evaluate the potential for contaminant introduction under field conditions. As required by Section 4.2.1.5 of the QAPP, a minimum of one field blank and one equipment blank sample was collected for every twenty samples. Analytical results from field blank and equipment blank samples showed no detections with the exception of equipment blank sample EQB110408H with sulfate detected a 0.6 mg/L, which is between the MDL and PQL. The low level detection of sulfate is not considered significant given the concentrations of this constituent in the samples.

## 5. DATA QUALITY INDICATORS

The QAPP provides several DQIs for assessing the overall quality of the data. These DQIs include the following:

- Precision
- Bias
- Accuracy
- Representativeness
- Comparability
- Completeness
- Sensitivity

Each of these DQIs is discussed below in relation to the Q1-2009 groundwater sampling and analysis conducted by HGC.

### 5.1 Precision

Precision indicates how well a measurement can be reproduced. Precision is quantified by calculating the RPD between duplicate samples. For the purposes of QA/QC, precision was quantified by calculating the RPDs between duplicates among the following groups of duplicate samples:

- Laboratory duplicate samples
- Field duplicate samples

As discussed in Sections 4.5.2 and 4.5.4, there were no exceedances of RPD QA criteria for any laboratory duplicates. During this monitoring period, a total of five field filtered

duplicate samples (DUP012009, DUP012809, DUP021209, DUP021909, and DUP022609) were collected by HGC for analysis. The collection of five duplicate samples exceeds the QA/QC goal of collecting one duplicate sample for every twenty groundwater samples collected, as stated in Section 4.2.1.5 of the QAPP.

Results for the five duplicate samples collected are provided in the table below. The range of RPD values was between zero and 8.97 percent, all within the 20 percent acceptance criteria for field duplicates, as stated in Section 3.3.1 of the QAPP. Overall, the DQI for precision is deemed to be met.

Well ID	Duplicate Sample ID	ACZ Project ID	Sulfate (mg/L)	Sulfate Duplicate (mg/L)	RPD (%)
BIMA	DUP012009	L74122	190	200	5.13
HOWARD	DUP012809	L74166	640	640	0
NWC-04	DUP021209	L74431	181	198	8.97
BMO-2008-8M	DUP021909	L74529	147	149	1.35
TM-03	DUP022609	L74631	107	102	4.78

mg/L = milligrams per liter  
 RPD = Relative Percent Difference

## 5.2 Bias

Bias is a systematic distortion of measurements causing consistent errors in one direction. Bias is managed in this data set by the consistent application of standardized sample collection and analysis procedures.

### **5.3 Accuracy**

Accuracy is a measure of the agreement of a measurement to a known value and is measured using the recoveries from laboratory control samples. As discussed in Sections 4.5.1, 4.5.2, and 4.5.3 respectively, there were no significant exceedances of the recovery QA criteria for any of the calibration standards, analytical spikes, or laboratory control standards. Based on this information, the overall accuracy of the data is judged sufficient for the purpose of aquifer characterization.

### **5.4 Representativeness**

All samples were taken from locations specified in the Work Plan (HGC, 2008) using sampling procedures specified in the QAPP. Therefore, the samples are judged to provide a good representation of groundwater quality at the sampled locations. The analytical data are judged to be representative of groundwater conditions because the analyses used standard procedures and methods that met QA/QC guidelines of the QAPP.

### **5.5 Comparability**

All samples were collected using standardized procedures (HGC, 2008a) and were analyzed by ACZ using standardized methods. Insofar as standardized sample collection and analytical methods are adhered to, the sample results should be comparable.



## **5.6 Completeness**

All samples collected were subsequently analyzed and reported by ACZ are judged to satisfy the QA/QC criteria for this project and are deemed usable for aquifer characterization. Thus, the completeness of analytical results is 100 percent.

## **5.7 Sensitivity**

The analytical methods used to analyze the samples meet the MDL requirements specified in Table F.2 of the QAPP. Therefore, the analytical sensitivity is considered acceptable for use in aquifer characterization.

## 6. REFERENCES

- Arizona Department of Environmental Quality. 2007. Mitigation Order on Consent, Docket No. P-121-07, In the Matter of: Phelps Dodge Corporation, Copper Queen Branch, located at 36 West Highway 92, Bisbee, Arizona, ADEQ Identification Number 100531. November 14, 2007.
- Hydro Geo Chem, Inc. (HGC). 2008. Revision 1, Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Concentrator Tailing Storage Area, Cochise County, Arizona. July 3, 2008.



## TABLE

**TABLE A.1  
ACZ PROJECT ID AND ASSOCIATED WELLS**

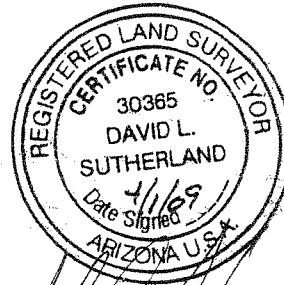
<b>ACZ Project ID</b>	<b>Wells Reported</b>
<i>Number of wells sampled: 80            Number of duplicate samples collected: 5            Number of field blank samples collected: 10</i>	
L74103	NWC-04
L74122	NOTEMAN, EAST, RAY, OSBORN, SWAN, BIMA, EPPELE 641, BANKS 986, FULTZ DODSON, PANAGAKOS, FRANCO, PALMER, FB012009, DUP012009, EQB012009
L74166	NESS, ANDERSON, CHAMBERS, COOPER C, HOBAN, HOWARD, KEEFER MCCONNELL 265, FB012809, EQB012809, DUP012809
L74214	GARNER 635, WEISKOPF, SCHWARTZ, RAMIREZ, PIONKE, MOORE
L74368	DURAZO
L74430	POOL, WEED, PARRA, RUIZ
L74431	ROGERS 803, ROGERS E, ZANDER, BURKE, TVI 236, TVI 875, COLLINS, COOPER METZLER, NWC-02, NWC-03, NWC-04, NWC-06, COB MW-1, COB MW-2, COB MW-3 COB WL, DUP021209, EQB021209, FB021209
L74529	BMO-2008-13B, BMO-2008-13M, BMO-2008-5B, BMO-2008-5M, BMO-2008-7M, TM-07 BMO-2008-4B, BMO-2008-8B, BMO-2008-8M, BMO-2008-3B, TM-16 BMO-2008-6B BMO-2008-6M, BF-01, TM-42, DUP021909, EQB021909, FB021909
L74591	SCHWARTZ
L74631	GGOOSE 547, TM-02A, BMO-2008-1G, BMO-2008-10GU, BMO-2008-10GL, TM-03 BMO-2008-11G, BMO-2008-9M, TM-15 MILLER, TM-06 MILLER, GL-03, FB021909 EQB022609, DUP022609
L74686	TM-19A
L74790	NWC-04
L74791	AWC-02, AWC-03, AWC-04, AWC-05

**APPENDIX A.1**

**ARIZONA LAND SPECIALISTS, INC. WELL SURVEY**

ARIZONA LAND SPECIALISTS, INC.  
FREEPORT-MCMORAN COPPER QUEEN BRANCH  
March 5, 2009

ALS POINT	DESCRIPTION	ELEVATION (FEET) NAVD88	UTM NAD83 NORTHING	UTM NAD83 EASTING
7054	PANAGAKOS	4691.40	3469323.140	605304.234
7056	PANAGAKOS/GROUND	4689.47		
7057	FLEMING	4693.68	3469342.523	605565.701
7058	FLEMING/GROUND	4692.83		



**APPENDIX B**

**ANALYTICAL REPORTS FROM ACZ LABORATORIES, INC.**



January 26, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720005.0

ACZ Project ID: L74103

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on January 23, 2009. This project has been assigned to ACZ's project number, L74103. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74103. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 26, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**

Project ID: 8720005.0

Sample ID: NWC 04

ACZ Sample ID: **L74103-01**

Date Sampled: 01/22/09 10:53

Date Received: 01/23/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	184			mg/L	3	10	01/26/09 11:06	aml

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.

ACZ Project ID: **L74103**

Project ID: 8720005.0

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG258880</b>													
WG258880ICV	ICV	01/23/09 18:32	WI081218-1	50		49.39	mg/L	98.8	90	110			
WG258880ICB	ICB	01/23/09 18:53				U	mg/L		-1.5	1.5			
WG258880ICV1	ICV	01/24/09 11:14	WI081218-1	50		50.69	mg/L	101.4	90	110			
WG258880ICB1	ICB	01/24/09 11:35				U	mg/L		-1.5	1.5			
WG258880LFB	LFB	01/24/09 11:56	WI081125-2	30		30.08	mg/L	100.3	90	110			
WG258880ICV2	ICV	01/26/09 10:23	WI081218-1	50		50.83	mg/L	101.7	90	110			
WG258880ICB2	ICB	01/26/09 10:44				U	mg/L		-1.5	1.5			
L74103-01AS	AS	01/26/09 11:27	WI081125-2	150	184	321.2	mg/L	91.5	90	110			
L74103-01DUP	DUP	01/26/09 11:48			184	184.1	mg/L				0.1	20	

Hydro Geo Chem, Inc.

ACZ Project ID: **L74103**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

Hydro Geo Chem, Inc.

ACZ Project ID: **L74103**

No certification qualifiers associated with this analysis

**Hydro Geo Chem, Inc.**  
 8720005.0

ACZ Project ID: L74103  
 Date Received: 1/23/2009  
 Received By:  
 Date Printed: 1/23/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA7787	4.7	14

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**

Hydro Geo Chem, Inc.  
 8720005.0

ACZ Project ID: L74103  
 Date Received: 1/23/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74103-01	NWC 04									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

**Report to:**

Name: <b>Dan Simpson</b>	Address: <b>51 W. Wetmore Rd</b>
Company: <b>Hydro Geo Chem, Inc</b>	<b>Tucson, AZ 85705</b>
E-mail:	Telephone: <b>520-293-1500 x-133</b>

**Copy of Report to:**

Name: <b>Jim Norris</b>	E-mail: <b>jimn@hgcinc.com</b>
Company: <b>HGC, Inc</b>	Telephone: <b>520-293-1500 x-112</b>

**Invoice to:**

Name: <b>Dan Simpson</b>	Address: <b>51 W. Wetmore Rd</b>
Company: <b>HGC, Inc</b>	<b>Tucson, AZ 85705</b>
E-mail:	Telephone: <b>520-293-1500 x-133</b>

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES  NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

**PROJECT INFORMATION**

**ANALYSES REQUESTED (attach list or use quote number)**

Quote #: <b>504-IC</b>	# of Containers <b>504-IC</b>																				
Project/PO #: <b>8720005.0</b>																					
Reporting state for compliance testing: <b>AZ</b>																					
Sampler's Name: <b>Travis Taylor</b>																					
Are any samples NRC licensable material? <b>No</b>																					

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers																		
<b>NWC 04</b>	<b>1-22-09:1053</b>	<b>GW</b>	<b>1</b>	<b>X</b>																	

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

**REMARKS/ SAMPLE DISCLOSURES**

**Request 72 hour turn around.**

PAGE  
1 of 1

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
<b>Travis Taylor</b>	<b>1-22-09:1525</b>	<b>[Signature]</b>	<b>1-23-09:10:04</b>

February 17, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720002.2

ACZ Project ID: L74122

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on January 26, 2009. This project has been assigned to ACZ's project number, L74122. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74122. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after March 17, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



Hydro Geo Chem, Inc.

February 17, 2009

Project ID: 8720002.2

ACZ Project ID: L74122

**Sample Receipt**

ACZ Laboratories, Inc. (ACZ) received 16 ground water samples from Hydro Geo Chem, Inc. on January 26, 2009. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L74122. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

**Holding Times**

All analyses were performed within EPA recommended holding times.

**Sample Analysis**

These samples were analyzed for inorganic parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports. The extended qualifier reports may contain footnotes qualifying specific elements due to QC failures. In addition the following has been noted with this specific project:

1. A few of the Sulfate values have been qualified with the N1 flag on the extended qualifier report. The chemist noted that the values are estimated due to potential coelution of an unknown analyte.

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2  
Sample ID: NOTEMAN

ACZ Sample ID: **L74122-01**  
Date Sampled: 01/19/09 16:15  
Date Received: 01/26/09  
Sample Matrix: Ground Water

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	322		*	mg/L	5	30	02/02/09 22:32	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: EAST

ACZ Sample ID: **L74122-02**

Date Sampled: 01/20/09 17:26

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	12.5		*	mg/L	0.5	3	01/30/09 13:09	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: RAY

ACZ Sample ID: **L74122-03**

Date Sampled: 01/20/09 16:18

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	88		*	mg/L	3	10	02/02/09 23:15	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: FB012009

ACZ Sample ID: **L74122-04**

Date Sampled: 01/20/09 00:00

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography		U	*	mg/L	0.5	3	01/30/09 14:12	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: DUP012009ACZ Sample ID: **L74122-05**  
Date Sampled: 01/20/09 00:00  
Date Received: 01/26/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	200		*	mg/L	3	10	02/02/09 23:36	aml

Arizona license number: AZ0102



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: OSBORN

ACZ Sample ID: **L74122-06**

Date Sampled: 01/20/09 13:35

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	16.0		*	mg/L	0.5	3	01/30/09 14:54	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: SWAN

ACZ Sample ID: **L74122-07**

Date Sampled: 01/20/09 12:15

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	19.8		*	mg/L	0.5	3	01/30/09 15:16	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: BIMA

ACZ Sample ID: **L74122-08**

Date Sampled: 01/20/09 09:30

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	190		*	mg/L	3	10	02/02/09 23:57	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: EPPELLE 641ACZ Sample ID: **L74122-09**  
Date Sampled: 01/21/09 14:23  
Date Received: 01/26/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	22.7		*	mg/L	0.5	3	01/30/09 16:40	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BANKS 986ACZ Sample ID: **L74122-10**  
Date Sampled: 01/21/09 12:01  
Date Received: 01/26/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	164		*	mg/L	1	5	02/03/09 0:18	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: EQB012109ACZ Sample ID: **L74122-11**  
Date Sampled: 01/21/09 00:00  
Date Received: 01/26/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography		U	*	mg/L	0.5	3	01/30/09 17:22	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: FULTZ

ACZ Sample ID: **L74122-12**

Date Sampled: 01/21/09 09:45

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	82		*	mg/L	3	10	02/03/09 0:39	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: DODSON

ACZ Sample ID: **L74122-13**

Date Sampled: 01/22/09 13:26

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	51.8		*	mg/L	0.5	3	01/30/09 18:47	aml

Arizona license number: **AZ0102**



**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: PANAGAKOSACZ Sample ID: **L74122-14**  
Date Sampled: 01/22/09 12:29  
Date Received: 01/26/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	397		*	mg/L	5	30	02/03/09 1:00	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: FRANCO

ACZ Sample ID: **L74122-15**

Date Sampled: 01/22/09 17:09

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	740		*	mg/L	10	50	02/03/09 1:21	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: PALMER

ACZ Sample ID: **L74122-16**

Date Sampled: 01/20/09 10:25

Date Received: 01/26/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	14.3		*	mg/L	0.5	3	01/30/09 20:32	aml

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.  
 Project ID: 8720002.2

ACZ Project ID: **L74122**

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG259175</b>													
WG259175ICV	ICV	01/23/09 18:32	WI081218-1	50		49.39	mg/L	98.8	90	110			
WG259175ICB	ICB	01/23/09 18:53				U	mg/L		-1.5	1.5			
WG259175ICV1	ICV	01/30/09 11:23	WI081218-1	50		48.4	mg/L	96.8	90	110			
WG259175ICB1	ICB	01/30/09 11:44				U	mg/L		-1.5	1.5			
WG259175LFB1	LFB	01/30/09 12:06	WI081125-2	30		28.35	mg/L	94.5	90	110			
L74122-02AS	AS	01/30/09 13:30	WI081125-2	30	12.5	38.81	mg/L	87.7	90	110			M2
L74122-11AS	AS	01/30/09 17:43	WI081125-2	30	U	29.41	mg/L	98	90	110			
L74122-11DUP	DUP	01/30/09 18:04			U	U	mg/L				0	20	RA
WG259175LFB2	LFB	01/30/09 22:18	WI081125-2	30		28.37	mg/L	94.6	90	110			
WG259175ICV2	ICV	02/02/09 21:50	WI081218-1	50		52.09	mg/L	104.2	90	110			
WG259175ICB2	ICB	02/02/09 22:11				U	mg/L		-1.5	1.5			
L74122-01DUP	DUP	02/02/09 22:53			322	321.2	mg/L				0.2	20	
WG259175LFB2	LFB	02/03/09 2:46	WI081125-2	30		31.05	mg/L	103.5	90	110			
WG259175ICV3	ICV	02/03/09 11:51	WI081218-1	50		52.18	mg/L	104.4	90	110			
WG259175ICB3	ICB	02/03/09 12:12				U	mg/L		-1.5	1.5			

Hydro Geo Chem, Inc.

ACZ Project ID: **L74122**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L74122-01	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			300.0 - Ion Chromatography	N1	See Case Narrative.
L74122-02	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74122-03	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			300.0 - Ion Chromatography	N1	See Case Narrative.
L74122-04	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74122-05	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74122-06	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74122-07	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74122-08	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74122-09	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74122-10	WG259175	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74122-11	WG259175	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74122-12	WG259175	Sulfate	300.0 - Ion Chromatography	N1	See Case Narrative.
			300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74122-13	WG259175	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74122-14	WG259175	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74122-15	WG259175	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74122-16	WG259175	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Hydro Geo Chem, Inc.

ACZ Project ID: **L74122**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74122  
 Date Received: 1/26/2009  
 Received By:  
 Date Printed: 1/26/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?		X	
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

The following items were not in agreement: number of samples. Sample 16 added to Chain of Custody per Scott H., samples were recieved together.

**Contact (For any discrepancies, the client must be contacted)**

The client was not contacted.

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA7795	1.4	15

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**



Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74122  
 Date Received: 1/26/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74122-01	BAILEY									X		<input type="checkbox"/>
L74122-02	EAST									X		<input type="checkbox"/>
L74122-03	RAY									X		<input type="checkbox"/>
L74122-04	FB012009									X		<input type="checkbox"/>
L74122-05	DUP012009									X		<input type="checkbox"/>
L74122-06	OSBORN									X		<input type="checkbox"/>
L74122-07	SWAN									X		<input type="checkbox"/>
L74122-08	BIMA									X		<input type="checkbox"/>
L74122-09	EPPELLE 641									X		<input type="checkbox"/>
L74122-10	BANKS 986									X		<input type="checkbox"/>
L74122-11	EQB012109									X		<input type="checkbox"/>
L74122-12	FULTZ									X		<input type="checkbox"/>
L74122-13	DODSON									X		<input type="checkbox"/>
L74122-14	PANAGAKOS									X		<input type="checkbox"/>
L74122-15	FRANCO									X		<input type="checkbox"/>
L74122-16	PALMER									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



Laboratories, Inc.

L74122

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jim Norris
Company: HGCs Inc

E-mail: jimn@hgcinc.com
Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson
Company: HGCs Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: 504-IC
Project/PO #: 8720002.2
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? NO

Table with columns for analyses requested and a vertical label '# of Containers' with handwritten '504-IC'.

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix, and multiple columns for analysis results. Rows include BAILEY, EAST, RAY, FB012009, DUP012009, OSBORN, SWAN, BIMA, EPPELE 641, and BANKS 986.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE 102

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Includes handwritten signatures and dates.



February 11, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720002.2

ACZ Project ID: L74166

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on January 29, 2009. This project has been assigned to ACZ's project number, L74166. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74166. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after March 11, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: NESS

ACZ Sample ID: **L74166-01**

Date Sampled: 01/26/09 16:12

Date Received: 01/29/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	52.3			mg/L	0.5	3	02/09/09 17:44	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: ANDERSONACZ Sample ID: **L74166-02**  
Date Sampled: 01/27/09 14:02  
Date Received: 01/29/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	488			mg/L	5	30	02/09/09 18:47	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: CHAMBERSACZ Sample ID: **L74166-03**  
Date Sampled: 01/27/09 15:05  
Date Received: 01/29/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	5.3			mg/L	0.5	3	02/09/09 19:08	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: COOPERCACZ Sample ID: **L74166-04**  
Date Sampled: 01/27/09 16:25  
Date Received: 01/29/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	950			mg/L	10	50	02/09/09 19:29	aml

**Arizona license number: AZ0102**



**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: DUP012809ACZ Sample ID: **L74166-05**  
Date Sampled: 01/28/09 00:00  
Date Received: 01/29/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	640			mg/L	10	50	02/09/09 19:50	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: FB012809

ACZ Sample ID: **L74166-06**

Date Sampled: 01/28/09 00:00

Date Received: 01/29/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography		U		mg/L	0.5	3	02/09/09 20:11	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: EQB012809ACZ Sample ID: **L74166-07**  
Date Sampled: 01/28/09 00:00  
Date Received: 01/29/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography		U		mg/L	0.5	3	02/09/09 20:33	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: HOBAN

ACZ Sample ID: **L74166-08**

Date Sampled: 01/28/09 10:05

Date Received: 01/29/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	580			mg/L	10	50	02/09/09 21:36	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: HOWARD

ACZ Sample ID: **L74166-09**

Date Sampled: 01/28/09 11:43

Date Received: 01/29/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	640			mg/L	10	50	02/09/09 21:57	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: KEEFER

ACZ Sample ID: **L74166-10**

Date Sampled: 01/28/09 13:06

Date Received: 01/29/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	6.1			mg/L	0.5	3	02/09/09 22:18	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: MCCONNELL 265

ACZ Sample ID: **L74166-11**

Date Sampled: 01/28/09 14:31

Date Received: 01/29/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	660		*	mg/L	10	50	02/09/09 22:39	aml

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>



Hydro Geo Chem, Inc.  
 Project ID: 8720002.2

ACZ Project ID: **L74166**

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG259459</b>													
WG259459 CV	ICV	02/09/09 13:49	WI081218-1	50		50.38	mg/L	100.8	90	110			
WG259459 CB	ICB	02/09/09 14:10				U	mg/L		-1.5	1.5			
WG259459 CV1	ICV	02/09/09 16:40	WI081218-1	50		54.44	mg/L	108.9	90	110			
WG259459 CB1	ICB	02/09/09 17:01				U	mg/L		-1.5	1.5			
WG259459 LFB	LFB	02/09/09 17:23	WI081125-2	30		30.25	mg/L	100.8	90	110			
L74166-01AS	AS	02/09/09 18:05	WI081125-2	30	52.3	80.38	mg/L	93.6	90	110			
L74166-01DUP	DUP	02/09/09 18:26			52.3	52.26	mg/L				0.1	20	
L74166-11AS	AS	02/09/09 23:00	WI081125-2	600	660	1156	mg/L	82.7	90	110			M2
L74166-11DUP	DUP	02/09/09 23:21			660	717	mg/L				8.3	20	

Hydro Geo Chem, Inc.

ACZ Project ID: **L74166**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L74166-11	WG259459	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.

Hydro Geo Chem, Inc.

ACZ Project ID: **L74166**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74166  
 Date Received: 1/29/2009  
 Received By:  
 Date Printed: 1/29/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA7804	0.1	14

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74166  
 Date Received: 1/29/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74166-01	NESS									X		<input type="checkbox"/>
L74166-02	ANDERSON									X		<input type="checkbox"/>
L74166-03	CHAMBERS									X		<input type="checkbox"/>
L74166-04	COOPERC									X		<input type="checkbox"/>
L74166-05	DUP012809									X		<input type="checkbox"/>
L74166-06	FB012809									X		<input type="checkbox"/>
L74166-07	EQB012809									X		<input type="checkbox"/>
L74166-08	HOBAN									X		<input type="checkbox"/>
L74166-09	HOWARD									X		<input type="checkbox"/>
L74166-10	KEEFER									X		<input type="checkbox"/>
L74166-11	MCCONNELL 265									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



# Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

L74166

## CHAIN of CUSTODY

### Report to:

Name: Dan Simpson  
 Company: Hydro Geo Chem, Inc  
 E-mail:

Address: 51 W. Wetmore Rd  
Tucson, AZ 85705  
 Telephone: 520-293-1500 x-133

### Copy of Report to:

Name: Jim Norris  
 Company: HGC, Inc

E-mail: Jimn@hgcinc.com  
 Telephone: 520-293-1500 x-112

### Invoice to:

Name: Dan Simpson  
 Company: HGC, Inc  
 E-mail:

Address: 51 W. Wetmore Rd  
Tucson, AZ 85705  
 Telephone: 520-293-1500 x-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES   
 NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO"

is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

### PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: 504-IC  
 Project/PO #: 8720002.2  
 Reporting state for compliance testing: AZ  
 Sampler's Name: Travis Taylor  
 Are any samples NRC licensable material? NO

# of Containers	504-IC									
1	X									
1	X									
1	X									
1	X									
1	X									
1	X									
1	X									
1	X									
1	X									
1	X									

SAMPLE IDENTIFICATION	DATE:TIME	Matrix
<u>NESS</u>	<u>1-26-09: 1612</u>	<u>GW</u>
<u>ANDERSON</u>	<u>1-27-09: 1402</u>	<u>GW</u>
<u>CHAMBERS</u>	<u>1-27-09: 1505</u>	<u>GW</u>
<u>COOPER C</u>	<u>1-27-09: 1625</u>	<u>GW</u>
<u>DUP012809</u>	<u>1-28-09:</u>	<u>GW</u>
<u>FB012809</u>	<u>1-28-09:</u>	<u>GW</u>
<u>EQB012809</u>	<u>1-28-09:</u>	<u>GW</u>
<u>HOBAN</u>	<u>1-28-09: 1005</u>	<u>GW</u>
<u>HOWARD</u>	<u>1-28-09: 1143</u>	<u>GW</u>
<u>KEEFER</u>	<u>1-28-09: 1306</u>	<u>GW</u>

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

### REMARKS/ SAMPLE DISCLOSURES

Blank area for remarks and disclosures.

PAGE  
1 of 2

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
<u>Travis Taylor</u>	<u>1-28-09: 1525</u>	<u>CTC</u>	<u>1-29-09 9:10</u>



# Laboratories, Inc.

## CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

### Report to:

Name: Don Simpson  
 Company: Hydro Geo Chem, Inc  
 E-mail:

Address: 51 W. Wetmore Rd  
Tucson, AZ  
 Telephone: 520-293-1500 x-133

### Copy of Report to:

Name: Jim Norris  
 Company: HGC, Inc

E-mail: Jimn@hgcinc.com  
 Telephone: 520-293-1500 x-112

### Invoice to:

Name: Don Simpson  
 Company: HGC, Inc  
 E-mail:

Address: 51 W. Wetmore Rd  
Tucson, AZ 85705  
 Telephone: 520-293-1500 x-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES  NO   
 If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

### PROJECT INFORMATION ANALYSES REQUESTED (attach list or use quote number)

Quote #: <u>S04-IC</u>	# of Containers	S04-IC																		
Project/PO #: <u>8720002.2</u>																				
Reporting state for compliance testing: <u>AZ</u>																				
Sampler's Name: <u>Travis Taylor</u>																				
Are any samples NRC licensable material? <u>NO</u>																				
SAMPLE IDENTIFICATION		DATE:TIME	Matrix																	
<u>MCCONNELL 265</u>		<u>1-28-09:1431</u>	<u>GW</u>	<u>1</u>	<u>X</u>															

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

### REMARKS/ SAMPLE DISCLOSURES

PAGE  
2 of 2

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
<u>Travis Taylor</u>	<u>1-28-09:1525</u>	<u>LTB</u>	<u>1-29-09:10</u>

February 12, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720002.2

ACZ Project ID: L74214

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 02, 2009. This project has been assigned to ACZ's project number, L74214. Please reference this number in all future inquiries.


All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74214. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after March 12, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.





**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: GARNER 635ACZ Sample ID: **L74214-01**  
Date Sampled: 01/28/09 17:35  
Date Received: 02/02/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	37.4			mg/L	0.5	3	02/10/09 22:30	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: WEISKOPFACZ Sample ID: **L74214-02**  
Date Sampled: 01/29/09 16:50  
Date Received: 02/02/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	503			mg/L	5	30	02/11/09 14:22	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: SCHWARTZACZ Sample ID: **L74214-03**  
Date Sampled: 01/29/09 15:36  
Date Received: 02/02/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	124			mg/L	3	10	02/11/09 15:25	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: RAMIREZ

ACZ Sample ID: **L74214-04**

Date Sampled: 01/29/09 13:15

Date Received: 02/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	8.3			mg/L	0.5	3	02/11/09 15:46	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: PIONKE

ACZ Sample ID: **L74214-05**

Date Sampled: 01/29/09 11:21

Date Received: 02/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	385			mg/L	5	30	02/11/09 16:07	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: MOORE

ACZ Sample ID: **L74214-06**

Date Sampled: 01/29/09 10:01

Date Received: 02/02/09

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	6.6			mg/L	0.5	3	02/11/09 16:28	aml

Arizona license number: AZ0102

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.

ACZ Project ID: **L74214**

Project ID: 8720002.2

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG259574</b>													
WG259574ICV	ICV	02/09/09 13:49	WI081218-1	50		50.38	mg/L	100.8	90	110			
WG259574ICB	ICB	02/09/09 14:10				U	mg/L		-1.5	1.5			
WG259574ICV1	ICV	02/10/09 14:45	WI081218-1	50		52.4	mg/L	104.8	90	110			
WG259574ICB1	ICB	02/10/09 15:06				U	mg/L		-1.5	1.5			
WG259574LFB	LFB	02/10/09 15:28	WI081125-2	30		30.73	mg/L	102.4	90	110			
WG259574ICV2	ICV	02/11/09 11:12	WI081218-1	50		52.31	mg/L	104.6	90	110			
WG259574ICB2	ICB	02/11/09 11:33				U	mg/L		-1.5	1.5			
L74209-04AS	AS	02/11/09 13:40	WI081125-2	150	128	267.6	mg/L	93.1	90	110			
L74209-04DUP	DUP	02/11/09 14:01			128	128.1	mg/L				0.1	20	



Hydro Geo Chem, Inc.

ACZ Project ID: **L74214**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

Hydro Geo Chem, Inc.

ACZ Project ID: **L74214**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74214  
 Date Received: 2/2/2009  
 Received By:  
 Date Printed: 2/2/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA7820	1.1	12

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74214  
 Date Received: 2/2/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74214-01	GARNER 635									X		<input type="checkbox"/>
L74214-02	WEISKOPF									X		<input type="checkbox"/>
L74214-03	SCHWARTZ									X		<input type="checkbox"/>
L74214-04	RAMIREZ									X		<input type="checkbox"/>
L74214-05	PIONKE									X		<input type="checkbox"/>
L74214-06	MOORE									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



Laboratories, Inc. L74214

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: simn@hgcinc.com
Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

YES [X]
NO [ ]

ANALYSES REQUESTED (attach list or use quote number)

PROJECT INFORMATION

Quote #: 504-IC
Project/PO #: 8720002.2
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? No

Table with columns: Matrix, # of Containers, 504-IC, and multiple empty columns for analysis results.

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix. Rows include GARNER 635, WEISKOPF, SCHWARTZ, RAMIREZ, PIONKE, MOORE.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE 1 of 1

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY: Travis Taylor DATE:TIME 1-30-09:1100 RECEIVED BY: [Signature] DATE:TIME 2-2-09 9:23

February 16, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720002.2

ACZ Project ID: L74368

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 11, 2009. This project has been assigned to ACZ's project number, L74368. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74368. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after March 16, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: DURAZO

ACZ Sample ID: **L74368-01**

Date Sampled: 02/10/09 11:19

Date Received: 02/11/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	386			mg/L	5	30	02/13/09 11:22	aml

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>



Hydro Geo Chem, Inc.

ACZ Project ID: **L74368**

Project ID: 8720002.2

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG259695</b>													
WG259695ICV	ICV	02/09/09 13:49	WI081218-1	50		50.38	mg/L	100.8	90	110			
WG259695ICB	ICB	02/09/09 14:10				U	mg/L		-1.5	1.5			
WG259695ICV1	ICV	02/12/09 18:58	WI081218-1	50		51.74	mg/L	103.5	90	110			
WG259695ICB1	ICB	02/12/09 19:19				U	mg/L		-1.5	1.5			
WG259695LFB	LFB	02/12/09 19:40	WI081125-2	30		28.81	mg/L	96	90	110			
L74339-05AS	AS	02/12/09 20:22	WI081125-2	30	45.1	73.54	mg/L	94.8	90	110			
L74339-05DUP	DUP	02/12/09 20:43			45.1	45.1	mg/L				0	20	

Hydro Geo Chem, Inc.

ACZ Project ID: **L74368**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

Hydro Geo Chem, Inc.

ACZ Project ID: **L74368**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74368  
 Date Received: 2/11/2009  
 Received By:  
 Date Printed: 2/11/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA7866	1.4	14

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74368  
 Date Received: 2/11/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74368-01	DURAZO											<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



Laboratories, Inc.

L74368

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 554-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: jimn@hgcinc.com
Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: 504-IC
Project/PO #: 8720002.2
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? NO

Table with columns for # of Containers and analysis results. Row 1: 504-IC, X

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix, # of Containers, and analysis results. Row 1: DURAZO, 02-10-09:1119, GW, 1, X

Matrix SW (Surface Water) - GW (Ground Water) - WW (Waste Water) - DW (Drinking Water) - SL (Sludge) - SO (Soil) - OL (Oil) - Other

REMARKS/ SAMPLE DISCLOSURES

72 hour turnaround please.

PAGE 1 of 1

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Row 1: Travis Taylor, 02-10-09:1210, [Signature], 2-11-09:10:31

February 24, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720002.2

ACZ Project ID: L74430

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 14, 2009. This project has been assigned to ACZ's project number, L74430. Please reference this number in all future inquiries.


All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74430. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after March 24, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: POOL

ACZ Sample ID: **L74430-01**

Date Sampled: 02/13/09 09:19

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	141			mg/L	1	5	02/18/09 11:22	aml

**Arizona license number: AZ0102**



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: WEED

ACZ Sample ID: **L74430-02**

Date Sampled: 02/13/09 10:07

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	12.6			mg/L	0.5	3	02/17/09 18:53	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: PARRA

ACZ Sample ID: **L74430-03**

Date Sampled: 02/13/09 11:08

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	405			mg/L	5	30	02/18/09 11:43	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: RUIZ

ACZ Sample ID: **L74430-04**

Date Sampled: 02/12/09 16:42

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	254			mg/L	3	10	02/18/09 12:04	aml

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.

ACZ Project ID: **L74430**

Project ID: 8720002.2

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG259886</b>													
WG259886 CV	ICV	02/09/09 13:49	WI081218-1	50		50.38	mg/L	100.8	90	110			
WG259886 CB	ICB	02/09/09 14:10				U	mg/L		-1.5	1.5			
WG259886 CV1	ICV	02/17/09 16:25	WI081218-1	50		53.04	mg/L	106.1	90	110			
WG259886 CB1	ICB	02/17/09 16:46				U	mg/L		-1.5	1.5			
WG259886 LFB	LFB	02/17/09 17:07	WI081125-2	30		30.1	mg/L	100.3	90	110			
WG259886 CV2	ICV	02/18/09 9:36	WI081218-1	50		52.03	mg/L	104.1	90	110			
WG259886 CB2	ICB	02/18/09 9:57				U	mg/L		-1.5	1.5			
L74386-01AS	AS	02/18/09 10:39	WI081125-2	60	101	157.9	mg/L	94.8	90	110			
L74386-01DUP	DUP	02/18/09 11:01			101	104	mg/L				2.9	20	

Hydro Geo Chem, Inc.

ACZ Project ID: **L74430**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

Hydro Geo Chem, Inc.

ACZ Project ID: **L74430**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74430  
 Date Received: 2/14/2009  
 Received By:  
 Date Printed: 2/14/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA7900	2.1	15

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**



Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74430  
 Date Received: 2/14/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74430-01	POOL									X		<input type="checkbox"/>
L74430-02	WEED									X		<input type="checkbox"/>
L74430-03	PARRA									X		<input type="checkbox"/>
L74430-04	RUIZ									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



Laboratories, Inc.

L 74430

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Gen Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: jimn@hginc.com
Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: S04-IC
Project/PO #: 8720002.2
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? NO

Table with columns for # of Containers and analysis results. Includes handwritten 'S04-IC' in the # of Containers column.

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix. Includes handwritten entries: POOL, WEED, PARRA, RUIZ.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE 1 of 1

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Includes handwritten signatures and dates.

February 26, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720002.2

ACZ Project ID: L74431

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 14, 2009. This project has been assigned to ACZ's project number, L74431. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74431. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after March 26, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: ROGERS 803ACZ Sample ID: **L74431-01**  
Date Sampled: 02/10/09 14:05  
Date Received: 02/14/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	141			mg/L	2	8	02/18/09 12:25	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: ROGERS E

ACZ Sample ID: **L74431-02**

Date Sampled: 02/10/09 15:27

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	5.4			mg/L	0.5	3	02/17/09 20:17	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: ZANDER

ACZ Sample ID: **L74431-03**

Date Sampled: 02/10/09 16:51

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	6.0			mg/L	0.5	3	02/17/09 21:21	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: BURKE

ACZ Sample ID: **L74431-04**

Date Sampled: 02/11/09 10:37

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	23.9			mg/L	0.5	3	02/17/09 21:42	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: TVI236

ACZ Sample ID: **L74431-05**

Date Sampled: 02/11/09 11:40

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	27.6			mg/L	0.5	3	02/17/09 22:03	aml

**Arizona license number: AZ0102**



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: TVI875

ACZ Sample ID: **L74431-06**

Date Sampled: 02/11/09 12:33

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	312			mg/L	5	30	02/18/09 12:46	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: COLLINS

ACZ Sample ID: **L74431-07**

Date Sampled: 02/11/09 13:31

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	567			mg/L	5	30	02/18/09 14:32	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: COOPER

ACZ Sample ID: **L74431-08**

Date Sampled: 02/11/09 15:16

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	34.3			mg/L	0.5	3	02/17/09 23:48	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: METZLER

ACZ Sample ID: **L74431-09**

Date Sampled: 02/11/09 16:32

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	321			mg/L	5	30	02/18/09 14:53	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: EQB021209ACZ Sample ID: **L74431-10**  
Date Sampled: 02/12/09 08:22  
Date Received: 02/14/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography		U		mg/L	0.5	3	02/18/09 0:31	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: FB021209

ACZ Sample ID: **L74431-11**

Date Sampled: 02/12/09 08:24

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography		U		mg/L	0.5	3	02/18/09 1:34	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: NWC-04

ACZ Sample ID: **L74431-12**

Date Sampled: 02/12/09 08:45

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	181			mg/L	3	10	02/18/09 15:14	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: NWC-06

ACZ Sample ID: **L74431-13**

Date Sampled: 02/12/09 09:13

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	8.0			mg/L	0.5	3	02/18/09 2:16	aml

**Arizona license number: AZ0102**



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: NWC-02

ACZ Sample ID: **L74431-14**

Date Sampled: 02/12/09 09:38

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	6.6			mg/L	0.5	3	02/18/09 2:37	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: DUP021209ACZ Sample ID: **L74431-15**  
Date Sampled: 02/12/09 00:00  
Date Received: 02/14/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	198			mg/L	3	10	02/18/09 15:35	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: NWC-03

ACZ Sample ID: **L74431-16**

Date Sampled: 02/12/09 09:55

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	412			mg/L	5	30	02/23/09 13:33	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: COB MW-3ACZ Sample ID: **L74431-17**  
Date Sampled: 02/12/09 11:32  
Date Received: 02/14/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	112			mg/L	3	10	02/23/09 13:55	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: COB MW-1ACZ Sample ID: **L74431-18**  
Date Sampled: 02/12/09 13:32  
Date Received: 02/14/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	750			mg/L	10	50	02/23/09 14:16	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: COB MW-2ACZ Sample ID: **L74431-19**  
Date Sampled: 02/12/09 14:14  
Date Received: 02/14/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	35.6			mg/L	0.5	3	02/21/09 14:54	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: COB WL

ACZ Sample ID: **L74431-20**

Date Sampled: 02/12/09 15:14

Date Received: 02/14/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	94			mg/L	3	10	02/23/09 14:37	aml

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>



Hydro Geo Chem, Inc.  
 Project ID: 8720002.2

ACZ Project ID: **L74431**

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG259886</b>													
WG259886 CV	ICV	02/09/09 13:49	WI081218-1	50		50.38	mg/L	100.8	90	110			
WG259886 CB	ICB	02/09/09 14:10				U	mg/L		-1.5	1.5			
WG259886 CV1	ICV	02/17/09 16:25	WI081218-1	50		53.04	mg/L	106.1	90	110			
WG259886 CB1	ICB	02/17/09 16:46				U	mg/L		-1.5	1.5			
WG259886 LFB	LFB	02/17/09 17:07	WI081125-2	30		30.1	mg/L	100.3	90	110			
WG259886 CV2	ICV	02/18/09 9:36	WI081218-1	50		52.03	mg/L	104.1	90	110			
WG259886 CB2	ICB	02/18/09 9:57				U	mg/L		-1.5	1.5			
L74386-01AS	AS	02/18/09 10:39	WI081125-2	60	101	157.9	mg/L	94.8	90	110			
L74386-01DUP	DUP	02/18/09 11:01			101	104	mg/L				2.9	20	
L74431-06AS	AS	02/18/09 13:07	WI081125-2	300	312	607.2	mg/L	98.4	90	110			
L74431-06DUP	DUP	02/18/09 13:28			312	320.2	mg/L				2.6	20	
<b>WG260060</b>													
WG260060 CV	ICV	02/09/09 13:49	WI081218-1	50		50.38	mg/L	100.8	90	110			
WG260060 CB	ICB	02/09/09 14:10				U	mg/L		-1.5	1.5			
WG260060 CV1	ICV	02/21/09 11:01	WI081218-1	50		51.99	mg/L	104	90	110			
WG260060 CB1	ICB	02/21/09 11:23				U	mg/L		-1.5	1.5			
WG260060 LFB	LFB	02/21/09 11:44	WI081125-2	30		32.44	mg/L	108.1	90	110			
WG260060 CV2	ICV	02/23/09 11:48	WI081218-1	50		51.99	mg/L	104	90	110			
WG260060 CB2	ICB	02/23/09 12:09				U	mg/L		-1.5	1.5			
L74411-01AS	AS	02/23/09 12:51	WI081125-2	300	209	492.4	mg/L	94.5	90	110			
L74411-01DUP	DUP	02/23/09 17:26			256	247.2	mg/L				3.5	20	

Hydro Geo Chem, Inc.

ACZ Project ID: **L74431**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

**Hydro Geo Chem, Inc.**

ACZ Project ID: **L74431**

No certification qualifiers associated with this analysis

**Hydro Geo Chem, Inc.**  
 8720002.2

ACZ Project ID: L74431  
 Date Received: 2/14/2009  
 Received By:  
 Date Printed: 2/14/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
1997	1.6	19

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74431  
 Date Received: 2/14/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74431-01	ROGERS 803									X		<input type="checkbox"/>
L74431-02	ROGERS E									X		<input type="checkbox"/>
L74431-03	ZANDER									X		<input type="checkbox"/>
L74431-04	BURKE									X		<input type="checkbox"/>
L74431-05	TVI236									X		<input type="checkbox"/>
L74431-06	TVI875									X		<input type="checkbox"/>
L74431-07	COLLINS									X		<input type="checkbox"/>
L74431-08	COOPER									X		<input type="checkbox"/>
L74431-09	METZLER									X		<input type="checkbox"/>
L74431-10	EQB021209									X		<input type="checkbox"/>
L74431-11	FB021209									X		<input type="checkbox"/>
L74431-12	NWC-04									X		<input type="checkbox"/>
L74431-13	NWC-06									X		<input type="checkbox"/>
L74431-14	NWC-02									X		<input type="checkbox"/>
L74431-15	DUP021209									X		<input type="checkbox"/>
L74431-16	NWC-03									X		<input type="checkbox"/>
L74431-17	COB MW-3									X		<input type="checkbox"/>
L74431-18	COB MW-1									X		<input type="checkbox"/>
L74431-19	COB MW-2									X		<input type="checkbox"/>
L74431-20	COB WL									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



Laboratories, Inc.

L74431

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: jimn@hgcinc.com
Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO"

is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: S04-IC
Project/PO #: 8720002.2
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? NO

Table with columns for # of Containers and analysis results. Row 1: # of Containers: 504-IC, Analysis: X

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix, # of Containers, and analysis results. Rows include ROGERS 803, ROGERS E, ZANDER, BURKE, TVI 236, TVI 875, COLLINS, COOPER, METZLER, EQB021209.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

Empty box for remarks. Includes PAGE 1 of 2 label.

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Row 1: Travis Taylor, 2-12-09:1550, MYL, 2-14-09 10:33



Laboratories, Inc.

L74431

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 x-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: jimn@hgcinc.com
Telephone: 520-293-1500 x-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 x-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION ANALYSES REQUESTED (attach list or use quote number)

Table with columns: Quote #, Project/PO #, Reporting state, Sampler's Name, Are any samples NRC licensable material?, Matrix, # of Containers, and analysis results for various samples like FB021209, NWC-04, etc.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES
Please refer to ACZ's terms & conditions located on the reverse side of this COC.

PAGE 2 of 2

RELINQUISHED BY: Travis Taylor DATE: 2-12-09 11:50 RECEIVED BY: WPL DATE: 2-14-09 10:33

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Rd. Suite 101  
Tucson, AZ 85705

March 10, 2009

Cc: Jim Norris

Project ID: 8720002.2  
ACZ Project ID: L74529

Dan Simpson:

Enclosed are revised analytical reports for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 21, 2009 and reported on March 06, 2009. Refer to the case narrative for an explanation of the changes. This project was assigned to ACZ's project number, L74529. Please reference this number in all future inquiries.

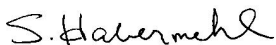
All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74529. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all the requirements of NELAC.

This report should be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after April 06, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years. Please notify your Project Manager if you have other needs.

If you have any questions, please contact your Project Manager or Customer Service Representative.



Scott Habermehl has reviewed  
and approved this report.





Hydro Geo Chem, Inc.

March 10, 2009

Project ID: 8720002.2

ACZ Project ID: L74529

**Sample Receipt**

ACZ Laboratories, Inc. (ACZ) received 18 ground water samples from Hydro Geo Chem, Inc. on February 21, 2009. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L74529. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

**Holding Times**

All analyses were performed within EPA recommended holding times.

**Sample Analysis**

These samples were analyzed for inorganic parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports. The extended qualifier reports may contain footnotes qualifying specific elements due to QC failures. In addition the following has been noted with this specific project:

This project has been revised to edit the sample identification on L74529-17 and -18. The id's had been transposed during the login process.

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-13MACZ Sample ID: **L74529-01**  
Date Sampled: 02/17/09 14:08  
Date Received: 02/21/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	441		*	mg/L	3	10	02/27/09 14:16	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: BMO-2008-13B

ACZ Sample ID: **L74529-02**

Date Sampled: 02/17/09 15:56

Date Received: 02/21/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	1000		*	mg/L	10	50	03/01/09 13:24	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-5BACZ Sample ID: **L74529-03**  
Date Sampled: 02/18/09 09:27  
Date Received: 02/21/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	192		*	mg/L	3	10	03/01/09 13:46	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-5MACZ Sample ID: **L74529-04**  
Date Sampled: 02/18/09 10:29  
Date Received: 02/21/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	122		*	mg/L	3	10	03/01/09 14:07	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: TM-42

ACZ Sample ID: **L74529-05**

Date Sampled: 02/18/09 12:37

Date Received: 02/21/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	429		*	mg/L	5	30	03/01/09 14:28	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-7MACZ Sample ID: **L74529-06**  
Date Sampled: 02/18/09 14:13  
Date Received: 02/21/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	27.6		*	mg/L	0.5	3	02/27/09 16:01	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-4BACZ Sample ID: **L74529-07**  
Date Sampled: 02/18/09 15:40  
Date Received: 02/21/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	13.4		*	mg/L	0.5	3	02/27/09 17:05	aml

Arizona license number: AZ0102



**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-8MACZ Sample ID: **L74529-08**  
Date Sampled: 02/19/09 10:47  
Date Received: 02/21/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	147		*	mg/L	3	10	03/01/09 14:49	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-8BACZ Sample ID: **L74529-09**  
Date Sampled: 02/19/09 11:35  
Date Received: 02/21/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	1570		*	mg/L	30	100	03/01/09 15:10	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-3BACZ Sample ID: **L74529-10**  
Date Sampled: 02/19/09 14:12  
Date Received: 02/21/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	155		*	mg/L	3	10	03/01/09 15:31	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: FB021909

ACZ Sample ID: **L74529-11**

Date Sampled: 02/19/09 10:20

Date Received: 02/21/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography		U	*	mg/L	0.5	3	02/27/09 19:11	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: EQB021909ACZ Sample ID: **L74529-12**  
Date Sampled: 02/19/09 10:20  
Date Received: 02/21/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography		U	*	mg/L	0.5	3	02/27/09 19:32	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: DUP021909ACZ Sample ID: **L74529-13**  
Date Sampled: 02/19/09 00:00  
Date Received: 02/21/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	149		*	mg/L	3	10	03/01/09 16:34	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-6BACZ Sample ID: **L74529-14**  
Date Sampled: 02/19/09 15:56  
Date Received: 02/21/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	54.3		*	mg/L	0.5	3	02/27/09 20:14	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: BF-01

ACZ Sample ID: **L74529-15**

Date Sampled: 02/20/09 08:43

Date Received: 02/21/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	1330		*	mg/L	50	300	03/03/09 13:09	aml

**Arizona license number: AZ0102**



**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-6MACZ Sample ID: **L74529-16**  
Date Sampled: 02/20/09 10:25  
Date Received: 02/21/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	193		*	mg/L	3	10	03/01/09 17:59	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: TM-16

ACZ Sample ID: **L74529-17**

Date Sampled: 02/20/09 11:23

Date Received: 02/21/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	492		*	mg/L	5	30	03/01/09 18:20	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: TM-7

ACZ Sample ID: **L74529-18**

Date Sampled: 02/20/09 13:39

Date Received: 02/21/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	22.5		*	mg/L	0.5	3	02/27/09 22:21	aml

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.

ACZ Project ID: **L74529**

Project ID: 8720002.2

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG260317</b>													
WG260317ICV	ICV	02/09/09 13:49	WI081218-1	50		50.38	mg/L	100.8	90	110			
WG260317ICB	ICB	02/09/09 14:10				U	mg/L		-1.5	1.5			
WG260317ICV1	ICV	02/27/09 12:09	WI081218-1	50		49.53	mg/L	99.1	90	110			
WG260317ICB1	ICB	02/27/09 12:30				U	mg/L		-1.5	1.5			
WG260317LFB	LFB	02/27/09 12:51	WI081125-2	30		29.07	mg/L	96.9	90	110			
L74443-01AS	AS	02/27/09 13:33	WI081125-2	300	U	289.8	mg/L	96.6	90	110			
L74443-01DUP	DUP	02/27/09 13:55			U	U	mg/L				0	20	RA
WG260317ICV2	ICV	03/01/09 12:42	WI081218-1	50		51.9	mg/L	103.8	90	110			
WG260317ICB2	ICB	03/01/09 13:03				U	mg/L		-1.5	1.5			
L74529-10AS	AS	03/01/09 15:52	WI081125-2	150	155	273	mg/L	78.7	90	110			M2
L74529-10DUP	DUP	03/01/09 16:13			155	168.9	mg/L				8.6	20	
WG260317ICV3	ICV	03/03/09 12:27	WI081218-1	50		51.81	mg/L	103.6	90	110			
WG260317ICB3	ICB	03/03/09 12:48				U	mg/L		-1.5	1.5			

Hydro Geo Chem, Inc.

ACZ Project ID: **L74529**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L74529-01	WG260317	Sulfate	300.0 - Ion Chromatography	DF	Sample required dilution due to high sediment.
			300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74529-02	WG260317	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74529-03	WG260317	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74529-04	WG260317	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74529-05	WG260317	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74529-06	WG260317	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74529-07	WG260317	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74529-08	WG260317	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74529-09	WG260317	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74529-10	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74529-11	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74529-12	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74529-13	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74529-14	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74529-15	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74529-16	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74529-17	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L74529-18	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.

Hydro Geo Chem, Inc.

ACZ Project ID: **L74529**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74529  
 Date Received: 2/21/2009  
 Received By:  
 Date Printed: 2/21/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA7924	1.4	16

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**



Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74529  
 Date Received: 2/21/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74529-01	BMO-2008-13M									X		<input type="checkbox"/>
L74529-02	BMO-2008-13B									X		<input type="checkbox"/>
L74529-03	BMO-2008-5B									X		<input type="checkbox"/>
L74529-04	BMO-2008-5M									X		<input type="checkbox"/>
L74529-05	TM-42									X		<input type="checkbox"/>
L74529-06	BMO-2008-7M									X		<input type="checkbox"/>
L74529-07	BMO-2008-4B									X		<input type="checkbox"/>
L74529-08	BMO-2008-8M									X		<input type="checkbox"/>
L74529-09	BMO-2008-8B									X		<input type="checkbox"/>
L74529-10	BMO-2008-3B									X		<input type="checkbox"/>
L74529-11	FB021909									X		<input type="checkbox"/>
L74529-12	EQB021909									X		<input type="checkbox"/>
L74529-13	DUP021909									X		<input type="checkbox"/>
L74529-14	BMO-2008-6B									X		<input type="checkbox"/>
L74529-15	BF-01									X		<input type="checkbox"/>
L74529-16	BMO-2008-6M									X		<input type="checkbox"/>
L74529-17	TM-7									X		<input type="checkbox"/>
L74529-18	TM-16									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

**Report to:**

Name: <i>Dan Simpson</i>	Address: <i>51 W. Wetmore Rd</i>
Company: <i>Hydro Geo Chem, Inc</i>	<i>Tucson, AZ 85705</i>
E-mail:	Telephone: <i>520-293-1500 X-133</i>

**Copy of Report to:**

Name: <i>Jim Norris</i>	E-mail: <i>simn@hgcinc.com</i>
Company: <i>HGC, Inc</i>	Telephone: <i>520-293-1500 X-112</i>

**Invoice to:**

Name: <i>Dan Simpson</i>	Address: <i>51 W. Wetmore Rd</i>
Company: <i>HGC, Inc.</i>	<i>Tucson, AZ 85705</i>
E-mail:	Telephone: <i>520-293-1500 X-133</i>

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES   
NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO"

is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

**PROJECT INFORMATION**

ANALYSES REQUESTED (attach list or use quote number)

Quote #: <i>504-IC</i>	# of Containers <i>504-IC</i>																			
Project/PO #: <i>8720002.2</i>																				
Reporting state for compliance testing: <i>AZ</i>																				
Sampler's Name: <i>Travis Taylor</i>																				
Are any samples NRC licensable material? <i>NO</i>																				

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers																	
<i>BMO-2008-13M</i>	<i>2-17-09:1408</i>	<i>GW</i>	<i>1</i>	<i>X</i>																
<i>BMO-2008-13B</i>	<i>2-17-09:1556</i>	<i>GW</i>	<i>1</i>	<i>X</i>																
<i>BMO-2008-5B</i>	<i>2-18-09:0927</i>	<i>GW</i>	<i>1</i>	<i>X</i>																
<i>BMO-2008-5M</i>	<i>2-18-09:1029</i>	<i>GW</i>	<i>1</i>	<i>X</i>																
<i>TM-42</i>	<i>2-18-09:1237</i>	<i>GW</i>	<i>1</i>	<i>X</i>																
<i>BMO-2008-7M</i>	<i>2-18-09:1413</i>	<i>GW</i>	<i>1</i>	<i>X</i>																
<i>BMO-2008-4B</i>	<i>2-18-09:1540</i>	<i>GW</i>	<i>1</i>	<i>X</i>																
<i>BMO-2008-8M</i>	<i>2-19-09:1047</i>	<i>GW</i>	<i>1</i>	<i>X</i>																
<i>BMO-2008-8B</i>	<i>2-19-09:1135</i>	<i>GW</i>	<i>1</i>	<i>X</i>																
<i>BMO-2008-3B</i>	<i>2-19-09:1412</i>	<i>GW</i>	<i>1</i>	<i>X</i>																

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

**REMARKS/ SAMPLE DISCLOSURES**

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
<i>Travis Taylor</i>	<i>2-20-09:1515</i>	<i>[Signature]</i>	<i>2-21-09 10:40</i>



Laboratories, Inc. L74529

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 x-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: jimn@hgcinc.com
Telephone: 520-293-1500 x-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 x-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: 504-IC
Project/PO #: 8720002.2
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? NO

# of Containers
504-IC

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix, and multiple columns for analyses requested. Rows include FB021909, EQB021909, DUP021909, BMO-2008-6B, BF-01, BMO-2008-6M, TM-7, TM-16.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE 2 of 2

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table for Relinquished By and Received By with Date:Time. Relinquished by Travis Taylor on 2-20-09:1515. Received by [Signature] on 2-21-09 10:46.

March 09, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720005.0

ACZ Project ID: L74591

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 26, 2009. This project has been assigned to ACZ's project number, L74591. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74591. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after April 09, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**Project ID: 8720005.0  
Sample ID: SCHWARTZACZ Sample ID: **L74591-01**  
Date Sampled: 02/23/09 17:28  
Date Received: 02/26/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	123		*	mg/L	3	10	02/27/09 22:42	aml

Arizona license number: AZ0102

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.

ACZ Project ID: **L74591**

Project ID: 8720005.0

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG260317</b>													
WG260317ICV	ICV	02/09/09 13:49	WI081218-1	50		50.38	mg/L	100.8	90	110			
WG260317ICB	ICB	02/09/09 14:10				U	mg/L		-1.5	1.5			
WG260317ICV1	ICV	02/27/09 12:09	WI081218-1	50		49.53	mg/L	99.1	90	110			
WG260317ICB1	ICB	02/27/09 12:30				U	mg/L		-1.5	1.5			
WG260317LFB	LFB	02/27/09 12:51	WI081125-2	30		29.07	mg/L	96.9	90	110			
WG260317ICV2	ICV	03/01/09 12:42	WI081218-1	50		51.9	mg/L	103.8	90	110			
WG260317ICB2	ICB	03/01/09 13:03				U	mg/L		-1.5	1.5			
L74529-10AS	AS	03/01/09 15:52	WI081125-2	150	155	273	mg/L	78.7	90	110			M2
L74529-10DUP	DUP	03/01/09 16:13			155	168.9	mg/L				8.6	20	
WG260317ICV3	ICV	03/03/09 12:27	WI081218-1	50		51.81	mg/L	103.6	90	110			
WG260317ICB3	ICB	03/03/09 12:48				U	mg/L		-1.5	1.5			

Hydro Geo Chem, Inc.

ACZ Project ID: **L74591**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L74591-01	WG260317	Sulfate	300.0 - Ion Chromatography	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.



Hydro Geo Chem, Inc.

ACZ Project ID: **L74591**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720005.0

ACZ Project ID: L74591  
 Date Received: 2/26/2009  
 Received By:  
 Date Printed: 2/26/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA7940	4.5	13

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**

Hydro Geo Chem, Inc.  
 8720005.0

ACZ Project ID: L74591  
 Date Received: 2/26/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74591-01	SCHWARTZ									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



Laboratories, Inc.

L74591

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: St W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: jimn@hgcinc.com
Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: St W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: 8720005.0 or 504-IC
Project/PO #: 8720005.0
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? NO

Table with columns for # of Containers and analyses requested. Contains handwritten '504-IC' and 'X'.

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix, # of Containers, and analyses requested. Row 1: SCHWARTZ, 2-23-09: 1728, GW, 1, X.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

72 hour turnaround please.

PAGE 1 of 1

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Row 1: Travis Taylor, 2-24-09: 0945, [Signature], 2/26/09 11:21.

March 11, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720002.2

ACZ Project ID: L74631

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on March 02, 2009. This project has been assigned to ACZ's project number, L74631. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74631. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after April 11, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: GGOOSE 547ACZ Sample ID: **L74631-01**  
Date Sampled: 02/24/09 13:15  
Date Received: 03/02/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	186			mg/L	5	30	03/04/09 18:16	aml

Arizona license number: AZ0102

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: TM-02A

ACZ Sample ID: **L74631-02**

Date Sampled: 02/24/09 15:59

Date Received: 03/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	20.3			mg/L	0.5	3	03/04/09 0:25	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: BMO-2008-01G

ACZ Sample ID: **L74631-03**

Date Sampled: 02/25/09 11:03

Date Received: 03/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	109			mg/L	3	10	03/04/09 18:37	aml

**Arizona license number: AZ0102**



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2  
Sample ID: BMO-2008-10GU

ACZ Sample ID: **L74631-04**  
Date Sampled: 02/25/09 13:20  
Date Received: 03/02/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	1740			mg/L	30	100	03/10/09 23:24	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: BMO-2008-10GL

ACZ Sample ID: **L74631-05**

Date Sampled: 02/25/09 14:59

Date Received: 03/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	1180			mg/L	10	50	03/10/09 23:42	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: EQB022609ACZ Sample ID: **L74631-06**  
Date Sampled: 02/26/09 09:09  
Date Received: 03/02/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	0.6	B	*	mg/L	0.5	3	03/11/09 0:01	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: FB022609

ACZ Sample ID: **L74631-07**

Date Sampled: 02/26/09 09:10

Date Received: 03/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography		U	*	mg/L	0.5	3	03/11/09 0:55	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: TM-15 MILLER

ACZ Sample ID: **L74631-08**

Date Sampled: 02/26/09 09:14

Date Received: 03/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	14.6		*	mg/L	0.5	3	03/11/09 1:13	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: TM-06 MILLERACZ Sample ID: **L74631-09**  
Date Sampled: 02/26/09 10:34  
Date Received: 03/02/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	32.7		*	mg/L	0.5	3	03/11/09 1:31	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: TM-03

ACZ Sample ID: **L74631-10**

Date Sampled: 02/26/09 11:38

Date Received: 03/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	107		*	mg/L	3	10	03/11/09 1:49	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: BMO-2008-11G

ACZ Sample ID: **L74631-11**

Date Sampled: 02/26/09 13:26

Date Received: 03/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	12.3		*	mg/L	0.5	3	03/11/09 2:44	aml

**Arizona license number: AZ0102**



**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: DUP-022609ACZ Sample ID: **L74631-12**  
Date Sampled: 02/26/09 00:00  
Date Received: 03/02/09  
Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	102		*	mg/L	3	10	03/11/09 3:02	aml

Arizona license number: **AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: GL-03

ACZ Sample ID: **L74631-13**

Date Sampled: 02/26/09 14:39

Date Received: 03/02/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	54.8		*	mg/L	0.5	3	03/11/09 3:20	aml

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**Project ID: 8720002.2  
Sample ID: BMO-2008-9MACZ Sample ID: **L74631-14**  
Date Sampled: 02/26/09 15:58  
Date Received: 03/02/09  
Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	28.8		*	mg/L	0.5	3	03/11/09 3:38	aml

Arizona license number: **AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.  
 Project ID: 8720002.2

ACZ Project ID: **L74631**

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG260436</b>													
WG260436ICV	ICV	02/09/09 13:49	WI081218-1	50		50.38	mg/L	100.8	90	110			
WG260436ICB	ICB	02/09/09 14:10				U	mg/L		-1.5	1.5			
WG260436ICV1	ICV	03/03/09 14:13	WI081218-1	50		52.16	mg/L	104.3	90	110			
WG260436ICB1	ICB	03/03/09 14:34				U	mg/L		-1.5	1.5			
WG260436LFB	LFB	03/03/09 14:55	WI081125-2	30		29.44	mg/L	98.1	90	110			
L74628-04AS	AS	03/03/09 20:33	WI081125-2	30	57.3	87.63	mg/L	101.1	90	110			
L74628-04DUP	DUP	03/03/09 20:54			57.3	57.14	mg/L				0.3	20	
WG260436ICV2	ICV	03/04/09 14:45	WI081218-1	50		51.86	mg/L	103.7	90	110			
WG260436ICB2	ICB	03/04/09 15:06				U	mg/L		-1.5	1.5			
<b>WG260761</b>													
WG260761ICV	ICV	03/10/09 13:25	WI081218-1	50		50.71	mg/L	101.4	90	110			
WG260761ICB	ICB	03/10/09 13:43				U	mg/L		-1.5	1.5			
WG260761ICV1	ICV	03/10/09 18:53	WI081218-1	50		51.62	mg/L	103.2	90	110			
WG260761ICB1	ICB	03/10/09 19:11				U	mg/L		-1.5	1.5			
WG260486LFB	LFB	03/10/09 19:29	WI081125-2	30		29.69	mg/L	99	90	110			
L74606-01DUP	DUP	03/10/09 20:05			21.2	21.37	mg/L				0.8	20	
L74631-06AS	AS	03/11/09 0:19	WI081125-2	30	.6	32.19	mg/L	105.3	90	110			
L74631-06DUP	DUP	03/11/09 0:37			.6	.58	mg/L				3.4	20	RA

Hydro Geo Chem, Inc.

ACZ Project ID: **L74631**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L74631-06	WG260761	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74631-07	WG260761	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74631-08	WG260761	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74631-09	WG260761	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74631-10	WG260761	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74631-11	WG260761	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74631-12	WG260761	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74631-13	WG260761	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L74631-14	WG260761	Sulfate	300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Hydro Geo Chem, Inc.

ACZ Project ID: **L74631**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74631  
 Date Received: 3/2/2009  
 Received By:  
 Date Printed: 3/2/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
1934	1.9	13

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**



Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74631  
 Date Received: 3/2/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74631-01	GGOOSE 547									X		<input type="checkbox"/>
L74631-02	TM-02A									X		<input type="checkbox"/>
L74631-03	BMO-2008-01G									X		<input type="checkbox"/>
L74631-04	BMO-2008-10GU									X		<input type="checkbox"/>
L74631-05	BMO-2008-10GL									X		<input type="checkbox"/>
L74631-06	EQB022609									X		<input type="checkbox"/>
L74631-07	FB022609									X		<input type="checkbox"/>
L74631-08	TM-15 MILLER									X		<input type="checkbox"/>
L74631-09	TM-06 MILLER									X		<input type="checkbox"/>
L74631-10	TM-03									X		<input type="checkbox"/>
L74631-11	BMO-2008-11G									X		<input type="checkbox"/>
L74631-12	DUP-022609									X		<input type="checkbox"/>
L74631-13	GL-03									X		<input type="checkbox"/>
L74631-14	BMO-2008-9M									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson  
 Company: Hydro Geo Chem, Inc  
 E-mail:

Address: 51 W. Wetmore Rd  
Tucson, AZ 85705  
 Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jan Norris  
 Company: HGC, Inc

E-mail: Simn@hgcinc.com  
 Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson  
 Company: HGC, Inc  
 E-mail:

Address: 51 W. Wetmore Rd  
Tucson, AZ 85705  
 Telephone: 520-293-1500 X-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES   
 NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: SD4-IC  
 Project/PO #: 870 872000 2.2  
 Reporting state for compliance testing: AZ  
 Sampler's Name: Travis Taylor  
 Are any samples NRC licensable material? NO

# of Containers	504-IC																			
-----------------	--------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SAMPLE IDENTIFICATION	DATE:TIME	Matrix																		
GGOOSE 547	2-24-09:1315	GW	1	X																
TM-02A	2-24-09:1559	GW	1	X																
BMO-2008-01G	2-25-09:1103	GW	1	X																
BMO-2008-10GU	2-25-09:1320	GW	1	X																
BMO-2008-10GL	2-25-09:1459	GW	1	X																
EQB022609	2-26-09:0909	GW	1	X																
FB022609	2-26-09:0910	GW	1	X																
TM-15 MILLER	2-26-09:0914	GW	1	X																
TM-06 MILLER	2-26-09:1034	GW	1	X																
TM-03	2-26-09:1138	GW	1	X																

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

Blank area for remarks and disclosures.

PAGE  
1 of 2

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Travis Taylor	2-27-09:0940	LPL	2-2-09 11:38



Laboratories, Inc.

274631

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: jimn@hgcinc.com
Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: 504-IC
Project/PO #: 8720002.2
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? NO

Table with columns for Matrix, # of Containers, and analysis results. Includes handwritten '504-IC' in the # of Containers column.

Table with columns for SAMPLE IDENTIFICATION, DATE:TIME, and Matrix. Includes handwritten entries for BMD-2008-11G, DUPO2-609, GL-03, and BMD-2008-9M.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

Empty box for remarks and disclosures.

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Includes handwritten signatures and dates.

March 17, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720002.2

ACZ Project ID: L74686

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on March 04, 2009. This project has been assigned to ACZ's project number, L74686. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74686. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after April 17, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: TM-19A

ACZ Sample ID: **L74686-01**

Date Sampled: 03/03/09 12:16

Date Received: 03/04/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	66.2			mg/L	0.5	3	03/11/09 20:19	aml

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.  
 Project ID: 8720002.2

ACZ Project ID: **L74686**

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG260761</b>													
WG260761ICV	ICV	03/10/09 13:25	WI081218-1	50		50.71	mg/L	101.4	90	110			
WG260761ICB	ICB	03/10/09 13:43				U	mg/L		-1.5	1.5			
WG260761ICV1	ICV	03/10/09 18:53	WI081218-1	50		51.62	mg/L	103.2	90	110			
WG260761ICB1	ICB	03/10/09 19:11				U	mg/L		-1.5	1.5			
<b>WG260787</b>													
WG260787ICV	ICV	03/11/09 18:12	WI081218-1	50		52.11	mg/L	104.2	90	110			
WG260787ICB	ICB	03/11/09 18:31				U	mg/L		-1.5	1.5			
WG260787LFB	LFB	03/13/09 16:06	WI081125-2	30		31.1	mg/L	103.7	90	110			
L74608-05AS	AS	03/13/09 16:42	WI081125-2	300	387	696.6	mg/L	103.2	90	110			
L74608-05DUP	DUP	03/13/09 17:00			387	384.4	mg/L				0.7	20	

Hydro Geo Chem, Inc.

ACZ Project ID: **L74686**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis



Hydro Geo Chem, Inc.

ACZ Project ID: **L74686**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74686  
 Date Received: 3/4/2009  
 Received By:  
 Date Printed: 3/4/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA7971	4.9	19

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74686  
 Date Received: 3/4/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74686-01	TM-19A									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



Laboratories, Inc.

L74686

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: jimn@hgcinc.com
Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 X-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: 504-IC
Project/PO #: 8720002.2
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? NO

Table with columns for # of Containers and analysis results. Includes handwritten entry '504-IC' and 'X' in the first row.

Table with columns for SAMPLE IDENTIFICATION, DATE:TIME, and Matrix. Includes handwritten entry 'TM-19A', '3-3-09:1216', and 'GW'.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

Empty box for remarks and disclosures.

PAGE 1 of 1

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns for RELINQUISHED BY, DATE:TIME, RECEIVED BY, and DATE:TIME. Includes handwritten signatures and dates.

March 18, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720005.0

ACZ Project ID: L74790

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on March 12, 2009. This project has been assigned to ACZ's project number, L74790. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74790. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after April 18, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**

Project ID: 8720005.0

Sample ID: NWC-4

ACZ Sample ID: **L74790-01**

Date Sampled: 03/11/09 13:09

Date Received: 03/12/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	197			mg/L	3	10	03/17/09 5:29	ccp

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.  
 Project ID: 8720005.0

ACZ Project ID: **L74790**

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG260761</b>													
WG260761ICV	ICV	03/10/09 13:25	WI081218-1	50		50.71	mg/L	101.4	90	110			
WG260761ICB	ICB	03/10/09 13:43				U	mg/L		-1.5	1.5			
WG260761ICV1	ICV	03/10/09 18:53	WI081218-1	50		51.62	mg/L	103.2	90	110			
WG260761ICB1	ICB	03/10/09 19:11				U	mg/L		-1.5	1.5			
<b>WG260930</b>													
WG260930ICV	ICV	03/14/09 1:39	WI081218-1	50		52.87	mg/L	105.7	90	110			
WG260930ICB	ICB	03/14/09 1:57				U	mg/L		-1.5	1.5			
WG260930LFB	LFB	03/14/09 2:15	WI081125-2	30		31.58	mg/L	105.3	90	110			
L74649-01AS	AS	03/14/09 7:41	WI081125-2	150	308	460.5	mg/L	101.7	90	110			
L74649-01DUP	DUP	03/14/09 7:59			308	307.3	mg/L				0.2	20	



Hydro Geo Chem, Inc.

ACZ Project ID: **L74790**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

Hydro Geo Chem, Inc.

ACZ Project ID: **L74790**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720005.0

ACZ Project ID: L74790  
 Date Received: 3/12/2009  
 Received By:  
 Date Printed: 3/12/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA8023	2.1	21

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**

Hydro Geo Chem, Inc.  
 8720005.0

ACZ Project ID: L74790  
 Date Received: 3/12/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74790-01	NWC-4									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_



Laboratories, Inc. L74790

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson	Address: 51 W. Wetmore Rd
Company: Hydro Geo Chem, Inc	Tucson, AZ 85705
E-mail:	Telephone: 520-293-1500 X-133

Copy of Report to:

Name: Jim Norris	E-mail: jimmorris@simn@hgcinc.com
Company: HGC, Inc	Telephone: 520-293-1500 X-112

Invoice to:

Name: Dan Simpson	Address: 51 W. Wetmore Rd
Company: HGC, Inc	Tucson, AZ 85705
E-mail:	Telephone: 520-293-1500 X-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES  NO

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: 504-IC	# of Containers	504-IC																			
Project/PO #: 872000 5.0																					
Reporting state for compliance testing: AZ																					
Sampler's Name: Travis Taylor																					
Are any samples NRC licensable material? NO																					
SAMPLE IDENTIFICATION	DATE:TIME	Matrix																			
NWC-4	3-11-09:1309	GW	1	X																	

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

1 week turnaround please.

PAGE  
| of |

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Travis Taylor	3-11-09:1530	[Signature]	3/20/09:11:08

March 18, 2009

## Report to:

Dan Simpson  
Hydro Geo Chem, Inc.  
51 West Wetmore Road Suite 101  
Tuscon, AZ 85705

## Bill to:

Accounts Payable  
Hydro Geo Chem, Inc.  
P. O. Box 97220  
Phoenix, AZ 85060

cc: Jim Norris

Project ID: 8720002.2

ACZ Project ID: L74791

Dan Simpson:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on March 12, 2009. This project has been assigned to ACZ's project number, L74791. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L74791. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after April 18, 2009. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: AWC-5

ACZ Sample ID: **L74791-01**

Date Sampled: 03/11/09 10:32

Date Received: 03/12/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	16.5			mg/L	0.5	3	03/14/09 4:58	ccp

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: AWC-2

ACZ Sample ID: **L74791-02**

Date Sampled: 03/11/09 11:37

Date Received: 03/12/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	15.5			mg/L	0.5	3	03/14/09 5:52	ccp

**Arizona license number: AZ0102**



**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: AWC-4

ACZ Sample ID: **L74791-03**

Date Sampled: 03/11/09 11:55

Date Received: 03/12/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	27.2			mg/L	0.5	3	03/14/09 6:11	ccp

**Arizona license number: AZ0102**

**Hydro Geo Chem, Inc.**

Project ID: 8720002.2

Sample ID: AWC-3

ACZ Sample ID: **L74791-04**

Date Sampled: 03/11/09 12:24

Date Received: 03/12/09

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	300.0 - Ion Chromatography	64.2			mg/L	0.5	3	03/14/09 6:29	ccp

**Arizona license number: AZ0102**

**Report Header Explanations**

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

**QC Sample Types**

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

**Method References**

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

**Comments**

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Hydro Geo Chem, Inc.  
 Project ID: 8720002.2

ACZ Project ID: **L74791**

**Sulfate** 300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG260761</b>													
WG260761ICV	ICV	03/10/09 13:25	WI081218-1	50		50.71	mg/L	101.4	90	110			
WG260761ICB	ICB	03/10/09 13:43				U	mg/L		-1.5	1.5			
WG260761ICV1	ICV	03/10/09 18:53	WI081218-1	50		51.62	mg/L	103.2	90	110			
WG260761ICB1	ICB	03/10/09 19:11				U	mg/L		-1.5	1.5			
<b>WG260930</b>													
WG260930ICV	ICV	03/14/09 1:39	WI081218-1	50		52.87	mg/L	105.7	90	110			
WG260930ICB	ICB	03/14/09 1:57				U	mg/L		-1.5	1.5			
WG260930LFB	LFB	03/14/09 2:15	WI081125-2	30		31.58	mg/L	105.3	90	110			
L74649-01AS	AS	03/14/09 7:41	WI081125-2	150	308	460.5	mg/L	101.7	90	110			
L74649-01DUP	DUP	03/14/09 7:59			308	307.3	mg/L				0.2	20	

Hydro Geo Chem, Inc.

ACZ Project ID: **L74791**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

Hydro Geo Chem, Inc.

ACZ Project ID: **L74791**

No certification qualifiers associated with this analysis

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74791  
 Date Received: 3/12/2009  
 Received By:  
 Date Printed: 3/12/2009

**Receipt Verification**

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

**Exceptions: If you answered no to any of the above questions, please describe**

N/A

**Contact (For any discrepancies, the client must be contacted)**

N/A

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/hr)
NA8023	2.1	21

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

**Notes**

Hydro Geo Chem, Inc.  
 8720002.2

ACZ Project ID: L74791  
 Date Received: 3/12/2009  
 Received By:

**Sample Container Preservation**

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y < 2	YG < 2	B < 2	O < 2	T > 12	N/A	RAD	ID
L74791-01	AWC-5									X		<input type="checkbox"/>
L74791-02	AWC-2									X		<input type="checkbox"/>
L74791-03	AWC-4									X		<input type="checkbox"/>
L74791-04	AWC-3									X		<input type="checkbox"/>

**Sample Container Preservation Legend**

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

\* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: \_\_\_\_\_





Laboratories, Inc.

L74791

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Dan Simpson
Company: Hydro Geo Chem, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 x-133

Copy of Report to:

Name: Jim Norris
Company: HGC, Inc

E-mail: Jimn@hgcinc.com
Telephone: 520-293-1500 x-112

Invoice to:

Name: Dan Simpson
Company: HGC, Inc
E-mail:

Address: 51 W. Wetmore Rd
Tucson, AZ 85705
Telephone: 520-293-1500 x-133

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES [X]
NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO"

is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: 504-IC
Project/PO #: 8720002.2
Reporting state for compliance testing: AZ
Sampler's Name: Travis Taylor
Are any samples NRC licensable material? NO

Table with columns for # of Containers, Matrix, and analysis results. Includes handwritten '504-IC' and 'X' marks.

Table with columns for SAMPLE IDENTIFICATION, DATE:TIME, and Matrix. Includes handwritten entries for AWC-5, AWC-2, AWC-4, and AWC-3.

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

1 week turnaround please.

PAGE 1 of 1

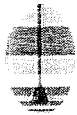
Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table for RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Includes handwritten signatures and dates.

**APPENDIX C**

**HYDRO GEO CHEM, INC. GROUNDWATER SAMPLING FORMS**





# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 3-11-09
Well ID: AWC-3	Weather: Cloudy, cool
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bis): 271'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 16"	2	0.16
Static Water Level (ft bmp): N/A	4	0.65
Casing Volume (gals): N/A	5	1.02
3 Casing Volumes (gals): N/A	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1059			77000				
1216	77	1000	<del>77</del>	7.25	21.2	445	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
AWC-3	1224	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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\_\_\_\_\_

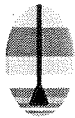












# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-27-09
Well ID: ANDERSON	Weather: Windy, cool, sunny
ADWR No: 613396	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 285' 236'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): 145.97'	4	0.65
Casing Volume (gals): 132	5	1.02
3 Casing Volumes (gals): 397	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1317							
1322	5	9	45	6.95	19.9	938	
1326	9	9	81	7.09	20.8	1005	
1332	15	9	135	7.18	21.0	1003	
1336	19	9	171	7.19	20.8	959	
1341	24	9	216	7.21	20.8	960	
1344	27	9	243	7.22	20.9	945	
1348	31	9	279	7.22	20.8	964	
1353	36	9	324	7.23	20.6	966	
1357	40	9	360	7.26	20.7	967	
1402	45	9	405	7.27	21.0	965	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
ANDERSON	1402	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-21-09
Well ID:	BANKS 986	Weather:	cloudy, cool
ADWR No:	647986	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
	2	0.16
Casing Diameter (in):	4	0.65
Static Water Level (ft bmp):	5	1.02
Casing Volume (gals):	6	1.47
	8	2.61
3 Casing Volumes (gals):	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1139				7.28			
1145	6	7	42	<del>6.78</del>	22.0	887	
1149	10	7	70	7.51	21.7	874	
1154	15	7	105	7.62	21.6	873	
1157	18	7	126	7.65	21.6	873	
1159	20	7	140	7.66	21.6	874	
1201	22	7	154	7.66	21.6	872	

### SAMPLE INFORMATION

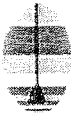
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BANKS 986	1201	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

Σ @ BANKS 987 = 206.64







**HYDRO GEO CHEM, INC.**  
Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-20-09
Well ID:	BF-01	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

**WELL DATA**

Well Depth (ft bis):	400'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	4"	2	0.16
		4	0.65
		5	1.02
		6	1.47
		8	2.61
Static Water Level (ft bmp):	348.78	10	4.08
Casing Volume (gals):	34	Casing Volume = gallons/foot * water column (feet)	
3 Casing Volumes (gals):	102		

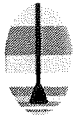
**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0815							
0824	9	7	63	—	—	—	Pump off (well dry)
0842	—	—	—	6.42	19.2	*1477	pump on

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BF-01	0843	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* @ 0824 well was dry. Will let recover and get samples & parameters.  
\* Specific Conductance parameters jumped between 1392 & 1477 for over 10 minutes.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: <u>8720000</u>	Client: <u>Freeport Copper Queen Branch</u>
Task No: <u>2.2</u>	Date: <u>1-20-09</u>
Well ID: <u>BIMA</u>	Weather: <u>Sunny, cool</u>
ADWR No: <u>577927</u>	Sampler: <u>Travis Taylor</u>

### WELL DATA

Well Depth (ft bls): <u>460'</u>	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
	2	0.16
	4	0.65
	5	1.02
Casing Diameter (in): <u>4.0"</u>	6	1.47
Static Water Level (ft bmp): <u>353.07'</u>	8	2.61
Casing Volume (gals): <u>69.8</u>	10	4.08
3 Casing Volumes (gals): <u>209.4</u>	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
<u>0901</u>							
<u>0909</u>	<u>8</u>	<u>8</u>	<u>64</u>	<u>6.38</u>	<u>19.8</u>	<u>1206</u>	
<u>0914</u>	<u>13</u>	<u>8</u>	<u>104</u>	<u>6.41</u>	<u>20.5</u>	<u>1197</u>	
<u>0923</u>	<u>22</u>	<u>8</u>	<u>176</u>	<u>6.43</u>	<u>21.3</u>	<u>1218</u>	
<u>0930</u>	<u>29</u>	<u>8</u>	<u>232</u>	<u>6.40</u>	<u>21.7</u>	<u>1233</u>	

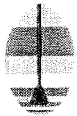
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
<u>BIMA</u>	<u>0930</u>	<u>Plastic</u>	<u>250 ml</u>	<u>1</u>	<u>EPA 300.0</u>	<u>None</u>	
<u>DUP012009</u>	<u>0930</u>	<u>  </u>	<u>  </u>	<u>  </u>	<u>  </u>	<u>  </u>	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: <u>8720000</u>	Client: <u>Freeport Copper Queen Branch</u>
Task No: <u>2.2</u>	Date: <u>2-11-09</u>
Well ID: <u>BLOMMER</u>	Weather: <u>cold, sunny</u>
ADWR No:	Sampler: <u>Travis Taylor</u>

### WELL DATA

Well Depth (ft bls): <u>N/A 350'</u>	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): <u>6"</u>	2	0.16
Static Water Level (ft bmp): <u>N/A</u>	4	0.65
Casing Volume (gals): <u>N/A</u>	5	1.02
3 Casing Volumes (gals): <u>N/A</u>	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

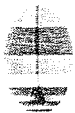
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
		Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* owner does not want well sampled. Said she is on city water and well is dry.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	3720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-25-09
Well ID:	BMO-2008-01G	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	Casing Diameter (in):	Static Water Level (ft bmp):	Casing Volume (gals):	Casing Capacity	
				Nominal Size (inches)	Gallons per Linear Foot
320'	5"	61.43	264	2	0.16
				4	0.65
				5	1.02
				6	1.47
				8	2.61
				10	4.08
3 Casing Volumes (gals):	792	Casing Volume = gallons/foot * water column (feet)			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0933							
0944	11	8	88	7.01	21.8	1015	
0957	24	8	192	7.06	21.8	890	
1010	37	8	296	7.03	22.2	899	
1016	43	8	344	7.04	22.4	895	
1025	52	8	416	7.00	22.4	879	
1033	60	8	480	6.98	23.0	869	
1040	67	8	536	6.95	23.4	867	
1048	75	8	600	6.93	22.1	862	
1055	82	8	656	6.94	22.2	860	
1100	87	8	696	7.01	22.0	860	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-01G	1103	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

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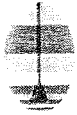


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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-19-09
Well ID:	BMO-2008-3B	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	265'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	138.19	4	0.65
Casing Volume (gals):	130	5	1.02
3 Casing Volumes (gals):	390	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1355							
1400	5	27	135	7.05	21.2	661	
1405	10	27	270	7.17	21.4	660	
1410	15	27	405	7.24	21.4	664	

### SAMPLE INFORMATION

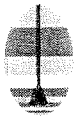
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-3B	1412	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-18-09
Well ID:	BMO-2008-4B	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	Casing Diameter (in):	Static Water Level (ft bmp):	Casing Volume (gals):	Casing Capacity	
				Nominal Size (inches)	Gallons per Linear Foot
610'	5"	130.58	490	2	0.16
				4	0.65
				5	1.02
				6	1.47
				8	2.61
				10	4.08
3 Casing Volumes (gals):	1470	Casing Volume = gallons/foot * water column (feet)			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1439							
1456	17	25	425	7.26	22.7	373	
1506	27	25	675	7.23	23.2	367	
1516	37	25	925	7.23	23.2	367	
1526	47	25	1175	7.21	23.2	366	
1536	57	25	1425	7.17	23.2	370	

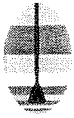
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-4B	1540	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-18-09
Well ID:	BMO-2008-5B	Weather:	Sunny, cold
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	295'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	144.35	4	0.65
Casing Volume (gals):	154	5	1.02
3 Casing Volumes (gals):	462	6	1.47
		8	2.61
		10	4.08
Casing Volume = gallons/foot * water column (feet)			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0842							
0852	10	12	120	7.03	20.6	702	
0904	22	12	264	6.95	21.6	688	
0916	34	12	408	6.98	21.6	687	
0923	41	12		<del>6.91</del> 7.03	21.5	691	

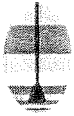
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-5B	0927	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-18-09
Well ID:	BMO-2008-5M	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	460'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	145.97	4	0.65
Casing Volume (gals):	321	5	1.02
3 Casing Volumes (gals):	963	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0937							
0947	10	20	200	7.02	21.7	567	
0956	21	20	420	7.04	22.5	561	
1009	32	20	640	7.00	22.5	561	
1018	41	20	820	7.00	22.5	561	
1025	48	20	960	7.06	22.5	562	

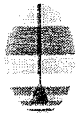
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-5M	1029	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-19-09
Well ID:	BMO-2008-6B	Weather:	SUNNY, COOL
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	265'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	189.71	4	0.65
Casing Volume (gals):	77	5	1.02
3 Casing Volumes (gals):	231	6	1.47
		8	2.61
		10	4.08
Casing Volume = gallons/foot * water column (feet)			

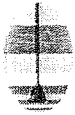
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1515							
1526	11	6	66	7.05	20.9	418	
1536	21	6	126	7.22	21.3	440	
1546	31	6	186	7.22	21.2	444	
1553	38	6	228	7.23	21.1	444	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-6B	1556	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-20-09
Well ID:	BMO-2008-6M	Weather:	Sunny, Cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	450'	Casing Capacity	
Casing Diameter (in):	5"	Nominal Size (inches)	Gallons per Linear Foot
Static Water Level (ft bmp):	190.70	2	0.16
Casing Volume (gals):	265	4	0.65
3 Casing Volumes (gals):	795	5	1.02
		6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0945							
0950	5	22	110	7.13	21.0	714	
0956	11	22	242	7.15	21.8	704	
1006	21	22	462	7.11	21.9	701	
1017	32	22	704	7.06	22.1	702	
1022	37	22	814	7.11	22.0	702	

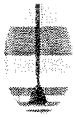
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-6M	1025	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-18-09
Well ID: BMO-2008-7M	Weather: sunny, cool
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 670'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 5"	2	0.16
Static Water Level (ft bmp): 238.90	4	0.65
	5	1.02
Casing Volume (gals): 43440	6	1.47
	8	2.61
3 Casing Volumes (gals): 1320	10	4.08
	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1315							
1325	10	24	240	7.32	22.5	436	
1335	20	24	480	7.26	23.1	447	
1345	30	24	720	7.24	23.3	449	
1355	40	24	960	7.23	23.4	453	
1406	51	24	1224	7.26	23.4	452	
1410	55	24	1320	7.31	23.3	452	

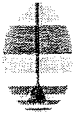
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-7M	1413	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-19-09
Well ID:	BMO-2008-8B	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	480'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
		4	0.65
		5	1.02
		6	1.47
		8	2.61
Static Water Level (ft bmp):	297.63	10	4.08
Casing Volume (gals):	186	Casing Volume = gallons/foot * water column (feet)	
3 Casing Volumes (gals):	558		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1059							
1106	7	17	119	6.20	21.0	2914	
1114	15	17	255	6.20	21.0	2956	
1124	25	17	425	6.19	21.1	2958	
1132	33	17	561	6.19	21.0	2958	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-8B	1135	Plastic	250 ml	1	EPA 300.0	None	

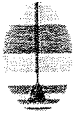
Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-19-09
Well ID:	BMO-2008-8M	Weather:	Sunny, cold
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	1210'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
		4	0.65
Static Water Level (ft bmp):	298.32	5	1.02
		6	1.47
Casing Volume (gals):	930	8	2.61
		10	4.08
3 Casing Volumes (gals):	2790	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0824							
0844	20	20	400	7.36	20.3	761	
0904	40	20	800	7.40	22.1	720	
0924	60	20	1200	7.18	22.8	346	
0944	80	20	1600	7.20	23.1	762	
1004	100	<del>20</del> 20	2000	7.20	23.2	760	
1024	120	20	2400	7.26	22.4	<del>744</del> 762	
1044	140	20	2800	7.27	23.5	758	

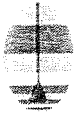
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-8M	1047	Plastic	250 ml	1	EPA 300.0	None	
DUP021909	1047						

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-26-09
Well ID:	BMO-2008-9M	Weather:	Sunny, windy, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	785'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	285.65	4	0.65
		5	1.02
Casing Volume (gals):	509	6	1.47
		8	2.61
3 Casing Volumes (gals):	1526	10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1514							
1522	8	22	176	8.63	23.1	427	
1532	18	22	396	7.70	23.9	488	
1541	27	22	594	7.76	24.3	482	
1549	35	22	770	7.71	24.5	480	
1555	41	22	902	7.71	24.5	482	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-9M	1558	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \*parameters stable after 902 gallons pumped.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	3720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-25-09
Well ID:	BMO-2008-10GU	Weather:	Sunny, Warm
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	700'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	289.84	4	0.65
Casing Volume (gals):	419	5	1.02
C Casing Volumes (gals):	1257	6	1.47
		8	2.61
		10	4.08
Casing Volume = gallons/foot * water column (feet)			

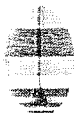
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1157							
1202	5	6	30	6.01	21.6	3463	
1219	22	6	132	6.09	20.9	3466	
1239	42	6	252	5.99	21.5	3500	
1254	57	6	342	6.01	22.1	3514	
1307	70	6	420	6.02	21.7	3452	
* 1317	80	4.6	-	5.96	22.7	3426	Water is brown, gpm drop

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-10GU	1320	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* @ 1317, significant drop in gpm & water color changed from clear to brown.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	3720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-25-09
Well ID:	BMO-2008-10GL	Weather:	Sunny, warm
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	810'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	516.72	4	0.65
		5	1.02
Casing Volume (gals):	300	6	1.47
		8	2.61
Casing Volumes (gals):	900	10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1327							
1334	7	5	35	6.33	23.2	2711	
1344	17	5	85	6.36	25.1	3204	
1355	28	5	140	6.33	25.6	3167	
1406	39	5	195	6.29	26.0	3131	
1417	50	5	250	6.34	26.2	2825	
1429	62	5	310	6.35	26.3	2666	
1438	71	5	355	6.36	26.4	2633	
1447	80	5	400	6.32	26.6	2660	
1457	90	5	450	6.34	26.8	2646	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-10GL	1459	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	3720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-26-09
Well ID:	BMO-2008-11G	Weather:	Sunny, windy, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	820'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	575.91	4	0.65
Casing Volume (gals):	249	5	1.02
3 Casing Volumes (gals):	747	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

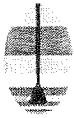
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1240							
1252	12	10	120	7.82	24.5	320	
1303	23	10	230	7.89	24.9	318	
1313	33	10	330	7.90	25.2	320	
1322	42	10	420	7.92	25.1	319	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-11G	1326	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* parameters are stable after pumping  
420 gallons,



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-17-09
Well ID:	BMO-2008-13B	Weather:	sunny, windy, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	474'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	206.11	4	0.65
Casing Volume (gals):	274	5	1.02
3 Casing Volumes (gals):	822	6	1.47
		8	2.61
		10	4.08
Casing Volume = gallons/foot * water column (feet)			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1509							
1517	8	21	168	6.60	20.9	1939	
1527	18	21	378	6.55	21.0	1926	
1541	32	21	672	6.57	20.9	1933	
1552	43	21	903	6.51	20.9	1941	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-13B	1556	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-17-09
Well ID:	BMO-2008-13M	Weather:	Sunny, cool, windy
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	1030'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	208.74	4	0.65
Casing Volume (gals):	838	5	1.02
3 Casing Volumes (gals):	2514	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

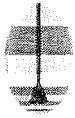
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1045						1273	
1110	25	6	150	9.49	20.4	1259	
1120	35	6	210	9.22	21.5	1275	
1130	45	6	270	9.15	21.5	1278	
1151	66	6	396	9.15	21.6	1286	
1221	96	6	576	9.08	21.8	1301	
1242	117	6	702	8.97	22.0	1300	
1307	142	6	852	8.85	22.2	1326	
1322	157	6	942	8.52	22.4	1326	
1338	173	6	1038	8.35	22.5	1338	
1402	197	6	1182	8.21	22.7	1340	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-13M	1408	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	<del>2-10</del> 2-11-09
Well ID:	BURKE	Weather:	Cold, <del>Sunny</del> Partly cloudy
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	Casing Diameter (in):	Static Water Level (ft bmp):	Casing Volume (gals):	Casing Capacity	
				Nominal Size (inches)	Gallons per Linear Foot
780'	6"	N/A	N/A	2	0.16
				4	0.65
				5	1.02
				6	1.47
				8	2.61
				10	4.08
3 Casing Volumes (gals):	N/A	Casing Volume = gallons/foot * water column (feet)			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0937							
1023	46	2	92	7.24	23.1	370	
1027	50	2	100	7.25	24.7	368	
1032	55	2	110	7.23	25.0	363	

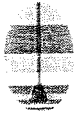
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BURKE	1037	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* unable to get ~~see~~ sounder reading b/c WL is past 500' sounder limit.  
 \* owner has installed a pump powered by solar energy.







**HYDRO GEO CHEM, INC.**  
Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 3-3-09
Well ID: CAMPBELL	Weather: Sunny, Warm
ADWR No:	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bis):	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
	2	0.16
Casing Diameter (in):	4	0.65
Static Water Level (ft bmp): N/A	5	1.02
	6	1.47
Casing Volume (gals):	8	2.61
	10	4.08
3 Casing Volumes (gals):	Casing Volume = gallons/foot * water column (feet)	

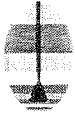
**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
		Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* WL only  
 \* well on concrete pad is dry.  
 \* other well has an obstruction.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-27-09
Well ID:	CHAMBERS	Weather:	Windy, cool, sunny
ADWR No:	629807	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	245	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	unable to access hole due to design of stick up & sounding hole.	4	0.65
		5	1.02
		6	1.47
		8	2.61
		10	4.08
Casing Volume (gals):		Casing Volume = gallons/foot * water column (feet)	
3 Casing Volumes (gals):			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1444							
1446	2	11	22	7.18	20.1	314	
1450	6	11	66	7.43	21.3	313	
1455	11	11	122	7.51	21.6	312	
1500	16	11	176	7.57	21.3	312	
1503	19	11	209	7.57	21.4	314	
1505	21	11	231	7.57	21.5	312	

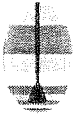
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
CHAMBERS	1505	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-12-09
Well ID:	COB MW-1	Weather:	Sunny, cool, windy
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	420'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	8"	2	0.16
Static Water Level (ft bmp):	234.05	4	0.65
Casing Volume (gals):	486	5	1.02
3 Casing Volumes (gals):	1458	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

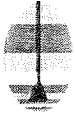
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1211							
1218	7	12	84	6.96	21.2	1155	
1230	19	12	228	6.91	21.3	1240	
1243	32	12	384	6.89	21.2	1268	
1253	42	12	504	6.90	21.2	1264	
1305	54	12	648	6.91	21.1	1294	
1312	61	12	732	6.91	21.2	1299	
1322	71	12	852	6.90	21.2	1305	
1327	76	12	912	6.92	21.1	1313	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COB MW-1	1332	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* well is used to supply plants area office w/ water.  
 \* will pump til parameters are stable.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-12-09
Well ID:	COB MW-2	Weather:	Sunny, cool, windy
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	162	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	4"	2	0.16
Static Water Level (ft bmp):	123.39	4	0.65
		5	1.02
Casing Volume (gals):	26	6	1.47
		8	2.61
3 Casing Volumes (gals):	78	10	4.08
Casing Volume = gallons/foot * water column (feet)			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1405							
1410	5	10	50	7.32	20.4	381	
1414	9	10	90	7.35	20.2	379	

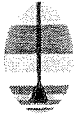
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COB MW-2	1414	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-12-09
Well ID:	COB MW-3	Weather:	Sunny, Cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	300'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	4"	2	0.16
Static Water Level (ft bmp):	110.91	4	0.65
Casing Volume (gals):	124	5	1.02
3 Casing Volumes (gals):	372	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1118							
1120	2	27	54	7.33	20.8	437	
1125	7	27	189	7.34	21.0	435	
1129	11	27	297	7.35	21.1	432	
1132	14	27	378	7.35	21.1	432	

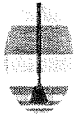
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COB MW-3	1132	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-12-09
Well ID:	COB WL	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	150'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	4"	2	0.16
Static Water Level (ft bmp):	58.89	4	0.65
Casing Volume (gals):	60	5	1.02
3 Casing Volumes (gals):	180	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1448							
1459	11	7	77	7.06	20.1	816	
1504	16	7	112	6.95	20.4	817	
1509	21	7	147	6.97	20.6	819	
1514	26	7	182	6.98	20.6	814	

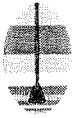
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COB WL	1514	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-11-09
Well ID:	COLLINS	Weather:	Sunny, Cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	320'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	4.5"	2	0.16
Static Water Level (ft bmp):	290.71'	4	0.65
Casing Volume (gals):	25	5	1.02
3 Casing Volumes (gals):	75	6	1.47
		8	2.61
		10	4.08
Casing Volume = gallons/foot * water column (feet)			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1320							
1326	6	11	66	6.68	21.3	1146	
1328	8	11	88	6.68	21.4	1147	

### SAMPLE INFORMATION

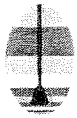
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COLLINS	1331	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-11-09
Well ID: COOPER	Weather: partly cloudy, cool
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bis): 325'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): N/A	4	0.65
Casing Volume (gals): N/A	5	1.02
3 Casing Volumes (gals): N/A	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

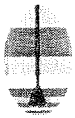
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1454							
1455	1	3	3	7.54	21.6	336	
1502	8	3	24	7.39	19.6	334	
1505	11	3	33	7.33	18.9	336	
1507	13	3	39	7.31	19.1	337	
1512	18	3	54	7.32	19.2	333	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COOPER	1516	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

\*no access on well for sounding. Will purge well until parameters are stable.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-27-09
Well ID:	COOPER C	Weather:	Windy, Cool, Sunny
ADWR No:	637069	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	22.0'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	155.62'	4	0.65
Casing Volume (gals):	94.6	5	1.02
		6	1.47
		8	2.61
		10	4.08
3 Casing Volumes (gals):	284	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1553							
1657	4	9	36	6.81	17.5	1457	
1603	10	9	90	6.85	20.6	1488	
1608	15	9	135	6.89	20.6	1477	
1612	19	9	171	6.90	20.6	1487	
1617	24	9	216	6.92	20.4	1487	
1622	29	9	261	6.93	20.5	1486	
1625	32	9	288	6.92	20.5	1489	

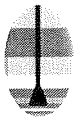
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COOPER C	1625	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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\_\_\_\_\_



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-22-09
Well ID:	DODSON	Weather:	Cloudy, cool
ADWR No:	644927	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	200'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6'	2	0.16
Static Water Level (ft bmp):	unable to fit sounder down hole	4	0.65
Casing Volume (gals):	N/A	5	1.02
3 Casing Volumes (gals):	N/A	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

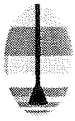
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1254							
1300	6	11	66	6.97	19.6	808	
1306	12	11	132	7.10	20.2	819	
1308	14	11	154	7.15	20.3	835	
1312	18	11	198	7.17	20.3	858	
1316	22	11	242	7.19	20.4	882	
1320	26	11	286	7.19	20.3	882	
1323	29	11	319	7.21	20.2	892	
1326	32	11	352	7.20	20.4	892	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
DODSON	1326	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

82.33



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-19-09
Well ID:	Douglas 791	Weather:	Sunny, cool
ADWR No:	592791	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	200'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
Static Water Level (ft bmp):	26.51 (mp = surface casing)	4	0.65
Casing Volume (gals):	N/A	5	1.02
3 Casing Volumes (gals):	N/A	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
		Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* water level only; well not in use

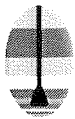
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**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-20-09
Well ID: DOUGLASS 792	Weather: Windy, sunny, cool
ADWR No: 529792	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls): 200'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
	2	0.16
	4	0.65
	5	1.02
	6	1.47
Casing Diameter (in): 5"	8	2.61
Static Water Level (ft bmp): 86.26 (mp = surface casing)	10	4.08
Casing Volume (gals): N/A	Casing Volume = gallons/foot * water column (feet)	
3 Casing Volumes (gals): N/A		

**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

**SAMPLE INFORMATION**

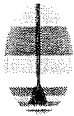
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
		Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* water level only; well not in use.

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-10-09
Well ID: DURAZO	Weather: windy, cold, snow
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls):	Casing Diameter (in):	Static Water Level (ft bmp):	Casing Volume (gals):	3 Casing Volumes (gals):	Casing Capacity	
					Nominal Size (inches)	Gallons per Linear Foot
N/A	6"	N/A	N/A	N/A	2	0.16
					4	0.65
					5	1.02
					6	1.47
					8	2.61
					10	4.08
					Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

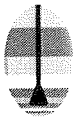
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1047							
1057	10	2	20	7.05	14.2	391	
1102	15	2	30	7.20	18.5	387	
1107	20	2	40	7.21	17.8	<del>388</del> 46	
1111	24	2	48	7.23	19.4	838	
1115	28	2	56	7.22	18.8	848	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
DURAZO	1119	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

\* unable to get sounder reading b/c sounding tube cap is rusted on.  
 \* took sample after parameters stabilized.



**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-20-09
Well ID: EAST	Weather: Sunny, cool, windy
ADWR No: 599796	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls): 125'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): 50.52	4	0.65
Casing Volume (gals): 109	5	1.02
3 Casing Volumes (gals): 328	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

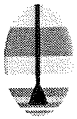
**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1656							
1702	6	11	66	6.75	20.5	456	
1706	10	11	110	7.13	20.3	466	
1709	13	11	143	7.17	20.3	474	
1714	18	11	198	7.27	20.2	478	
1718	22	11	242	7.33	20.1	477	
1726	30	11	330	7.33	20.0	482	

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
EAST	1726	Plastic	250 ml	1	EPA 300.0	None	
FB012009	1722	"	"	"	"	"	

Additional Comments: \* also took field blank sample.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-21-09
Well ID:	EPPELE 641	Weather:	Cloudy, cool
ADWR No:	805641	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	265	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	5"	2	0.16
		4	0.65
Static Water Level (ft bmp):	27.35	5	1.02
		6	1.47
Casing Volume (gals):	242	8	2.61
		10	4.08
3 Casing Volumes (gals):	728	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1310							
1315	5	10	50	6.92	21.7	531	
1320	10	10	100	7.13	21.2	527	
1325	15	10	150	7.21	21.1	525	
1330	20	10	200	7.25	21.1	526	
1335	25	10	250	7.27	21.1	525	
1340	30	10	300	7.31	21.0	523	
1350	40	10	400	7.32	21.2	524	
1400	50	10	500	7.36	20.9	521	
1410	60	10	600	7.41	21.0	516	
1420	70	10	700	7.53	21.1	504	
1423	73	10	730	7.60	21.1	500	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
EPPELE 641	1423	Plastic	250 ml	1	EPA 300.0	None	
EQB012109	1455	"	"	1	"	"	

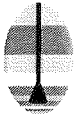
Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-22-09
Well ID: <del>Frame</del> FRANCO	Weather: rain, cool
ADWR No: 500101	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 200'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): unable to fit sampler into hole.	4	0.65
	5	1.02
Casing Volume (gals): N/A	6	1.47
	8	2.61
3 Casing Volumes (gals): N/A	10	4.08
	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

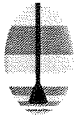
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1643							
1646	3	9	27	6.97	19.3	1194	
1652	9	9	81	7.08	19.9	1185	
1657	14	9	126	7.15	20.0	1177	
1700	17	9	153	7.18	20.1	1176	
1705	22	9	198	7.19	19.9	1178	
1709	26	9	234	7.19	20.1	1178	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
FRANCO	1709	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

OBSTRUCTION



**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-21-09
Well ID: FULTZ	Weather: cloudy, cool
ADWR No: 212447	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls): 300	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 5"	2	0.16
Static Water Level (ft bmp): *	4	0.65
	5	1.02
Casing Volume (gals): N/A	6	1.47
3 Casing Volumes (gals): N/A	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

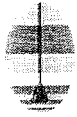
**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0856							
0918	22	9	198	6.57	20.8	1480	
0924	28	9	252	6.68	21.4	1490	
0929	33	9	297	6.72	21.4	1487	
0933	37	9	333	6.73	21.4	1482	
0938	42	9	378	6.74	21.2	1482	
0941	45	9	405	6.75	21.2	1480	
0945	49	9		6.74	21.2	1481	

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
FULTZ	0945	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* unable to get sounder into well casing, stuck in between surface & well casings.  
 40.66



**HYDRO GEO CHEM, INC.**  
Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 3-3-09
Well ID: GALLANT	Weather: Sunny, Warm
ADWR No:	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bis):	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
	2	0.16
	4	0.65
	5	1.02
Casing Diameter (in):	6	1.47
Static Water Level (ft bmp): 31.59	8	2.61
Casing Volume (gals):	10	4.08
3 Casing Volumes (gals):	Casing Volume = gallons/foot * water column (feet)	

**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
		Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* WL only

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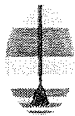


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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-28-09
Well ID:	GARNER 635	Weather:	Sunny, Cool
ADWR No:	587635	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	680	Casing Capacity	
Casing Diameter (in):	5"	Nominal Size (inches)	Gallons per Linear Foot
Static Water Level (ft bmp):	194.80	2	0.16
Casing Volume (gals):	495	4	0.65
3 Casing Volumes (gals):	1485	5	1.02
		6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

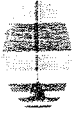
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1642							
1647	5	13	65	7.42	21.4	377	
1653	11	13	143	7.68	23.8	370	
1700	18	13	234	7.66	22.6	367	
1706	24	13	312	7.69	23.5	367	
1713	31	13	403	7.69	22.8	368	
1723	41	13	533	7.71	23.2	368	
1730	48	13	624	7.70	23.0	367	
1735	53	13	689	7.69	23.4	368	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
GARNER 635	1735	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

\*stopped discharging early b/c parameters have stabilize



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-24-09
Well ID:	GOOSE 547	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	800'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	236.13	4	0.65
Casing Volume (gals):	829	5	1.02
3 Casing Volumes (gals):	2487	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

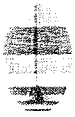
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1210							
1226	16	28	448	7.04	23.5	840	
1244	34	28	952	7.08	23.0	850	
1300	50	28	1400	7.06	23.1	850	
1312	62	28	1736	7.09	23.6	846	
1315	65	28	1820	7.06	23.8	851	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
GOOSE 547	1315	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* parameters were stable after two casing volumes.

~~977-3421~~



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-26-09
Well ID:	GL-03	Weather:	Sunny, windy, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	820'	Casing Capacity	
Casing Diameter (in):	5"	Nominal Size (inches)	Gallons per Linear Foot
Static Water Level (ft bmp):	658.62	2	0.16
Casing Volume (gals):	165	4	0.65
3 Casing Volumes (gals):	495	5	1.02
		6	1.47
		8	2.61
		10	4.08
Casing Volume = gallons/foot * water column (feet)			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1413							
1420	7	10	70	7.02	24.8	571	
1430	17	10	170	7.01	26.5	609	
1435	22	10	220	7.05	26.5	603	

### SAMPLE INFORMATION

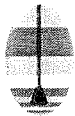
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
GL-03	1439	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

\* significant drop in discharge rate @ 1437.







# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-28-09
Well ID:	HOBAN	Weather:	cold, sunny
ADWR No:	805290	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	316'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	163.82'	4	0.65
Casing Volume (gals):	223.5	5	1.02
		6	1.47
		8	2.61
		10	4.08
3 Casing Volumes (gals):	671	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0901							
0913	12	10.5	126	6.78	18.1	1180	
0921	20	10.5	210	6.82	20.9	1243	
0927	26	10.5	273	6.84	21.2	1240	
0934	33	10.5	347	6.81	21.3	1246	
0941	40	10.5	420	6.81	21.1	1253	
0947	46	10.5	483	6.81	20.9	1242	
0952	51	10.5	536	6.82	21.2	1224	
1001	60	10.5	630	6.78	20.9	1237	
1005	64	10.5	672	6.82	21.3	1220	

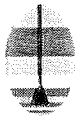
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
HOBAN	1005	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-24-09
Well ID:	HOWARD	Weather:	Sunny, Cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	220'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	150.67	4	0.65
		5	1.02
Casing Volume (gals):	102	6	1.47
		8	2.61
3 Casing Volumes (gals):	306	10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1109							
1112	3	9	27	6.75	19.6	1093	
1119	10	9	90	6.82	20.5	1156	
1125	16	9	144	6.84	20.7	1157	
1129	20	9	180	6.82	20.7	1182	
1133	24	9	216	6.82	20.8	1216	
1136	27	9	243	6.80	20.8	1180	
1139	30	9	270	6.81	20.8	1186	
1143	34	9	306	6.82	21.0	1203	

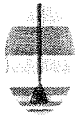
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
HOWARD	1143	Plastic	250 ml	1	EPA 300.0	None	
DUP012809	1143	"	"	"	"	"	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-28-09
Well ID: KEEFER	Weather: cool, sunny
ADWR No: 209744	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bis): <del>250'</del> 245'	Casing Capacity	
Casing Diameter (in): 5" (est)	Nominal Size (inches)	Gallons per Linear Foot
Static Water Level (ft bmp): 134.88	2	0.16
Casing Volume (gals): 113	4	0.65
3 Casing Volumes (gals): 339	5	1.02
	6	1.47
	8	2.61
	10	4.08
	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1232							
1235	3	10	30	7.18	19.7	349	
1243	11	10	110	7.28	15.9	337	
1250	18	10	180	7.39	18.0	342	
1255	23	10	230	7.42	19.9	357	
1302	30	10	300	7.42	20.1	360	
1306	34	10	340	7.42	19.5	356	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
KEEFER	1306	Plastic	250 ml	1	EPA 300.0	None	
FB012809	1300						
EQB012809	1325						

Additional Comments:

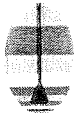
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**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-28-09
Well ID:	MCCONNELL 265	Weather:	Sunny, cool
ADWR No:	539265	Sampler:	Travis Taylor

**WELL DATA**

Well Depth (ft bls):	216	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	156.70'	4	0.65
		5	1.02
Casing Volume (gals):	87	6	1.47
		8	2.61
3 Casing Volumes (gals):	262	10	4.08
Casing Volume = gallons/foot * water column (feet)			

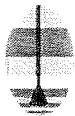
**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1403							
1408	5	10	50	6.72	20.9	1276	
1412	9	10	90	6.80	21.1	1278	
1416	13	10	130	6.83	21.3	1275	
1421	18	10	180	6.83	21.3	1272	
1425	22	10	220	6.85	21.2	1265	
1429	26	10	260	6.85	21.2	1265	
1431	28	10	280	6.85	21.0	1274	

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
MCCONNELL 265	1431	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-11-09
Well ID:	METZLER	Weather:	Partly cloudy, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	351'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	287.74	4	0.65
Casing Volume (gals):	93	5	1.02
3 Casing Volumes (gals):	279	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1542							
1547	5	6	30	7.17	21.1	818	
1552	10	6	60	7.18	21.5	808	
1557	15	6	90	7.13	21.6	814	
1603	21	6	126	7.11	21.4	<del>808</del> 810	
1608	26	6	156	7.11	21.5	820	
1618	36	6	216	7.11	21.3	812	
1627	45	6	270	7.12	21.3	818	

### SAMPLE INFORMATION

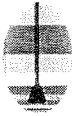
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
METZLER	1632	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-29-09
Well ID: MOORE	Weather: Sunny, cool
ADWR No: 538847	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 220	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): N/A	4	0.65
Casing Volume (gals): N/A	5	1.02
3 Casing Volumes (gals): N/A	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

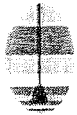
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0932							
0943	11	9	99	7.02	19.2	336	
0948	16	9	144	7.15	21.7	327	
0954	22	9	198	7.14	21.7	326	
0958	26	9	234	7.12	21.6	328	
1001	29	9	261	7.11	21.7	328	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
MOORE	1001	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* unable to get water level reading. Previous data shows same issue.



**HYDRO GEO CHEM, INC.**  
Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-13-09
Well ID: MOROYOQUI	Weather:
ADWR No:	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bis):	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
	2	0.16
Casing Diameter (in):	4	0.65
Static Water Level (ft bmp): Dry Well @ 287.5	5	1.02
	6	1.47
Casing Volume (gals):	8	2.61
	10	4.08
3 Casing Volumes (gals):	Casing Volume = gallons/foot * water column (feet)	

**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
		Plastic	250 ml	1	EPA 300.0	None	

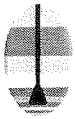
Additional Comments: \_\_\_\_\_

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**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: <del>1-22-09</del> 1-26-09
Well ID: NESS	Weather: windy, cloudy, cool
ADWR No: 509127	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls): 812	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	2	0.16
Static Water Level (ft bmp): 35 N/A	4	0.65
Casing Volume (gals): N/A	5	1.02
3 Casing Volumes (gals): N/A	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1612	—	—	—	7.39	17.2	422	

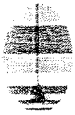
**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NESS	1612	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \*unable to get sounder reading after dropping it to the 500' sounder limit.

\*pump is constantly on and off all day, no purging of well needed





# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-25-09
Weil ID:	Notaman	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
	2	0.16
Casing Diameter (in):	4	0.65
Static Water Level (ft bmp):	5	1.02
	6	1.47
Casing Volume (gals):	8	2.61
	10	4.08
3 Casing Volumes (gals):	Casing Volume = gallons/foot * water column (feet)	

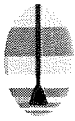
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
		Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \*WL only



**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-19-09
Well ID: <del>BAILLEY</del> NOTEMAN	Weather: Sunny, cool
ADWR No: 212483	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls): 470	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 5.0	2	0.16
	4	0.65
Static Water Level (ft bmp): N/A *see comments	5	1.02
	6	1.47
Casing Volume (gals): N/A	8	2.61
	10	4.08
3 Casing Volumes (gals): N/A	Casing Volume = gallons/foot * water column (feet)	

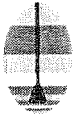
**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1556							
1558	2	11.5	23	6.31	21.8	1099	
1608	12	10.7	123.7	6.38	22.9	1098	

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
<del>BAILLEY</del> NOTEMAN	1615	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \*Dropped sounder down to about 470'; no reading. checked sounder & it is working fine.  
 Per owner's request, discharge time was cut down.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-12-09
Well ID: NWC-02	Weather: Sunny, cold
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bis):	Casing Diameter (in):	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
410'		2	0.16
		4	0.65
		5	1.02
		6	1.47
		8	2.61
		10	4.08
Static Water Level (ft bmp): N/A		Casing Volume = gallons/foot * water column (feet)	
Casing Volume (gals): N/A			
3 Casing Volumes (gals): N/A			

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0932	—	—	—	7.54	21.1	331	
0936	—	—	—	7.58	21.6	330	

### SAMPLE INFORMATION

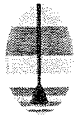
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC-02	0938	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* pump is constantly on & off.

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-12-09
Well ID: NWC-03	Weather: windy, sunny, cool
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bis): 100'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	2	0.16
Static Water Level (ft bmp): N/A	4	0.65
Casing Volume (gals): N/A	5	1.02
3 Casing Volumes (gals): N/A	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0955	—	—	—	7.06	20.2	1023	

### SAMPLE INFORMATION

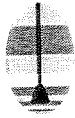
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC-03	0955	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: <del>22</del> 5.0	Date: 1-22-09
Well ID: NWC-04	Weather: rain, cool
ADWR No: 551849	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 379	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	2	0.16
	4	0.65
Static Water Level (ft bmp): * N/A	5	1.02
	6	1.47
Casing Volume (gals): N/A	8	2.61
	10	4.08
3 Casing Volumes (gals): N/A	Casing Volume = gallons/foot * water column (feet)	

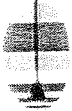
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
<del>1032</del>							
1040	—	—	—	7.17	23.0	668	*see comments
1044	—	—	—	7.20	22.7	668	
1046	—	—	—	7.22	22.9	692	
1049	—	—	—	7.22	23.2	697	
1053	—	—	—	7.23	22.9	688	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC 04	1053	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* unable to get a sounder reading  
 \* pump is constantly on @ about 30 gpm (totalizer reading)  
 \* Pump is on auto setting.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-12-09
Well ID: NWC-04	Weather: Cloudy, Cold
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bis): 379'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	2	0.16
Static Water Level (ft bmp): N/A	4	0.65
Casing Volume (gals): N/A	5	1.02
3 Casing Volumes (gals): N/A	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0838	—	—	—	7.12	18.4	701	
0842	—	—	—	7.20	19.8	699	

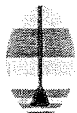
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC-04	0845	Plastic	250 ml	1	EPA 300.0	None	
DUP021209	0845						

Additional Comments: \* pump is constantly on & off.  
 \* unable to get sonder reading b/c of obstruction in well.







# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-12-09
Well ID:	<del>NWC-06</del> NWC-06	Weather:	sunny, cold
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	120'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):		2	0.16
Static Water Level (ft bmp):	N/A	4	0.65
Casing Volume (gals):	N/A	5	1.02
3 Casing Volumes (gals):	N/A	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0907	—	—	—	7.44	21.3	307	
0911	—	—	—	7.54	21.8	306	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC-06	0913	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* pump is constantly on & off.

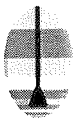
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**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-20-09
Well ID: OSBORN	Weather: Sunny, windy, cool
ADWR No: 643436	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls): 258'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 8"	2	0.16
Static Water Level (ft bmp): N/A *	4	0.65
Casing Volume (gals): N/A	5	1.02
3 Casing Volumes (gals): N/A	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

**FIELD SAMPLING DATA**

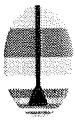
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1310							
1317	7	8	56	6.97	22.3	476	
1324	14	8	112	7.12	22.4	473	
1329	19	8	152	7.17	22.5	471	
1332	22	8	176	7.29	22.4	470	
1335	25	8	200	7.33	22.4	469	

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
OSBORN	1335	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* could not get sounder into well casing b/c well casing is too far to one side inside surface casing.

69.23



**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-20-09
Well ID: PALMER	Weather: sunny, windy, cool
ADWR No: 578819	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls): 220'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): N/A cannot access	4	0.65
	5	1.02
Casing Volume (gals): N/A	6	1.47
3 Casing Volumes (gals): N/A	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1025	—	—	—	7.33	19.4	441	

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
PALMER	1025	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* sample taken from tanks

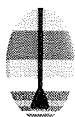
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**HYDRIC GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: <u>8720000</u>	Client: <u>Freeport Copper Queen Branch</u>
Task No: <u>2.2</u>	Date: <u>1-22-09</u>
Well ID: <u>PANAGAKOS</u>	Weather: <u>cloudy, cool</u>
ADWR No: <u>076413</u>	Sampler: <u>Travis Taylor</u>

**WELL DATA**

Well Depth (ft bls): <u>200'</u>	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): <u>5"</u>	2	0.16
Static Water Level (ft bmp): <u>Unable to fit sounder down hole.</u>	4	0.65
	5	1.02
Casing Volume (gals): <u>N/A</u>	6	1.47
	8	2.61
3 Casing Volumes (gals): <u>N/A</u>	10	4.08
	Casing Volume = gallons/foot * water column (feet)	

**FIELD SAMPLING DATA**

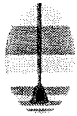
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
<u>1204</u>							
<u>1213</u>	<u>9</u>	<u>4</u>	<u>36</u>	<u>6.68</u>	<u>18.9</u>	<u>1036</u>	
<u>1217</u>	<u>13</u>	<u>4</u>	<u>52</u>	<u>6.84</u>	<u>19.5</u>	<u>1044</u>	
<u>1220</u>	<u>16</u>	<u>4</u>	<u>64</u>	<u>6.92</u>	<u>19.8</u>	<u>967</u>	
<u>1223</u>	<u>19</u>	<u>4</u>	<u>76</u>	<u>6.91</u>	<u>19.8</u>	<u>999</u>	
<u>1227</u>	<u>23</u>	<u>4</u>	<u>92</u>	<u>6.91</u>	<u>19.7</u>	<u>998</u>	
<u>1229</u>	<u>25</u>	<u>4</u>	<u>100</u>	<u>6.92</u>	<u>19.7</u>	<u>997</u>	

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
<u>PANAGAKOS</u>	<u>1229</u>	<u>Plastic</u>	<u>250 ml</u>	<u>1</u>	<u>EPA 300.0</u>	<u>None</u>	

Additional Comments:

▽ @ 155.28



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-13-09
Well ID: PARRA	Weather: Sunny, Cool
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 355'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): 280.75	4	0.65
Casing Volume (gals): 109	5	1.02
3 Casing Volumes (gals): 327	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1028							
1032	4	9	36	7.28	20.1	957	
1037	9	9	81	7.27	21.4	970	
1043	15	9	135	7.22	21.2	963	
1050	22	9	198	7.22	21.7	965	
1056	28	9	252	7.18	21.6	966	
1102	34	9	306	7.22	21.9	966	
1105	37	9	333	7.24	22.1	965	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
PARRA	1108	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

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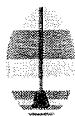


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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-29-09
Well ID:	PIONKE	Weather:	Sunny, windy, cool
ADWR No:	613395	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	330'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	8" 6"	2	0.16
Static Water Level (ft bmp):	No access	4	0.65
		5	1.02
		6	1.47
		8	2.61
Casing Volume (gals):	N/A	10	4.08
3 Casing Volumes (gals):	N/A	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

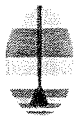
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1058							
1101	3	—	—	6.95	18.8	857	
1105	7	—	—	7.16	19.3	834	
1108	10	—	—	7.27	19.6	836	
1111	13	—	—	7.30	19.6	847	
1114	16	—	—	7.28	19.5	846	
1121	23	—	—	7.13	19.9	847	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
PIONKE	1121	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* unable to get gem rate, b/c no adapter available to connect to discharge point (connection is too large).  
 \* No access to sounding hole, b/c discharge piping in the way.





# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-13-09
Well ID: POOL	Weather: Sunny, cold
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bis): 313'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): 204.74	4	0.65
Casing Volume (gals): 159	5	1.02
3 Casing Volumes (gals): 477	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0846							
0856	10	15	150	7.31	19.2	479	
0902	16	15	240	7.52	20.6	476	
0908	22	15	330	7.53	20.8	473	
0916	30	15	450	7.63	20.7	476	
0919	33	15	495	7.62	20.8	473	

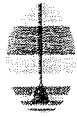
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
POOL	0919	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 3-3-09
Well ID: POWER	Weather: Sunny, Warm
ADWR No:	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls):	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	2	0.16
Static Water Level (ft bmp): 44.31'	4	0.65
	5	1.02
Casing Volume (gals):	6	1.47
	8	2.61
3 Casing Volumes (gals):	10	4.08
Casing Volume = gallons/foot * water column (feet)		

**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
		Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* WL only

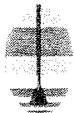
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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-29-09
Well ID: RAMIREZ	Weather: sunny, cool, windy
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft b1s): 300'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): 158.74'	4	0.65
Casing Volume (gals): 207.5	5	1.02
3 Casing Volumes (gals): 623	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

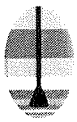
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1225							
1231	6	10	60	7.14	21.6	296	
1236	11	10	110	7.18	22.6	301	
1242	17	10	170	7.19	22.4	299	
1247	22	10	220	7.22	22.2	300	
1252	27	10	270	7.24	22.3	298	
1257	32	10	320	7.24	22.0	297	
1302	37	10	370	7.23	22.1	303	
1312	47	10	470	7.24	22.0	302	
1315	50	10	500	7.24	22.2	301	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
RAMIREZ	1315	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

\*stopped discharging early bc parameters stabilized



**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-20-09
Well ID: RAY	Weather: sunny, cool, windy
ADWR No: 803772	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls): 100'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 8"	2	0.16
Static Water Level (ft bmp): 44.31	4	0.65
Casing Volume (gals): 145	5	1.02
3 Casing Volumes (gals): 435	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

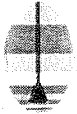
**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1601							
1606	5	7.5	37.5	6.65	20.8	1386	
1611	10	7.5	75	6.81	21.4	1386	
1615	14	7.5	105	6.87	21.4	1382	
1618	17	7.5	127.5	6.92	20.6	1355	

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
RAY	1618	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \*stopped discharge due to flooding of owner's yard.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-10-09
Well ID: ROGERS 803	Weather: Windy, cold
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 300'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): 130.62	4	0.65
Casing Volume (gals): <del>249</del> 249	5	1.02
3 Casing Volumes (gals): 747	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

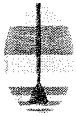
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1307							
1312	5	6	30	7.28	14.8	480	
1318	11	6	66	7.35	16.3	477	
1324	17	6	102	7.41	17.0	473	
1333	26	6	156	7.41	17.2	476	
1343	36	6	216	7.40	17.6	478	
1352	45	6	270	7.41	17.7	474	
1400	53	6	318	7.42	17.9	475	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
ROGERS 803	1405	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

\* took sample after parameters were stable.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-10-09
Well ID: ROGERS E	Weather: Windy, cold
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft b/s): 285'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): <del>173.38</del> 149.02	4	0.65
	5	1.02
Casing Volume (gals): 164	6	1.47
3 Casing Volumes (gals): 492	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1444							
1448	4	13	<del>52</del> 52	7.41	19.7	323	
1455	11	13	<del>143</del> 143	7.45	21.5	323	
1501	17	13	221	7.44	21.3	324	
1506	22	13	286	7.47	21.2	323	
1511	27	13	351	7.47	21.2	320	
1517	33	13	429	7.49	20.5	321	
1522	38	13	494	7.51	20.7	322	

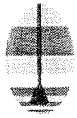
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
ROGERS E	1527	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-12-09
Well ID:	RUIZ	Weather:	sunny, windy, cool
ADWR No:		Sampler:	

### WELL DATA

Well Depth (ft bls):	312	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	294.62	4	0.65
Casing Volume (gals):	26	5	1.02
3 Casing Volumes (gals):	78	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

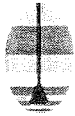
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1630							
1634	4	~10	40	6.94	20.4	750	
1639	9	~10	90	6.94	20.9	748	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
RUIZ	1642	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* discharge is running into tank & out of spicket. GPM is an estimate.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-29-09
Well ID:	SCHWARTZ	Weather:	Sunny, Windy, cool
ADWR No:	210865	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bls):	305'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	122.87'	4	0.65
Casing Volume (gals):	267.5	5	1.02
3 Casing Volumes (gals):	803	6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1355							
1401	6	8	48	6.95	20.8	481	
1408	13	8	104	7.02	21.9	476	
1418	23	8	184	7.03	21.8	474	
1428	33	8	264	7.04	21.8	475	
1438	43	8	344	7.08	21.8	474	
1448	53	8	424	7.06	21.9	474	
1458	63	8	504	7.07	21.9	475	
1508	73	8	584	7.08	22.0	475	
1518	83	8	664	7.08	22.1	475	
1529	94	8	752	7.08	21.9	474	
1536	101	8	808	7.08	22.0	475	

### SAMPLE INFORMATION

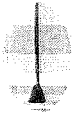
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
SCHWARTZ	1536	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	5.0	Date:	2-23-09
Well ID:	SCHWARTZ	Weather:	cloudy, windy, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	305'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
		4	0.65
Static Water Level (ft bmp):	122.69'	5	1.02
		6	1.47
Casing Volume (gals):	268	8	2.61
		10	4.08
3 Casing Volumes (gals):	804	Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1624							
1632	8	9	72	7.16	23.4	615	
1638	14	9	126	7.24	22.4	612	
1647	23	9	207	7.32	22.3	610	
1654	30	9	270	7.31	22.2	611	
1701	37	9	333	7.30	22.2	609	
1708	44	9	396	7.32	22.1	610	
1715	51	9	459	7.32	22.0	609	
1724	60	9	540	7.33	22.1	610	

### SAMPLE INFORMATION

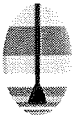
Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
SCHWARTZ	1728	Plastic	250 ml	1	EPA 300.0	None	Filtered

Additional Comments: \* 5 people are renting house & have been using well. Sulfate Only  
 \* parameters have ~~stable~~ are stable after two casing volumes









**HYDRO GEO CHEM, INC.**  
**Groundwater Sampling Form**

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 1-20-09
Well ID: SWAN	Weather: sunny, windy, cool
ADWR No:	Sampler: Travis Taylor

**WELL DATA**

Well Depth (ft bls): * 98"	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 4"	2	0.16
Static Water Level (ft bmp): unable to fit sampler down tube.	4	0.65
	5	1.02
Casing Volume (gals):	6	1.47
	8	2.61
3 Casing Volumes (gals):	10	4.08
Casing Volume = gallons/foot * water column (feet)		

**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1201							
1205	4	9	36	6.69	20.4	397	
1210	9	9	81	6.97	17.8	396	
1215	14	9	126	7.05	20.4	391	

**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
SWAN	1215	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* well depth estimate based on owner.  
 29.77



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	3720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-24-09
Well ID:	TM-02A	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	925'	Casing Capacity	
Casing Diameter (in):	4"	Nominal Size (inches)	Gallons per Linear Foot
Static Water Level (ft bmp):	348.64	2	0.16
Casing Volume (gals):	377	4	0.65
3 Casing Volumes (gals):	1131	5	1.02
		6	1.47
		8	2.61
		10	4.08
		Casing Volume = gallons/foot * water column (feet)	

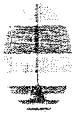
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1503							
1508	5	10	50	8.68	22.6	296	
1516	13	10	130	7.97	23.1	345	
1522	19	10	190	7.95	23.5	345	
1533	30	10	300	8.00	24.1	342	
1543	40	10	400	8.04	24.5	340	
1551	48	10	480	8.08	24.7	340	
1556	53	10	530	8.10	24.8	340	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-02A	1559	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* parameters are stable after about 1.5 casing volumes.



**HYDRO GEO CHEM, INC.**  
Groundwater Sampling Form

Project No:	3720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-26-09
Well ID:	TM-03	Weather:	Sunny, cool, windy
ADWR No:		Sampler:	Travis Taylor

**WELL DATA**

Well Depth (ft bis):	200'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	4"	2	0.16
Static Water Level (ft bmp):	126.94 (mp = top of discharge pipe)	4	0.65
		5	1.02
Casing Volume (gals):	48	6	1.47
		8	2.61
3 Casing Volumes (gals):	144	10	4.08
		Casing Volume = gallons/foot * water column (feet)	

**FIELD SAMPLING DATA**

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1122							
1125	3	12	36	7.17	21.7	731	
1131	9	12	108	7.15	21.7	734	
1134	12	12	144	7.21	21.8	737	

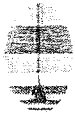
**SAMPLE INFORMATION**

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-03	1138	Plastic	250 ml	1	EPA 300.0	None	
DUPO22609	1138						

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



HYDRO GEO CHEM, INC.  
Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-26-09
Well ID:	TM-06 MILLER	Weather:	Sunny, cool, windy
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bis):	Casing Diameter (in):	Static Water Level (ft bmp):	Casing Volume (gals):	3 Casing Volumes (gals):	Casing Capacity	
					Nominal Size (inches)	Gallons per Linear Foot
200'	4"	159.26	7	21	2	0.16
					4	0.65
					5	1.02
					6	1.47
					8	2.61
					10	4.08

Casing Volume = gallons/foot \* water column (feet)

FIELD SAMPLING DATA

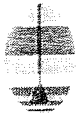
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1027							
1029	2	11	22	7.18	20.4	574	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-06 MILLER 1034		Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_





# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	3720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	12-20-09
Weil ID:	<del>TM-07</del> TM-07	Weather:	A sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	350'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	4"	2	0.16
Static Water Level (ft bmp):	N/A	4	0.65
Casing Volume (gals):	N/A	5	1.02
3 Casing Volumes (gals):	N/A	6	1.47
		8	2.61
		10	4.08
Casing Volume = gallons/foot * water column (feet)			

### FIELD SAMPLING DATA

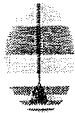
Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1105							
1107	2	10	20	7.32	20.6	471	
1108	3	—	—	—	—	—	well pumped dry
1123	—	—	—	7.77	19.9	376	Pump on

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-7	1123	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* obstruction in well @ about 52'. Tried fat & skinny sounders.





# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	2-20-09
Well ID:	TM-16	Weather:	Sunny, cool
ADWR No:		Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	115'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	4"	2	0.16
		4	0.65
		5	1.02
		6	1.47
		8	2.61
Static Water Level (ft bmp):	81.88	10	4.08
Casing Volume (gals):	22	Casing Volume = gallons/foot * water column (feet)	
3 Casing Volumes (gals):	66		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1251							
1255	4	15	<del>60</del>	6.85	21.0	1296	Pump is kicking on & off
1303	12	15		6.86	21.0	1295	turned pump off
1332	—	15	—	—	—	—	rewired cord & pump on
1334	2	17	34	6.86	21.1	1283	
1336	4	17	68	6.90	22.1	1292	

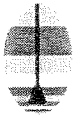
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-16	1339	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments:

\* pump kept kicking on and off.  
 \* After re-wiring extension cord, pump now works.





# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-18-09
Well ID: TM-42	Weather: Sunny, cool
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bis): 250	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 5"	2	0.16
Static Water Level (ft bmp): 212.31	4	0.65
	5	1.02
Casing Volume (gals): 39	6	1.47
	8	2.61
3 Casing Volumes (gals): 117	10	4.08
	Casing Volume = gallons/foot * water column (feet)	

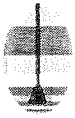
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1214							
1220	6	4	24	6.74	21.8	1268	
1226	14	4	56	6.69	22.1	1257	
1232	18	4	72	6.67	22.2	1254	
1235	21	4	~84	6.72	22.3	1245	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-42	1237	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \*Stopped pumping early b/c discharge rate had a significant decrease.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-11-09
Well ID: TVI 236	Weather: <del>W</del> Cold, Sunny
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 222'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 12"	2	0.16
Static Water Level (ft bmp): <del>44.11</del> 21.28	4	0.65
	5	1.02
Casing Volume (gals): 458	6	1.47
3 Casing Volumes (gals): 1374	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

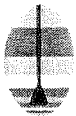
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1126							
1133	7	~500	3500	7.17	19.5	398	
1138	12	~500	6000	7.37	20.1	391	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TVI 236	1140	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* pump has not been on since 2-5-09.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-11-09
Well ID: TVI 713	Weather: cold, sunny
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls):	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
	2	0.16
Casing Diameter (in):	4	0.65
Static Water Level (ft bmp): <del>149.87</del> 149.87	5	1.02
Casing Volume (gals): N/A	6	1.47
	8	2.61
	10	4.08
3 Casing Volumes (gals): N/A	Casing Volume = gallons/foot * water column (feet)	

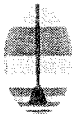
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
		Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* WL only  
 \* pump has been off since 2-5-09



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-11-09
Well ID: TVI 875	Weather: Cold, Sunny
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bis): 330'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): 119.87	4	0.65
Casing Volume (gals): 181-265	5	1.02
3 Casing Volumes (gals): 795	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1222							
1225	3	~500	1500	7.27	20.3	732	
1229	7	~500	3500	7.20	20.7	738	

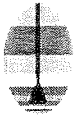
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TVI 875	1233	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \*pump has been shut off since 2-5-09.







# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-13-09
Well ID: WEED	Weather:
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 300'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	2	0.16
Static Water Level (ft bmp): N/A	4	0.65
Casing Volume (gals): N/A	5	1.02
3 Casing Volumes (gals): N/A	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

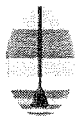
### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0952							
0955	3	16	48	7.61	20.2	306	
0959	7	16	112	7.67	21.1	303	
1002	10	16	160	7.67	21.1	302	
1005	13	16	208	7.66	21.1	303	

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
WEED	1007	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \* no sounding port on well. Will pump well until parameters are stable.



# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No:	8720000	Client:	Freeport Copper Queen Branch
Task No:	2.2	Date:	1-29-09
Well ID:	WEISKOPF	Weather:	cool, sunny, windy
ADWR No:	641802	Sampler:	Travis Taylor

### WELL DATA

Well Depth (ft bis):	200'	Casing Capacity	
		Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in):	6"	2	0.16
Static Water Level (ft bmp):	143.99	4	0.65
		5	1.02
Casing Volume (gals):	83	6	1.47
		8	2.61
3 Casing Volumes (gals):	249	10	4.08
		Casing Volume = gallons/foot * water column (feet)	

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1614							
1619	5	7	35	6.84	20.2	863	
1624	10	7	70	6.82	20.2	892	
1629	15	7	105	6.81	20.9	964	
1634	20	7	140	6.85	20.8	986	
1639	25	7	175	6.81	20.8	989	
1645	31	7	217	6.81	20.7	1004	
1650	36	7	252	6.79	20.7	1014	

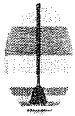
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
WEISKOPF	1650	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-10-09
Well ID: ZANDER	Weather: windy, cold
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): 280'	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): 6"	2	0.16
Static Water Level (ft bmp): <del>169.54</del> 144.83	4	0.65
	5	1.02
Casing Volume (gals): 163	6	1.47
3 Casing Volumes (gals): 489	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1604							
1608	4	13	52	7.46	19.3	321	
1615	11	13	143	7.47	20.7	317	
1624	20	13	260	7.49	20.8	317	
1630	26	13	338	7.50	20.8	317	
1636	32	13	416	7.52	20.5	313	
1646	42	13	546	7.50	20.4	317	

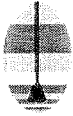
### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
ZANDER	1651	Plastic	250 ml	1	EPA 300.0	None	

Additional Comments: \_\_\_\_\_

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# HYDRO GEO CHEM, INC.

## Groundwater Sampling Form

Project No: 8720000	Client: Freeport Copper Queen Branch
Task No: 2.2	Date: 2-12-09
Well ID: EQB021209/FB021209	Weather: Cloudy, cold
ADWR No:	Sampler: Travis Taylor

### WELL DATA

Well Depth (ft bls): N/A	Casing Capacity	
	Nominal Size (inches)	Gallons per Linear Foot
Casing Diameter (in): N/A	2	0.16
Static Water Level (ft bmp): N/A	4	0.65
Casing Volume (gals): N/A	5	1.02
3 Casing Volumes (gals): N/A	6	1.47
	8	2.61
	10	4.08
Casing Volume = gallons/foot * water column (feet)		

### FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

### SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
EQB021209	0822	Plastic	250 ml	1	EPA 300.0	None	
FB021209	0824						

Additional Comments: \_\_\_\_\_

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