



## TECHNICAL MEMORANDUM

**Date:** March 28, 2013  
**To:** Casey McKeon, PhD  
**From:** John Malusa, RG  
Golder Associates Inc.  
**RE:** GROUNDWATER ASSESSMENT UPDATE: WEST PLANT SITE, SUPERIOR, ARIZONA

**Project No.:** 123-92566  
**Company:** Resolution Copper Mining, LLC  
**Email:** Casey.McKeon@riotinto.com

### 1.0 INTRODUCTION

This Technical Memorandum presents the first update of the Groundwater Assessment prepared by Golder Associates Inc. (Golder) on behalf of Resolution Copper Mining Company LLC (RCML). This work is required as part of the Area-Wide Aquifer Protection Permit (APP) No. P101703, for the West Plant Site (Figure 1). Specifically, this Technical Memorandum partially fulfills APP Compliance Schedule Item (CSI) No. 2.

■ **CSI No. 2 – Update groundwater assessment and groundwater model every 5 years**

Golder submitted the initial Groundwater Assessment in November 2007 (Golder, 2007), followed by the Groundwater Model in December 2008 (Golder, 2008). Both were approved by the Arizona Department of Environmental Quality (ADEQ) in February, 2008, and March, 2009, respectively.

The Groundwater Modeling component of CSI No. 2 is being provided as a standalone Technical Memorandum that references this updated Groundwater Assessment. The requirements for CSI No. 2 are set forth in Section 2.7.4.6 of the Area-Wide APP as follows:

*The groundwater modeling report shall include hydrographs, trending analysis for each well and constituents in the compliance monitoring program; stiff diagrams and/or tri-linear diagrams as appropriate; updated quarterly groundwater contour maps; and groundwater modeling to assess fate, transport, and well spacing. The model shall assess the post-closure period required by this permit and recommend adjustments to the post-closure monitoring period based on aquifer properties, groundwater modeling results, trending analysis and groundwater quality data.*

The updated Groundwater Assessment follows the same format as the initial submittal but incorporates new information. This report is organized as follows:

- **Section 2 – Groundwater Assessment**
- Physiography and Climate
  - Mine Operations and History



- Surface Hydrology
- Hydrogeology
  - Hydrostratigraphy and Hydraulic Units
  - Groundwater Levels and Direction of Flow
  - Groundwater Quality
  - Groundwater Classifications
  - Exceedances of Groundwater Standards
  - Trending Analysis

### ■ Section 3 – Summary and Conclusions

## 2.0 GROUNDWATER ASSESSMENT

The updated Groundwater Assessment of the West Plant Site is based on a variety of information available at the site. This assessment generally follows the same format as the initial with the addition of new data from the past 5 years, such as data from the groundwater monitoring well network. The compliance program currently includes 10 wells, 9 points of compliance (POC) wells, and 1 alert well (Table 1 and Figure 2). The recently installed Well MCC-6D is also included in this assessment as it will replace MCC-6C upon completion of ambient monitoring in second quarter of 2014. Consequently, RCML currently monitors 11 wells for water quality on a quarterly basis. A larger set of wells are used to construct the quarterly contour maps (Figure 3). No new hydraulic conductivity data are available since the initial assessment. The locations of the wells with hydraulic conductivity data are shown on Figure 4 and testing details are summarized in Table 2. Logs for wells used for this assessment are included in Attachment 1.

In addition to monitoring well data, the updated Groundwater Assessment summarizes physiographic, topographic, climatic, historical operations, and surface hydrology in the following sections.

### 2.1 Physiography and Climate

The West Plant Site is located in an alluvial valley near the edge of mountainous and rugged terrain comprising the Apache Leap. The Apache Leap rises to an elevation of approximately 4,600 feet above mean sea level (ft-amsl), and is characterized by steep slopes, cliff formations, and deeply incised canyons (Figure 5). The West Plant Site ranges in elevation from a high of approximately 3,975 ft-amsl in the northern portion of the site, to a low of approximately 2,675 ft-amsl at the southern edge of the site.

Mining activities have altered the site topography, including changes in watercourse patterns. Figure 5 shows the approximate location of the pre-mining watercourses (Apex Wash and Magma Wash), as identified on a 1942 U.S. Bureau of Mines Geologic Map (Arizona Bureau of Mines, 1942).

Climatic data consisting of daily precipitation measurements were first collected at the West Plant Site in 1920. That record continues to the present and includes 92 years of data. One meteorological station

was installed at the West Plant Site in 2002 (Figure 5). The self-recording equipment was installed on a 30-foot tower with lightning protection. The equipment consisted of a tipping bucket rain gauge, evaporation pan at ground level, wind speed anemometer, wind direction sensor, relative humidity sensor, temperature sensor, barometric pressure sensor, and pyranometer.

The annual rainfall from 1920 to 2012 averaged approximately 18 inches. Extreme precipitation years with annual rainfall exceeding 35 inches occurred in 1979 and 1992. The lowest annual total rainfall of approximately 5 inches occurred in 2002.

Average pan evaporation from 2002 through 2003 was 83 inches. Highest evaporation rates were generally in May through July corresponding with the lowest precipitation periods. Evaporation rates exceeded precipitation totals in all months.

## 2.2 Mining Operations History

Mining of the Magma Vein, a quartz-sulfide ore body, occurred from the late 1800s through the 1940s at the West Plant Site and was followed by the discovery of a carbonate replacement ore body to the east. Underground mining activities conducted from the late 1880s through mid-1996 produced approximately 26 million tons of ore at that time, out of which approximately 20 million tons were tailings. About 6 to 7 million tons of tailing were returned to the underground workings as structural support and the remainder sent to the tailing facilities at the West Plant Site. Approximately 200 acres of tailing generated from former milling operations are located at the West Plant Site. Many of the facilities associated with the mine site ceased operation or were closed prior to January 1, 1986, and are therefore exempt from regulation under the APP program (ADEQ, 2012). Major facilities that are exempt under the APP program, their function, and history of activity is as follows (Figure 5):

- Tailings Ponds 1/2 – Tailings from magma vein. Active from 1914 to mid to late 1920s
- Tailings Ponds 3/4 – Tailings from the magma vein. Active from mid to late 1920s to early to mid 1950s
- Slag Pile – Slag from smelter. Active from 1920s to early 1970s

APP facilities regulated under the Area-wide APP will either be clean closed by removal (subject to approval by the ADEQ) or closed in-place. The Area-wide APP facilities subject to **clean closed by removal** and their status is as follows:

- **Closed by Removal Facilities:**
  - **Mills Sands Pond** – Stored sand sized tailings material for use as underground mine backfill material. Active until approximately 1996. Closure completed and approved by ADEQ in September 2011.
  - **Depot Pond** – Retained overflow from the Smelter Pond. Closure completed and approved by ADEQ in July 2011.
- **Operating Facilities to be Closed by Removal:**

- **Indian Ponds** – Retained overflow from the Depot Pond. Currently active as final retention basin in stormwater control system. A downgradient seepage control system associated with this facility is also regulated under the APP. Closure workplan approved by ADEQ in May 2011.
- **Stormwater Pond on Tailings Pond 6** – Currently active as long term storage of stormwater for evaporation.

The APP facilities subject to closure in place and their status are as follows:

- **Closed In-place Facilities:**
  - **Tailings Pond 5** – Storage impoundment for tailings produced during mining of magma vein and carbonate replacement orebodies. Active between 1957 and 1971 then re-mined to produce fertilizer until 1986. Closure completed and approved by ADEQ in February 2011.
  - **Settling Pond 2** – The first retention treatment pond in the mine water treatment circuit and retained overflow water from the thickening tanks. Closure completed by construction of the North Sludge Storage Impoundment over the pond and approved by ADEQ in November 2010.
  - **Smelter Pond** – Retained overflow from stormwater/seepage water for reused and/or treatment and discharge. Water retained was classified as process water. Overflow was either pumped to Tailings Pond 6 for eventual reuse, or fed into an open channel to the Depot Pond. A lime slurry was introduced into water flowing through the open channel to the Depot Pond. Facility includes downgradient seepage control system. A downgradient seepage control system associated with this facility is also regulated under the APP. Closure completed and approved by ADEQ in February 2011.
  - **500 Yard Waste Rock Facility** – Waste rock facility containing approximately 2 million tons of material originating from the No. 5 Shaft, the access tunnel to the No. 3 Shaft, and the Never Sweat Tunnel. Closure Completed and approved by ADEQ in February 2009.
- **Facilities to be Closed In-place:**
  - **Tailings Pond 6 and 7** – Merged storage impoundment for tailings produced during mining of carbonate replacement orebodies. Tailings Pond 6 was active from 1971 to 1996. Tailings Pond 7 was active from 1974 to 1982. Closure of the inactive Tailings Pond 7 was moved from the Area-wide APP to an Individual APP (No. P106257) because the new permit is for a facility that will cap the Tailings Pond 7 and hence, it is more practical to regulate under the new Individual APP.
  - **Settling Pond 1** – Retained treated overflow from Settling Pond 2 and Tailings Pond 6. Water was used as process water in the mill and sand plant operations. Final design for closure approved by ADEQ in February 2011.

## 2.3 Surface Hydrology

Historical drainages are depicted on Figure 5 and current surface water drainages are depicted on Figure 6. The primary surface water drainage near the West Plant Site is Queen Creek. The creek is approximately 53 miles long with channel elevations that range from approximately 5,600 ft-amsl at its headwaters, to approximately 1,200 ft-amsl where it discharges to the Gila River near the San Tan Mountains. The Queen Creek reach adjacent to the site is ephemeral. The drainage pattern within the

West Plant Site is predominately from northeast to southwest. Flow in all of the drainages of the area is ephemeral.

The West Plant Site lies between two tributaries of Queen Creek, Apex Wash to the northwest and Magma Wash to the southeast. However, the course of these tributaries has been altered by mining activities. Apex Wash prior to mining flowed into Queen Creek west of the study area. Currently, only the lower reach of the wash flows to Queen Creek southwest of Tailings Pond 6. North of the study area, the wash was diverted in 1971 by the Apex Berm and Apex Tunnel (Figures 5 and 6) into the Silver King Wash located farther to the west. This removed any surface run-on water from entering the landfill and Tailings Ponds 6 and 7.

Runoff from the West Plant Site and any flows entering the study area along Magma Wash from the northeast were previously contained by various stormwater collection facilities (e.g., Smelter Pond, Depot Pond, and Indian Ponds), and pumped back to Tailings Ponds 6 (Figure 5). Stormwater occurring within the West Plant Site is also collected and pumped back to Tailings Ponds 6.

As part of closure, RCML has been converting the existing "contact" storm water system to a new system for "non-contact" storm water, at the same time improving flood control at the West Plant Site (Figure 6). The new system diverts run-on around Area-wide APP facilities to the extent practical, and where impractical conveys run-on over the Area-wide APP facilities in channels lined with low permeability materials. As part of these upgrades, new ponds and channels have been added while some ponds and channels have been removed. Changes are indicated on Figure 6.

## 2.4 Geology

The geology and geologic history of the Superior Mining District is complex. Basement Precambrian rocks covered by sediments were faulted, uplifted, intruded, and mineralized. The West Plant Site is located west of the zone of faulting and mineralization within an alluvial valley. The most recent geologic map was published in 1969 (Peterson, 1969) included on Figure 7.

Geologic units in the Superior district range from Precambrian metasedimentary deposits to Quaternary Alluvium. Rocks east of the Concentrator Fault consist of Precambrian schist, diabase, quartzite, basalt, and limestone (Apache Group) overlain by Cambrian and Paleozoic sedimentary rocks, Tertiary Volcanics (Apache Leap Tuff), and Tertiary and Quaternary Alluvium. Deposits west of the Concentrator Fault (Figure 7) are Tertiary-Quaternary basin-fill deposits consisting of moderately to well-consolidated conglomerates (Gila Conglomerate at the West Plant Site) interbedded with fine-grained silts and sands, lava flows, volcanic ash, and mudstone (interbedded in the Gila Conglomerate at the West Plant Site) (B&C, 1999). A large alluvial fan deposit of Quaternary age lies on top of the Gila Conglomerate at the southeastern edge of the West Plant Site and extends to the east beneath the Town of Superior.

Numerous northerly and east-west trending faults are evident in the Precambrian, Cambrian, and Paleozoic rocks east of the study area. The major fault cutting across the east side of the site, as noted above, is the Concentrator Fault, which extends for more than 10 miles along the base of the Apache Leap escarpment (Figure 7) and has an offset of approximately 1,600 feet near the West Plant Site (Kuhn, 1942). The Concentrator Fault is not mineralized, and no mineral deposits are known to exist west of it. According to Hammer (1989), the ancestral Concentrator Fault system controlled the orientation of the Magma orebody and acted as a natural barrier to the westward migration of ore fluids in the Superior area.

The Main Fault, a less prominent fault to the east of the Concentrator Fault, exhibits rotational displacement and terminates against the Concentrator Fault in the Queen Creek drainage (Figure 7). Offset on the Main Fault is approximately 900 feet near the West Plant Site (Kuhn, 1942). The block between the Concentrator Fault and the Main Fault contains several associated minor faults.

## 2.5 Hydrogeology

This section describes general aspects of the regional hydrogeology and provides a detailed description of the site hydrogeology.

### 2.5.1 Regional Hydrogeology

In the regional sense, groundwater recharge occurs in the mountainous region east and northeast of the study area, and flows westward to southwestward towards the lower topographic valley regions. The Concentrator Fault (Figure 7), however, acts as a barrier to flow along the range front impeding groundwater flow to the west.

### 2.5.2 Site Hydrogeology

The discussion of site hydrogeology includes descriptions of the site hydrostratigraphy and associated hydraulic conductivities, groundwater levels and directions of flow, and groundwater quality.

#### 2.5.2.1 Hydrostratigraphy and Hydraulic Conductivities

Three primary geologic units control the movement of groundwater beneath the West Plant Site: Gila Conglomerate, an unnamed mudstone interbed of the Gila Conglomerate, and Quaternary Alluvium (Figure 7). Even though the Gila Conglomerate is an extensive geologic unit, the much less extensive mudstone is a prominent geologic feature at the site. The third unit, the Quaternary Alluvium, is located along the southern boundary of the West Plant Site. A hydrogeologic cross section with the primary hydrostratigraphic units is presented on Figure 8.

B&C (1999) encountered the mudstone at approximately 20 feet below ground surface (ft-bgs) in the southern site area at Well MCC-4, and at the surface in the nearby excavated clay pit west of the Indian Ponds. The top of the mudstone and its lateral extent elsewhere on site were delineated using a seismic

survey. Subsequent monitoring well drilling largely substantiated the seismic survey results. The thickness of the unit, however, was not as readily determined from the seismic survey. To estimate the depth to the base of the mudstone, driller's logs from the ADWR Wells 55 database and corelogs were used to augment the seismic survey B&C (1999). Figure 7 includes the mudstone isopach map developed by B&C (1999). Based on core logs, the mudstone has a maximum thickness of 630 feet (B&C, 1999). The top of the mudstone is approximately 200 to 300 ft-bgs at its northern end.

Results of the seismic survey indicated that the mudstone pinches out in the northern portion of the West Plant Site, just south of well GAI-02-01 (Figures 7 and 8). B&C also interpreted that the unit thins to the east (B&C, 1999).

Based on the three geologic units described above and the site hydrogeologic conditions, six hydrostratigraphic units have been defined as follows (Figure 8):

- **Mudstone Unit**— applies to the lenticular fine grained formation within the Gila Conglomerate described above. The mudstone extends from the central portion of the site beyond the southern boundary
- **Unconfined Gila Unit** – applies to the thick zone of the Gila Conglomerate that lies north of the Mudstone Unit.
- **Confined Gila Unit** – applies to the portion of the Gila Conglomerate that lies beneath the Mudstone Unit
- **Shallow Unconfined Gila Unit** – applies to the portion of the Gila Conglomerate that overlies the Mudstone Unit
- **Alluvial Unit** – applies to recent alluvium located on the south side of the study area.
- **Fractured Bedrock Unit** – applies to Apache Leap Tuff underlying 500 yard stockpile on eastside of Concentrator Fault

Hydraulic characteristics of the above listed hydrostratigraphic units were estimated from hydraulic tests performed on 13 monitoring wells (Table 2). Seven of the tests were slug tests and eight of the tests were constant-rate pumping tests. For hydrostratigraphic units with more than one test result, a geometric mean of the test results was calculated to represent the estimated hydraulic conductivity of the unit. Estimated hydraulic conductivities for the hydrostratigraphic units are as follows:

- **Mudstone Unit** –  $1.3 \times 10^{-9}$  centimeter/second (cm/sec) (or  $3.7 \times 10^{-6}$  feet per day [ft/day])
- **Unconfined Gila Unit** –  $3.4 \times 10^{-7}$  cm/sec ( $9.7 \times 10^{-4}$  ft/day)
- **Confined Gila Unit** –  $3.7 \times 10^{-7}$  cm/sec ( $1.1 \times 10^{-3}$  ft/day)
- **Shallow Unconfined Gila Unit** –  $2.0 \times 10^{-6}$  cm/sec ( $5.7 \times 10^{-3}$  ft/day)
- **Alluvial Unit** –  $3.4 \times 10^{-5}$  cm/sec ( $9.6 \times 10^{-2}$  ft/day)
- **Fractured Bedrock Unit** –  $5.4 \times 10^{-7}$  cm/sec ( $1.5 \times 10^{-3}$  ft/day)

The most notable characteristic of the results listed above is that the hydraulic conductivities of all of the units are remarkably low, with the exception of the Alluvial Unit. As described further in sections below,

the low hydraulic conductivities in turn result in very slow groundwater velocities, and limit the quantity of groundwater that flows through the site groundwater system.

### 2.5.2.2 Groundwater Levels and Direction of Flow

Within the West Plant Site, depths to groundwater vary from approximately 175 ft-bgs at well GAI-02-01 in the north to approximately 10 ft-bgs in the Alluvial Unit located downgradient of the Smelter Pond (i.e., Smelter Pond POC Well) in the south. Sulfate precipitates and seasonal ponded water suggest that the water table seasonally daylight in the southern area.

Water level hydrographs for wells north and south of monitoring well MCC-2, located approximately in the center of the study area, are presented on Figures 9 and 10, respectively. Water level data used for the hydrographs is included in Attachment 2. Hydrographs indicate that groundwater levels are generally consistent over time with a slight downward trend at most wells. This downward trend may be due to the long-term drought the area is experiencing and facility closures.

The well showing the most change in groundwater levels is MCC-3C, located south of Tailings Ponds 3/4. The potentiometric surface in this deep Confined Gila Unit well decreased approximately 50 feet between 1998 and 2007. However, the well has recovered approximately 25 feet in the past 5 years. The start of the water level recovery correlates with the change in groundwater sampling protocol from standard purge methods to low flow purging techniques. Consequently, it is likely that water levels during standard purge methods were not truly static, and the water levels currently observed at this well are likely closer to static.

A combination of water levels from compliance wells and other wells are used to construct the groundwater contour maps. The most recent quarterly contour map is included as Figure 11. All of the 22 quarterly contour map submittals are included in Attachment 3.

Groundwater levels from the Shallow Unconfined Gila Unit, and groundwater levels from wells completed in the upper portion of the Gila Conglomerate Unit in the northern portion of the site, were used to construct water table contour maps. Groundwater levels from Well MCC-1, located west of Tailings Pond 6, were also used to approximate water table conditions at this location, though screened approximately 300 feet below the water table. Because of the deep screened interval, this well was removed from the contour map starting with the May 2010 quarterly submittal. All of the other groundwater levels used to construct the water table contour map were screened in the Gila Conglomerate Unit above the mudstone, or in the Unconfined Gila Conglomerate Unit at a depth of less than 70 feet below the water table. In addition, starting in September 2009, a well screened in the Settling Pond 1 and 2 pond sediments (i.e., SP1&2-Alert-B) was added to the contour map.

Also included on the contour maps are groundwater contours representing the deep potentiometric surface beneath the Mudstone Unit. Groundwater levels for the deep Confined Gila Unit were taken from

wells MCC-3C and MCC-4. In addition, groundwater levels from Well MCC-6B were included, even though the Mudstone Unit appears to pinch out just south of this well location, because the screened interval (500 to 580 ft-bgs) is at approximately the same elevation as the other two wells noted above, and a minimum of three wells are required for contouring purposes.

Based on the contour maps, the direction of groundwater flow at the water table is generally towards the southwest. The direction of flow beneath the mudstone appears to be nearly due south. The horizontal hydraulic gradients at the water table and beneath the mudstone are nearly the same, 0.049 and 0.048, respectively. The flow direction has not varied over the over the last 5 years (Attachment 3).

Two of the well clusters at the site are suitable for evaluating vertical gradients: the MCC-3 series wells, located south of Tailings Ponds 3/4, and the MCC-6 series wells, located southwest of Tailings Pond 6. The MCC-3 series wells show a downward vertical hydraulic gradient between the shallow well above the mudstone and the deeper well in the Gila Conglomerate below the mudstone. The MCC-6 series wells include MCC-6C (shallowest), MCC-6A (intermediate), and MCC-6B (deepest). The MCC-6 series wells show an upward vertical hydraulic gradient across all three wells.

#### 2.5.2.3 Groundwater Quality

Water quality results and summary statistics for wells in the compliance program are included in Attachment 4. Results of each well are compared to their respected Alert Levels (ALs) and Aquifer Quality Limits (AQLs) with the exception of newly installed MCC-6D which will not have ALs and AQLs until ambient monitoring is complete in the second quarter of 2014. RCML collects samples on a quarterly basis.

The MCC-series wells were monitored as part of the sampling program prior to permit issuance (B&C, 1999a). Samples collected during this time frame were analyzed for trace metals, major ions, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs). VOC and SVOC sampling occurred at least twice without detection. Therefore, continued sampling for VOC and SVOC analytes was deemed unwarranted by ADEQ. However, later site characterization of the Settling Ponds indicated the presence of benzene in Settling Pond 1 porewater (Golder, 2006). Consequently, VOCs and SVOCs are included for the SP1&2-Alert-B analytical suite. Conditional APP CSI's 21, 22, and 23 required a Workplan, Report, and Corrective Action Plan (respectively) upon detection of VOCs. However, because no VOCs have been detected, ADEQ considers these conditional CSIs as completed.

Since permit issuance, analytical suites have been adjusted as dictated by the APP. In general, the new APP analytical suites include trace metals, major ions and radionuclides.

#### 2.5.2.4 Groundwater Classifications

Piper plots graphically represent the chemistry of major cations (Ca, Mg, and Na) and anions (Cl, SO<sub>4</sub>, and bicarbonate) in milliequivalents per liter. These diagrams facilitate identification of water types and aid in identifying changes in major ion chemistry through time. A piper plot was generated for each hydrostratigraphic unit and is presented in Attachment 5. Additionally, one piper plot is presented with all hydrostratigraphic units. To evaluate temporal changes, major ion concentrations from the initial routine sampling event and the most recent sampling event were plotted. If major ions were not analyzed during these sampling events, the sampling event closest in time to these events (i.e., the initial routine or most recent sampling event) were plotted.

Piper plots of groundwater from Unconfined Gila Unit wells (MCC-6C, -6D and TP5-POC-B) indicate a variety of water types. Wells MCC-6C and TP5-POC-B classify as Na-HCO<sub>3</sub> type water and Well MCC-6D classifies as Mg-SO<sub>4</sub> type water. The elevated sulfate in MCC-6D indicates influence from sulfide oxidation/gypsum dissolution. Temporal trends between the initial routine and most recent sampling event are evident in MCC-6C, but not the other wells. The more recent sample from this well shows a decrease in sulfate and calcium.

Groundwater from MCC-3C, screened in the Confined Gila Unit beneath the mudstone, classifies as Na-HCO<sub>3</sub> type water. The other Confined Gila Unit well, MCC-4, classifies as Na-SO<sub>4</sub>-Cl type water. No temporal trends were noted from wells completed in this Confined Gila Unit.

Groundwater from wells screened in the Shallow Unconfined Gila Unit indicates Ca-SO<sub>4</sub> type water at MCC-9 and Ca-Mg-SO<sub>4</sub> type water at GAI-02-01. These wells are downgradient from major mine and/or tailing facilities, and indicate a water type consistent with oxidation of sulfides in the presence of carbonate minerals/gypsum dissolution. No temporal trends were noted from wells completed in this hydrostratigraphic unit.

Groundwater from wells screened in the Alluvial Unit indicates Ca-SO<sub>4</sub> type water at the Indian Ponds POC well and Mg-SO<sub>4</sub> type water at the Smelter Pond POC well. No temporal trends were noted at the Indian Ponds well however the Smelter Pond POC well shows that the major cations are trending from calcium to magnesium over time. In addition, with respect to major anions at the Smelter Pond POC well, sulfate concentrations are increasing relative to bicarbonate. This trend indicates an increase influence of sulfide oxidation.

Groundwater from the 500 YD Well, completed in the Fractured Bedrock Unit is classified as Ca-SO<sub>4</sub> type water. No temporal trends in major ions are noted at this well however; the high sulfate does indicate impacts from sulfide oxidation.

A statistical summary of the analytical results is presented in Attachment 4. Based on this summary, the pH values for groundwater are typically circumneutral to slightly alkaline. Wells with mean pH less than 6.5 standard units (su) include MCC-6D and SP1&2-Alert-B. Four wells have minimum pH values less than 6.5 su. Of these four wells, the low pH values reported at MCC-3C and MCC-4 (5.38 and 3.89 su, respectively) appear to be outliers likely due to poor field measurements or transcription errors. The statistical summary in Attachment 4 also shows some constituents are seldom detected throughout the West Plant Site. In particular, none of the VOCs or SVOCs have been detected above their reporting limits.

#### 2.5.2.5 Exceedances of Water Quality Standards

All groundwater quality data collected to date for wells in the compliance program are presented in Attachment 4. Results are compared to the well specific ALs and AQLs starting with the first routine sampling event. The first routine sampling event for each well is indicated on the tables included in the attachment. Well MCC-6D is currently in the ambient monitoring program and consequently, does not have ALs or AQLs; this well is compared to Arizona Aquifer Water Quality Standards (AWQS). Of the 20 constituents with ALs and AQLs, only four constituents have had exceedances with only two of the four exceeded constituents being verified. A summary of exceedances of standards, including non-verified exceedances is included, in Table 3. A discussion of the exceedance history for each analyte follows.

##### **2.5.2.5.1 Chromium**

Chromium exceeded the AL at the Smelter Pond POC well on two occasions, August and October 2012. The results of verification sampling triggered by these exceedances were below ALs and consequently, no additional action has been taken. Both exceedances occurred shortly after a reclamation project that replaced the upper 2 feet of impacted materials surrounding the well location. The reclamation may have changed redox conditions as a result of the removal of organic rich surficial material.

##### **2.5.2.5.2 Fluoride**

Groundwater at the Smelter Pond POC well currently exceeds the AQL of 4 mg/L for fluoride. The first exceedance of fluoride occurred in December 2010. Results of verification sampling did not exceed the AQL and routine quarterly sampling was reinstated. In June 2012, another fluoride exceedance was detected. Verification sampling and subsequent monthly sampling have yielded results exceeding the AQL since the initial June 2012 exceedance. Materials from a non-APP facility may be the source of the fluoride and a workplan (Golder, 2013) to assess the source has been approved by ADEQ.

#### **2.5.2.5.3 Gross Alpha**

Unadjusted gross alpha standards have been exceeded at MCC-6D, Indian Ponds POC, Smelter Pond POC, 500 YD POC, and SP1&2-Alert-B wells. However, upon adjustment for uranium species (i.e., adjusted gross alpha), none of the wells exceeded gross alpha standards.

#### **2.5.2.5.4 Nickel**

Nickel exceeded AQL's for one sampling event at two wells, MCC-4 and the Indian Ponds POC well, but both may be related to well and/or pump disturbance. Verification sampling of the November 2011 MCC-4 exceedance was below standards; hence, no additional action has been taken. It is suspected that well disturbance during maintenance activities may have contributed to the MCC-4 nickel exceedance. Prior to the exceeding sampling event, the surface completion was converted to an above grade completion to protect the well head. During this activity, the low flow pump was observed to have corrosion issues. Residual corroded material possibly left on the pump after cleaning may have contributed to the exceedance.

The February, 2012, AQL exceedance at the Indian Ponds POC well has not been verified as the well has not produced sufficient water for sampling since the exceedance. However, corrosion of a newly installed dedicated sampling pump may be the source of the exceedance at this well. Nickel has been below the reporting limit for all but one of 18 prior sampling events. The only detection of nickel at this well was approximately one order of magnitude less than the exceedance. Given the analytical history, the newly installed dedicated pump was considered a possible source. To test the possibility that the pump was responsible, the pump was thoroughly decontaminated and an equipment blank was collected using distilled water. The sample results indicated an exceedance of the nickel AQL. Consequently, the pump is believed to be the source of the nickel.

#### **2.5.2.5.5 Nitrite plus Nitrate (as Nitrogen)**

Groundwater at the 500 YD POC well currently exceeds the AQL of 10 mg/L for nitrite plus nitrate. The first exceedance of these nitrogen species occurred in August 2012. Verification sampling and subsequent monthly sampling have yielded results exceeding the AQL since the initial exceedance. Within 30 days after receiving the laboratory results of the sixth sampling event that confirms the exceedance, a workplan to evaluate the source of these nitrogen species will be submitted to ADEQ. A possible source is blasting residues.

#### **2.5.2.6 Trending Analysis**

Each well and constituent in the compliance monitoring program were analyzed for trends. All data were first subjected to Seasonal Kendall analysis to filter out seasonal effects and, absent seasonality, to determine the potential existence of any significant, long-term trends. Analysis was performed using a program developed by the United States Geological Survey (Helsel et. al, 2006). Seasonal Kendall

analysis is a modification of Sen's slope estimation method that accounts for cyclical patterns in time series data. It is a common statistical tool for determining the presence or absence of long-term trends, but does not adequately quantify (estimate) the value of the slope that the trend describes. Seasonal Kendall results are included as Attachment 6.

Sen's non-parametric estimator of slope was then applied to those constituents that:

- Yielded a non-zero slope in Seasonal Kendall analysis
- Yielded significance at a 95 percent confidence level ( $\alpha = 0.05$ ) in Seasonal Kendall analysis and
- Exhibited greater than 50 percent non-detections over the period of record

Sen's slope estimation method, which computes the median of slopes between all pairs of time points, is a more effective method than Seasonal Kendall analysis for estimating the true slope value of a data set. It is a non-parametric estimation method that is suitable for a moderate number of non-detections, and is relatively insensitive to outliers (EPA, 2006). In addition to the Kendall and Sen's slope estimator graphs, time series graphs are presented in Attachment 7.

Sen's analysis was performed using ProUCL Version 4.1.00, a computer program developed by the United States Environmental Protection Agency (EPA, 2010). Results imply trends for twelve constituents, two field parameters, and one physical parameter (Table 4 and Attachment 6). Four of the twelve trends indicate decreasing concentrations. Only two constituents with ALs or AQLs show an increasing trend. These include fluoride at the Smelter Pond POC well (increasing at approximately 1 milligram per liter per year [mg/L/yr]) and MCC-6C which has an arsenic concentration increasing by approximately 0.001 mg/L/yr.

### 3.0 SUMMARY AND CONCLUSIONS

The majority of wells and constituents meet their respective AQLs and ALs. Of the 10 wells currently in the compliance program, only two wells have had verified exceedances. These include fluoride at the Smelter Pond POC and nitrite plus nitrate at the 500 YD POC. Therefore, only 2 of the 20 constituents with ALs and AQLs have had exceedances verified. Additionally, organic compounds have not been detected during the APP compliance program.

The majority of water levels from the primary hydrostratigraphic units (i.e., the Gila Units) show relatively little water level change. The consistent water levels in the Gila Units are likely a result of the associated low hydraulic conductivities. In comparison, non-Gila hydrostratigraphic units have relatively large water level fluctuations. The largest fluctuations are observed in the Alluvial Unit where approximately 40 feet of variability is observed.

As with the water levels, water quality from Gila Unit groundwater is relatively stable in comparison to the non-Gila unit water quality. The consistent water quality of the Gila Units is likely a result of the associated low hydraulic conductivities and high acid neutralization capacity. The only verified exceedance to standards is fluoride in the Alluvial Unit and nitrite plus nitrate in the Fractured Bedrock Unit. The Gila Unit has had no verified exceedances.

## 4.0 REFERENCES

- Arizona Department of Environmental Quality, 2012. *State of Arizona, Area-Wide Aquifer Protection Permit No. P-101703, Place ID # 7820, LTF# 54902.* Signed March 29, 2012.
- Arizona Bureau of Mines, 1942. *Geologic Map of Superior Mining Area, Arizona. Bulletin 150, Geologic Series No. 16.*
- B&C, 1999. *Aquifer Protection Permit Application, Superior Mine.* Prepared for BHP-Billiton – Superior. December 3, 1999.
- B&C. 2005. *Volume 1- Administrative Information, Aquifer Protection Permit Application – Resolution Copper Mining Limited, West Plant Site, Superior Mine, Superior, Arizona.* Prepared for Resolution Copper Mining LLC. June 24, 2005.
- Hammer, D.F., 1989. *Potential for Discovery of Additional Ore in the Magma Mine, Pinal County, Arizona.* Prepared for Magma Copper Company. March 1989.
- Golder. 2007. *Groundwater assessment and model workplan, West Plant Site, Superior, Arizona.* Submitted to Resolution Copper Mining LLC. November 21, 2007
- Golder. 2008. *Amended Report on groundwater model of West Plant Site, Superior, Arizona.* Submitted to Resolution Copper Mining LLC. December 18, 2008.
- Golder. 2013. *Workplan to evaluate fluoride trends at smelter pond point of compliance well, West Plant Site, Superior, Arizona.* Submitted to Resolution Copper Mining LLC. February 1, 2013.
- Helsel, D.R., Mueller, D.K., and Slack, J.R., 2006, *Computer program for the Kendall family of trend tests:* U.S. Geological Survey Scientific Investigations Report 2005-5275, 4 p.
- Kuhn, T.H., 1942. *Geological Report of the Properties of the Magma Copper Company, Superior, Arizona.* Unpublished Report.
- Peterson, D.W., 1969. USGS Geologic Quadrangle Map GQ-818, Superior Quadrangle, Arizona. Scale 1:24,000, 1 Plate.
- United States Environmental Protection Agency. *Data Quality Assessment Statistical Methods for Practitioners, EPA QA/G-9S.* Office of Environmental Information, Washington, DC 20460. February 2006.
- United States Environmental Protection Agency. *ProUCL Version 4.1.00 Technical Guide, Statistical software for environmental applications for data sets with and without nondetect observations.* EPA/600/R-07/041. May 2010.

## **TABLES**

**TABLE 1**  
**MONITORING WELL COMPLIANCE PROGRAM**

<b>Monitoring Well Identification</b>	<b>Coordinates*</b>			<b>Well Construction Details</b>				<b>Monitoring Well Compliance Classification</b>
	<b>Groundwater Measuring Point Elevation (ft amsl)</b>	<b>Easting</b>	<b>Northing</b>	<b>Total Depth of Well Casing (ft bgs)</b>	<b>Screened Interval (ft bgs)</b>	<b>Date Installation Complete</b>	<b>Screened Geologic Unit</b>	
<b>Unconfined Gila Unit</b>								
MCC-6C	2811.42	944,158.1	837,240.0	116	75 to 116	8/20/1997	Gila Conglomerate	POC Well (routine monitoring)
MCC-6D	2817.72	944,258.8	837,377.8	54.4	24.4 to 54.4	8/3/2012	Gila Conglomerate	POC Well (ambient monitoring)
TP5-POC-B	3024.58	947,331.2	837,679.6	135.5	90 to 130	6/16/2009	Gila Conglomerate	POC Well (routine monitoring)
<b>Confined Gila Unit</b>								
MCC-3C	2800.01	947,898.4	835,636.7	579	499 to 579	8/16/1997	Gila Conglomerate	POC Well (routine monitoring)
MCC-4	2676.43	944,407.9	832,966.5	250	200 to 250	3/23/1995	Gila Conglomerate	POC Well (routine monitoring)
<b>Shallow Unconfined Gila Unit</b>								
GAI-02-01	3008.15	945,370.1	837,325.0	200	152 to 206	4/23/2002	Gila Conglomerate	POC Well (routine monitoring)
MCC-9	2769.24	947,318.2	834,907.6	48	28 to 48	8/19/1997	Gila Conglomerate	POC Well (routine monitoring)
<b>Alluvial Unit</b>								
Indian Ponds POC	2674.25	945,032.8	832,934.3	52	7 to 47	5/31/2007	Alluvium	POC Well (routine monitoring)
Smelter Pond POC	2746.28	947,378.4	834,588.6	17.5	7 to 17	1/29/2007	Alluvium	POC Well (routine monitoring)
<b>Bedrock Unit</b>								
500 Yard POC	2,998.67	950,758.3	837,352.4	140	95 to 135	6/4/2007	Apache Leap Dacite Tuff	POC Well (routine monitoring)
<b>Tailings Porewater</b>								
SP1&2 Alert-B	2977.45	948,297.2	837,787.3	81	35.5 to 75.5	5/6/2009	Settling Ponds	POC Well (routine monitoring)

Notes:

ft amsl = feet above mean sea level

ft bgs = feet below ground surface

\* = Arizona State Plane Central, NAD 83

**TABLE 2**  
**HYDRAULIC TESTING SUMMARY**

Monitoring Well Identification	Screened Geologic Unit	Analysis Type	Estimated Hydraulic Conductivity (cm/sec)	Estimated Hydraulic Conductivity (ft/day)	Geometric Mean of Estimated Hydraulic Conductivity (cm/sec)	Geometric Mean of Estimated Hydraulic Conductivity (ft/day)
<b>Mudstone Unit</b>						
MCC-3B	Gila Mudstone	Theis*	1.3E-09	3.69E-06	1.30E-09	3.69E-06
<b>Unconfined Gila Unit</b>						
MCC-1	Gila Conglomerate	Bower and Rice Rising Head Slug Test	1.10E-06	3.12E-03	3.42E-07	9.69E-04
		Bower and Rice Falling Head Slug Test	1.40E-07	3.97E-04		
		Bower and Rice Falling Head Slug Test	3.50E-07	9.92E-04		
MCC-6A	Gila Conglomerate	Bower and Rice Rising Head Slug Test	1.10E-07	3.12E-04	3.42E-07	9.69E-04
		Bower and Rice Falling Head Slug Test	2.50E-07	7.09E-04		
MCC-6B	Gila Conglomerate	Bower and Rice Rising Head Slug Test	2.80E-07	7.94E-04		
		Bower and Rice Falling Head Slug Test	3.50E-08	9.92E-05		
MCC-6C	Gila Conglomerate	Bower and Rice Falling Head Slug Test	7.10E-07	2.01E-03		
Settling Ponds 1 & 2 Alert Well	Gila Conglomerate	Cooper-Jacob Drawdown	1.76E-06	4.99E-03		
		Theis Recovery	7.06E-07	2.00E-03		
Tailings Pond 5 POC	Gila Conglomerate	Cooper-Jacob Drawdown	7.06E-07	2.00E-03		
		Theis Recovery	2.82E-07	7.99E-04		
<b>Confined Gila Unit</b>						
MCC-3C	Gila Conglomerate	Bower and Rice Rising Head Slug Test	1.10E-06	3.12E-03	3.73E-07	1.06E-03
		Bower and Rice Falling Head Slug Test	3.50E-07	9.92E-04		
MCC-4	Gila Conglomerate	Bower and Rice Rising Head Slug Test	2.80E-07	7.94E-04		
		Bower and Rice Falling Head Slug Test	1.80E-07	5.10E-04		
<b>Shallow Unconfined Gila Unit</b>						
GAI-02-01	Gila Conglomerate	Cooper-Jacob Drawdown	1.76E-06	4.99E-03	2.01E-06	5.69E-03
		Theis Recovery	1.06E-06	3.00E-03		
GAI-02-02	Gila Conglomerate	Cooper-Jacob Drawdown	2.47E-05	7.00E-02		
		Theis Recovery	2.12E-05	6.01E-02		
MCC-2	Gila Conglomerate	Bower and Rice Rising Head Slug Test	3.50E-08	9.92E-05		
		Bower and Rice Falling Head Slug Test	3.50E-07	9.92E-04		
MCC-9	Gila Conglomerate	Theis Recovery	1.10E-05	3.12E-02		
<b>Bedrock Unit</b>						
500 YD	Apache Leap	Bower and Rice Rising Head Slug Test	4.60E-07	1.30E-03	5.43E-07	1.54E-03
		Hvolslev Rising Head Slug Test	6.40E-07	1.81E-03		
<b>Alluvial Unit</b>						
Smelter Pond POC	Alluvium	Cooper-Jacob Drawdown	3.33E-05	9.44E-02	3.40E-05	9.64E-02
		Theis Recovery	3.47E-05	9.84E-02		

Notes:

\* = Approximation based on long term recovery data

cm/sec = centimeter per second

ft/day = feet per day

**TABLE 3**  
**EXCEDANCE HISTORY**

Monitoring Well Identification	Well Construction Details				Monitoring Well Compliance Classification	AL and AQL Exceedances
	Total Depth of Well Casing (ft bgs)	Screened Interval (ft bgs)	Date Installation Complete	Screened Geologic Unit		
<b>Unconfined Gila Unit</b>						
MCC-6C	116	75 to 116	8/20/1997	Gila Conglomerate	POC Well (routine monitoring)	None
TP5-POC-B	135.5	90 to 130	6/16/2009	Gila Conglomerate	POC Well (routine monitoring)	None
<b>Confined Gila Unit</b>						
MCC-3C	579	499 to 579	8/16/1997	Gila Conglomerate	POC Well (routine monitoring)	None
MCC-4	250	200 to 250	3/23/1995	Gila Conglomerate	POC Well (routine monitoring)	Ni
<b>Shallow Unconfined Gila Unit</b>						
GAI-02-01	200	152 to 206	4/23/2002	Gila Conglomerate	POC Well (routine monitoring)	None
MCC-9	48	28 to 48	8/19/1997	Gila Conglomerate	POC Well (routine monitoring)	None
<b>Alluvial Unit</b>						
Indian Ponds POC	52	7 to 47	5/31/2007	Alluvium	POC Well (routine monitoring)	Ni
Smelter Pond POC	17.5	7 to 17	1/29/2007	Alluvium	POC Well (routine monitoring)	Cr and F
<b>Bedrock Unit</b>						
500 Yard POC	140	95 to 135	6/4/2007	Apache Leap Dacite Tuff	POC Well (routine monitoring)	Nitrate/Nitrite
<b>Tailings Porewater</b>						
SP1&2 Alert-B	81	35.5 to 75.5	5/6/2009	Settling Ponds	POC Well (routine monitoring)	None

Notes:

ft bgs = feet below ground

**TABLE 4**  
**SEN'S SLOPE ESTIMATOR RESULTS**

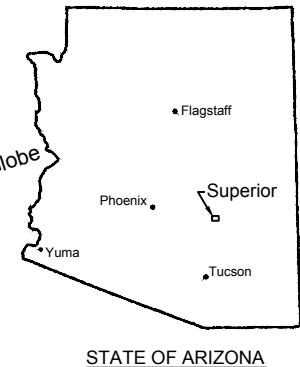
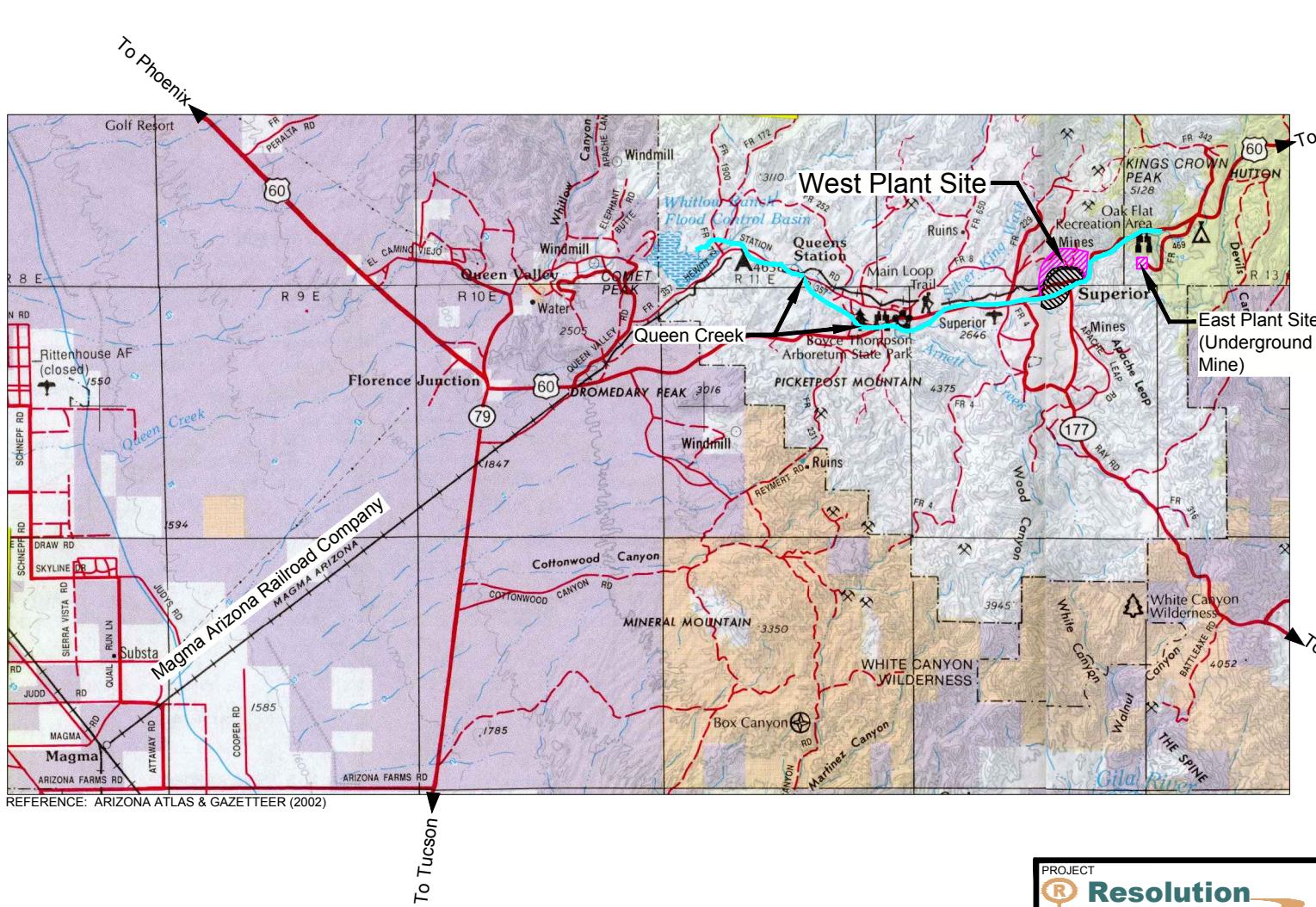
Well ID	Constituent	Type of Trend	Magnitude of Change (mg/L/yr)
GAI-02-01	Ca	Increase	0.97
	Cl	Increase	1.1
	HCO <sub>3</sub>	Decrease	-3.4
	Mg	Increase	1.2
	SO <sub>4</sub>	Increase	14.5
	TDS	Increase	20.3
Smelter Pond	F	Increase	1.0
	HCO <sub>3</sub>	Increase	86.7
	Na	Increase	51.1
	SO <sub>4</sub>	Increase	1,405
	TDS	Increase	1,648
MCC-3C	Field EC	Decrease	-10.31
MCC-4	As	Decrease	0.215
MCC-6C	As	Increase	0.001
	Field EC	Decrease	-13.17

Note:

Constituents listed are only those which, per Sen's analysis, show a significant trend at  $\alpha \leq 0.05$

mg/L/yr = milligrams per liter per year

## **FIGURES**



0 2 4 6  
SCALE MILES

PROJECT  
**Resolution Copper Mining**  
GROUNDWATER ASSESSMENT UPDATE  
WEST PLANT SITE, SUPERIOR MINE  
SUPERIOR, ARIZONA

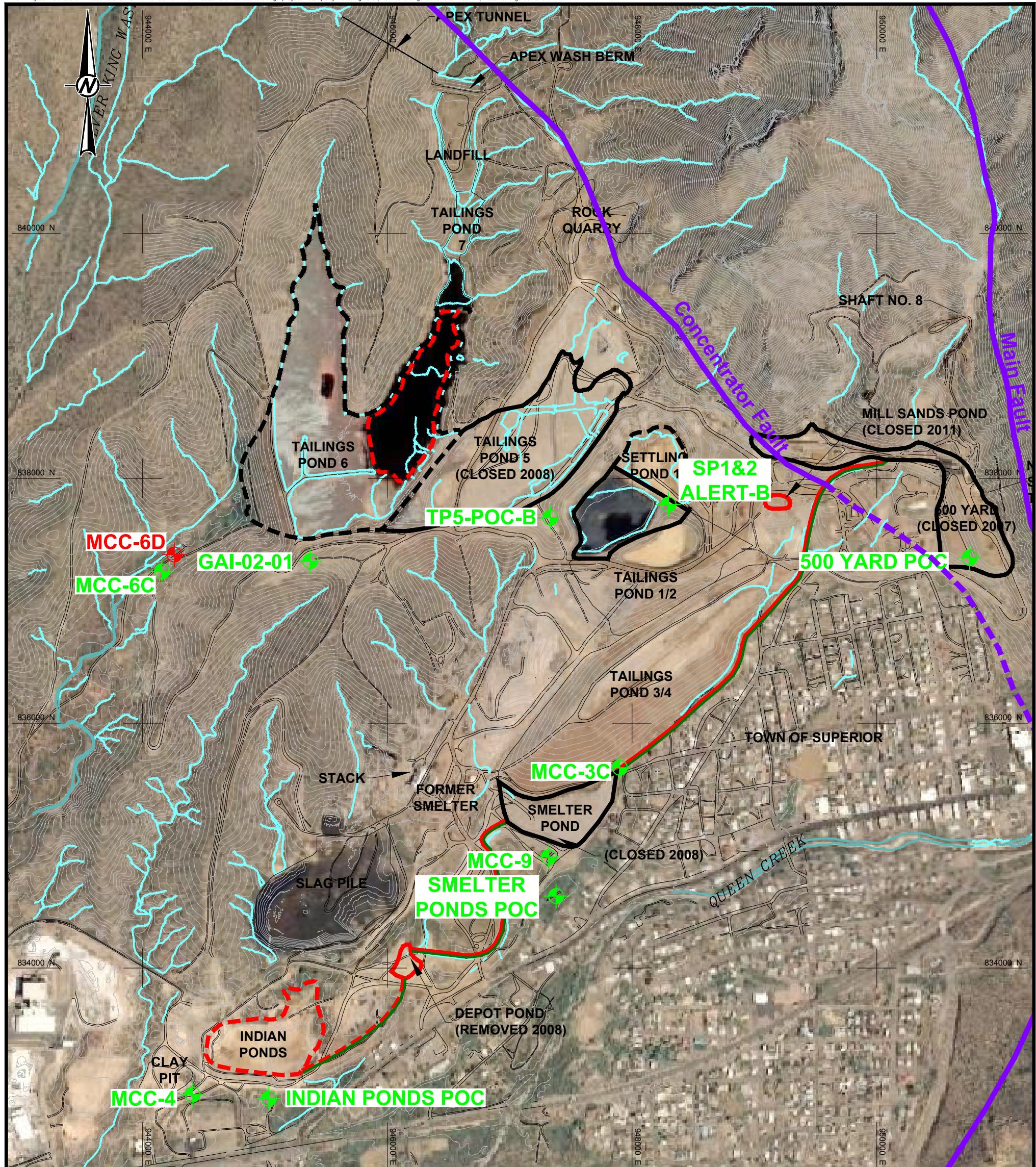
TITLE

## SITE LOCATION MAP



PROJECT No.	12392566.7	FILE No.	12392566B001
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CADD	JHR	03-04-2013	
CHECK	JM	03-04-2013	
REVIEW	JM	03-04-2013	

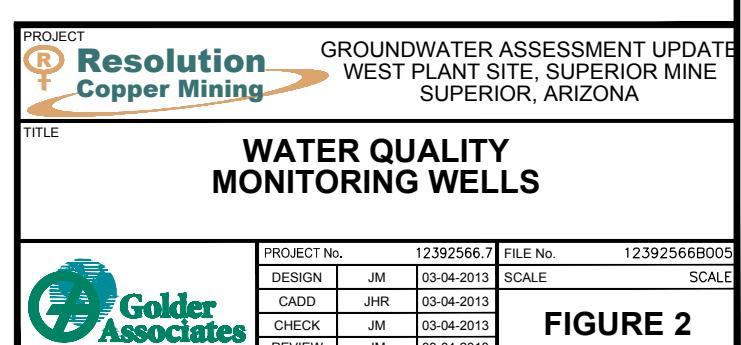
**FIGURE 1**

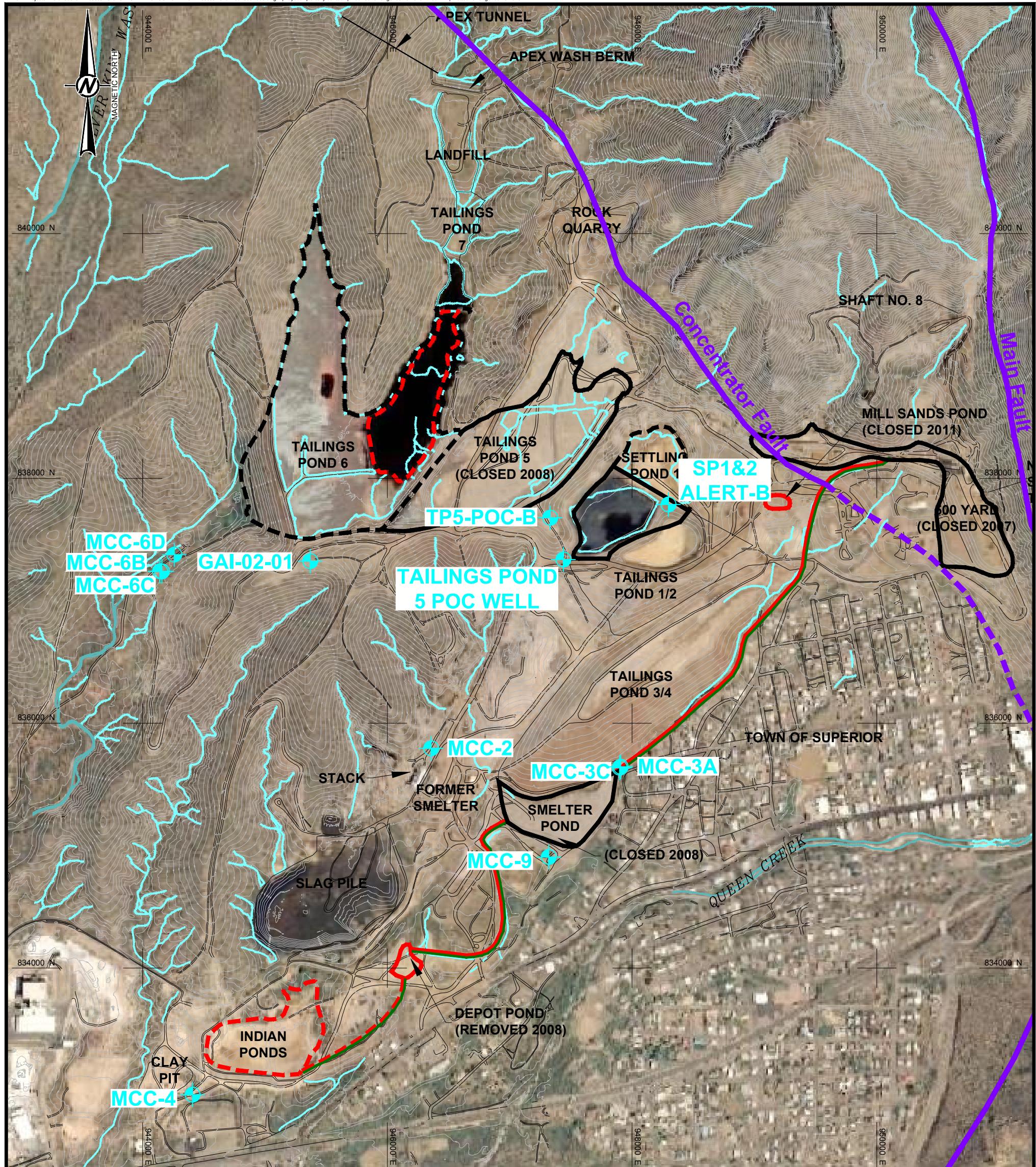


#### LEGEND

EXISTING TOPOGRAPHY (C.I. = 10 FT)	CHANNEL ASSOCIATED WITH MAIN FACILITY
EXISTING ROADS	PROPERTY LINE
EXISTING DRAINAGE	POINT OF COMPLIANCE (POC) WELL LOCATION AMBIENT MONITORING
PROPERTY LINE	POINT OF COMPLIANCE (POC) WELL LOCATION ROUTINE MONITORING
APP FACILITY CLEAN CLOSED BY REMOVAL (COMPLETED)	
APP FACILITY TO BE CLEAN CLOSED BY REMOVAL (FUTURE)	
APP FACILITY CLOSED IN-PLACE (COMPLETED)	
APP FACILITY TO BE CLOSED IN-PLACE (FUTURE)	
EXISTING FAULT (DASHED WHERE INFERRED)	

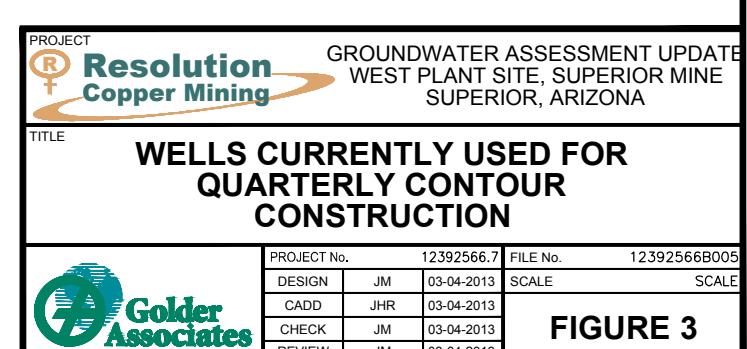
1. 2010 TOPOGRAPHY PROVIDED BY RESOLUTION COPPER MINING, LLC.
2. GEOLOGY FROM DI-13 - GEOLOGIC MAP OF PORTIONS OF THE GLOBE 30' X 60' QUADRANGLE, ARIZONA, ARIZONA GEOLOGIC SURVEY, 1998.

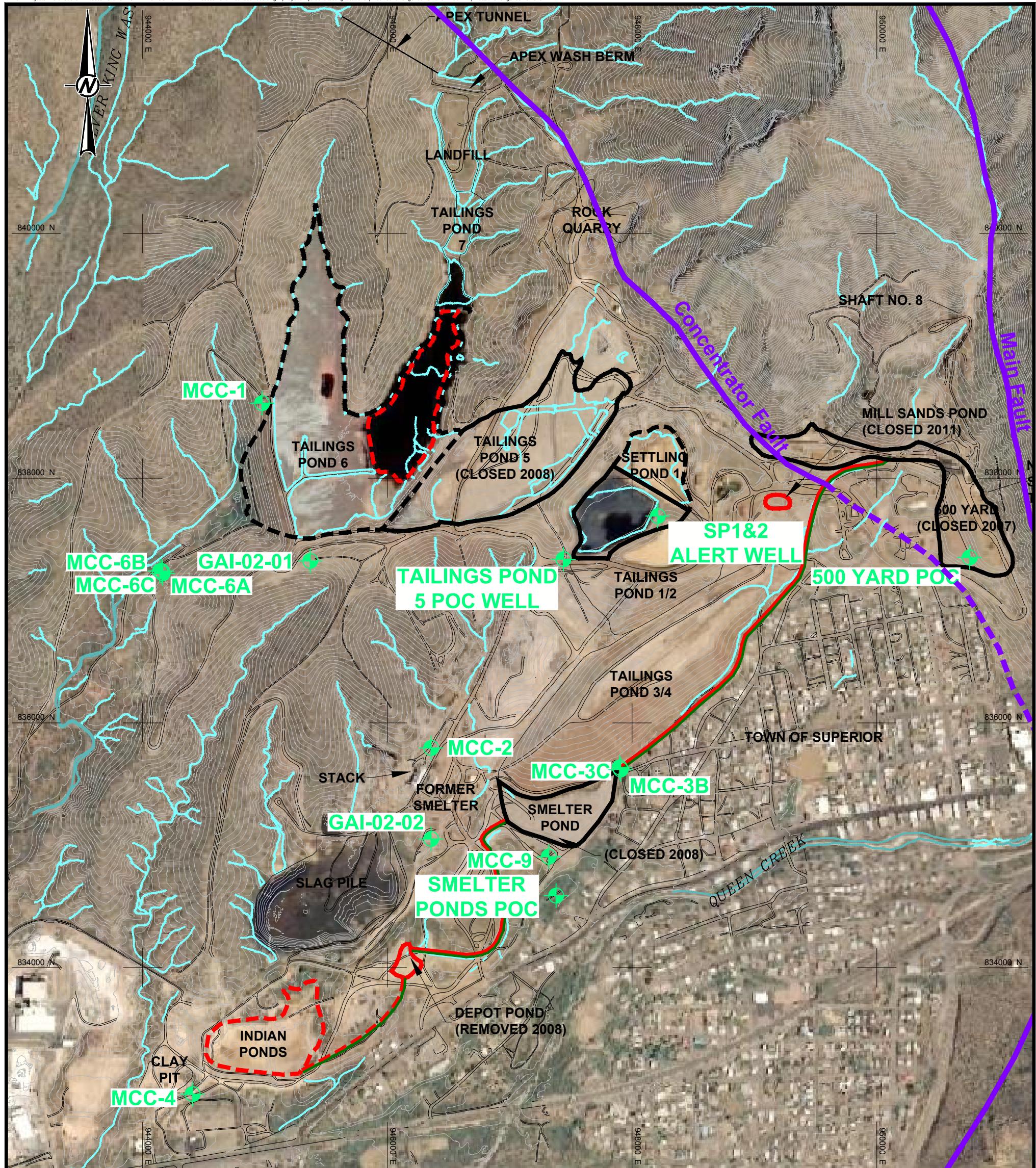




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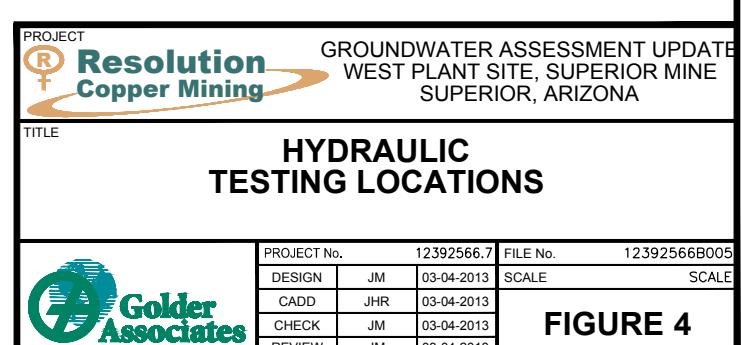
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EXISTING DRAINAGE		MONITORING WELL USED FOR QUARTERLY CONTOUR MAP CONSTRUCTION
PROPERTY LINE		
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APP FACILITY TO BE CLEAN CLOSED BY REMOVAL (FUTURE)		2. GEOLOGY FROM DI-13 - GEOLOGIC MAP OF PORTIONS OF THE GLOBE 30' X 60' QUADRANGLE, ARIZONA, ARIZONA GEOLOGIC SURVEY, 1998.
APP FACILITY CLOSED IN-PLACE (COMPLETED)		
APP FACILITY TO BE CLOSED IN-PLACE (FUTURE)		
EXISTING FAULT (DASHED WHERE INFERRED)		

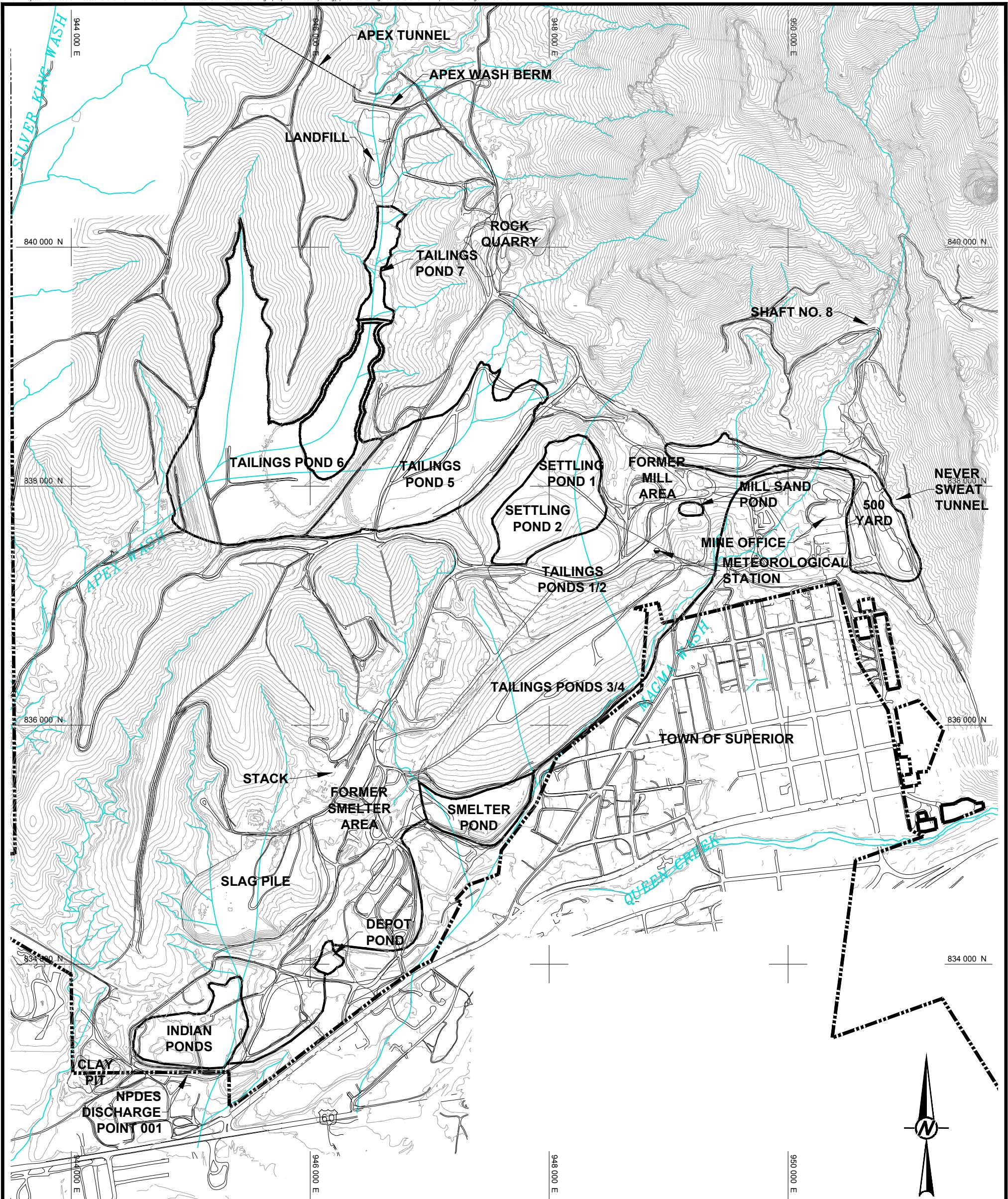




#### LEGEND

EXISTING TOPOGRAPHY (C.I. = 10 FT)		CHANNEL ASSOCIATED WITH MAIN FACILITY
EXISTING ROADS		PROPERTY LINE
EXISTING DRAINAGE		MONITORING WELL WITH HYDRAULIC TESTING
PROPERTY LINE		
APP FACILITY CLEAN CLOSED BY REMOVAL (COMPLETED)		1. 2010 TOPOGRAPHY PROVIDED BY RESOLUTION COPPER MINING, LLC.
APP FACILITY TO BE CLEAN CLOSED BY REMOVAL (FUTURE)		2. GEOLOGY FROM DI-13 - GEOLOGIC MAP OF PORTIONS OF THE GLOBE 30' X 60' QUADRANGLE, ARIZONA, ARIZONA GEOLOGIC SURVEY, 1998.
APP FACILITY CLOSED IN-PLACE (COMPLETED)		
APP FACILITY TO BE CLOSED IN-PLACE (FUTURE)		
EXISTING FAULT (DASHED WHERE INFERRRED)		





#### LEGEND

EXISTING TOPOGRAPHY  
(C.I. = 10 FT)

PROPERTY LINE

EXISTING ROADS

APP FACILITIES

HISTORICAL DRAINAGE

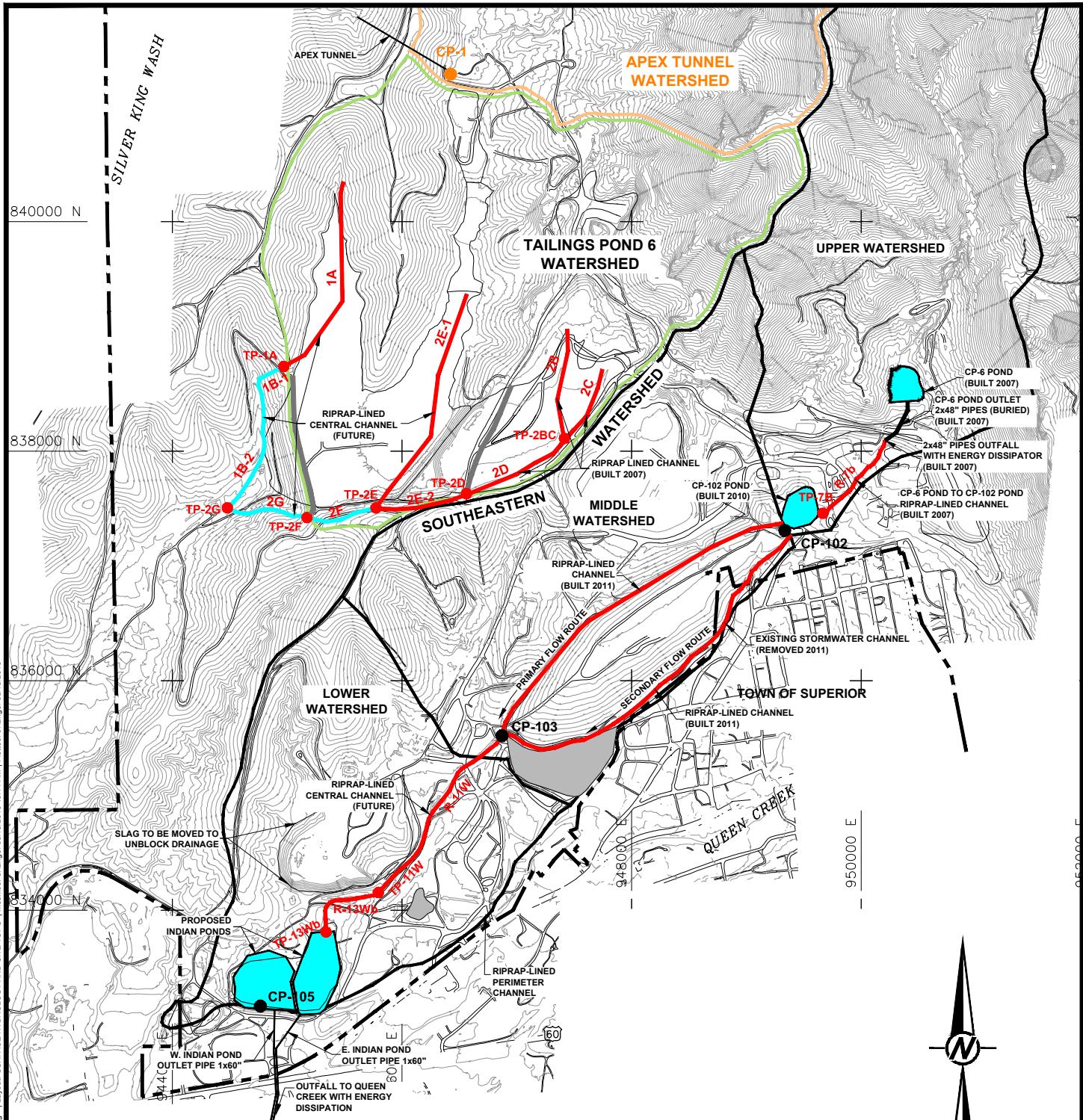
OTHER FACILITIES

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SCALE FEET



#### REFERENCES

- 1.) 2010 TOPOGRAPHY PROVIDED BY RESOLUTION COPPER MINING, LLC.
- 2.) HISTORICAL DRAINAGE TAKEN FROM PLATE 1, "GEOLOGIC MAP OF THE SUPERIOR MINING AREA ARIZONA", ARIZONA BUREAU OF MINES BULLETIN 150, GEOLOGIC SERIES No. 16, UNIVERSITY OF ARIZONA BULLETIN Vol. XIII, No.1, JANUARY 1, 1942.



#### LEGEND

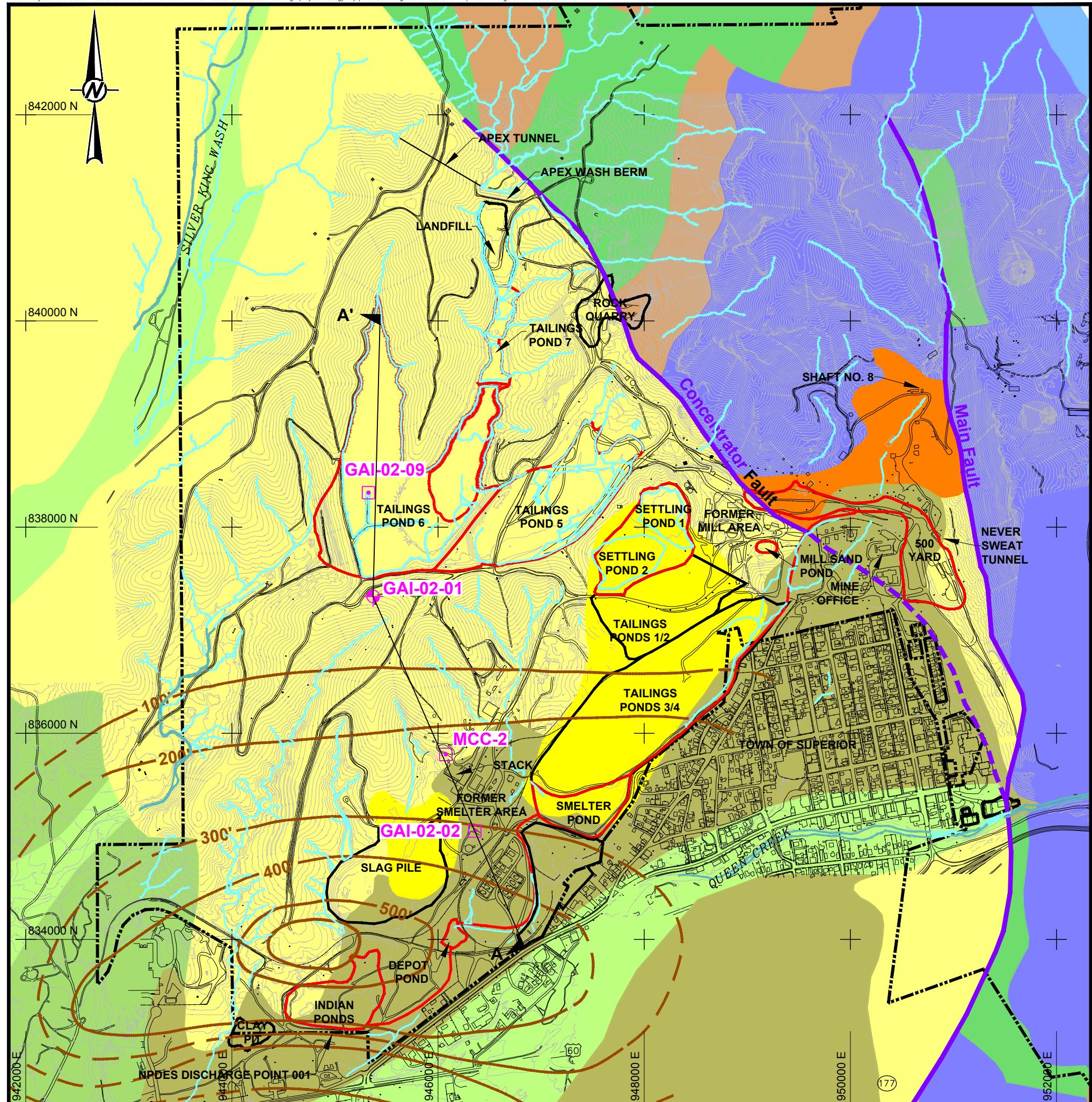
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<span style="color:cyan">—</span>	CHANNEL REACH DESIGNED FOR 1/2 PROBABLE MAX. FLOOD
<span style="color:green">—</span>	TAILINGS POND 6 WATERSHED
<span style="color:black">—</span>	SOUTHEASTERN WATERSHED
<span style="color:orange">—</span>	APEX TUNNEL WATERSHED
<span style="color:black">---</span>	PROPERTY LINE
●	CONCENTRATION POINT
● TP-11EB	TERMINAL POINT
■	SURFACE WATER CONTROL BERM
○	ELIMINATED POND
○	NEW POND

0 1250 2500 3750  
SCALE FEET

PROJECT		GROUNDWATER ASSESSMENT UPDATE		
		WEST PLANT SITE, SUPERIOR MINE		
		SUPERIOR, ARIZONA		
TITLE				
SURFACE HYDROLOGY: WEST PLANT SITE				
		PROJECT No.	1239256.7	
DESIGN	JM	03-04-2013	FILE No.	1239256B006
CADD	JHR	03-04-2013	SCALE	AS SHOWN
CHECK	JM	03-04-2013	FIGURE	
REVIEW	JM	03-04-2013		

#### REFERENCES

- 1.) 2010 TOPOGRAPHY PROVIDED BYRESOLUTION COPPER MINING, LLC.



#### LEGEND

- The legend consists of seven entries, each with a short horizontal line symbol followed by a descriptive label. The symbols are: a thin black line for Existing Topography, two parallel black lines for Existing Roads, a thick teal line for Existing Drainage, a thin black line with small dots for Existing Fence, a thick purple line with dashed segments for Existing Fault, a thick black line with dashed segments for Property Line, and a thick red line for Area-Wide App Facilities.

Symbol	Description
—	EXISTING TOPOGRAPHY (C.I. = 10 FT)
— —	EXISTING ROADS
—	EXISTING DRAINAGE
— . . . —	EXISTING FENCE
— — — — —	EXISTING FAULT (DASHED WHERE INFERRED)
— - - - -	PROPERTY LINE
—	AREA-WIDE APP FACILITIES

A A' CROSS-SECTION

- ## NOTES

1. 2004 TOPOGRAPHY PROVIDED BY RESOLUTION COPPER MINING, LLC.

2. GEOLOGY FROM DI-13 - GEOLOGIC MAP OF PORTIONS OF THE GLOBE  
30' X 60' QUADRANGLE, ARIZONA ARIZONA GEOLOGIC SURVEY 1998



#### REFERENCES / SPECIFICATIONS

EXTENT OF TAILINGS SLAG PILES, AND FILL IN 1968

HOLOCENE ALLUVIUM

QUATERNARY ALLUVIAL FAN REMNANTS DEEPLY INCISED

QUATERNARY ALLUVIUM, UNDIFFERENTIATED

TERTIAIRY/ QUATERNARY

The diagram illustrates a geological column with five distinct layers, each represented by a colored rectangle and labeled with its corresponding geological unit:

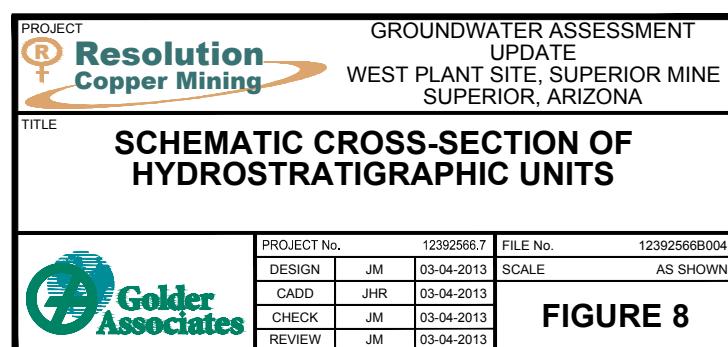
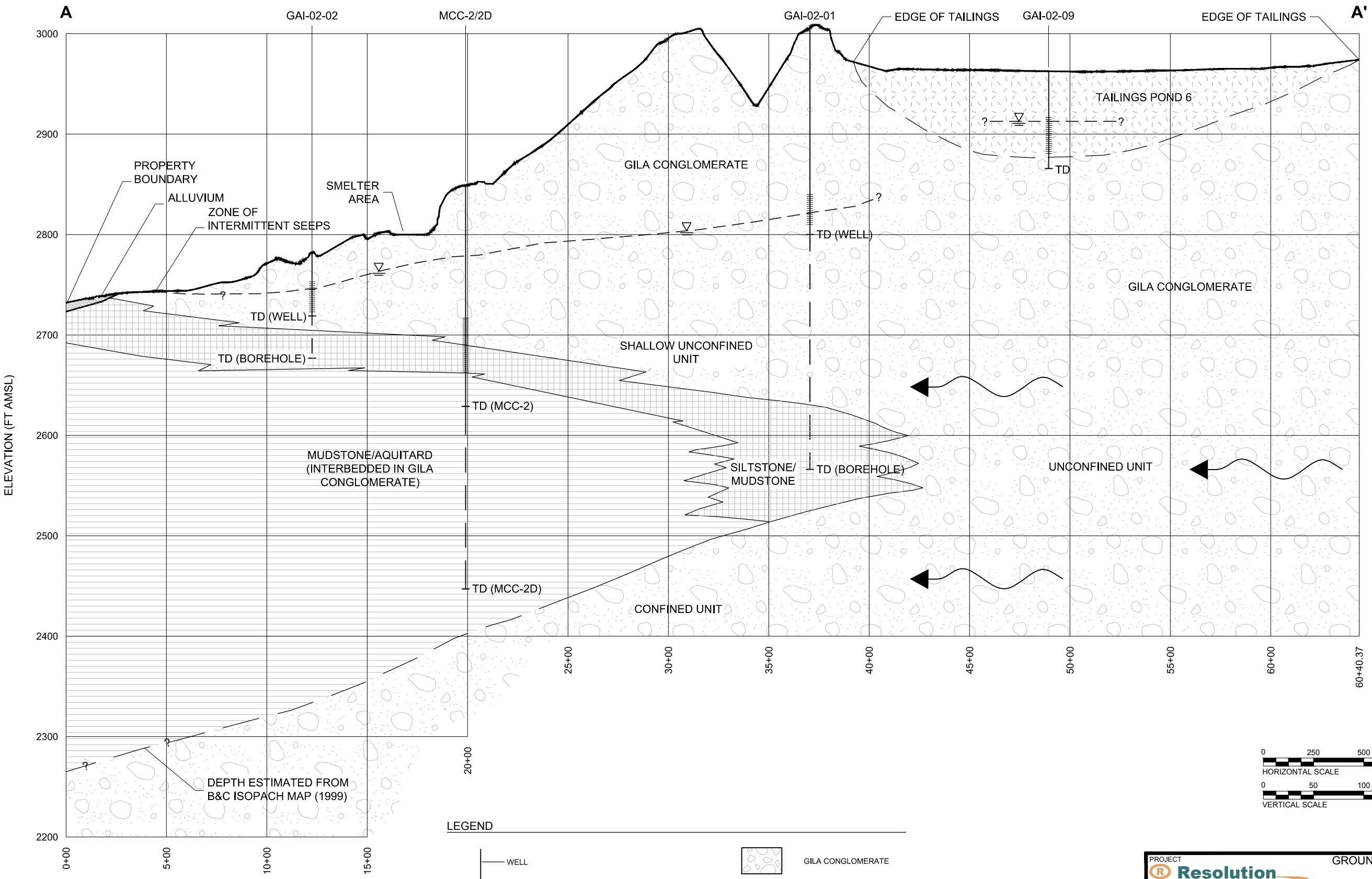
- TERTIARY APACHE LEAP TUFF** (Orange)
- PENNSYLVANIAN NACO LIMESTONE** (Light blue)
- MISSISSIPPAN, DEVONIAN, AND CAMBRIAN SEDIMENTARY ROCKS** (Purple)
- PRECAMBRIAN DIABASE** (Green)
- PRECAMBRIAN APACHE GROUP** (Brown)

PROJECT GROUNDWATER ASSESSMENT  
**Resolution** UPDATE  
Copper Mining WEST PLANT SITE, SUPERIOR MINE  
SUPERIOR, ARIZONA

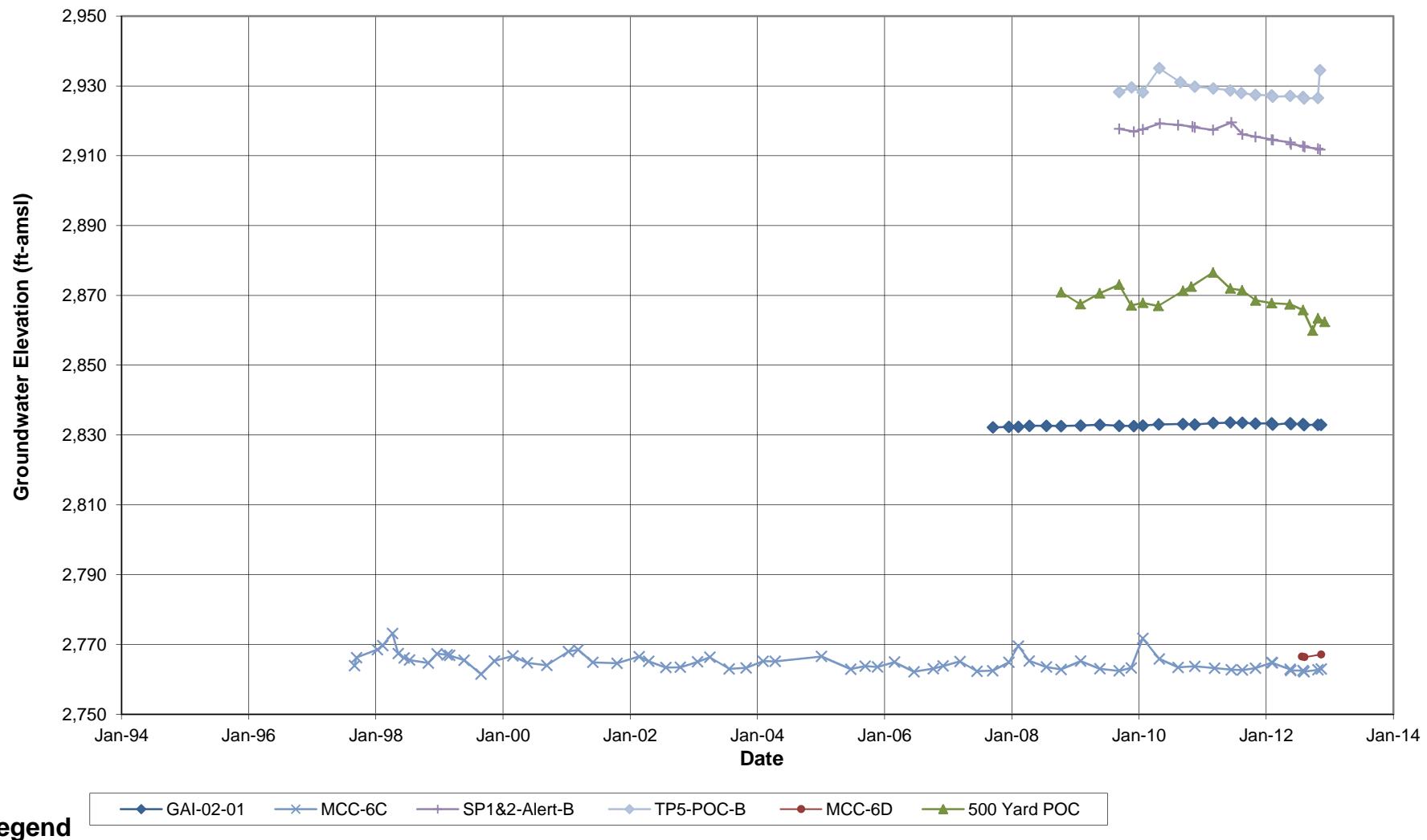
TITLE

# GEOLOGY MAP WITH CROSS-SECTION LOCATION

**FIGURE 7**



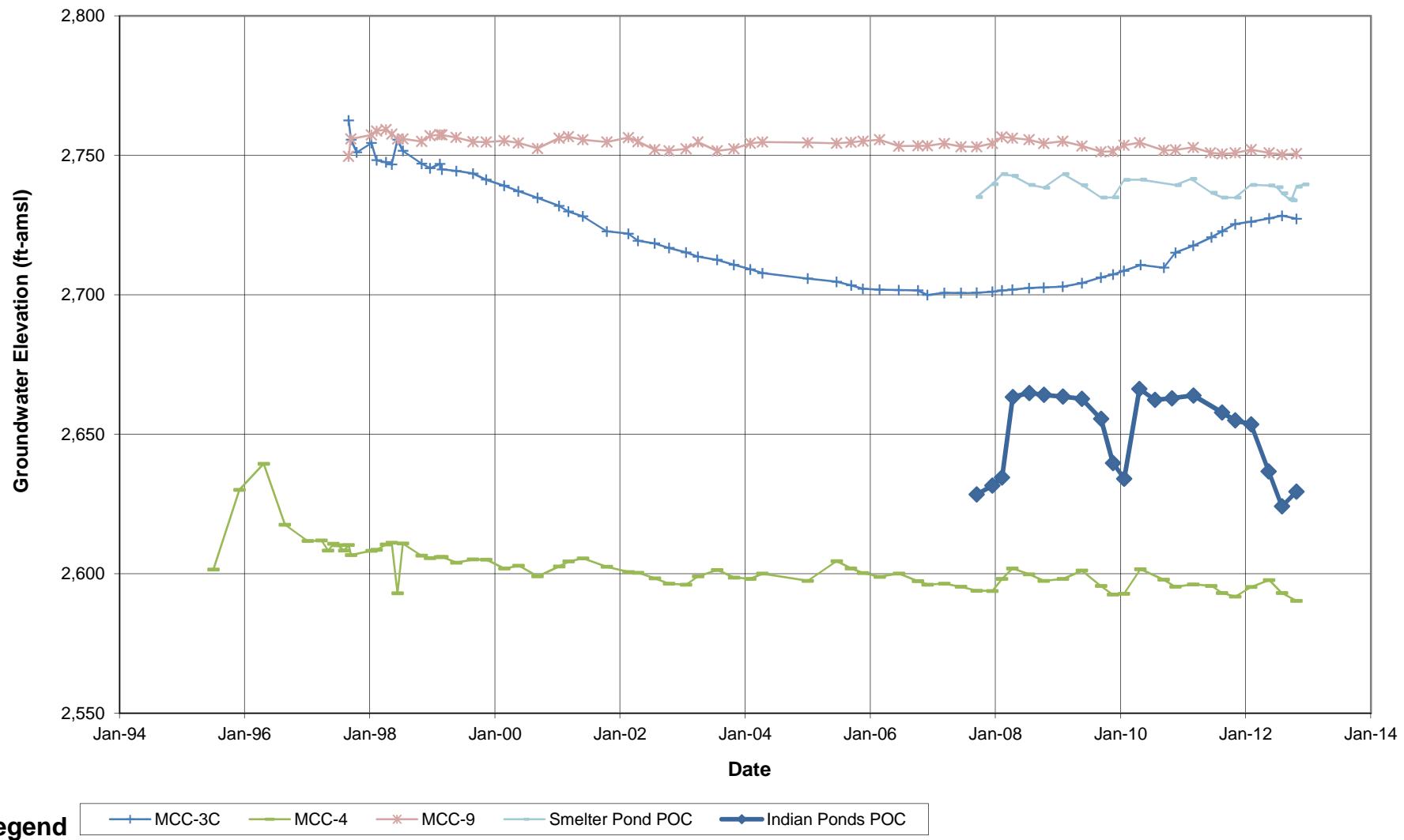
**FIGURE 8**



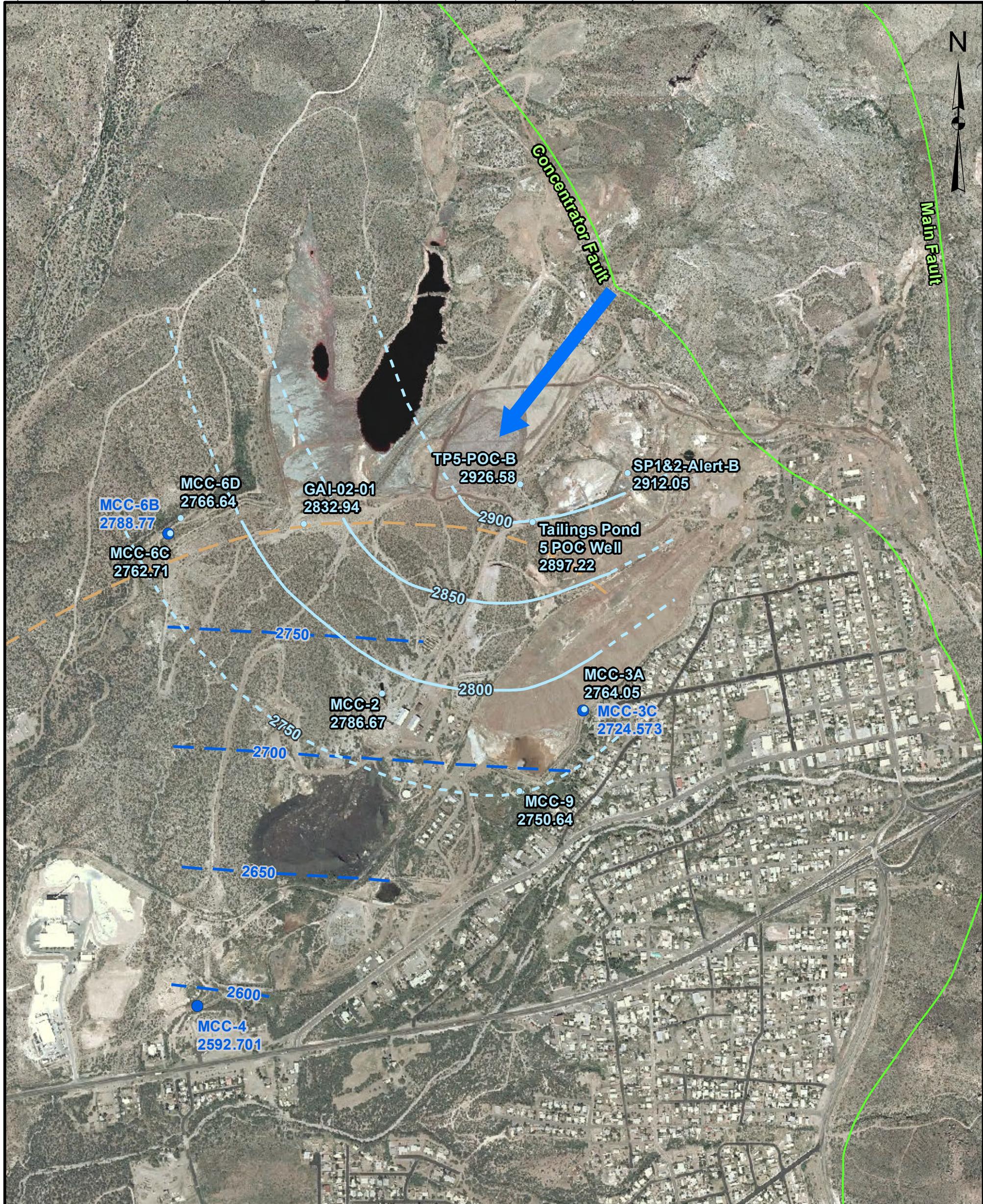
### Legend

◆ GAI-02-01    ✕ MCC-6C    + SP1&2-Alert-B    ⬤ TP5-POC-B    • MCC-6D    ▲ 500 Yard POC

 <b>Golder Associates</b> Tucson, Arizona	TITLE				
	<b>North Area Well Hydrographs</b>				
CLIENT/PROJECT <b>Resolution Copper Mining</b>	DRAWN CB	DATE 2/7/2013	JOB NO. 123-92566		
Groundwater Assessment Update, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA		
	REVIEWED	FILE NO.	FIGURE NO.	9	



 <b>Golder Associates</b> Tucson, Arizona	TITLE			
	<b>South Area Wells Hydrographs</b>			
CLIENT/PROJECT <b>Resolution Copper Mining</b>	DRAWN CB	DATE 2/7/2013	JOB NO. 123-92566	
Groundwater Assessment Update, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA	
	REVIEWED	FILE NO.	FIGURE NO.	10



#### LEGEND

- Well with Groundwater Elevation
  - Shallow or Upper Unstratified Unit
  - Deep Confined Unit
- Groundwater Elevation Contour (50 ft)
- Inferred Groundwater Elevation Contour (50 ft)
- Deep Confined Unit**
  - Groundwater Elevation Contour (50 ft)
  - Inferred Groundwater Elevation Contour (50 ft)
- Approximate Northern Extent of Mudstone Aquitard
- Fault
- Approximate Direction of Regional Gradient

0 480 960 1,920  
SCALE 1:10,212 FEET

#### NOTES

SP1&2-Alert-B well is completed in the Settling Ponds 1 & 2 Tailings.

#### PROJECT



GROUNDWATER ASSESSMENT  
WEST PLANT SITE  
SUPERIOR MINE, SUPERIOR, AZ

#### TITLE

WATER TABLE CONTOUR MAP  
AND DEEP  
POTENIOMETRIC SURFACE  
4TH QUARTER 2012



PROJECT No.  
073-92562

FIGURE 11

#### REFERENCES

- 1) Projection: NAD 1983 StatePlane Arizona Central FIPS 0202 Feet.
- 2) Regional flow direction from Montgomery and Associates, 2001. Summary of Hydrogeologic Data for the Superior Area, Pinal and Gila Counties, Arizona. November 27, 2001.
- 3) March 2006 Aerial Provided by Arizona State Land Department.

**ATTACHMENT 1  
WELL LOGS  
(ON DVD)**

**ATTACHMENT 2  
WATER LEVEL TABLE**

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
500 Yard POC	09/25/07	2998.67	dry	dry
500 Yard POC	12/26/07	2998.67	dry	dry
500 Yard POC	02/20/08	2998.67	dry	dry
500 Yard POC	04/21/08	2998.67	dry	dry
500 Yard POC	07/28/08	2998.67	dry	dry
500 Yard POC	10/22/08	2998.67	127.77	2870.90
500 Yard POC	02/10/09	2998.67	131.18	2867.49
500 Yard POC	06/01/09	2998.67	128.10	2870.57
500 Yard POC	09/22/09	2998.67	125.60	2873.07
500 Yard POC	11/30/09	2998.67	131.53	2867.14
500 Yard POC	02/04/10	2998.67	130.80	2867.87
500 Yard POC	05/04/10	2998.67	131.69	2866.98
500 Yard POC	09/24/10	2998.67	127.36	2871.31
500 Yard POC	11/10/10	2998.67	126.12	2872.55
500 Yard POC	03/16/11	2998.67	122.10	2876.57
500 Yard POC	06/22/11	2998.67	126.70	2871.97
500 Yard POC	08/30/11	2998.67	127.19	2871.48
500 Yard POC	11/15/11	2998.67	130.12	2868.55
500 Yard POC	02/16/12	2998.67	130.87	2867.80
500 Yard POC	05/30/12	2998.67	131.22	2867.45
500 Yard POC	08/15/12	2998.67	132.86	2865.81
500 Yard POC	10/08/12	2998.67	138.72	2859.95
500 Yard POC	11/08/12	2998.67	135.21	2863.46
500 Yard POC	12/17/12	2998.67	136.25	2862.42
GAI-02-01	09/26/07	3008.15	176.00	2832.15
GAI-02-01	12/26/07	3008.15	175.80	2832.35
GAI-02-01	02/20/08	3008.15	175.84	2832.31
GAI-02-01	04/23/08	3008.15	175.52	2832.63
GAI-02-01	07/29/08	3008.15	175.53	2832.62
GAI-02-01	10/22/08	3008.15	175.60	2832.55
GAI-02-01	02/12/09	3008.15	175.43	2832.72
GAI-02-01	06/03/09	3008.15	175.23	2832.92
GAI-02-01	09/21/09	3008.15	175.50	2832.65
GAI-02-01	12/15/09	3008.15	175.60	2832.55
GAI-02-01	02/04/10	3008.15	175.46	2832.69
GAI-02-01	05/07/10	3008.15	175.10	2833.05
GAI-02-01	09/24/10	3008.15	174.99	2833.16
GAI-02-01	11/30/10	3008.15	175.14	2833.01
GAI-02-01	03/17/11	3008.15	174.74	2833.41
GAI-02-01	06/23/11	3008.15	174.60	2833.55
GAI-02-01	09/01/11	3008.15	174.67	2833.48
GAI-02-01	11/15/11	3008.15	174.86	2833.29
GAI-02-01	02/16/12	3008.15	174.82	2833.33
GAI-02-01	06/01/12	3008.15	174.79	2833.36
GAI-02-01	08/15/12	3008.15	174.99	2833.16
GAI-02-01	11/08/12	3008.15	175.21	2832.94
Indian Ponds POC	09/25/07	2674.25	45.80	2628.45
Indian Ponds POC	12/26/07	2674.25	42.65	2631.60
Indian Ponds POC	02/20/08	2674.25	39.72	2634.53
Indian Ponds POC	04/23/08	2674.25	10.89	2663.36
Indian Ponds POC	07/29/08	2674.25	9.44	2664.81
Indian Ponds POC	10/22/08	2674.25	10.10	2664.15
Indian Ponds POC	02/10/09	2674.25	10.76	2663.49
Indian Ponds POC	06/01/09	2674.25	11.51	2662.74
Indian Ponds POC	09/22/09	2674.25	18.74	2655.51

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
Indian Ponds POC	11/30/09	2674.25	34.55	2639.70
Indian Ponds POC	02/04/10	2674.25	40.15	2634.10
Indian Ponds POC	05/04/10	2674.25	7.98	2666.27
Indian Ponds POC	08/03/10	2674.25	11.91	2662.34
Indian Ponds POC	11/10/10	2674.25	11.34	2662.91
Indian Ponds POC	03/16/11	2674.25	10.34	2663.91
Indian Ponds POC	08/30/11	2674.25	16.42	2657.83
Indian Ponds POC	11/15/11	2674.25	19.27	2654.98
Indian Ponds POC	02/16/12	2674.25	20.66	2653.59
Indian Ponds POC	05/29/12	2674.25	37.59	2636.66
Indian Ponds POC	08/15/12	2674.25	50.10	2624.15
Indian Ponds POC	11/08/12	2674.25	44.79	2629.46
MCC-1	07/05/95	2963.95	189.65	2774.30
MCC-1	12/04/95	2963.95	151.15	2812.80
MCC-1	04/24/96	2963.95	151.40	2812.55
MCC-1	08/26/96	2963.95	151.88	2812.07
MCC-1	01/07/97	2963.95	162.62	2801.33
MCC-1	03/28/97	2963.95	152.78	2811.17
MCC-1	05/06/97	2963.95	158.95	2805.00
MCC-1	06/05/97	2963.95	153.61	2810.34
MCC-1	07/01/97	2963.95	153.22	2810.73
MCC-1	08/08/97	2963.95	153.17	2810.78
MCC-1	09/03/97	2963.95	163.58	2800.37
MCC-1	09/17/97	2963.95	153.25	2810.70
MCC-1	01/15/98	2963.95	153.35	2810.60
MCC-1	02/13/98	2963.95	153.99	2809.96
MCC-1	04/10/98	2963.95	153.15	2810.80
MCC-1	06/16/98	2963.95	153.52	2810.43
MCC-1	07/17/98	2963.95	154.15	2809.80
MCC-1	11/04/98	2963.95	154.79	2809.16
MCC-1	12/23/98	2963.95	154.28	2809.67
MCC-1	02/19/99	2963.95	154.12	2809.83
MCC-1	03/05/99	2963.95	154.10	2809.85
MCC-1	05/25/99	2963.95	154.00	2809.95
MCC-1	09/01/99	2963.95	155.10	2808.85
MCC-1	11/17/99	2963.95	155.08	2808.87
MCC-1	03/02/00	2963.95	154.96	2808.99
MCC-1	05/24/00	2963.95	155.42	2808.53
MCC-1	09/13/00	2963.95	155.96	2807.99
MCC-1	09/20/05	2963.95	154.31	2809.64
MCC-1	11/29/05	2963.95	159.62	2804.33
MCC-1	03/07/06	2963.95	159.42	2804.53
MCC-1	06/27/06	2963.95	159.33	2804.62
MCC-1	10/17/06	2963.95	159.38	2804.57
MCC-1	12/12/06	2963.95	160.03	2803.92
MCC-1	03/20/07	2963.95	159.59	2804.36
MCC-1	09/25/07	2963.95	159.85	2804.10
MCC-1	12/26/07	2963.95	159.66	2804.29
MCC-1	02/19/08	2963.95	159.22	2804.73
MCC-1	04/22/08	2963.95	159.05	2804.90
MCC-1	07/29/08	2963.95	159.25	2804.70
MCC-1	10/22/08	2963.95	159.38	2804.57
MCC-1	02/12/09	2963.95	159.07	2804.88
MCC-1	06/02/09	2963.95	159.88	2804.07

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-1	09/22/09	2963.95	160.50	2803.45
MCC-1	02/05/10	2963.95	160.00	2803.95
MCC-1	05/13/10	2963.95	157.22	2806.73
MCC-1	09/27/10	2963.95	157.81	2806.14
MCC-1	12/01/10	2963.95	159.40	2804.55
MCC-1	03/01/11	2963.95	157.88	2806.07
MCC-1	06/29/11	2963.95	158.64	2805.31
MCC-1	09/02/11	2963.95	158.18	2805.77
MCC-1	11/15/11	2963.95	158.14	2805.81
MCC-1	02/16/12	2963.95	157.81	2806.14
MCC-1	06/01/12	2963.95	157.54	2806.41
MCC-1	08/15/12	2963.95	157.71	2806.24
MCC-1	11/08/12	2963.95	158.00	2805.95
MCC-2	07/05/95	2851.27	56.21	2795.06
MCC-2	12/04/95	2851.27	56.94	2794.33
MCC-2	04/24/96	2851.27	57.45	2793.82
MCC-2	08/26/96	2851.27	58.48	2792.79
MCC-2	01/07/97	2851.27	58.35	2792.92
MCC-2	03/28/97	2851.27	58.24	2793.03
MCC-2	05/06/97	2851.27	58.56	2792.71
MCC-2	06/05/97	2851.27	58.30	2792.97
MCC-2	07/01/97	2851.27	58.44	2792.83
MCC-2	08/08/97	2851.27	58.75	2792.52
MCC-2	09/03/97	2851.27	57.81	2793.46
MCC-2	09/17/97	2851.27	59.00	2792.27
MCC-2	01/15/98	2851.27	59.65	2791.62
MCC-2	02/13/98	2851.27	59.73	2791.54
MCC-2	04/10/98	2851.27	58.95	2792.32
MCC-2	05/13/98	2851.27	58.75	2792.52
MCC-2	06/16/98	2851.27	57.20	2794.07
MCC-2	07/17/98	2851.27	58.00	2793.27
MCC-2	11/04/98	2851.27	58.97	2792.30
MCC-2	12/23/98	2851.27	59.45	2791.82
MCC-2	02/19/99	2851.27	59.88	2791.39
MCC-2	03/05/99	2851.27	59.90	2791.37
MCC-2	05/26/99	2851.27	61.00	2790.27
MCC-2	09/01/99	2851.27	61.50	2789.77
MCC-2	11/17/99	2851.27	61.38	2789.89
MCC-2	03/02/00	2851.27	62.00	2789.27
MCC-2	05/24/00	2851.27	62.34	2788.93
MCC-2	09/13/00	2851.27	63.00	2788.27
MCC-2	01/16/01	2851.27	62.74	2788.53
MCC-2	03/13/01	2851.27	61.48	2789.79
MCC-2	06/05/01	2851.27	60.56	2790.71
MCC-2	10/23/01	2851.27	60.61	2790.66
MCC-2	02/26/02	2851.27	61.49	2789.78
MCC-2	04/23/02	2851.27	62.02	2789.25
MCC-2	07/30/02	2851.27	62.92	2788.35
MCC-2	10/22/02	2851.27	63.49	2787.78
MCC-2	01/29/03	2851.27	64.20	2787.07
MCC-2	04/09/03	2851.27	64.29	2786.98
MCC-2	07/30/03	2851.27	63.86	2787.41
MCC-2	11/05/03	2851.27	64.22	2787.05
MCC-2	02/10/04	2851.27	64.48	2786.79

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-2	04/20/04	2851.27	64.61	2786.66
MCC-2	01/10/05	2851.27	64.82	2786.45
MCC-2	06/28/05	2851.27	62.08	2789.19
MCC-2	09/20/05	2851.27	62.20	2789.07
MCC-2	11/29/05	2851.27	62.18	2789.09
MCC-2	03/07/06	2851.27	62.76	2788.51
MCC-2	06/27/06	2851.27	63.25	2788.02
MCC-2	10/17/06	2851.27	63.15	2788.12
MCC-2	12/12/06	2851.27	63.78	2787.49
MCC-2	03/20/07	2851.27	64.09	2787.18
MCC-2	09/25/07	2851.27	64.24	2787.03
MCC-2	12/26/07	2851.27	64.45	2786.82
MCC-2	02/20/08	2851.27	63.62	2787.65
MCC-2	04/23/08	2851.27	62.82	2788.45
MCC-2	07/29/08	2851.27	62.90	2788.37
MCC-2	10/21/08	2851.27	62.81	2788.46
MCC-2	02/12/09	2851.27	62.62	2788.65
MCC-2	06/02/09	2851.27	62.46	2788.81
MCC-2	09/22/09	2851.27	63.00	2788.27
MCC-2	11/30/09	2851.27	63.36	2787.91
MCC-2	02/05/10	2851.27	63.55	2787.72
MCC-2	05/13/10	2851.27	61.42	2789.85
MCC-2	09/27/10	2851.27	61.72	2789.55
MCC-2	12/01/10	2851.27	dry	dry
MCC-2	03/01/11	2851.27	61.00	2790.27
MCC-2	06/29/11	2851.27	61.73	2789.54
MCC-2	09/02/11	2851.27	62.87	2788.40
MCC-2	11/15/11	2851.27	63.23	2788.04
MCC-2	02/16/12	2851.27	63.56	2787.71
MCC-2	06/01/12	2851.27	63.78	2787.49
MCC-2	08/15/12	2851.27	64.18	2787.09
MCC-2	11/08/12	2851.27	64.60	2786.67
MCC-3A	07/05/95	2798.22	26.00	2772.22
MCC-3A	12/04/95	2798.22	25.60	2772.62
MCC-3A	04/24/96	2798.22	25.70	2772.52
MCC-3A	08/27/96	2798.22	26.68	2771.54
MCC-3A	01/07/97	2798.22	26.70	2771.52
MCC-3A	03/28/97	2798.22	26.15	2772.07
MCC-3A	05/06/97	2798.22	26.55	2771.67
MCC-3A	06/05/97	2798.22	25.55	2772.67
MCC-3A	07/01/97	2798.22	26.82	2771.40
MCC-3A	08/08/97	2798.22	27.00	2771.22
MCC-3A	09/03/97	2798.22	25.78	2772.44
MCC-3A	09/17/97	2798.22	75.55	2722.67
MCC-3A	10/20/97	2798.22	27.24	2770.98
MCC-3A	01/15/98	2798.22	26.98	2771.24
MCC-3A	02/13/98	2798.22	26.68	2771.54
MCC-3A	04/10/98	2798.22	10.42	2787.80
MCC-3A	05/13/98	2798.22	26.25	2771.97
MCC-3A	06/16/98	2798.22	26.15	2772.07
MCC-3A	07/17/98	2798.22	26.84	2771.38
MCC-3A	11/04/98	2798.22	28.72	2769.50
MCC-3A	12/23/98	2798.22	27.80	2770.42
MCC-3A	02/19/99	2798.22	27.88	2770.34

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-3A	03/02/99	2798.22	27.88	2770.34
MCC-3A	05/25/99	2798.22	28.24	2769.98
MCC-3A	08/31/99	2798.22	28.51	2769.71
MCC-3A	11/16/99	2798.22	28.92	2769.30
MCC-3A	03/01/00	2798.22	29.02	2769.20
MCC-3A	05/23/00	2798.22	29.33	2768.89
MCC-3A	09/12/00	2798.22	30.43	2767.79
MCC-3A	01/15/01	2798.22	29.13	2769.09
MCC-3A	03/12/01	2798.22	28.33	2769.89
MCC-3A	06/04/01	2798.22	28.39	2769.83
MCC-3A	10/22/01	2798.22	29.06	2769.16
MCC-3A	02/25/02	2798.22	29.21	2769.01
MCC-3A	04/22/02	2798.22	29.52	2768.70
MCC-3A	07/29/02	2798.22	30.84	2767.38
MCC-3A	10/21/02	2798.22	31.41	2766.81
MCC-3A	01/28/03	2798.22	31.44	2766.78
MCC-3A	04/08/03	2798.22	30.75	2767.47
MCC-3A	07/29/03	2798.22	31.57	2766.65
MCC-3A	11/04/03	2798.22	31.78	2766.44
MCC-3A	02/09/04	2798.22	31.42	2766.80
MCC-3A	04/19/04	2798.22	30.95	2767.27
MCC-3A	01/10/05	2798.22	31.50	2766.72
MCC-3A	06/27/05	2798.22	29.84	2768.38
MCC-3A	09/19/05	2798.22	30.17	2768.05
MCC-3A	11/28/05	2798.22	30.26	2767.96
MCC-3A	03/06/06	2798.22	30.03	2768.19
MCC-3A	06/26/06	2798.22	30.58	2767.64
MCC-3A	10/16/06	2798.22	31.18	2767.04
MCC-3A	03/19/07	2798.22	31.54	2766.68
MCC-3A	09/25/07	2798.22	28.54	2769.68
MCC-3A	12/26/07	2798.22	31.35	2766.87
MCC-3A	02/20/08	2798.22	30.07	2768.15
MCC-3A	04/21/08	2798.22	29.86	2768.36
MCC-3A	07/28/08	2798.22	30.19	2768.03
MCC-3A	10/21/08	2798.22	30.39	2767.83
MCC-3A	02/09/09	2798.22	29.97	2768.25
MCC-3A	06/01/09	2798.22	30.13	2768.09
MCC-3A	09/21/09	2798.22	dry	dry
MCC-3A	11/30/09	2798.22	31.36	2766.86
MCC-3A	02/03/10	2798.22	30.06	2768.16
MCC-3A	05/04/10	2798.22	28.72	2769.50
MCC-3A	09/24/10	2798.22	32.87	2765.35
MCC-3A	12/01/10	2798.22	30.20	2768.02
MCC-3A	03/15/11	2798.22	30.13	2768.09
MCC-3A	06/29/11	2798.22	30.89	2767.33
MCC-3A	09/01/11	2798.22	31.13	2767.09
MCC-3A	11/15/11	2798.22	31.23	2766.99
MCC-3A	02/16/12	2798.22	30.76	2767.46
MCC-3A	06/01/12	2798.22	31.10	2767.12
MCC-3A	08/15/12	2798.22	31.60	2766.62
MCC-3A	11/08/12	2798.22	31.73	2766.49
MCC-3B	09/05/96	2798.09	344.60	2453.49
MCC-3B	01/07/97	2798.09	335.95	2462.14
MCC-3B	03/28/97	2798.09	364.67	2433.42

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-3B	06/05/97	2798.09	363.85	2434.24
MCC-3B	07/01/97	2798.09	358.24	2439.85
MCC-3B	08/08/97	2798.09	350.75	2447.34
MCC-3B	09/03/97	2798.09	359.92	2438.17
MCC-3B	09/17/97	2798.09	343.30	2454.79
MCC-3B	10/20/97	2798.09	347.12	2450.97
MCC-3B	01/14/98	2798.09	355.00	2443.09
MCC-3B	02/13/98	2798.09	362.25	2435.84
MCC-3B	04/10/98	2798.09	356.00	2442.09
MCC-3B	05/13/98	2798.09	365.10	2432.99
MCC-3B	06/16/98	2798.09	344.56	2453.53
MCC-3B	07/17/98	2798.09	353.16	2444.93
MCC-3B	11/03/98	2798.09	349.42	2448.67
MCC-3B	12/23/98	2798.09	358.83	2439.26
MCC-3B	02/19/99	2798.09	348.86	2449.23
MCC-3B	03/03/99	2798.09	347.17	2450.92
MCC-3B	05/26/99	2798.09	342.70	2455.39
MCC-3B	08/31/99	2798.09	238.70	2559.39
MCC-3B	11/16/99	2798.09	309.14	2488.95
MCC-3B	03/01/00	2798.09	325.95	2472.14
MCC-3B	05/23/00	2798.09	341.42	2456.67
MCC-3B	09/12/00	2798.09	348.62	2449.47
MCC-3B	01/15/01	2798.09	216.94	2581.15
MCC-3B	03/12/01	2798.09	296.85	2501.24
MCC-3B	06/04/01	2798.09	297.49	2500.60
MCC-3B	10/22/01	2798.09	342.41	2455.68
MCC-3B	02/25/02	2798.09	343.19	2454.90
MCC-3B	04/22/02	2798.09	358.18	2439.91
MCC-3B	07/29/02	2798.09	358.36	2439.73
MCC-3B	10/21/02	2798.09	358.22	2439.87
MCC-3B	01/28/03	2798.09	353.91	2444.18
MCC-3B	04/08/03	2798.09	252.95	2545.14
MCC-3B	07/29/03	2798.09	329.75	2468.34
MCC-3B	11/04/03	2798.09	312.21	2485.88
MCC-3B	02/09/04	2798.09	320.67	2477.42
MCC-3B	04/19/04	2798.09	285.02	2513.07
MCC-3B	01/10/05	2798.09	134.65	2663.44
MCC-3B	06/27/05	2798.09	177.32	2620.77
MCC-3B	09/19/05	2798.09	261.95	2536.14
MCC-3B	11/28/05	2798.09	337.76	2460.33
MCC-3B	03/06/06	2798.09	337.00	2461.09
MCC-3B	06/26/06	2798.09	313.43	2484.66
MCC-3B	10/16/06	2798.09	226.81	2571.28
MCC-3B	12/11/06	2798.09	330.39	2467.70
MCC-3B	03/19/07	2798.09	315.96	2482.13
MCC-3B	09/25/07	2798.09	138.73	2659.36
MCC-3B	12/26/07	2798.09	35.63	2762.46
MCC-3B	02/20/08	2798.09	0.34	2797.75
MCC-3B	04/21/08	2798.09	3.99	2794.10
MCC-3B	07/28/08	2798.09	1.35	2796.74
MCC-3B	10/21/08	2798.09	0.59	2797.50
MCC-3B	02/09/09	2798.09	0.17	2797.92
MCC-3B	06/01/09	2798.09	1.36	2796.73
MCC-3B	09/21/09	2798.09	1.99	2796.10

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-3B	11/30/09	2798.09	dry	dry
MCC-3B	02/04/10	2798.09	dry	dry
MCC-3B	05/04/10	2798.09	87.66	2710.43
MCC-3B	09/24/10	2798.09	92.36	2705.73
MCC-3B	12/01/10	2798.09	2.09	2796.00
MCC-3B	03/15/11	2798.09	4.84	2793.25
MCC-3B	06/29/11	2798.09	2.40	2795.69
MCC-3B	09/02/11	2798.09	170.32	2627.77
MCC-3B	11/15/11	2798.09	154.07	2644.02
MCC-3B	02/16/12	2798.09	138.77	2659.32
MCC-3B	06/01/12	2798.09	124.67	2673.42
MCC-3B	08/15/12	2798.09	115.95	2682.14
MCC-3B	11/08/12	2798.09	106.94	2691.15
MCC-3C	09/03/97	2798.44	35.90	2762.54
MCC-3C	09/17/97	2798.44	42.85	2755.59
MCC-3C	10/20/97	2798.44	47.36	2751.08
MCC-3C	01/14/98	2798.44	44.00	2754.44
MCC-3C	02/13/98	2798.44	50.18	2748.26
MCC-3C	04/10/98	2798.44	50.90	2747.54
MCC-3C	05/13/98	2798.44	51.65	2746.79
MCC-3C	06/16/98	2798.44	42.84	2755.60
MCC-3C	07/17/98	2798.44	46.81	2751.63
MCC-3C	11/04/98	2798.44	51.40	2747.04
MCC-3C	12/23/98	2798.44	53.06	2745.38
MCC-3C	02/19/99	2798.44	51.51	2746.93
MCC-3C	03/03/99	2798.44	53.48	2744.96
MCC-3C	05/26/99	2798.44	54.02	2744.42
MCC-3C	08/31/99	2798.44	54.95	2743.49
MCC-3C	11/16/99	2798.44	57.17	2741.27
MCC-3C	03/01/00	2798.44	59.33	2739.11
MCC-3C	05/23/00	2798.44	61.27	2737.17
MCC-3C	09/12/00	2798.44	63.67	2734.77
MCC-3C	01/15/01	2798.44	66.54	2731.90
MCC-3C	03/12/01	2798.44	68.60	2729.84
MCC-3C	06/04/01	2798.44	70.29	2728.15
MCC-3C	10/22/01	2798.44	75.70	2722.74
MCC-3C	02/25/02	2798.44	76.52	2721.92
MCC-3C	04/22/02	2798.44	79.04	2719.40
MCC-3C	07/29/02	2798.44	79.99	2718.45
MCC-3C	10/21/02	2798.44	81.65	2716.79
MCC-3C	01/28/03	2798.44	83.20	2715.24
MCC-3C	04/08/03	2798.44	84.77	2713.67
MCC-3C	07/29/03	2798.44	85.91	2712.53
MCC-3C	11/04/03	2798.44	87.66	2710.78
MCC-3C	02/09/04	2798.44	89.29	2709.15
MCC-3C	04/19/04	2798.44	90.67	2707.77
MCC-3C	01/10/05	2798.44	92.62	2705.82
MCC-3C	06/27/05	2798.44	93.72	2704.72
MCC-3C	09/21/05	2798.44	95.07	2703.37
MCC-3C	11/28/05	2798.44	96.27	2702.17
MCC-3C	03/06/06	2798.44	96.61	2701.83
MCC-3C	06/26/06	2798.44	96.73	2701.71
MCC-3C	10/16/06	2798.44	96.84	2701.60
MCC-3C	12/11/06	2798.44	98.48	2699.96

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-3C	03/19/07	2798.44	97.73	2700.71
MCC-3C	06/25/07	2798.44	97.78	2700.66
MCC-3C	09/25/07	2798.44	97.69	2700.75
MCC-3C	12/26/07	2798.44	97.32	2701.12
MCC-3C	02/20/08	2798.44	96.88	2701.56
MCC-3C	04/21/08	2798.44	96.60	2701.84
MCC-3C	07/28/08	2798.44	96.02	2702.42
MCC-3C	10/21/08	2798.44	95.83	2702.61
MCC-3C	02/09/09	2798.44	95.49	2702.95
MCC-3C	06/01/09	2798.44	94.25	2704.19
MCC-3C	09/21/09	2798.44	92.20	2706.24
MCC-3C	11/30/09	2798.44	91.15	2707.29
MCC-3C	02/03/10	2798.44	89.83	2708.61
MCC-3C	05/11/10	2798.44	87.69	2710.75
MCC-3C	09/24/10	2798.44	88.70	2709.74
MCC-3C	12/01/10	2798.44	83.30	2715.14
MCC-3C	03/15/11	2798.44	80.80	2717.64
MCC-3C	06/29/11	2798.44	77.83	2720.61
MCC-3C	09/01/11	2798.44	75.67	2722.77
MCC-3C	11/15/11	2798.44	73.05	2725.39
MCC-3C	02/16/12	2798.44	72.25	2726.19
MCC-3C	06/01/12	2798.44	71.03	2727.41
MCC-3C	08/15/12	2798.44	70.09	2728.35
MCC-3C	11/08/12	2798.44	71.14	2727.30
MCC-4	07/05/95	2673.96	72.49	2601.47
MCC-4	12/04/95	2673.96	43.86	2630.10
MCC-4	04/24/96	2673.96	34.52	2639.44
MCC-4	08/26/96	2673.96	56.36	2617.60
MCC-4	01/07/97	2673.96	62.21	2611.75
MCC-4	03/28/97	2673.96	62.02	2611.94
MCC-4	05/06/97	2673.96	65.68	2608.28
MCC-4	06/05/97	2673.96	63.22	2610.74
MCC-4	07/01/97	2673.96	63.75	2610.21
MCC-4	08/08/97	2673.96	65.63	2608.33
MCC-4	09/03/97	2673.96	63.62	2610.34
MCC-4	09/17/97	2673.96	67.25	2606.71
MCC-4	01/15/98	2673.96	65.73	2608.23
MCC-4	02/13/98	2673.96	65.39	2608.57
MCC-4	04/10/98	2673.96	63.47	2610.49
MCC-4	05/13/98	2673.96	62.80	2611.16
MCC-4	06/16/98	2673.96	81.01	2592.95
MCC-4	07/17/98	2673.96	63.15	2610.81
MCC-4	11/04/98	2673.96	67.48	2606.48
MCC-4	12/23/98	2673.96	68.35	2605.61
MCC-4	02/19/99	2673.96	67.98	2605.98
MCC-4	03/05/99	2673.96	67.95	2606.01
MCC-4	05/26/99	2673.96	69.98	2603.98
MCC-4	09/01/99	2673.96	68.83	2605.13
MCC-4	11/17/99	2673.96	68.88	2605.08
MCC-4	03/02/00	2673.96	72.10	2601.86
MCC-4	05/24/00	2673.96	71.05	2602.91
MCC-4	09/12/00	2673.96	74.90	2599.06
MCC-4	01/17/01	2673.96	71.34	2602.62
MCC-4	03/13/01	2673.96	69.55	2604.41

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-4	06/05/01	2673.96	68.43	2605.53
MCC-4	10/23/01	2673.96	71.49	2602.47
MCC-4	02/26/02	2673.96	73.32	2600.64
MCC-4	04/23/02	2673.96	73.62	2600.34
MCC-4	07/30/02	2673.96	75.58	2598.38
MCC-4	10/22/02	2673.96	77.53	2596.43
MCC-4	01/29/03	2673.96	77.86	2596.10
MCC-4	04/09/03	2673.96	74.92	2599.04
MCC-4	07/30/03	2673.96	72.62	2601.34
MCC-4	11/05/03	2673.96	75.31	2598.65
MCC-4	02/09/04	2673.96	75.77	2598.19
MCC-4	04/20/04	2673.96	73.91	2600.05
MCC-4	01/10/05	2673.96	76.49	2597.47
MCC-4	06/28/05	2673.96	69.45	2604.51
MCC-4	09/20/05	2673.96	72.04	2601.92
MCC-4	11/29/05	2673.96	73.69	2600.27
MCC-4	03/07/06	2673.96	75.04	2598.92
MCC-4	06/27/06	2673.96	73.86	2600.10
MCC-4	10/17/06	2673.96	76.65	2597.31
MCC-4	12/12/06	2673.96	77.84	2596.12
MCC-4	03/19/07	2673.96	77.48	2596.48
MCC-4	06/25/07	2673.96	78.65	2595.31
MCC-4	09/25/07	2673.96	80.02	2593.94
MCC-4	12/26/07	2673.96	80.15	2593.81
MCC-4	02/20/08	2673.96	75.83	2598.13
MCC-4	04/21/08	2673.96	72.04	2601.92
MCC-4	07/28/08	2673.96	74.16	2599.80
MCC-4	10/21/08	2673.96	76.51	2597.45
MCC-4	02/10/09	2673.96	75.84	2598.12
MCC-4	06/02/09	2673.96	72.85	2601.11
MCC-4	09/22/09	2673.96	78.37	2595.59
MCC-4	11/30/09	2673.96	81.42	2592.54
MCC-4	02/03/10	2673.96	81.12	2592.84
MCC-4	05/10/10	2673.96	72.35	2601.61
MCC-4	09/23/10	2673.96	76.10	2597.86
MCC-4	12/01/10	2673.96	78.65	2595.31
MCC-4	03/15/11	2673.96	77.75	2596.21
MCC-4	06/28/11	2673.96	78.32	2595.64
MCC-4	08/31/11	2673.96	80.85	2593.11
MCC-4	11/15/11	2673.96	82.15	2591.81
MCC-4	02/16/12	2673.96	78.73	2595.23
MCC-4	06/01/12	2673.96	76.24	2597.72
MCC-4	08/15/12	2673.96	80.90	2593.06
MCC-4	11/08/12	2673.96	83.73	2590.23
MCC-6A	09/06/96	2811.14	30.83	2780.31
MCC-6A	01/07/97	2811.14	18.21	2792.93
MCC-6A	03/28/97	2811.14	24.03	2787.11
MCC-6A	05/06/97	2811.14	25.82	2785.32
MCC-6A	06/05/97	2811.14	17.85	2793.29
MCC-6A	07/01/97	2811.14	24.24	2786.90
MCC-6A	08/08/97	2811.14	23.20	2787.94
MCC-6A	09/03/97	2811.14	24.25	2786.89
MCC-6A	09/15/97	2811.14	24.25	2786.89
MCC-6A	01/13/98	2811.14	24.13	2787.01

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-6A	02/13/98	2811.14	24.31	2786.83
MCC-6A	04/10/98	2811.14	23.59	2787.55
MCC-6A	05/13/98	2811.14	23.70	2787.44
MCC-6A	06/16/98	2811.14	25.24	2785.90
MCC-6A	07/17/98	2811.14	23.90	2787.24
MCC-6A	11/02/98	2811.14	25.45	2785.69
MCC-6A	12/23/98	2811.14	24.80	2786.34
MCC-6A	02/19/99	2811.14	24.45	2786.69
MCC-6A	03/05/99	2811.14	26.34	2784.80
MCC-6A	05/27/99	2811.14	24.45	2786.69
MCC-6A	09/02/99	2811.14	24.73	2786.41
MCC-6A	11/18/99	2811.14	25.18	2785.96
MCC-6A	03/03/00	2811.14	25.08	2786.06
MCC-6A	05/25/00	2811.14	25.01	2786.13
MCC-6A	09/14/00	2811.14	25.70	2785.44
MCC-6A	01/17/01	2811.14	25.34	2785.80
MCC-6A	03/14/01	2811.14	25.10	2786.04
MCC-6A	06/06/01	2811.14	25.22	2785.92
MCC-6A	10/24/01	2811.14	25.86	2785.28
MCC-6A	02/27/02	2811.14	25.78	2785.36
MCC-6A	04/24/02	2811.14	25.91	2785.23
MCC-6A	07/31/02	2811.14	26.33	2784.81
MCC-6A	10/23/02	2811.14	26.83	2784.31
MCC-6A	01/30/03	2811.14	26.98	2784.16
MCC-6A	04/10/03	2811.14	26.52	2784.62
MCC-6A	07/30/03	2811.14	26.87	2784.27
MCC-6A	11/06/03	2811.14	27.41	2783.73
MCC-6A	02/11/04	2811.14	27.33	2783.81
MCC-6A	04/21/04	2811.14	26.95	2784.19
MCC-6A	01/12/05	2811.14	27.51	2783.63
MCC-6A	06/29/05	2811.14	26.40	2784.74
MCC-6A	09/21/05	2811.14	27.07	2784.07
MCC-6A	11/30/05	2811.14	27.36	2783.78
MCC-6A	03/08/06	2811.14	27.08	2784.06
MCC-6A	06/28/06	2811.14	26.91	2784.23
MCC-6A	10/18/06	2811.14	27.18	2783.96
MCC-6A	12/13/06	2811.14	27.56	2783.58
MCC-6A	03/20/07	2811.14	27.05	2784.09
MCC-6A	09/25/07	2811.14	27.39	2783.75
MCC-6A	12/26/07	2811.14	27.44	2783.70
MCC-6A	02/19/08	2811.14	26.69	2784.45
MCC-6A	04/22/08	2811.14	22.60	2788.54
MCC-6A	07/29/08	2811.14	28.70	2782.44
MCC-6A	10/22/08	2811.14	27.07	2784.07
MCC-6A	02/12/09	2811.14	26.64	2784.50
MCC-6A	06/03/09	2811.14	27.24	2783.90
MCC-6A	09/21/09	2811.14	27.12	2784.02
MCC-6A	11/30/09	2811.14	28.13	2783.01
MCC-6A	02/04/10	2811.14	27.35	2783.79
MCC-6A	05/10/10	2811.14	26.28	2784.86
MCC-6A	08/27/10	2811.14	26.25	2784.89
MCC-6A	11/30/10	2811.14	24.48	2786.66
MCC-6A	03/24/11	2811.14	26.21	2784.93
MCC-6A	06/28/11	2811.14	32.00	2779.14

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-6A	09/01/11	2811.14	26.69	2784.45
MCC-6A	11/15/11	2811.14	26.95	2784.19
MCC-6A	02/16/12	2811.14	26.57	2784.57
MCC-6A	06/01/12	2811.14	26.42	2784.72
MCC-6A	08/15/12	2811.14	26.85	2784.29
MCC-6A	11/08/12	2811.14	27.17	2783.97
MCC-6B	09/05/96	2811.85	30.30	2781.55
MCC-6B	01/08/97	2811.85	24.87	2786.98
MCC-6B	03/28/97	2811.85	17.95	2793.90
MCC-6B	05/06/97	2811.85	18.52	2793.33
MCC-6B	06/05/97	2811.85	24.35	2787.50
MCC-6B	07/01/97	2811.85	17.90	2793.95
MCC-6B	08/08/97	2811.85	17.87	2793.98
MCC-6B	09/03/97	2811.85	17.90	2793.95
MCC-6B	09/16/97	2811.85	17.93	2793.92
MCC-6B	10/21/97	2811.85	18.57	2793.28
MCC-6B	01/13/98	2811.85	18.15	2793.70
MCC-6B	02/13/98	2811.85	18.19	2793.66
MCC-6B	04/10/98	2811.85	18.03	2793.82
MCC-6B	05/13/98	2811.85	18.00	2793.85
MCC-6B	06/16/98	2811.85	18.93	2792.92
MCC-6B	07/17/98	2811.85	18.01	2793.84
MCC-6B	11/03/98	2811.85	19.52	2792.33
MCC-6B	12/23/98	2811.85	18.52	2793.33
MCC-6B	02/19/99	2811.85	18.44	2793.41
MCC-6B	03/05/99	2811.85	19.52	2792.33
MCC-6B	05/27/99	2811.85	18.65	2793.20
MCC-6B	09/02/99	2811.85	18.90	2792.95
MCC-6B	11/18/99	2811.85	19.27	2792.58
MCC-6B	03/03/00	2811.85	19.52	2792.33
MCC-6B	05/25/00	2811.85	19.63	2792.22
MCC-6B	09/14/00	2811.85	21.30	2790.55
MCC-6B	01/17/01	2811.85	20.16	2791.69
MCC-6B	03/14/01	2811.85	20.04	2791.81
MCC-6B	06/06/01	2811.85	20.15	2791.70
MCC-6B	10/24/01	2811.85	20.63	2791.22
MCC-6B	02/27/02	2811.85	20.87	2790.98
MCC-6B	04/24/02	2811.85	21.11	2790.74
MCC-6B	07/31/02	2811.85	21.45	2790.40
MCC-6B	10/23/02	2811.85	21.76	2790.09
MCC-6B	01/30/03	2811.85	22.20	2789.65
MCC-6B	04/10/03	2811.85	22.06	2789.79
MCC-6B	07/31/03	2811.85	22.48	2789.37
MCC-6B	11/06/03	2811.85	22.86	2788.99
MCC-6B	02/11/04	2811.85	23.04	2788.81
MCC-6B	04/21/04	2811.85	22.96	2788.89
MCC-6B	01/12/05	2811.85	23.47	2788.38
MCC-6B	06/29/05	2811.85	22.82	2789.03
MCC-6B	09/21/05	2811.85	22.85	2789.00
MCC-6B	11/30/05	2811.85	22.92	2788.93
MCC-6B	03/08/06	2811.85	22.64	2789.21
MCC-6B	06/28/06	2811.85	22.60	2789.25
MCC-6B	10/18/06	2811.85	22.59	2789.26
MCC-6B	12/13/06	2811.85	22.97	2788.88

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-6B	03/20/07	2811.85	22.84	2789.01
MCC-6B	09/25/07	2811.85	23.16	2788.69
MCC-6B	12/26/07	2811.85	23.12	2788.73
MCC-6B	02/19/08	2811.85	22.83	2789.02
MCC-6B	04/22/08	2811.85	22.62	2789.23
MCC-6B	07/29/08	2811.85	22.63	2789.22
MCC-6B	10/22/08	2811.85	22.61	2789.24
MCC-6B	02/12/09	2811.85	22.23	2789.62
MCC-6B	06/03/09	2811.85	23.07	2788.78
MCC-6B	09/21/09	2811.85	24.00	2787.85
MCC-6B	11/30/09	2811.85	24.03	2787.82
MCC-6B	02/04/10	2811.85	23.56	2788.29
MCC-6B	05/10/10	2811.85	23.17	2788.68
MCC-6B	08/27/10	2811.85	23.17	2788.68
MCC-6B	11/30/10	2811.85	23.29	2788.56
MCC-6B	03/24/11	2811.85	23.10	2788.75
MCC-6B	06/28/11	2811.85	22.42	2789.43
MCC-6B	09/01/11	2811.85	22.35	2789.50
MCC-6B	11/15/11	2811.85	22.66	2789.19
MCC-6B	02/16/12	2811.85	23.55	2788.30
MCC-6B	06/01/12	2811.85	22.57	2789.28
MCC-6B	08/15/12	2811.85	22.80	2789.05
MCC-6B	11/08/12	2811.85	23.08	2788.77
MCC-6C	09/03/97	2811.42	47.50	2763.92
MCC-6C	09/15/97	2811.42	45.20	2766.22
MCC-6C	01/13/98	2811.42	42.90	2768.52
MCC-6C	02/13/98	2811.42	41.72	2769.70
MCC-6C	04/10/98	2811.42	38.29	2773.13
MCC-6C	05/13/98	2811.42	44.00	2767.42
MCC-6C	06/16/98	2811.42	45.27	2766.15
MCC-6C	07/17/98	2811.42	45.89	2765.53
MCC-6C	11/02/98	2811.42	46.76	2764.66
MCC-6C	12/23/98	2811.42	44.09	2767.33
MCC-6C	02/19/99	2811.42	44.40	2767.02
MCC-6C	03/05/99	2811.42	44.58	2766.84
MCC-6C	05/27/99	2811.42	45.95	2765.47
MCC-6C	09/02/99	2811.42	49.95	2761.47
MCC-6C	11/18/99	2811.42	46.14	2765.28
MCC-6C	03/03/00	2811.42	44.72	2766.70
MCC-6C	05/25/00	2811.42	46.72	2764.70
MCC-6C	09/14/00	2811.42	47.40	2764.02
MCC-6C	01/17/01	2811.42	43.43	2767.99
MCC-6C	03/14/01	2811.42	42.96	2768.46
MCC-6C	06/06/01	2811.42	46.54	2764.88
MCC-6C	10/24/01	2811.42	46.82	2764.60
MCC-6C	02/27/02	2811.42	44.92	2766.50
MCC-6C	04/24/02	2811.42	46.25	2765.17
MCC-6C	07/31/02	2811.42	48.02	2763.40
MCC-6C	10/23/02	2811.42	47.95	2763.47
MCC-6C	01/30/03	2811.42	46.42	2765.00
MCC-6C	04/10/03	2811.42	45.07	2766.35
MCC-6C	07/31/03	2811.42	48.42	2763.00
MCC-6C	11/06/03	2811.42	48.13	2763.29
MCC-6C	02/11/04	2811.42	46.23	2765.19

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-6C	04/21/04	2811.42	46.28	2765.14
MCC-6C	01/12/05	2811.42	44.87	2766.55
MCC-6C	06/29/05	2811.42	48.51	2762.91
MCC-6C	09/21/05	2811.42	47.63	2763.79
MCC-6C	11/30/05	2811.42	47.89	2763.53
MCC-6C	03/08/06	2811.42	46.47	2764.95
MCC-6C	06/28/06	2811.42	49.23	2762.19
MCC-6C	10/18/06	2811.42	48.35	2763.07
MCC-6C	12/13/06	2811.42	47.58	2763.84
MCC-6C	03/20/07	2811.42	46.31	2765.11
MCC-6C	06/26/07	2811.42	49.11	2762.31
MCC-6C	09/25/07	2811.42	48.95	2762.47
MCC-6C	12/26/07	2811.42	46.57	2764.85
MCC-6C	02/19/08	2811.42	41.90	2769.52
MCC-6C	04/22/08	2811.42	46.17	2765.25
MCC-6C	07/29/08	2811.42	47.89	2763.53
MCC-6C	10/22/08	2811.42	48.60	2762.82
MCC-6C	02/12/09	2811.42	46.19	2765.23
MCC-6C	06/03/09	2811.42	48.39	2763.03
MCC-6C	09/21/09	2811.42	49.00	2762.42
MCC-6C	11/30/09	2811.42	48.13	2763.29
MCC-6C	02/04/10	2811.42	39.70	2771.72
MCC-6C	05/10/10	2811.42	45.56	2765.86
MCC-6C	08/27/10	2811.42	48.01	2763.41
MCC-6C	11/30/10	2811.42	47.70	2763.72
MCC-6C	03/24/11	2811.42	48.21	2763.21
MCC-6C	06/28/11	2811.42	48.66	2762.76
MCC-6C	09/01/11	2811.42	48.78	2762.64
MCC-6C	11/15/11	2811.42	48.23	2763.19
MCC-6C	02/16/12	2811.42	46.62	2764.80
MCC-6C	06/01/12	2811.42	48.54	2762.88
MCC-6C	08/15/12	2811.42	48.93	2762.49
MCC-6C	11/08/12	2811.42	48.71	2762.71
MCC-6D	08/09/12	2817.72	51.22	2766.50
MCC-6D	08/23/12	2817.72	51.37	2766.35
MCC-6D	11/27/12	2817.72	50.63	2767.09
MCC-9	09/03/97	2769.24	19.60	2749.64
MCC-9	09/15/97	2769.24	13.34	2755.90
MCC-9	01/13/98	2769.24	11.90	2757.34
MCC-9	02/13/98	2769.24	10.52	2758.72
MCC-9	04/10/98	2769.24	10.00	2759.24
MCC-9	05/13/98	2769.24	11.60	2757.64
MCC-9	06/16/98	2769.24	13.34	2755.90
MCC-9	07/17/98	2769.24	13.32	2755.92
MCC-9	11/04/98	2769.24	14.27	2754.97
MCC-9	12/23/98	2769.24	12.20	2757.04
MCC-9	02/19/99	2769.24	11.84	2757.40
MCC-9	03/02/99	2769.24	11.90	2757.34
MCC-9	05/25/99	2769.24	12.82	2756.42
MCC-9	09/01/99	2769.24	14.35	2754.89
MCC-9	11/17/99	2769.24	14.45	2754.79
MCC-9	03/01/00	2769.24	14.00	2755.24
MCC-9	05/23/00	2769.24	14.77	2754.47
MCC-9	09/12/00	2769.24	16.78	2752.46

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MCC-9	01/16/01	2769.24	13.02	2756.22
MCC-9	03/12/01	2769.24	12.54	2756.70
MCC-9	06/04/01	2769.24	13.64	2755.60
MCC-9	10/22/01	2769.24	14.45	2754.79
MCC-9	02/25/02	2769.24	12.87	2756.37
MCC-9	04/22/02	2769.24	14.29	2754.95
MCC-9	07/29/02	2769.24	17.15	2752.09
MCC-9	10/21/02	2769.24	17.58	2751.66
MCC-9	01/28/03	2769.24	16.90	2752.34
MCC-9	04/08/03	2769.24	14.43	2754.81
MCC-9	07/29/03	2769.24	17.60	2751.64
MCC-9	11/04/03	2769.24	16.89	2752.35
MCC-9	02/09/04	2769.24	14.90	2754.34
MCC-9	04/19/04	2769.24	14.43	2754.81
MCC-9	01/10/05	2769.24	14.67	2754.57
MCC-9	06/27/05	2769.24	14.91	2754.33
MCC-9	09/19/05	2769.24	14.52	2754.72
MCC-9	11/29/05	2769.24	14.13	2755.11
MCC-9	03/06/06	2769.24	13.63	2755.61
MCC-9	06/26/06	2769.24	15.94	2753.30
MCC-9	10/16/06	2769.24	15.79	2753.45
MCC-9	12/11/06	2769.24	15.79	2753.45
MCC-9	03/19/07	2769.24	14.95	2754.29
MCC-9	06/25/07	2769.24	16.13	2753.11
MCC-9	09/25/07	2769.24	16.18	2753.06
MCC-9	12/26/07	2769.24	14.95	2754.29
MCC-9	02/19/08	2769.24	12.60	2756.64
MCC-9	04/21/08	2769.24	13.02	2756.22
MCC-9	07/28/08	2769.24	13.62	2755.62
MCC-9	10/21/08	2769.24	14.98	2754.26
MCC-9	02/09/09	2769.24	14.16	2755.08
MCC-9	06/01/09	2769.24	15.86	2753.38
MCC-9	09/21/09	2769.24	17.93	2751.31
MCC-9	11/30/09	2769.24	17.82	2751.42
MCC-9	02/03/10	2769.24	15.62	2753.62
MCC-9	05/07/10	2769.24	14.68	2754.56
MCC-9	09/24/10	2769.24	17.42	2751.82
MCC-9	12/01/10	2769.24	17.26	2751.98
MCC-9	03/15/11	2769.24	16.40	2752.84
MCC-9	06/23/11	2769.24	18.29	2750.95
MCC-9	08/31/11	2769.24	18.72	2750.52
MCC-9	11/15/11	2769.24	18.35	2750.89
MCC-9	02/16/12	2769.24	17.16	2752.08
MCC-9	06/01/12	2769.24	18.34	2750.90
MCC-9	08/15/12	2769.24	18.94	2750.30
MCC-9	11/08/12	2769.24	18.60	2750.64
Settling Ponds 1 and 2 Alert Well	09/25/07	2976.20	77.40	2898.80
Settling Ponds 1 and 2 Alert Well	12/26/07	2976.20	76.94	2899.26
Settling Ponds 1 and 2 Alert Well	02/20/08	2976.20	76.23	2899.97
Settling Ponds 1 and 2 Alert Well	04/22/08	2976.20	75.65	2900.55
Settling Ponds 1 and 2 Alert Well	07/29/08	2976.20	75.52	2900.68
Settling Ponds 1 and 2 Alert Well	10/22/08	2976.20	75.52	2900.68
Settling Ponds 1 and 2 Alert Well	02/11/09	2976.20	75.68	2900.52
Settling Ponds 1 and 2 Alert Well	06/03/09	2976.20	75.17	2901.03

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
Settling Ponds 1 and 2 Alert Well	09/22/09	2976.20	80.84	2895.36
Settling Ponds 1 and 2 Alert Well	11/30/09	2976.20	dry	dry
Settling Ponds 1 and 2 Alert Well	02/05/10	2976.20	85.27	2890.93
Settling Ponds 1 and 2 Alert Well	05/13/10	2976.20	80.06	2896.14
Settling Ponds 1 and 2 Alert Well	08/27/10	2976.20	80.16	2896.04
Settling Ponds 1 and 2 Alert Well	11/30/10	2976.20	80.85	2895.35
Settling Ponds 1 and 2 Alert Well	03/15/11	2976.20	81.40	2894.80
Settling Ponds 1 and 2 Alert Well	06/29/11	2976.20	81.89	2894.31
Settling Ponds 1 and 2 Alert Well	09/01/11	2976.20	82.75	2893.45
Settling Ponds 1 and 2 Alert Well	11/15/11	2976.20	84.25	2891.95
Settling Ponds 1 and 2 Alert Well	02/16/12	2976.20	85.88	2890.32
Settling Ponds 1 and 2 Alert Well	06/01/12	2976.20	86.69	2889.51
Settling Ponds 1 and 2 Alert Well	08/15/12	2976.20	87.34	2888.86
Settling Ponds 1 and 2 Alert Well	11/08/12	2976.20	88.71	2887.49
Settling Ponds 1 and 2 Alert Well-B	09/22/09	2977.45	59.74	2917.71
Settling Ponds 1 and 2 Alert Well-B	12/15/09	2977.45	60.50	2916.95
Settling Ponds 1 and 2 Alert Well-B	02/05/10	2977.45	59.86	2917.59
Settling Ponds 1 and 2 Alert Well-B	05/13/10	2977.45	58.20	2919.25
Settling Ponds 1 and 2 Alert Well-B	08/27/10	2977.45	58.60	2918.85
Settling Ponds 1 and 2 Alert Well-B	11/17/10	2977.45	59.08	2918.37
Settling Ponds 1 and 2 Alert Well-B	11/30/10	2977.45	59.30	2918.15
Settling Ponds 1 and 2 Alert Well-B	03/15/11	2977.45	60.05	2917.40
Settling Ponds 1 and 2 Alert Well-B	06/29/11	2977.45	57.91	2919.54
Settling Ponds 1 and 2 Alert Well-B	09/01/11	2977.45	61.30	2916.15
Settling Ponds 1 and 2 Alert Well-B	11/15/11	2977.45	61.97	2915.48
Settling Ponds 1 and 2 Alert Well-B	02/16/12	2977.45	62.81	2914.64
Settling Ponds 1 and 2 Alert Well-B	06/01/12	2977.45	63.62	2913.83
Settling Ponds 1 and 2 Alert Well-B	08/15/12	2977.45	64.68	2912.77
Settling Ponds 1 and 2 Alert Well-B	11/08/12	2977.45	65.40	2912.05
Smelter Pond POC	09/25/07	2746.28	11.21	2735.07
Smelter Pond POC	12/26/07	2746.28	6.59	2739.69
Smelter Pond POC	02/20/08	2746.28	3.01	2743.27
Smelter Pond POC	04/22/08	2746.28	3.58	2742.70
Smelter Pond POC	07/29/08	2746.28	6.87	2739.41
Smelter Pond POC	10/22/08	2746.28	7.84	2738.44
Smelter Pond POC	02/12/09	2746.28	2.99	2743.29
Smelter Pond POC	06/02/09	2746.28	6.95	2739.33
Smelter Pond POC	09/23/09	2746.28	11.41	2734.87
Smelter Pond POC	11/30/09	2746.28	11.35	2734.93
Smelter Pond POC	02/05/10	2746.28	5.05	2741.23
Smelter Pond POC	05/13/10	2746.28	4.98	2741.30
Smelter Pond POC	12/01/10	2746.28	6.95	2739.33
Smelter Pond POC	03/01/11	2746.28	4.74	2741.54
Smelter Pond POC	06/30/11	2746.28	9.71	2736.57
Smelter Pond POC	08/31/11	2746.28	11.37	2734.91
Smelter Pond POC	11/15/11	2746.28	11.43	2734.85
Smelter Pond POC	02/16/12	2746.28	6.87	2739.41
Smelter Pond POC	06/01/12	2746.28	7.08	2739.20
Smelter Pond POC	07/18/12	2746.28	7.70	2738.58
Smelter Pond POC	08/15/12	2746.28	9.83	2736.45
Smelter Pond POC	09/25/12	2746.28	11.92	2734.36
Smelter Pond POC	10/09/12	2746.28	12.43	2733.85
Smelter Pond POC	11/08/12	2746.28	7.50	2738.78
Smelter Pond POC	12/17/12	2746.28	6.73	2739.55

**ATTACHMENT 2**  
**GROUNDWATER ELEVATIONS**

Well	Measurement Date	Measuring Point Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
Tailings Pond 5 POC Well	09/25/07	2965.32	68.87	2896.45
Tailings Pond 5 POC Well	12/26/07	2965.32	68.77	2896.55
Tailings Pond 5 POC Well	02/20/08	2965.32	68.22	2897.10
Tailings Pond 5 POC Well	04/22/08	2965.32	67.58	2897.74
Tailings Pond 5 POC Well	07/30/08	2965.32	67.74	2897.58
Tailings Pond 5 POC Well	10/22/08	2965.32	68.43	2896.89
Tailings Pond 5 POC Well	02/11/09	2965.32	67.37	2897.95
Tailings Pond 5 POC Well	06/02/09	2965.32	63.85	2901.47
Tailings Pond 5 POC Well	09/21/09	2965.32	65.45	2899.87
Tailings Pond 5 POC Well	11/30/09	2965.32	66.30	2899.02
Tailings Pond 5 POC Well	02/05/10	2965.32	66.46	2898.86
Tailings Pond 5 POC Well	05/10/10	2965.32	64.10	2901.22
Tailings Pond 5 POC Well	09/09/10	2965.32	64.95	2900.37
Tailings Pond 5 POC Well	11/30/10	2965.32	65.25	2900.07
Tailings Pond 5 POC Well	03/17/11	2965.32	64.87	2900.45
Tailings Pond 5 POC Well	06/23/11	2965.32	65.43	2899.89
Tailings Pond 5 POC Well	09/02/11	2965.32	66.24	2899.08
Tailings Pond 5 POC Well	11/15/11	2965.32	66.79	2898.53
Tailings Pond 5 POC Well	02/16/12	2965.32	66.74	2898.58
Tailings Pond 5 POC Well	06/01/12	2965.32	66.97	2898.35
Tailings Pond 5 POC Well	08/15/12	2965.32	67.58	2897.74
Tailings Pond 5 POC Well	11/08/12	2965.32	68.10	2897.22
Tailings Pond 5 POC Well-B	09/22/09	3024.58	96.30	2928.28
Tailings Pond 5 POC Well-B	12/01/09	3024.58	95.00	2929.58
Tailings Pond 5 POC Well-B	02/04/10	3024.58	96.38	2928.20
Tailings Pond 5 POC Well-B	05/10/10	3024.58	89.50	2935.08
Tailings Pond 5 POC Well-B	09/09/10	3024.58	93.56	2931.02
Tailings Pond 5 POC Well-B	11/30/10	3024.58	94.77	2929.81
Tailings Pond 5 POC Well-B	03/17/11	3024.58	95.27	2929.31
Tailings Pond 5 POC Well-B	06/23/11	3024.58	95.85	2928.73
Tailings Pond 5 POC Well-B	08/25/11	3024.58	96.65	2927.93
Tailings Pond 5 POC Well-B	11/15/11	3024.58	97.12	2927.46
Tailings Pond 5 POC Well-B	02/16/12	3024.58	97.31	2927.27
Tailings Pond 5 POC Well-B	06/01/12	3024.58	97.43	2927.15
Tailings Pond 5 POC Well-B	08/15/12	3024.58	97.73	2926.85
Tailings Pond 5 POC Well-B	11/08/12	3024.58	98.00	2926.58

Notes:

ft = feet

ft amsl = feet above mean sea level

**ATTACHMENT 3**  
**CONTOUR MAPS**  
**(on dvd)**

**ATTACHMENT 4**  
**ANALYTICAL RESULTS AND**  
**SUMMARY STATISTICS**

## **ANALYTICAL RESULTS**

TABLE 4-1a  
GROUNDWATER QUALITY RESULTS - MAJOR IONS, RADIOCHEMISTRY AND MISC. PARAMETERS

Well Name	Sample Date	Physical Parameters and Other Constituents										Major Anions and Cations						Radiochemistry								
		Field pH (SU)	Field SC (mS/cm)	Field Temperature (Celsius)	CO <sub>3</sub> <sup>-2</sup> (mg/L as CaCO <sub>3</sub> )	HCO <sub>3</sub> <sup>-</sup> (mg/L as CaCO <sub>3</sub> )	Total Alkalinity (mg/L as CaCO <sub>3</sub> )	TDS (mg/L)	Hardness (Dissolved) (mg/L)	Hardness (Total) (mg/L)	NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> +NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	Ca (mg/L)	Cl (mg/L)	F (mg/L)	K (mg/L)	Mg (mg/L)	Na (mg/L)	SO <sub>4</sub> (mg/L)	Gross Alpha** (pCi/L)	Adjusted Gross Alpha** (pCi/L)	RA226 (pCi/L)	RA228 (pCi/L)	RA226 + RA228 (calc) (pCi/L)	Combined Radium*** (pCi/L)
Unconfined Gila Unit																										
	AQL	--	--	--	--	--	--	--	--	--	--	10	--	--	4	--	--	--	--	15	15	--	--	5	5	
	AL	--	--	--	--	--	--	--	--	--	--	8	--	--	3.2	--	--	--	--	12	12	--	--	4	4	
	09/16/97	--	--	<0.5	150	--	1440	490	--	--	<0.5	--	150	36	<1	--	28	270	810	--	--	--	--	--	--	
	09/17/97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.3	--	<0.73	2	2	2	
	01/14/98	8.34	--	22.6	<25	170	170	702	170	--	--	1.6	--	50	53	<0.5	2	8.8	160	290	--	--	--	--	--	
	01/19/98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.6	--	<0.9	1.6	1.6	1.6	
	04/08/98	--	--	--	<25	140	140	711	190	--	--	<0.5	--	60	26	0.67	2.3	9.9	180	280	--	--	--	--	--	
	07/30/98	8.22	--	24.7	<25	170	170	471	72	--	--	<0.5	--	23	20	0.6	1.7	3.3	150	--	--	--	--	--	--	
	11/03/98	--	--	<25	170	170	366	29	--	--	0.2	--	9.5	24	0.69	1.4	1.3	120	55	--	--	--	--	--	--	
	03/05/99	8.23	400	22.7	2	160	160	500	78	--	--	--	0.12	25	22	0.7	1.5	3.8	150	160	--	--	--	--	--	--
	05/27/99	8.27	422	23.9	32	130	170	359	37	--	<0.1	0.1	--	12	20	0.67	1.6	1.8	130	73	--	--	--	--	--	--
	09/02/99	8.22	740	23.2	--	180	180	470	72	--	<0.1	<0.1	--	23	19	0.67	1.5	3.6	140	150	--	--	--	--	--	--
	11/18/99	8.15	551	23	--	180	180	380	42	--	<0.1	0.19	--	14	16	0.59	1.3	1.8	120	73	--	--	--	--	--	--
	03/03/00	8.02	537	21.4	2	160	170	346	29	--	<0.1	0.16	--	9.3	18	0.74	1.2	1.3	110	56	--	--	--	--	--	--
	05/25/00	7.74	508	24	5	160	160	286	24	--	<0.5	<0.5	--	6	20	2.7	3.8	2.3	95	47	--	--	--	--	--	--
	09/14/00	7.92	730	24.2	--	180	180	467	81	--	<1	<1	--	26	22	0.65	1.4	4	140	160	--	--	--	--	--	--
	01/18/01	8.19	540	20	--	170	170	507	100	--	--	--	0.07	33	26	0.66	1.5	5.4	140	200	--	--	--	--	--	--
	03/15/01	7.81	1140	13.7	--	170	170	559	130	--	<0.1	0.1	--	39	23	0.59	3.2	6.9	150	250	--	--	--	--	--	--
	06/07/01	7.96	360	23.8	--	180	180	429	71	--	<0.1	0.16	--	22	21	0.71	1.5	3.9	140	150	--	--	--	--	--	--
	10/25/01	8.43	380	22.1	--	160	160	461	83	--	<0.5	<0.5	--	26	19	0.81	1.5	4.5	140	170	--	--	--	--	--	--
	02/28/02	8.31	330	14.8	<25	180	180	421	63	--	<10	<10	--	20	23	0.68	1.5	3.1	120	120	--	--	--	--	--	--
	04/25/02	7.52	630	22.9	<25	170	170	426	19	--	--	0.14	3.1	22	0.7	1.2	0.43	80	110	--	--	--	--	--	--	
	08/01/02	7.57	350	23.7	<25	180	180	411	69	--	<0.1	0.21	--	22	26	0.65	1.5	3.4	130	100	--	--	--	--	--	--
	10/24/02	7.47	330	21.7	<5	160	160	442	60	--	<0.1	0.19	--	19	30	0.71	<2	3	120	68	--	--	--	--	--	--
	01/31/03	7.48	349	22.5	<5	180	180	435	63	--	<0.1	0.16	--	20	19	0.68	<1	3.2	120	130	--	--	--	--	--	--
	04/10/03	7.49	408	23.3	<10	190	190	530	88	--	<0.02	<0.5	--	27	19	<2.5	1.8	5.2	130	220	--	--	--	--	--	--
	07/31/03	8.26	648	25.7	42	140	180	430	50	--	<0.02	<0.5	--	16	18	0.55	<2	2.6	100	110	--	--	--	--	--	--
	11/06/03	8.02	551	23.1	27	150	180	340	35	--	<0.02	<0.5	--	11	18	0.56	1.4	1.7	110	75	--	--	--	--	--	--
	02/12/04	7.34	330	17.7	<5	180	180	410	43	--	<0.0015	0.185	--	14	19	0.49	1.5	2.3	110	110	--	--	--	--	--	--
	04/22/04	7.87	542	23.1	<20	180	180	360	34	--	<0.02	<0.5	--	11	20	0.55	1.3	1.7	110	76	--	--	--	--	--	--
	01/12/05	7.41	648	22.6	<5	180	190	470	66	--	<0.1	0.11	--	21	20	0.66	1.4	3.4	130	150	--	--	--	--	--	--
	06/30/05	7.62	612	26	<5	180	180	410	41	--	<0.1	0.15	--	13	19	0.59	1.7	1.9	110	100	--	--	--	--		

TABLE 4-1a  
GROUNDWATER QUALITY RESULTS - MAJOR IONS, RADIOCHEMISTRY AND MISC. PARAMETERS

Well Name	Sample Date	Physical Parameters and Other Constituents										Major Anions and Cations						Radiochemistry								
		Field pH (SU)	Field SC (mS/cm)	Field Temperature (Celsius)	CO <sub>3</sub> <sup>-2</sup> (mg/L as CaCO <sub>3</sub> )	HCO <sub>3</sub> <sup>-</sup> (mg/L as CaCO <sub>3</sub> )	Total Alkalinity (mg/L as CaCO <sub>3</sub> )	TDS (mg/L)	Hardness (Dissolved) (mg/L)	Hardness (Total) (mg/L)	NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> +NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	Ca (mg/L)	Cl (mg/L)	F (mg/L)	K (mg/L)	Mg (mg/L)	Na (mg/L)	SO <sub>4</sub> (mg/L)	Gross Alpha** (pCi/L)	Adjusted Gross Alpha** (pCi/L)	RA226 (pCi/L)	RA228 (pCi/L)	RA226 + RA228 (calc) (pCi/L)	Combined Radium*** (pCi/L)
MCC-3C	09/18/97	--	--	--	80	140	--	283	30	--	--	<0.5	--	4.6	6.9	<1	17	2.1	100	33	--	--	--	--	--	--
	10/21/97	6.45	--	26.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	01/16/98	9.4	--	27	<25	110	110	585	93	--	--	<0.5	--	34	13	1.5	3.8	1	150	240	--	--	--	--	--	--
	01/19/98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.5	--	1.3	<1.3	1.3	1	
	03/11/98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	04/10/98	--	--	--	<25	150	150	394	95	--	--	<1.25	--	36	11	2.7	1.5	1.1	110	75	--	--	--	--	--	--
	08/27/98	--	--	--	<25	160	160	286	24	--	--	--	0.6	9.5	11	3	1.1	<0.25	100	--	--	--	--	--	--	--
	11/05/98	--	--	--	<25	160	160	236	25	--	--	0.5	--	9.5	11	2.7	1.2	0.3	110	41	--	--	--	--	--	--
	03/03/99	8.39	460	30	24	140	160	291	19	--	--	0.4	--	7	10	2.5	1.3	0.3	100	38	--	--	--	--	--	--
	05/26/99	8.74	415	27	20	160	180	302	20	--	<0.1	0.6	--	7.5	11	2.9	1.5	0.36	98	27	--	--	--	--	--	--
MCC-3C	08/31/99	8.89	434	26	--	170	170	280	23	--	<0.1	0.65	--	8.5	11	2.3	1.6	0.34	86	24	--	--	--	--	--	--
	11/16/99	8.75	429	26.2	<25	180	180	270	34	--	<0.1	0.45	--	8	10	2.3	1.5	0.33	88	22	--	--	--	--	--	--
	03/01/00	8.18	416	23.6	4	160	160	289	17	--	<0.5	0.51	--	6.1	11	2.5	1.2	0.39	97	20	--	--	--	--	--	--
	05/23/00	8.43	4330	26.1	11	150	160	286	16	--	<0.5	0.65	--	5.4	12	2.5	<1	0.48	92	21	--	--	--	--	--	--
	09/12/00	8.48	430	25.4	13	140	150	238	15	--	<0.1	0.41	--	5.3	9.9	2.6	1.1	0.36	96	20	--	--	--	--	--	--
	01/16/01	8.14	470	23.3	2	160	160	249	18	--	<0.1	0.28	<0.05	6.5	13	2.6	1.1	0.38	89	22	--	--	--	--	--	--
	03/13/01	8.34	570	20.6	--	160	160	236	21	--	<0.1	0.29	--	7.7	13	2.6	<1	0.3	88	24	--	--	--	--	--	--
	06/05/01	8.67	250	25.4	--	160	160	269	17	--	<0.1	0.36	--	6.2	12	2.7	1.4	0.27	91	23	--	--	--	--	--	--
	10/23/01	7.85	440	26.8	8	150	160	257	14	--	<1	<1	--	4.8	13	0.99	<1	0.52	90	17	--	--	--	--	--	--
	02/26/02	8.16	275	24.7	<25	150	150	261	14	--	<0.5	<0.5	--	5.2	12	2.7	1	0.35	86	15	--	--	--	--	--	--
MCC-3C	04/23/02	9.09	310	27.2	<25	170	170	240	18	--	<1	<1	--	6.8	12	2.6	1.1	0.26	86	17	--	--	--	--	--	--
	07/30/02	8.68	440	28.2	<25	170	170	225	11	--	<0.1	0.43	--	4	15	2.4	<1	0.3	76	13	--	--	--	--	--	--
	10/22/02	8.46	220	24.9	20	140	160	257	10	--	<0.1	0.48	--	4.1	12	2.6	<2	<1	76	8	--	--	--	--	--	--
	01/29/03	8.73	494	26	16	130	150	223	11	--	<0.1	0.4	--	3.7	12	2.9	<1	0.33	80	15	--	--	--	--	--	--
	04/08/03	8.34	402	24.8	<10	160	160	270	12.9	--	<0.02	0.73	--	4.6	11	2.3	<1	<0.5	77	18	--	--	--	--	--	--
	07/29/03	9.27	434	27.8	<20	160	160	270	<10	--	<0.1	0.13	--	2	23	2.3	<2	<1	71	17	--	--	--	--	--	--
	11/04/03	9.08	402	23.9	62	100	160	270	10	--	<0.022	<0.5	--	3.6	10	2.3	<1	<1	70	16	--	--	--	--	--	--
	02/10/04	9.11	415	26.9	54	110	160	250	7.29	--	<0.069	0.334	--	2.7	11	2.7	<0.046	0.12	83	18	--	--	--	--	--	--
	04/20/04	7.82	500	26.8	39	140	170	270	15	--	<0.02	0.62	--	4.8	11	2.1	0.85	0.64	86	22	--	--	--	--	--	--
	01/11/05	8.22	400	23.4	<5	160	170	270	16	--	<0.02	<0.5	--	5.9	12	2.4	<1	<0.5	84	18	--	--	--	--	--	--
MCC-3C	06/28/05	8.94	448	29.1	32	150	180	300	11	--	<0.1	0.28	--	4	10	2.4	<1	<0.5	83	17	--	--	--	--	--	--
	09/22/05	7.52	436	26.6	6	160	170	250	10	--	<0.1	0.1	--	4.2	12	2.5	1.2	<0.5	88	18	--					

TABLE 4-1a  
GROUNDWATER QUALITY RESULTS - MAJOR IONS, RADIOCHEMISTRY AND MISC. PARAMETERS

Well Name	Sample Date	Physical Parameters and Other Constituents										Major Anions and Cations						Radiochemistry							
		Field pH (SU)	Field SC (mS/cm)	Field Temperature (Celsius)	CO <sub>3</sub> <sup>-2</sup> (mg/L as CaCO <sub>3</sub> )	HCO <sub>3</sub> <sup>-</sup> (mg/L as CaCO <sub>3</sub> )	Total Alkalinity (mg/L as CaCO <sub>3</sub> )	TDS (mg/L)	Hardness (Dissolved) (mg/L)	Hardness (Total) (mg/L)	NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> +NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	Ca (mg/L)	Cl (mg/L)	F (mg/L)	K (mg/L)	Mg (mg/L)	Na (mg/L)	SO <sub>4</sub> (mg/L)	Gross Alpha** (pCi/L)	Adjusted Gross Alpha** (pCi/L)	RA226 (pCi/L)	RA228 (pCi/L)	RA226 + RA228 (calc) (pCi/L)
MCC-4	06/06/01	8.24	520	26.3	17	93	110	550	<1	--	<0.5	<0.5	--	7.7	87	6.4	5.9	<0.25	190	180	--	--	--	--	--
	10/24/01	8.65	787	23.5	5.8	100	110	579	17	--	<1	<0.5	--	6.8	90	6	5.4	0.12	180	190	--	--	--	--	--
	02/27/02	8.48	890	24.8	<25	110	110	580	18	--	<0.1	<0.1	--	7.2	81	5.9	4.8	<0.25	170	160	--	--	--	--	--
	04/24/02	8.74	500	25.5	<25	120	120	543	20	--	<1	<1	--	8.2	77	6.5	4.9	<0.25	160	180	--	--	--	--	--
	07/31/02	8.44	890	25.3	<25	110	110	570	17	--	<0.1	<0.1	--	6.9	80	5.6	4.8	<0.25	170	160	--	--	--	--	--
	10/23/02	8.28	910	25.2	10	100	110	614	17	--	<0.1	<0.1	--	7	84	6.5	6.9	<1	170	130	--	--	--	--	--
	01/30/03	8.68	910	25.4	5	100	110	558	17	--	<0.1	<0.1	--	6.8	110	6.1	3.7	<0.25	170	160	--	--	--	--	--
	04/09/03	8.26	881	25.6	23	94	120	600	15	--	<0.02	<0.5	--	6	77	5.7	7.1	<0.5	170	210	--	--	--	--	--
	07/30/03	8.7	907	25.3	<20	120	120	610	17	--	<0.02	<0.5	--	6.4	71	5.6	6.6	<1	140	180	--	--	--	--	--
	11/05/03	8.64	909	25	43	81	120	590	19	--	<0.02	<0.5	--	7.2	65	5.3	7.5	<1	150	170	--	--	--	--	--
	02/11/04	8.33	672	23.4	<5	120	120	590	16	--	<0.0016	0.95	--	6.2	74	6	7.8	0.12	170	190	--	--	--	--	--
	04/21/04	8.24	909	24.9	31	89	120	610	18	--	<0.02	<0.5	--	6.8	68	5.1	6.5	0.25	180	170	--	--	--	--	--
	01/12/05	7.98	678	24.6	8	110	120	680	19	--	<0.1	<0.1	--	7.2	79	6.2	5.9	<0.5	180	180	--	--	--	--	--
	06/29/05	8.25	917	25.4	12	100	110	620	18	--	<0.1	<0.1	--	7.2	79	5.9	6	<0.5	160	190	--	--	--	--	--
	09/21/05	7.52	914	25.2	10	100	110	630	18	--	<0.1	<0.1	--	7.1	75	6.3	6.1	<0.5	150	180	--	--	--	--	--
	11/30/05	7.7	909	24.8	6	110	110	610	23	--	<0.1	<0.1	--	7.6	79	6.7	6.8	0.95	180	180	--	--	--	--	--
	03/08/06	8.13	738	24.6	<5	110	120	600	--	--	<0.1	<0.1	--	7.4	76	6.2	6.3	<0.5	180	180	--	--	--	--	--
	06/28/06	7.82	690	25.5	8	110	110	630	17	--	<0.1	<0.1	--	6.7	71	5.8	5.4	<0.5	180	210	--	--	--	--	--
	10/18/06	8.61	910	24.8	10	110	120	600	19	--	<0.1	<0.1	--	7.4	81	5.5	6.8	<0.5	220	190	--	--	--	--	--
	12/13/06	8.61	1278	24.87	24	89	110	640	--	--	<0.1	<0.1	--	8.1	80	6	5.9	0.44	190	200	--	--	--	--	--
	03/20/07	8.85	835	24.7	6	110	120	610	19	--	<0.1	<0.1	--	7.6	82	6.4	5.5	<0.5	190	--	--	--	--	--	
	6/26/2007*	8.31	822	26.6	--	--	--	--	--	<0.1	<0.1	--	--	--	6.4	--	--	--	2.3	--	<0.4	<0.3	<0.4	<0.4	<0.4
	09/25/07	8.97	687	24.1	--	--	--	--	--	<0.1	<0.1	--	--	--	6.4	--	--	--	2	--	<0.3	<0.3	<0.3	<0.3	<0.3
	12/27/07	7.61	867	21.9	--	--	--	--	--	<0.1	<0.1	--	--	--	6.3	--	--	--	1.6	--	<0.4	<0.4	<0.4	<0.4	<0.4
	02/21/08	8.51	933	21.65	--	--	--	--	--	<0.1	<0.1	--	--	--	6.5	--	--	--	1.1	--	<0.3	<0.3	<0.3	<0.3	<0.3
	04/22/08	8.49	786	23.5	--	--	--	--	--	<0.2	<0.2	--	--	--	6.5	--	--	--	0.8	--	<0.2	<0.3	<0.3	<0.3	<0.3
	07/28/08	8.09	980	24.3	--	--	--	--	--	<0.1	<0.2	--	--	--	7	--	--	--	2.1	--	<0.3	<0.3	<0.3	<0.3	<0.3
	10/21/08	8.57	828	23.1	--	--	--	--	--	<0.1	<0.2	--	--	--	7	--	--	--	1.4	--	<0.3	<0.4	<0.4	<0.4	<0.4
	02/10/09	8.62	658	17.1	--	--	--	--	--	<0.2	<0.2	--	--	--	5.7	--	--	--	1.1	--	<0.2	<0.4	<0.4	<0.4	<0.4
	06/02/09	8.58	647	24.2	--	--	--	--	--	<0.2	<0.2	--	--	--	5.4	--	--	--	1.8	--	<0.2	<0.4	<0.4	<0.4	<0.4
	09/22/09	8.63	647	24.2	--	--	--	--	--	--	--	--	--	--	2.9	--	<1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3		
	12/14/09	8.51	703	22.4	--	--	--	--	--	<0.2	<0.2	--	--	--											

TABLE 4-1a  
GROUNDWATER QUALITY RESULTS - MAJOR IONS, RADIOCHEMISTRY AND MISC. PARAMTERS

Well Name	Sample Date	Physical Parameters and Other Constituents										Major Anions and Cations						Radiochemistry								
		Field pH (SU)	Field SC (mS/cm)	Field Temperature (Celsius)	CO <sub>3</sub> <sup>-2</sup> (mg/L as CaCO <sub>3</sub> )	HCO <sub>3</sub> <sup>-</sup> (mg/L as CaCO <sub>3</sub> )	Total Alkalinity (mg/L as CaCO <sub>3</sub> )	TDS (mg/L)	Hardness (Dissolved) (mg/L)	Hardness (Total) (mg/L)	NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> +NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	Ca (mg/L)	Cl (mg/L)	F (mg/L)	K (mg/L)	Mg (mg/L)	Na (mg/L)	SO <sub>4</sub> (mg/L)	Gross Alpha** (pCi/L)	Adjusted Gross Alpha** (pCi/L)	RA226 (pCi/L)	RA228 (pCi/L)	RA226 + RA228 (calc) (pCi/L)	Combined Radium*** (pCi/L)
MCC-9	05/23/00	7.23	1580	22.6	<25	220	220	740	--	<2	2.4	--	210	48	<0.4	4.3	52	86	630	--	--	--	--	--	--	
	09/12/00	7.05	1620	23.3	--	230	230	1240	850	--	<1	1.2	--	240	41	<0.4	4.7	62	90	660	--	--	--	--	--	--
	01/17/01	--	1460	19.3	--	240	240	1270	848	--	--	--	0.78	230	49	<0.4	4.3	64	83	670	--	--	--	--	--	--
	03/13/01	6.78	2340	19.5	--	230	230	1410	920	--	<0.1	0.86	--	250	41	<0.4	4.5	73	84	800	--	--	--	--	--	--
	06/05/01	7.02	830	23.4	--	230	230	1290	570	--	<1	<1	--	230	44	<0.4	1.6	56	81	910	--	--	--	--	--	--
	10/23/01	6.57	1580	23.2	--	230	230	1320	780	--	<2	<2	--	210	41	1	3.9	62	74	700	--	--	--	--	--	--
	02/26/02	7.05	1150	22.1	<25	230	230	1220	760	--	<1	1	--	220	44	<0.4	4.1	50	77	530	--	--	--	--	--	--
	04/23/02	7.36	1430	23.4	<25	230	230	1090	700	--	<1	<1	--	200	37	<0.4	4.2	49	77	560	--	--	--	--	--	--
	07/30/02	7.35	1480	23.4	<25	230	230	1260	700	--	<0.5	0.96	--	190	46	<0.4	4.5	51	70	640	--	--	--	--	--	--
	10/22/02	7.08	810	24.2	<5	220	220	1210	820	--	<0.5	0.98	--	220	41	<0.4	5.5	66	72	540	--	--	--	--	--	--
	01/29/03	7.02	1340	21.5	<5	220	220	1220	680	--	<1	0.8	--	190	55	<0.4	4.2	51	74	610	--	--	--	--	--	--
	04/08/03	6.93	1350	22.6	<10	240	240	1200	680	--	<0.02	1.2	--	180	35	<2.5	5.5	52	66	640	--	--	--	--	--	--
	07/29/03	7.36	1380	24.1	<20	230	230	1200	700	--	<0.02	0.92	--	190	31	<0.5	5	55	86	490	--	--	--	--	--	--
	11/04/03	6.83	1390	23.2	<5	240	240	1300	740	--	<0.02	0.89	--	200	30	<0.5	5.2	60	88	600	--	--	--	--	--	--
	02/10/04	6.99	1350	22.9	<5	240	240	1200	660	--	<0.0015	0.9	--	180	31	0.24	5.9	51	70	570	--	--	--	--	--	--
	04/20/04	7.32	1370	22.7	<5	250	250	1200	680	--	<0.02	0.95	--	180	30	<0.5	5	53	92	560	--	--	--	--	--	--
	01/11/05	7.4	1240	20.7	<5	240	240	1300	760	--	<0.02	0.83	--	210	37	0.18	4.2	56	75	650	--	--	--	--	--	--
	06/28/05	7.05	1350	24.3	<5	240	240	1200	710	--	<0.1	0.83	--	200	39	0.15	4.5	49	69	580	--	--	--	--	--	--
	09/20/05	7.11	1470	24.9	<5	240	240	1300	780	--	<0.1	0.88	--	220	35	0.2	4.8	55	68	630	--	--	--	--	--	--
	11/30/05	6.64	1370	23.3	<5	240	240	1200	730	--	<0.1	0.91	--	210	38	0.27	5.2	53	79	590	--	--	--	--	--	--
	03/07/06	7.31	1290	21.9	<5	240	240	1200	--	--	<0.1	0.89	--	210	38	0.18	4.8	50	81	630	--	--	--	--	--	--
	06/27/06	6.94	1370	23.3	<5	240	240	1200	720	--	<0.1	0.74	--	210	35	0.14	4.3	48	81	590	--	--	--	--	--	--
	10/17/06	7.36	1630	22.5	<5	240	240	1200	670	--	<0.1	0.9	--	190	39	0.22	6.2	47	82	630	--	--	--	--	--	--
	12/12/06	7.18	2019	21.37	<5	240	240	1200	--	--	<0.1	0.85	--	210	36	0.2	4.2	50	81	610	--	--	--	--	--	--
	03/20/07	7.4	1410	22.2	<5	230	230	1200	680	--	<0.1	0.93	--	200	39	0.17	4.5	45	85	690	--	--	--	--	--	--
	6/26/2007*	3.6	1420	25.2	--	--	--	--	--	<0.1	0.82	--	--	2	--	--	--	--	11	--	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	09/26/07	7.52	1410	22.6	--	--	--	--	--	<0.1	0.91	--	--	0.18	--	--	--	--	--	--	--	--	--	--	--	--
	12/27/07	7.56	1380	20.6	--	--	--	--	--	<0.1	0.87	--	--	0.17	--	--	--	--	9.5	--	<0.5	<0.4	<0.5	<0.5	<0.5	<0.5
	02/19/08	7.07	1433	22.27	--	--	--	--	--	<0.1	0.9	--	--	0.19	--	--	--	--	9.4	--	<0.3	<0.4	<0.4	<0.4	<0.4	<0.4
	04/21/08	7.05	1370	22.5	--	--	--	--	--	<0.2	0.91	--	--	0.24	--	--	--	--	8.7	--	<0.2	<0.3	<0.3	<0.3	<0.3	<0.3
	07/28/08	7.02	1460	23.1	--	--	--	--	--	<0.1	0.91	--	--	0.22	--	--	--	--	8.4	--						

TABLE 4-1a  
GROUNDWATER QUALITY RESULTS - MAJOR IONS, RADIOCHEMISTRY AND MISC. PARAMETERS

Well Name	Sample Date	Physical Parameters and Other Constituents										Major Anions and Cations						Radiochemistry								
		Field pH (SU)	Field SC (mS/cm)	Field Temperature (Celsius)	CO <sub>3</sub> <sup>-2</sup> (mg/L as CaCO <sub>3</sub> )	HCO <sub>3</sub> <sup>-</sup> (mg/L as CaCO <sub>3</sub> )	Total Alkalinity (mg/L as CaCO <sub>3</sub> )	TDS (mg/L)	Hardness (Dissolved) (mg/L)	Hardness (Total) (mg/L)	NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> +NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	Ca (mg/L)	Cl (mg/L)	F (mg/L)	K (mg/L)	Mg (mg/L)	Na (mg/L)	SO <sub>4</sub> (mg/L)	Gross Alpha** (pCi/L)	Adjusted Gross Alpha** (pCi/L)	RA226 (pCi/L)	RA228 (pCi/L)	RA226 + RA228 (calc) (pCi/L)	Combined Radium*** (pCi/L)
11/17/11	7.3	1207	22.1	<6	210	210	1500	1100	--	--	--	1.11	310	78	0.22	4.4	81	54	840	5.3	--	<0.3	<0.4	<0.4	<0.4	
	6.44	13700	16.86	<6	850	850	19000	13000	--	--	--	0.34	390	210	3.6	45	2900	660	16000	109	<1	<0.2	0.6	0.6	0.6	
	7.09	9133	27.09	<6	720	720	12000	8300	--	--	--	0.093	480	110	6	36	1700	360	8500	23	<1	<0.2	<0.4	<0.4	<0.4	
	7.08	9991	29.57	--	--	--	--	--	--	--	--	--	--	--	--	5.8	--	--	--	--	--	--	--	--	--	
	7.21	10100	27.29	<6	730	730	12000	8300	--	--	--	0.42	500	120	5.4	44	1700	390	9200	16	<1	<0.3	<0.4	<0.4	<0.4	
	7.04	10450	28.21	<6	750	750	12000	8700	--	--	--	0.25	490	110	5.5	43	1800	370	8700	<0.3	--	<0.4	<0.4	<0.4	<0.4	
	7.06	1074	26.06	<6	730	730	12000	8700	--	--	--	0.17	520	100	6	45	1800	400	8700	11.9	<1	<0.3	<0.3	<0.3	<0.3	
	--	--	<6	--	780	780	12000	8700	--	<1	<1	--	490	110	6.3	37	1800	360	8700	--	--	--	--	--	--	
	7.24	10180	23.83	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19	3.7	<0.5	<0.4	<0.5	<0.5	
	7.09	9810	20.45	<6	720	720	12000	--	--	--	--	1.6	470	110	5.6	35	1900	370	9600	14.5	2.4	0.4	<0.4	0.4	0.4	
	7.09	9810	20.45	<6	720	720	12000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
<b>Fractured Bedrock Unit</b>																										
500 YD	AQL	--	--	--	--	--	--	--	--	--	--	10	--	--	4	--	--	--	--	15	15	--	--	5	5	
	AL	--	--	--	--	--	--	--	--	--	--	--	--	--	3.2	--	--	--	--	12	12	--	--	4	4	
	10/23/08	7.33	3240	21.2	<6	170	170	2000	--	1300	<0.1	6.5	--	380	13	0.28	5	75	110	1200	137	4.5	<0.3	<0.3	<0.3	<0.3
	02/11/09	7.28	2250	20.6	<6	170	170	1900	1200	--	<0.2	6.4	--	360	13	0.29	6.5	68	100	1300	146.8	8.4	<0.2	<0.3	<0.3	<0.3
	06/03/09	7.25	2170	25.3	<6	180	180	2000	--	1300	<0.2	6.4	--	380	13	0.29	4.7	72	110	1300	132.9	1.8	<0.8	<0.8	<0.8	<0.8
	09/23/09	6.6	2190	25.1	<6	170	170	2300	--	1300	<0.2	6.6	--	440	13	0.23	4.9	84	120	1400	132.6	5.2	<0.3	<0.4	<0.4	<0.4
	12/01/09	6.85	2770	22	<6	180	180	2500	--	1300	<0.2	7	--	400	190	0.31	18	76	140	1300	121.4	5.5	<0.3	<0.5	<0.5	<0.5
	02/05/10	6.49	3310	21.6	<6	180	180	2600	--	1300	<4	9.1	--	420	250	0.5	35	80	200	1300	113.8	<1	<0.5	<0.4	<0.5	<0.5
	09/24/10	6.91	2081	24.8	<6	160	160	2200	1500	1300	<0.2	9.7	--	470	100	0.24	8.7	84	140	1300	116	<1	<0.3	<0.5	<0.5	<0.5
	11/11/10	6.86	2082	25.6	<6	170	170	2200	1300	1300	<0.2	10	--	400	79	0.28	6.4	77	120	1300	--	--	--	--	--	--
	03/17/11	7.13	1826	29.9	<6	170	170	2300	1300	--	<0.2	9.1	--	410	53	0.26	4.6	79	110	1400	97	<1	<0.5	<0.5	<0.5	<0.5
	06/22/11	7.32	2185	27.11	<6	170	170	2400	1400	--	<0.2	9.8	--	440	41	0.21	5.1	80	120	1400	113.5	4.1	<0.2	<0.4	<0.4	<0.4
	08/31/11	7.52	2150	26.78	<6	160	160	2500	1400	--	<0.2	10	--	440	34	0.2	5.7	79	110	1600	122.9	<1	<0.2	<0.4	<0.4	<0.4
	8/24/2012*	--	--	--	--	--	--	--	--	--	--	11	--	530	--	--	4.7	100	120	--	--	--	--	--	--	
	08/28/12	7.05	3058	27.62	<6	160	160	3100	--	--	--	11	--	29	0.2	--	--	--	2100	137	<1	<0.4	<0.5	<0.5	<0.5	
	10/09/12	7.13	3214	26.27	--	--	--	--	--	--	--	12	--	--	--	--	--	--	--	--	--	--	--	--		
	11/14/12	7.33	2984	25.05	<6	150	150	2900	1800	--	<0.2	12	--	540	25	0.2	5.3	100	130	1800	--	--	--	--	--	
	12/18/12	7.02	2862	22.34	--	--	--	--	--	1800	--	<0.2	12	--	560	--	--	5.3	100	130	--	--	--	--	--	
<b>Tailings Porewater</b>																										

**TABLE 4-1b**  
**GROUNDWATER QUALITY RESULTS FOR METAL**

Well Name	Sample Date	Dissolved Metals (mg/L)																		
		Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Mn	Hg	Mo	Ni	Pb	Se	Ag	Tl	Zn
Unconfined Gila Unit																				
MCC-6C	AQL	--	0.006	0.05	2	0.004	0.005	0.1	--	--	--	--	0.002	--	0.1	0.05	0.05	--	0.002	--
	AL	--	0.0048	0.04	1.6	0.0032	0.004	0.08	--	--	--	--	0.0016	--	0.08	0.04	0.04	--	0.0016	--
	09/16/97	<0.025	<0.001	0.003	0.02	<0.0025	<0.0025	<0.005	<0.005	<0.0025	0.03	0.023	<0.0002	0.016	<0.02	<0.001	<0.001	<0.005	<0.001	0.021
	09/17/97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	01/14/98	<0.025	<0.001	0.007	0.017	<0.001	<0.0025	<0.005	<0.005	<0.0025	<0.05	0.071	<0.0002	0.025	<0.02	0.001	0.001	<0.005	<0.001	<0.05
	01/19/98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/08/98	<0.025	<0.001	0.006	0.013	<0.0005	<0.002	<0.005	<0.005	0.008	<0.05	0.086	<0.0002	0.023	<0.02	<0.001	0.002	<0.005	<0.0001	<0.05
	07/30/98	<0.025	<0.001	0.011	0.0061	<0.0025	<0.002	<0.005	<0.005	<0.0025	<0.05	0.01	<0.0002	0.022	<0.02	<0.001	0.0014	<0.005	<0.001	<0.05
	11/03/98	<0.025	<0.001	0.012	0.0027	<0.0025	<0.002	<0.005	<0.005	<0.0025	<0.05	<0.0025	<0.0002	0.022	<0.02	0.0024	0.001	<0.005	<0.0005	<0.05
	03/05/99	<0.025	<0.005	0.0086	0.0059	<0.0025	<0.002	<0.005	<0.005	<0.0025	<0.05	<0.0025	<0.0002	0.019	<0.02	<0.005	<0.005	<0.005	<0.0025	<0.05
	05/27/99	<0.025	<0.001	0.014	0.0031	<0.0025	<0.002	<0.005	<0.005	<0.0025	<0.05	0.006	<0.0002	0.022	<0.02	<0.001	<0.001	<0.005	<0.0005	<0.05
	09/02/99	0.039	<0.001	0.011	0.0065	<0.0025	<0.002	<0.005	<0.005	<0.0025	<0.05	0.0043	<0.0002	0.018	<0.02	<0.001	<0.001	<0.005	<0.0005	<0.05
	11/18/99	<0.025	<0.001	0.014	0.0027	<0.0025	<0.002	<0.005	<0.005	0.0023	<0.05	0.0041	<0.0002	0.022	<0.02	<0.001	<0.001	<0.005	<0.0005	<0.05
	03/03/00	0.055	<0.001	0.016	0.0027	<0.0025	<0.002	<0.005	<0.00055	0.018	<0.03	<0.0025	<0.0002	0.02	<0.02	0.0011	<0.001	<0.005	<0.0005	<0.05
	05/25/00	0.035	0.0022	0.06	0.011	<0.0025	<0.002	<0.005	<0.005	<0.0025	0.062	0.0059	<0.0002	0.0073	<0.02	<0.001	<0.001	<0.005	<0.0005	<0.05
	09/14/00	<0.025	<0.001	0.014	0.0045	<0.0025	<0.002	<0.005	<0.005	<0.0025	<0.05	<0.0025	<0.0002	0.018	<0.02	<0.001	0.0013	<0.005	<0.0005	<0.05
	01/18/01	<0.025	<0.001	0.011	0.0053	<0.0025	<0.002	<0.005	<0.005	<0.0025	<0.05	<0.0025	<0.0002	0.016	<0.02	<0.001	<0.001	<0.005	<0.0005	<0.05
	03/15/01	0.17	<0.001	0.014	0.88	<0.002	<0.002	<0.005	<0.005	<0.0025	0.066	<0.0025	<0.0002	0.017	<0.02	<0.001	0.0019	<0.005	<0.0005	0.47
	06/07/01	0.18	<0.001	0.012	0.0036	<0.002	<0.002	<0.005	<0.005	<0.0025	0.096	0.0052	<0.0002	0.02	<0.02	<0.001	0.0011	<0.005	<0.0005	<0.05
	10/25/01	<0.025	<0.001	0.011	0.0077	<0.002	<0.002	<0.005	<0.005	<0.0025	<0.05	<0.0025	<0.0002	0.014	<0.02	<0.001	0.0014	<0.005	<0.0005	<0.05
	02/28/02	<0.025	<0.001	0.01	0.0034	<0.0025	<0.0025	<0.005	<0.005	<0.002	<0.05	<0.0025	<0.0002	0.013	<0.02	<0.001	<0.001	<0.005	<0.001	<0.05
	04/25/02	0.034	<0.001	0.024	0.0031	<0.0025	<0.0025	<0.005	<0.005	0.0055	0.06	0.0058	<0.0002	0.0073	<0.02	<0.001	<0.001	<0.005	<0.001	<0.05
	08/01/02	<0.025	<0.001	0.01	0.0029	<0.0025	<0.0025	<0.005	<0.005	<0.002	<0.05	<0.0025	<0.0002	0.011	<0.02	<0.001	<0.001	<0.005	<0.001	<0.05
	10/24/02	<0.1	<0.003	0.013	<0.01	<0.001	<0.003	<0.01	<0.01	<0.01	<0.1	<0.01	<0.0002	0.015	<0.01	<0.003	<0.006	<0.005	<0.001	<0.05
	01/31/03	<0.025	<0.001	0.015	<0.0025	<0.0025	<0.005	<0.005	<0.002	<0.05	<0.0025	<0.0002	0.011	<0.02	<0.001	<0.001	<0.005	<0.001	<0.05	
	04/10/03	<0.05	<0.005	0.0088	<0.005	<0.0005	<0.0015	<0.005	<0.005	<0.005	<0.05	<0.005	<0.0002	0.013	<0.05	<0.005	<0.005	<0.0025	<0.025	
	07/31/03	<0.05	<0.001	0.012	<0.005	<0.0005	<0.0015	<0.005	<0.005	<0.005	<0.05	<0.005	<0.0002	0.014	<0.05	<0.001	<0.001	<0.0025	<0.0005	<0.05
	11/06/03	0.1	<0.001	0.014	<0.005	<0.0005	<0.0015	<0.005	<0.005	<0.005	<0.05	<0.005	<0.0002	0.013	<0.05	<0.001	<0.001	<0.0025	<0.001	0.0076
	02/12/04	<0.028	<0.001	0.014	0.0027	<0.00005	0.00064	0.0014	<0.0008	<0.0028	<0.012	0.0018	<0.00008	0.015	<0.001	<0.001	<0.001	<0.0004	<0.001	<0.003

**TABLE 4-1b**  
**GROUNDWATER QUALITY RESULTS FOR METAL**

Well Name	Sample Date	Dissolved Metals (mg/L)																		
		Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Mn	Hg	Mo	Ni	Pb	Se	Ag	Tl	Zn
MCC-6D	11/30/10	--	<0.003	0.024	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	03/24/11	<0.2	<0.003	0.024	<0.01	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	0.021	<0.01	<0.001	<0.002	--	<0.001	<0.05
	06/28/11	--	<0.003	0.025	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	09/01/11	--	<0.003	0.024	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	11/18/11	--	<0.006	0.025	<0.01	<0.001	<0.002	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.002	<0.004	--	<0.002	--
	02/20/12	--	<0.003	0.024	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	06/05/12	--	<0.003	0.027	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	08/21/12	--	<0.003	0.024	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	11/27/12	--	<0.003	0.023	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.003	--	<0.001	--
	AWQS	--	<b>0.006</b>	<b>0.05</b>	<b>2</b>	<b>0.004</b>	<b>0.005</b>	<b>0.1</b>	--	--	--	--	<b>0.002</b>	--	<b>0.1</b>	<b>0.05</b>	<b>0.05</b>	--	<b>0.002</b>	--
TP5-POC-B	08/09/12	<0.2	<0.012	0.011	0.029	<0.001	<0.001	0.062	--	0.012	<0.1	23	<0.0002	<0.01	0.022	<0.002	<0.008	--	<0.002	<0.05
	08/23/12	<0.2	<0.006	0.0042	0.027	0.0013	<0.001	0.065	--	<0.01	<0.1	22	<0.0002	<0.01	0.021	<0.001	0.002	--	<0.001	<0.05
	11/27/12	<0.2	<0.003	0.0053	0.025	<0.001	<0.001	<0.01	--	<0.01	<0.1	20	<0.0002	<0.01	0.021	<0.001	<0.003	--	<0.001	<0.05
	AQL	--	<b>0.006</b>	<b>0.05</b>	<b>2</b>	<b>0.004</b>	<b>0.005</b>	<b>0.1</b>	--	--	--	--	<b>0.002</b>	--	<b>0.1</b>	<b>0.05</b>	<b>0.05</b>	--	<b>0.002</b>	--
	AL	--	<b>0.0048</b>	<b>0.04</b>	<b>1.6</b>	<b>0.0032</b>	<b>0.004</b>	<b>0.08</b>	--	--	--	--	<b>0.0016</b>	--	<b>0.08</b>	<b>0.04</b>	<b>0.04</b>	--	<b>0.0016</b>	--
	06/24/09	<0.2	<0.003	0.0028	0.058	<0.001	<0.001	<0.01	--	<0.01	<0.05	0.059	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	09/23/09	<0.2	<0.003	0.0027	0.07	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	12/15/09	<0.2	<0.003	0.0025	0.057	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	02/04/10	<0.2	<0.003	0.0026	0.052	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	05/10/10	<0.2	<0.003	0.0026	0.048	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	09/09/10	<0.2	<0.003	0.0026	0.049	<0.001	<0.001	<0.01	--	0.011	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
Confined Gila Unit	11/30/10	<0.2	<0.003	0.0025	0.041	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	03/17/11	<0.2	0.00025	0.0028	0.037	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	06/23/11	<0.2	<0.003	0.0027	0.039	<0.001	<0.001	<0.01	--	0.012	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0024	--	<0.001	0.11
	08/25/11	<0.2	<0.015	0.0024	0.037	<0.001	<0.005	<0.01	--	0.011	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.005	<0.01	--	<0.005	<0.05
	11/16/2011*	<0.2	<0.003	0.0027	0.039	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	02/22/12	<0.2	<0.003	0.0024	0.034	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	06/06/12	<0.2	<0.003	0.0026	0.035	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	08/21/12	<0.2	<0.003	0.0026	0.035	<0.001	<0.001	<0.01	--	<0.01	<0.1	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	11/20/12	<0.2	<0.003	<0.003	0.029	<0.001	<0.001	<0.01	--	<0.01	<0.1	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.001	--	<0.001	<0.05
	AQL	--	<b>0.006</b>	<b>0.2</b>	<b>2</b>	<b>0.004</b>	<b>0.005</b>	<b>0.1</b>	--	--	--	--	<b>0.002</b>	--	<b>0.1</b>	<b>0.05</b>	<b>0.05</b>	--	<b>0.002</b>	--
	AL	--	<b>0.0048</b>	--	<b>1.6</b>	<b>0.0032</b>	<b>0.004</b>	<b>0.08</b>	--	--	--	--	<b>0.0016</b>	--	<b>0.08</b>	<b>0.04</b>	<b>0.04</b>	--	<b>0.0016</b> </td	

**TABLE 4-1b**  
**GROUNDWATER QUALITY RESULTS FOR METAL**

Well Name	Sample Date	Dissolved Metals (mg/L)																		
		Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Mn	Hg	Mo	Ni	Pb	Se	Ag	Tl	Zn
MCC-3C	04/23/02	0.052	0.002	0.14	0.0096	<0.0025	<0.0025	<0.005	<0.005	0.0077	0.075	0.0076	<0.0002	0.013	<0.02	0.0017	<0.001	<0.005	<0.001	0.16
	07/30/02	<0.025	0.0026	0.17	0.0049	<0.0025	<0.0025	<0.005	<0.005	0.0085	<0.05	0.0061	<0.0002	0.015	<0.02	0.0025	<0.001	<0.005	<0.001	0.096
	10/22/02	<0.1	<0.003	0.14	<0.01	<0.001	<0.003	<0.01	<0.01	0.022	<0.1	<0.01	--	0.015	<0.01	<0.003	<0.003	<0.005	<0.001	<0.05
	01/29/03	<0.025	0.002	0.16	0.0028	<0.0025	0.0028	<0.005	<0.005	0.0089	0.076	0.0065	<0.0002	0.019	<0.02	0.0013	<0.001	<0.005	<0.001	<0.05
	04/08/03	<0.05	<0.005	0.15	0.0058	<0.0005	<0.0015	<0.005	<0.005	<0.005	0.093	0.013	<0.0002	0.016	<0.005	<0.005	<0.005	<0.025	<0.025	0.053
	07/29/03	<0.05	<0.001	0.16	<0.005	0.00065	0.007	<0.005	<0.005	<0.005	0.065	<0.005	<0.0002	0.015	<0.005	0.001	<0.001	0.0056	<0.0005	<0.05
	11/04/03	0.085	<0.001	0.14	0.006	<0.0005	<0.0015	<0.005	0.0078	0.0051	0.13	0.018	<0.0002	0.015	<0.005	<0.001	<0.001	<0.025	<0.001	0.089
	02/10/04	0.055	0.0018	0.17	0.0098	0.0015	0.0088	0.0094	<0.0008	0.013	0.11	0.0097	<0.00008	0.016	<0.001	0.0018	<0.001	<0.0004	<0.001	0.046
	04/20/04	<0.013	0.0011	0.16	0.0056	<0.0003	0.00088	<0.0006	0.004	0.061	0.007	<0.0002	0.016	<0.001	0.001	<0.001	<0.0006	<0.001	0.044	
	01/11/05	<0.5	0.0027	0.14	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	0.0014	<0.002	<0.005	<0.001	0.088
	06/28/05	<0.5	<0.002	0.16	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	09/22/05	<0.5	0.0028	0.14	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	11/29/05	<0.5	<0.002	0.15	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	03/07/06	<0.5	<0.002	0.17	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	06/27/06	<0.5	<0.002	0.16	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	10/17/06	<0.5	<0.002	0.18	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	12/12/06	<0.05	<0.002	0.18	<0.01	<0.002	<0.005	<0.01	<0.01	<0.04	<0.02	<0.0002	<0.02	<0.01	<0.001	<0.002	<0.01	<0.001	<0.02	
	03/20/07	<0.5	<0.002	0.16	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	0.057
	6/26/2007*	--	<0.002	0.16	<0.01	<0.004	<0.005	<0.01	--	--	--	--	<0.0002	--	<0.05	<0.001	<0.002	--	<0.001	--
	09/26/07	--	<0.002	0.17	<0.01	<0.004	<0.005	<0.01	--	--	--	--	<0.0002	--	<0.05	<0.001	<0.002	--	<0.001	--
	12/27/07	--	<0.002	0.19	<0.01	<0.004	<0.005	<0.01	--	--	--	--	<0.0002	--	<0.05	<0.001	<0.002	--	<0.001	--
	02/21/08	--	<0.003	0.17	<0.01	<0.004	<0.005	<0.01	--	--	--	--	<0.0002	--	<0.05	<0.001	<0.002	--	<0.001	--
	04/22/08	--	<0.003	0.16	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	07/28/08	--	<0.003	0.15	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	10/21/08	--	<0.003	0.15	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	02/09/09	--	<0.003	0.15	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	06/01/09	--	<0.003	0.15	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	09/21/09	--	<0.003	0.13	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	12/14/09	--	<0.003	0.14	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	02/03/10	--	<0.003	0.14	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--
	05/11/10	--	<0.003	0.15	<0.01	<0.001	<0.001	<0.01	--	--	--	--	0.00029	--	<0.01	<0.001	<0.002	--	<0.001	--
	09/24/10	--	<0.003	0.14	<0.01	<0.001	<0.001	<0.01	--	--										

**TABLE 4-1b**  
**GROUNDWATER QUALITY RESULTS FOR METAL**

Well Name	Sample Date	Dissolved Metals (mg/L)																		
		Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Mn	Hg	Mo	Ni	Pb	Se	Ag	Tl	Zn
MCC-4	01/16/98	<0.025	<0.001	0.002	0.0044	<0.001	<0.0025	<0.005	<0.005	<0.0025	<0.05	0.018	<0.0002	1.1	<0.02	0.002	<0.001	<0.005	<0.001	<0.05
	01/19/98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/10/98	0.4	<0.001	0.004	0.0043	<0.0005	<0.002	<0.005	<0.005	<0.0025	0.23	0.034	<0.0002	1.1	<0.02	<0.001	<0.001	<0.005	<0.0001	<0.05
	07/31/98	0.19	0.0018	0.0045	0.0047	<0.0025	<0.002	<0.005	<0.005	<0.0025	0.17	0.037	<0.0002	1	<0.02	<0.001	0.0054	<0.005	<0.001	<0.05
	11/05/98	0.14	<0.001	0.0049	0.0034	<0.0025	<0.002	<0.005	<0.005	<0.0025	0.089	<0.0025	<0.0002	1.1	<0.02	0.0028	0.0023	<0.005	<0.0005	<0.05
	03/05/99	0.051	<0.005	<0.005	0.0038	<0.0025	<0.002	<0.005	<0.005	<0.0025	0.06	0.014	<0.0002	1.1	<0.02	<0.005	<0.005	<0.005	<0.025	<0.05
	05/26/99	0.22	<0.001	0.0036	<0.0025	<0.0025	<0.002	0.006	<0.005	<0.0025	0.17	0.012	<0.0002	1.1	<0.02	<0.001	0.0025	<0.005	<0.0005	<0.05
	09/01/99	0.12	<0.001	0.0022	0.0042	<0.0025	<0.002	<0.005	<0.005	0.0039	0.15	0.015	<0.0002	1.1	<0.02	<0.001	0.0032	<0.005	<0.0005	<0.05
	11/17/99	<0.025	<0.001	0.0039	0.0032	<0.0025	<0.002	<0.005	<0.005	0.0027	<0.05	0.0054	<0.0002	1.3	<0.02	<0.001	<0.001	<0.005	<0.0005	<0.05
	03/02/00	0.05	<0.001	0.0042	0.0026	<0.0025	<0.002	<0.005	<0.00055	<0.0025	<0.03	0.0089	<0.0002	1.2	<0.02	<0.001	0.005	<0.005	<0.0005	<0.05
	05/24/00	0.13	<0.001	0.0037	0.0033	<0.005	<0.004	<0.01	<0.01	<0.005	0.099	0.0082	<0.0002	<0.01	<0.04	<0.001	0.0037	<0.01	<0.0005	<0.1
	09/12/00	0.18	0.0025	0.004	0.0032	<0.0025	<0.002	<0.005	<0.005	<0.0025	0.094	0.011	<0.0002	1.1	<0.02	<0.001	0.0015	<0.005	<0.0005	<0.05
	01/18/01	0.11	<0.001	0.0027	0.0036	<0.0025	<0.002	<0.005	<0.005	<0.0025	0.068	0.0051	<0.0002	1.1	<0.02	<0.001	0.0013	<0.005	<0.0005	<0.05
	03/14/01	0.31	<0.001	0.0049	0.0032	<0.0025	<0.002	<0.005	<0.005	<0.0025	0.17	0.02	<0.0002	1.1	<0.02	0.0036	0.0042	<0.005	<0.0005	<0.05
	06/06/01	0.2	<0.001	<0.001	0.004	<0.002	<0.002	<0.005	<0.005	0.0078	0.11	<0.0025	<0.0002	1.2	<0.02	<0.001	0.0039	<0.005	<0.0005	<0.05
	10/24/01	0.17	<0.001	0.0028	0.0037	<0.002	<0.0025	<0.005	<0.005	<0.0025	0.12	0.0094	<0.0002	1	<0.02	<0.001	0.0014	<0.005	<0.0005	<0.05
	02/27/02	0.082	<0.001	0.0025	0.003	<0.0025	<0.0025	<0.005	<0.005	<0.002	0.086	<0.0025	<0.0002	1	<0.02	<0.001	0.0019	<0.005	<0.001	<0.05
	04/24/02	0.2	<0.001	0.02	0.0044	<0.0025	<0.0025	<0.005	<0.005	<0.002	0.14	0.0083	<0.0002	1	<0.02	<0.001	0.0014	<0.005	<0.001	<0.05
	07/31/02	0.032	<0.001	<0.001	<0.0025	<0.0025	<0.0025	<0.005	<0.005	<0.002	<0.05	0.005	<0.0002	0.96	<0.02	<0.001	0.0034	<0.005	<0.001	<0.05
	10/23/02	<0.1	<0.003	<0.004	<0.01	<0.001	<0.003	<0.01	<0.01	<0.01	<0.1	<0.01	--	0.94	<0.01	<0.003	<0.003	<0.005	<0.001	<0.05
	01/30/03	0.14	<0.001	0.0027	<0.0025	<0.0025	<0.0025	<0.005	<0.005	0.0036	0.063	0.0044	<0.0002	0.99	<0.02	<0.001	0.0024	<0.005	<0.001	<0.05
	04/09/03	0.11	<0.005	<0.005	<0.0005	<0.0015	<0.005	<0.005	<0.005	<0.005	0.089	0.0066	<0.0002	0.96	<0.005	<0.005	<0.005	<0.025	<0.025	<0.05
	07/30/03	0.14	<0.001	0.0028	<0.005	0.00058	<0.0015	<0.005	<0.005	<0.005	0.082	0.0058	<0.0002	0.98	<0.005	<0.001	<0.001	<0.025	<0.0005	<0.05
	11/05/03	0.24	<0.001	0.0023	<0.005	<0.0005	<0.0015	<0.005	<0.005	<0.005	0.082	0.015	0.0003	1	<0.005	<0.001	<0.001	<0.025	<0.001	0.0084
	02/11/04	0.21	<0.001	0.0032	0.004	0.00067	0.0012	0.0026	0.0081	<0.0028	0.14	0.021	<0.00008	1	0.0024	<0.001	0.0023	<0.0004	<0.001	<0.0038
	04/21/04	0.13	0.0029	0.0028	0.0026	0.00045	<0.0003	<0.0005	0.0059	<0.0016	0.091	0.017	<0.0002	0.97	<0.001	<0.001	<0.0006	<0.001	<0.0055	
	01/12/05	<0.5	<0.002	0.0026	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	1.1	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	06/29/05	<0.5	<0.002	0.0023	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	1	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	09/21/05	<0.5	<0.002	0.0031	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	0.024	<0.0002	1	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	11/30/05	1.9	<0.002																	

**TABLE 4-1b**  
**GROUNDWATER QUALITY RESULTS FOR METAL**

Well Name	Sample Date	Dissolved Metals (mg/L)																		
		Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Mn	Hg	Mo	Ni	Pb	Se	Ag	Tl	Zn
	02/23/12	--	<0.003	0.0022	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	0.027	<0.001	<0.002	--	<0.001	--
	06/04/12	--	<0.003	0.0023	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	0.02	<0.001	<0.002	--	<0.001	--
	08/20/12	--	<0.003	0.0022	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	0.013	<0.001	<0.002	--	<0.001	--
	11/19/12	--	<0.003	<0.003	<0.01	<0.001	<0.001	<0.01	--	--	--	--	<0.0002	--	0.19	<0.001	<0.001	--	<0.001	--
	12/18/12	--	--	--	--	--	--	--	--	--	--	--	--	0.036	--	--	--	--	--	
Shallow Unconfined Gila Unit																				
GAI-02-01	AQL	--	0.006	0.05	2	0.004	0.005	0.1	--	--	--	--	0.002	--	0.1	0.05	0.05	--	0.002	--
	AL	--	0.0048	0.04	1.6	0.0032	0.004	0.08	--	--	--	--	0.0016	--	0.08	0.04	0.04	--	0.0016	--
	05/08/02	0.02	<0.005	0.02	0.022	<0.002	<0.006	<0.006	<0.003	<0.02	0.061	<0.0002	0.020	<0.01	<0.005	<0.01	<0.005	<0.001	0.008	
	05/29/02	0.02	<0.005	<0.01	0.018	<0.002	<0.002	<0.006	<0.006	<0.003	<0.02	0.079	<0.0002	0.030	<0.01	<0.005	<0.01	<0.005	<0.001	0.029
	03/20/03	<0.020	<0.005	0.016	0.0114	<0.002	<0.002	<0.006	<0.006	0.0065	<0.02	0.0047	<0.0002	0.0159	<0.01	<0.005	<0.01	<0.005	<0.001	0.0946
	09/27/07	<0.5	<0.002	0.0027	0.014	<0.004	<0.005	<0.01	--	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	0.0024	--	<0.001	<0.05
	12/26/07	<0.5	<0.002	0.0036	0.011	<0.004	<0.005	<0.01	--	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	0.0027	--	<0.001	<0.05
	02/20/08	<0.5	<0.002	0.0028	0.011	<0.004	<0.005	<0.01	--	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	0.0027	--	<0.001	<0.05
	04/23/08	<0.2	<0.003	0.0034	<0.01	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0024	--	<0.001	<0.05
	07/29/08	<0.2	<0.003	0.0033	0.011	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	10/22/08	<0.2	<0.003	0.0029	0.011	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	02/12/09	<0.2	<0.003	0.003	0.012	<0.001	0.0042	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0025	--	<0.001	<0.05
	06/03/09	<0.2	<0.003	0.0032	0.011	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.005	<0.002	--	<0.005	<0.05
	09/21/09	<0.2	<0.003	0.003	0.011	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	12/15/2009*	<0.2	<0.003	0.003	<0.01	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	02/04/10	<0.2	<0.003	0.0028	<0.01	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	05/07/10	<0.2	<0.003	0.0028	<0.01	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	09/24/10	<0.2	<0.003	0.0028	0.011	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	11/30/10	<0.2	<0.003	0.0029	0.01	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	03/17/11	<0.2	0.0004	0.0032	0.01	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0025	--	<0.001	<0.05
	06/23/11	<0.2	<0.003	0.0029	0.011	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0037	--	<0.001	<0.05
	09/01/11	<0.2	<0.003	0.0031	0.01	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0042	--	<0.001	<0.05
	11/18/11	<0.2	<0.006	0.003	0.011	<0.001	<0.002	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.002	<0.004	--	<0.002	<0.05
	02/21/12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	02/22/12	<0.2	<0.003	0.0026	0.011	<0.001	<0.001	0.012	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0029	--	<0.001	<0.05
	06/06/12	<0.2	<0.003	0.0028	0.011	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	08/21/12	<0.2	<0.003	0.0026	0.012	<0.001	<0.001	0.013	--	&										

**TABLE 4-1b**  
**GROUNDWATER QUALITY RESULTS FOR METAL**

Well Name	Sample Date	Dissolved Metals (mg/L)																		
		Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Mn	Hg	Mo	Ni	Pb	Se	Ag	Tl	Zn
MCC-9	02/26/02	<0.025	<0.001	0.001	0.013	<0.0025	<0.0025	<0.005	<0.005	<0.002	<0.05	<0.0025	<0.0002	<0.005	<0.02	<0.001	0.0014	<0.005	<0.001	<0.05
	04/23/02	0.036	0.0011	<0.001	0.013	<0.0025	<0.0025	<0.005	<0.005	<0.002	<0.05	0.0039	<0.0002	<0.005	<0.02	<0.001	0.0024	<0.005	<0.001	<0.05
	07/30/02	<0.025	<0.001	<0.001	0.013	<0.0025	<0.0025	<0.005	<0.005	<0.002	<0.05	0.15	<0.0002	<0.005	<0.02	<0.001	0.0016	<0.005	<0.001	<0.05
	10/22/02	<0.1	<0.003	<0.004	0.013	<0.001	<0.003	<0.01	<0.01	<0.01	<0.1	0.26	--	<0.01	<0.01	<0.003	<0.003	<0.005	<0.001	<0.05
	01/29/03	<0.025	<0.001	0.0026	0.013	<0.0025	<0.0025	<0.005	<0.005	<0.002	<0.05	<0.0025	<0.0002	<0.005	<0.02	<0.001	0.0014	<0.005	<0.001	<0.05
	04/08/03	<0.05	<0.005	0.013	<0.0005	<0.0015	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.025	<0.025	<0.025
	07/29/03	<0.05	<0.001	0.0022	0.012	0.00057	<0.0015	<0.005	<0.005	<0.005	<0.05	0.11	<0.0002	<0.005	<0.005	<0.001	<0.001	<0.025	<0.0005	<0.05
	11/04/03	0.066	<0.001	<0.001	0.012	<0.0005	<0.0015	<0.005	0.0057	<0.005	<0.05	0.29	<0.0002	<0.005	<0.005	<0.001	<0.001	<0.025	<0.001	0.0081
	02/10/04	<0.028	<0.001	0.0024	0.012	<0.00005	<0.0003	<0.0012	0.0064	<0.0028	<0.012	0.009	<0.00008	0.00089	<0.001	<0.001	0.0012	<0.0004	<0.001	0.011
	04/20/04	<0.013	<0.001	0.0022	0.012	<0.0003	<0.0005	<0.0006	<0.0016	<0.032	0.0091	<0.0002	0.0015	0.0013	<0.001	<0.001	<0.0006	<0.001	0.0084	
	01/11/05	<0.5	<0.002	0.0022	0.014	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	06/28/05	<0.5	<0.002	0.0017	0.012	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	09/20/05	<0.5	<0.002	0.0022	0.013	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	11/30/05	<0.5	<0.002	0.0023	0.018	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	0.058
	03/07/06	<0.5	<0.002	0.0024	0.012	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	0.0036	<0.005	<0.001	<0.05
	06/27/06	<0.5	<0.002	0.0028	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	10/17/06	<0.5	<0.002	0.001	0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	12/12/06	<0.05	<0.002	0.003	0.014	<0.002	<0.005	<0.01	<0.01	<0.01	<0.04	<0.02	<0.0002	<0.02	<0.01	<0.001	<0.002	<0.01	<0.001	0.041
	03/20/07	<0.5	<0.002	0.0023	<0.01	<0.004	<0.005	<0.01	<0.05	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	<0.005	<0.001	<0.05
	6/26/2007*	--	<0.002	0.0027	0.014	<0.004	<0.005	<0.01	--	--	--	<0.0002	--	<0.05	<0.001	<0.002	--	<0.001	--	--
	09/26/07	--	<0.002	0.0023	0.013	<0.004	<0.005	<0.01	--	--	--	<0.0002	--	<0.05	<0.001	<0.002	--	<0.001	--	--
	12/27/07	--	<0.002	0.0026	0.012	<0.004	<0.005	<0.01	--	--	--	<0.0002	--	<0.05	<0.001	<0.002	--	<0.001	--	--
	02/19/08	--	<0.002	0.0021	0.011	<0.004	<0.005	0.013	--	--	--	<0.0002	--	<0.05	<0.001	<0.002	--	<0.001	--	--
	04/21/08	--	<0.003	0.0026	<0.01	<0.001	<0.001	0.015	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--	--
	07/28/08	--	<0.003	0.0023	0.011	<0.001	<0.001	<0.01	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--	--
	10/21/08	--	<0.003	0.0025	0.012	<0.001	<0.001	<0.01	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--	--
	02/09/09	--	<0.003	0.0024	0.012	<0.001	<0.001	<0.01	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--	--
	06/01/09	--	<0.003	0.0023	0.011	<0.001	<0.001	<0.01	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--	--
	09/21/09	--	<0.003	0.0022	0.012	<0.001	<0.001	<0.01	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--	--
	12/14/09	--	<0.003	0.0024	<0.01	<0.001	<0.001	<0.01	--	--	--	<0.0002	--	<0.01	<0.001	<0.002	--	<0.001	--	--
	02/03/10	--	<0.003	0.0022	<0.01	<0.001	<0.001	<0.01	--	--	--	<0.0002	--	<						

**TABLE 4-1b**  
**GROUNDWATER QUALITY RESULTS FOR METAL**

Well Name	Sample Date	Dissolved Metals (mg/L)																		
		Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Mn	Hg	Mo	Ni	Pb	Se	Ag	Tl	Zn
Smelter Pond POC Well	02/05/10	<0.2	<0.003	0.01	0.038	<0.001	<0.001	<0.01	--	<0.01	<0.05	0.071	<0.0002	<0.01	<0.01	<0.001	0.002	--	<0.001	<0.05
	05/05/10	<0.2	<0.015	0.045	0.025	<0.001	<0.005	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.005	<0.01	--	<0.005	<0.05
	08/03/10	<0.2	<0.003	0.017	0.03	<0.001	<0.001	<0.01	--	<0.01	0.18	0.11	<0.0002	<0.01	<0.01	<0.001	0.0051	--	<0.001	<0.05
	11/11/10	<0.2	<0.003	0.03	0.026	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0038	--	<0.001	<0.05
	03/17/11	<0.2	<0.015	0.044	0.024	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.01	--	<0.001	<0.05
	06/22/11	0.22	<0.003	0.016	0.031	<0.001	<0.001	<0.01	--	<0.01	<0.05	0.013	<0.0002	<0.01	<0.01	<0.001	0.006	--	<0.001	<0.05
	08/31/11	<0.2	<0.003	0.012	0.034	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0059	--	<0.001	<0.05
	02/22/12	<0.2	<0.003	0.008	0.031	<0.001	<0.001	0.017	--	<0.01	<0.05	0.14	<0.0002	<0.01	<b>0.12</b>	<0.001	0.0056	--	<0.001	<0.05
	AQL	--	<b>0.006</b>	<b>0.05</b>	<b>2</b>	<b>0.004</b>	<b>0.005</b>	<b>0.1</b>	--	--	--	--	<b>0.002</b>	--	<b>0.1</b>	<b>0.05</b>	<b>0.05</b>	--	<b>0.002</b>	--
	AL	--	<b>0.0048</b>	<b>0.04</b>	<b>1.6</b>	<b>0.0032</b>	<b>0.004</b>	<b>0.08</b>	--	--	--	--	<b>0.0016</b>	--	<b>0.08</b>	<b>0.04</b>	<b>0.04</b>	--	<b>0.0016</b>	--
500 YD	06/21/07	<0.011	0.00022	0.0033	0.0322	<0.0002	<0.0003	0.00059	--	<0.0021	<0.0072	0.007	<0.0001	0.0024	0.0018	<0.0024	0.0021	--	<0.00002	0.0011
	09/27/07	<0.5	<0.002	0.0033	0.025	<0.004	<0.005	<0.01	--	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	--	<0.001	<0.05
	12/28/07	<0.5	<0.002	0.0042	0.021	<0.004	<0.005	<0.01	--	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	<0.002	--	<0.001	<0.05
	02/21/08	<0.5	<0.003	0.0065	0.039	<0.004	<0.005	<0.01	--	<0.02	<0.2	<0.02	<0.0002	<0.05	<0.05	<0.001	0.0047	--	<0.001	<0.05
	04/22/08	<0.2	<0.003	0.016	0.04	<0.001	<0.001	<0.01	--	<0.01	<0.05	0.024	<0.0002	<0.01	<0.01	<0.001	0.0094	--	<0.001	0.15
	07/29/08	<0.2	<0.003	0.0061	0.035	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	10/22/08	<0.2	<0.003	0.0096	0.042	<0.001	<0.001	<0.01	--	0.013	<0.05	<0.01	<0.0002	<0.01	<0.01	0.0037	0.0084	--	<0.001	<0.05
	02/12/09	<0.2	<0.015	0.0085	0.046	<0.001	<0.001	<0.01	--	0.017	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.005	<0.01	--	<0.005	<0.05
	06/02/09	<0.2	<0.003	0.0046	0.019	<0.001	<0.001	<0.01	--	<0.01	<0.05	0.022	<0.0002	<0.01	<0.01	<0.001	0.0034	--	<0.001	<0.05
	09/24/09	<0.2	<0.003	0.0041	0.11	<0.001	<0.001	<0.01	--	<0.01	0.42	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0023	--	<0.001	<0.05
	12/15/2009*	0.98	<0.003	0.004	0.023	<0.001	<0.001	<0.01	--	<0.01	0.55	0.044	<0.0002	<0.01	<0.01	0.0013	<0.002	--	<0.001	<0.05
	02/05/10	<0.2	<0.015	0.02	0.042	0.0011	<0.005	<0.01	--	0.031	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.005	0.023	--	<0.005	<0.05
	05/13/10	<0.2	<0.003	0.0068	0.039	<0.001	<0.001	<0.01	--	<0.01	<0.05	<0.01	0.00031	<0.01	<0.01	<0.001	0.0033	--	<0.001	<0.05
	12/01/10	<0.2	<0.006	0.0023	0.026	<0.001	<0.002	<0.01	--	0.011	<0.05	<0.01	<0.0002	<0.01	<0.01	<0.002	<0.004	--	<0.002	<0.05
	03/02/11	0.52	<0.015	0.018	0.03	<0.001	<0.005	<0.01	--	<0.01	0.34	0.023	<0.0002	<0.01	<0.01	<0.005	<0.01	--	<0.005	<0.05
	06/30/11	<0.2	<0.003	0.0075	0.024	<0.001	<0.001	<0.01	--	0.01	0.061	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0052	--	<0.001	<0.05
	09/01/11	<0.2	<0.003	0.0039	0.014	<0.001	<0.001	<0.01	--	<0.01	0.065	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0026	--	<0.001	<0.05
	11/17/11	<0.2	<0.006	0.0045	0.026	<0.001	<0.002	<0.01	--	<0.01	<0.05	0.036	<0.0002	<0.01	<0.01	<0.002	<0.004	--	<0.002	<0.05
	02/21/12	<0.2	<0.003	0.027	0.026	<0.001	<0.001	0.08	--	0.022	<0.05	0.12	<0.0002	<0.01	<0.01	<0.001	0.012	--	<0.001	0.053
	06/05/12	<0.2	<0.003	0.017	0.045	<0.001	<0.001	<0.01	--	<0.01	<0.05	1.6	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	07/19/12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	08/15/12	<0.2																		

**TABLE 4-1b**  
**GROUNDWATER QUALITY RESULTS FOR METAL**

Well Name	Sample Date	Dissolved Metals (mg/L)																		
		Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Mn	Hg	Mo	Ni	Pb	Se	Ag	Tl	Zn
	08/28/12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	10/09/12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	11/14/12	<0.2	<0.003	<0.003	0.025	<0.001	<0.001	<0.01	--	<0.01	<0.1	<0.01	<0.0002	<0.01	<0.01	<0.001	0.012	--	<0.001	<0.05
	12/18/12	<0.2	<0.003	<0.003	0.024	<0.001	<0.001	<0.01	--	<0.01	<0.1	<0.01	<0.0002	<0.01	<0.01	<0.001	0.0088	--	<0.001	<0.05
Tailings Porewater																				
SP1&2- Alert-B	AQL	--	<b>0.006</b>	<b>0.05</b>	<b>2</b>	<b>0.004</b>	<b>0.011</b>	<b>0.1</b>	--	--	--	--	<b>0.002</b>	--	<b>0.1</b>	<b>0.05</b>	<b>0.05</b>	--	<b>0.002</b>	--
	AL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	06/23/09	<0.20	<0.20	0.0049	<0.010	<0.0010	0.010	<0.010	--	0.21	0.090	11	<0.00020	<0.010	<0.010	0.0016	0.0038	--	<0.0010	1.4
	09/23/09	<0.2	<0.003	0.0014	0.012	<0.001	<0.001	<0.01	--	0.052	<0.05	3.4	<0.0002	<0.01	<0.01	<0.001	0.0089	--	<0.001	<0.05
	12/15/09	<0.2	<0.003	0.0014	<0.01	<0.001	<0.001	<0.01	--	<0.01	0.83	2.8	<0.0002	<0.01	<0.01	<0.001	0.007	--	<0.001	<0.05
	02/05/10	<0.2	<0.003	0.0031	<0.01	<0.001	0.0051	<0.01	--	0.25	0.39	14	<0.0002	<0.01	<0.01	<0.001	0.012	--	<0.001	1.6
	05/13/10	<0.2	<0.003	0.0042	<0.01	<0.001	0.0055	<0.01	--	0.2	0.65	16	0.00031	<0.01	<0.01	<0.002	<0.004	--	<0.002	2
	08/27/10	<0.2	<0.015	<0.005	<0.01	<0.001	0.0054	0.011	--	0.078	0.69	15	<0.0002	<0.01	<0.01	<0.005	<0.01	--	<0.005	1.9
	11/30/10	<0.2	<0.003	0.006	<0.01	<0.001	0.0044	<0.01	--	0.05	0.76	13	<0.0002	<0.01	<0.01	<0.001	0.017	--	<0.001	1.7
	03/15/11	<0.2	<0.015	0.0073	<0.01	<0.001	0.0059	<0.01	--	0.029	0.17	12	<0.0002	<0.01	<0.01	<0.001	0.02	--	<0.001	1.6
	06/29/11	<2	<0.003	0.0048	0.011	<0.001	0.0036	<0.01	--	0.077	0.86	11	<0.0002	<0.01	<0.01	<0.001	0.0027	--	<0.001	1.5
	9/1/2011*	<0.2	<0.003	0.0056	<0.01	<0.001	0.0037	<0.01	--	0.075	0.83	10	<0.0002	<0.01	<0.01	<0.001	<0.01	--	<0.001	1.5
	11/17/11	<0.2	<0.03	<0.01	<0.01	<0.001	0.0026	<0.01	--	0.063	0.7	9.2	<0.0002	0.01	<0.01	<0.01	<0.02	--	0.0017	1.3
	02/23/12	<0.2	<0.003	<0.001	0.011	<0.001	<0.001	0.011	--	0.052	0.5	2.2	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	06/06/12	<0.2	<0.003	<0.001	0.012	<0.001	<0.001	<0.01	--	0.045	1.4	2.2	<0.0002	<0.01	<0.01	<0.001	<0.002	--	<0.001	<0.05
	08/23/12	<0.2	<0.006	<0.002	0.011	<0.001	<0.002	0.013	--	0.036	<0.1	2.1	<0.0002	<0.01	<0.01	<0.001	<0.004	--	<0.001	<0.05
	11/20/12	<0.2	<0.003	<0.003	<0.01	<0.001	0.002	<0.01	--	0.061	0.48	7.8	<0.0002	<0.01	<0.01	<0.001	<0.001	--	<0.001	0.94

Notes:

\* = Start of routine sampling and comparison to ALs and AQLs

AL = Alert Level; AQL = Aquifer Quality Limit; AWQS = Aquifer Water Quality Standards

11 = AL, AQL, or AWQS exceedance

POC = Point of Compliance

mg/L = milligrams per liter

**TABLE 4-1C**  
GROUNDWATER QUALITY RESULTS FOR ORGANIC COMPOUNDS

Well Name	Sample Date	SVOC															VOC				
		2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Chrysene	Dibenzofuran	Fluor-anthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	1,2,4-Trimethylbenzene	Benzene	Ethylbenzene	Toluene	Xylenes, total
Tailings Porewater																					
SP1&2- Alert-B	AQL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	AL	--	--	--	--	--	0.0002	--	--	--	--	--	--	--	--	--	0.005	0.7	1	10	
	06/23/09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	09/23/09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	12/15/09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	02/05/10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	05/13/10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	08/27/10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	11/17/10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	03/15/11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	06/29/11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	07/29/11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	09/01/11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	<1	<1	<1	<1.5
	09/27/11	<10	<10	<10	<10	<10	<0.05	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.5
	11/17/11	<10	<10	<10	<10	<10	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.5
	12/29/11	<10	<10	<10	<10	<10	<0.05	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.5
	02/23/12	<10	<10	<10	<10	<10	<0.05	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.5
	06/06/12	<10	<10	<10	<10	<10	<0.05	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.5
	08/23/12	<10	<10	<10	<10	<10	<0.05	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.5
	11/20/12	<10	<10	<10	<10	<10	<0.05	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.5

Notes:  
 units - ug/L (micrograms per liter) unless otherwise indicated  
 SVOC = semi-volatile organic compounds  
 VOC = volatile organic compounds

## **SUMMARY STATISTICS**

**TABLE 4-2a**  
GROUNDWATER STATISTICAL RESULTS - MAJOR IONS, RADIOCHEMISTRY AND MISC. PARAMETERS

Well Name	Statistical Parameter	Physical Parameters and Other Constituents										Major Anions and Cations						Radiochemistry								
		Field pH (SU)	Field SC (mS/cm)	Field Temperature (Celsius)	CO <sub>3</sub> <sup>-2</sup> (mg/L as CaCO <sub>3</sub> )	HCO <sub>3</sub> <sup>-</sup> (mg/L as CaCO <sub>3</sub> )	Total Alkalinity (mg/L as CaCO <sub>3</sub> )	TDS (mg/L)	Hardness (Dissolved) (mg/L)	Hardness (Total) (mg/L)	NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> (mg/L as Nitrogen)	NO <sub>3</sub> <sup>-2</sup> +NO <sub>2</sub> <sup>-</sup> (mg/L as Nitrogen)	Ca (mg/L)	Cl (mg/L)	F (mg/L)	K (mg/L)	Mg (mg/L)	Na (mg/L)	SO <sub>4</sub> (mg/L)	Gross Alpha (pCi/L)	Adjusted Gross Alpha (pCi/L)	RA226 (pCi/L)	RA228 (pCi/L)	RA226 + RA228 (calc) (pCi/L)	Combined Radium (pCi/L)
MCC-6C	Count	55	53	55	33	40	39	40	36	1	44	49	8	37	40	57	36	37	37	40	24	2	24	24	24	24
	Non-Detect Count	---	---	---	20	0	0	0	0	1	44	26	1	0	0	3	5	0	0	0	0	1	22	21	20	20
	Non-Detect %	---	---	---	61	0	0	0	0	100	100	53	13	0	0	5	14	0	0	0	50	92	88	83	83	
	Minimum	6.24	245	13.70	2	130	140	220	11	--	--	0.1	0.062	3.1	16	0.49	0.97	0.42	80	12	3.0	1.4	0.3	1.3	0.3	
	Maximum	8.95	1140	27.49	42	200	210	1440	490	--	--	1.6	0.140	150.0	53	2.70	3.80	28.00	270	810	8.6	1.4	2.2	2.0	3.5	
	Mean	8.07	454	22.79	13	170	176	437	74	--	--	0.2	0.088	22.7	21	0.69	1.63	3.79	130	127	6.6	1.4	1.3	1.6	1.9	
	Median	8.22	396	23.06	8	170	180	416	62	--	--	0.2	0.077	19.0	20	0.67	1.50	3.00	130	105	6.7	1.4	1.3	1.6	1.8	
	Standard Deviation	0.58	161	2.51	13	15	13	196	81	--	--	0.3	0.030	24.6	6	0.29	0.56	4.58	32	132	1.3	--	1.3	0.4	1.3	
MCC-6D	Coef. Of Variation	0.07	0.36	0.11	0.99	0.09	0.07	0.45	1.10	--	--	1.39	0.34	1.08	0.30	0.41	0.35	1.21	0.24	1.04	0.20	--	1.07	0.22	0.71	
	Count	3	3	3	3	3	3	3	2	1	0	0	3	3	3	3	3	3	3	3	3	3	3	3	2	
	Non-Detect Count	---	---	---	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	3	3	2	
	Non-Detect %	---	---	---	100	0	0	0	0	0	0	0	67	0	0	0	0	0	0	0	0	33	100	100	100	
	Minimum	6.15	6606	23.36	--	920	920	7800	5600	5500	--	--	0.03	560	56	1.8	6.9	1000	200	5400	370	2.1	--	--	--	
	Maximum	6.28	6746	26.22	--	940	940	8300	5900	5500	--	--	0.03	580	57	1.9	7.6	1100	230	5800	38.6	5.8	--	--	--	
	Mean	6.24	6684	24.68	--	933	933	8033	5750	5500	--	--	0.03	573	57	1.9	7.1	1033	210	5633	37.9	4.0	--	--	--	
	Median	6.28	6700	24.46	--	940	940	8000	5750	5500	--	--	0.03	580	57	1.9	6.9	1000	200	5700	38.0	4.0	--	--	--	
TP5-POC-B	Standard Deviation	0.08	71	1.44	--	12	12	252	212	--	--	--	--	12	1	0.1	0.4	58	17	208	0.8	2.6	--	--	--	
	Coef. Of Variation	0.01	0.01	0.06	--	0.01	0.03	0.04	--	--	--	--	0.02	0.01	0.03	0.06	0.08	0.04	0.02	0.66	--	--	--	--	--	
	Count	15	15	15	14	14	14	10	5	10	6	15	14	15	15	14	15	15	15	15	15	15	15	14		
	Non-Detect Count	---	---	---	14	0	0	0	0	9	0	0	0	0	0	0	1	0	0	0	0	1	13	14	12	
	Non-Detect %	---	---	---	100	0	0	0	0	90	0	0	0	0	0	0	7	0	0	0	0	100	87	93	80	
	Minimum	7.26	286.3	22.26	--	190	190	330	160	150	0.25	4.5	3.8	23	28	0.31	2.0	18	61	26	4.3	--	0.3	0.4	0.3	
	Maximum	8.26	637.0	29.32	--	230	240	380	180	180	0.25	5.9	6.1	36	42	1.10	5.1	28	79	41	9.3	--	0.4	0.4	0.4	
	Mean	7.76	494.3	25.15	--	219	220	356	164	164	0.25	5.3	5.5	26	30	0.44	2.8	25	66	31	6.6	--	0.4	0.4	0.4	
	Median	7.79	472.0	24.60	--	220	220	355	160	160	0.25	5.3	5.7	25	29	0.37	2.7	25	66	29	6.5	--	0.4	0.4	0.4	
MCC-3C	Standard Deviation	0.24	102.6	2.34	--	12	13	15	7	11	--	--	0.4	0.8	4	4	0.19	0.8	2	4	5	--	0.1	--	0.1	
	Coef. Of Variation	0.03	0.21	0.09	--	0.05	0.06	0.04	0.04	0.07	--	--	0.07	0.15	0.14	0.13	0.44	0.29	0.09	0.06	0.15	0.19	--	0.20	0.16	
	Count	55	53	55	33	36	35	36	33	0	47	52	7	36	36	58	35	35	35	35	24	2	24	24	24	
	Non-Detect Count	---	---	---	12	0	0	0	5	0	43	30	5	1	0	1	15	0	0	0	0	20	23	20	20	
	Non-Detect %	---	---	---	36	0	0	0	0	15	91	58	71	3	0	2	43	36	0	0	0	0	83	96	83	
	Minimum	5.38	198.8	19.81	2	100	110	223	7.29	--	0.022	0.17	0.048	2	6.9	0.99	0.51	0.083	70	8	1.9	1.2	0.3	1.3	0.3	
	Maximum	9.89	4330.0	31.09	80	180	180	600	95.00	--	0.170	0.73	0.600	36	23.0	3.00	17.00	31.000	150	300	8.2	1.6	1.3	2.3	2.3	

TABLE 4-2b  
GROUNDWATER STATISTICAL RESULTS FOR METALS

Well Name	Statistical Parameter	Dissolved Metals (mg/L)																			
		Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Mn	Hg	Mo	Ni	Pb	Se	Ag	Tl	Zn	
MCC-6C	Count	38	57	57	57	57	57	35	37	37	37	37	57	37	57	57	35	57	37	37	
	Non-Detect Count	31	55	0	36	57	56	55	34	33	32	25	57	9	57	54	49	35	57	33	
	Non-Detect %	82	96	0	63	100	98	96	97	89	86	68	100	24	100	95	86	100	100	89	
	Minimum	0.034	0.0022	0.003	0.002	--	0.00064	0.0013	0.00068	0.0023	0.030	0.0018	--	0.0073	--	0.0010	0.001	--	--	0.0076	
	Maximum	0.180	0.0039	0.060	0.880	--	0.00064	0.0014	0.00068	0.0180	0.096	0.0860	--	0.0250	--	0.0024	0.002	--	--	0.4700	
	Mean	0.088	0.0031	0.018	0.048	--	0.00064	0.0014	0.00068	0.0085	0.063	0.0169	--	0.0165	--	0.0015	0.001	--	--	0.1271	
	Median	0.055	0.0031	0.015	0.005	--	0.00064	0.0014	0.00068	0.0068	0.062	0.0059	--	0.0160	--	0.0011	0.001	--	--	0.0155	
	Standard Deviation	0.064	0.0012	0.009	0.191	--	--	0.0001	--	0.0068	0.023	0.0285	--	0.0047	--	0.0008	0.000	--	--	0.2287	
	Coef. Of Variation	0.73	0.39	0.48	3.98	--	--	0.05	--	0.80	0.37	1.51	--	0.28	--	0.52	0.28	--	--	1.80	
MCC-6D	Count	3	3	3	3	3	3	0	3	3	3	3	3	3	3	3	3	0	3	3	
	Non-Detect Count	3	3	0	0	2	3	1	0	2	3	0	3	3	0	3	2	0	3	3	
	Non-Detect %	100	100	0	0	67	100	33	--	67	100	0	100	100	0	100	67	--	100	100	
	Minimum	--	--	0.0042	0.025	0.0013	--	0.062	--	0.012	--	20.0	--	--	0.021	--	0.002	--	--	--	
	Maximum	--	--	0.0110	0.029	0.0013	--	0.065	--	0.012	--	23.0	--	--	0.022	--	0.002	--	--	--	
	Mean	--	--	0.0068	0.027	0.0013	--	0.064	--	0.012	--	21.7	--	--	0.021	--	0.002	--	--	--	
	Median	--	--	0.0053	0.027	0.0013	--	0.064	--	0.012	--	22.0	--	--	0.021	--	0.002	--	--	--	
	Standard Deviation	--	--	0.0037	0.002	--	--	0.002	--	--	--	1.5	--	--	0.001	--	--	--	--	--	
	Coef. Of Variation	--	--	0.53	0.07	--	--	0.03	--	--	--	0.07	--	--	0.03	--	--	--	--	--	
TP5-POC-B	Count	15	15	15	15	15	15	0	15	15	15	15	15	15	15	15	15	0	15	15	
	Non-Detect Count	15	14	1	0	15	15	15	0	12	15	14	15	15	14	0	15	14	--	--	
	Non-Detect %	100	93	7	0	100	100	--	80	100	93	100	100	100	93	--	100	93	--	--	
	Minimum	--	0.00025	0.0024	0.029	--	--	--	0.011	--	0.059	--	--	--	--	0.0024	--	--	0.11		
	Maximum	--	0.00025	0.0028	0.070	--	--	--	0.012	--	0.059	--	--	--	--	0.0024	--	--	0.11		
	Mean	--	0.00025	0.0026	0.044	--	--	--	0.011	--	0.059	--	--	--	--	0.0024	--	--	0.11		
	Median	--	0.00025	0.0026	0.039	--	--	--	0.011	--	0.059	--	--	--	--	0.0024	--	--	0.11		
	Standard Deviation	--	--	0.0001	0.011	--	--	0.001	--	--	--	--	--	--	--	--	--	--	--		
	Coef. Of Variation	--	--	0.05	0.26	--	--	0.05	--	--	--	--	--	--	--	--	--	--	--		
MCC-3C	Count	35	58	60	58	58	58	58	35	35	35	35	57	35	58	58	58	35	58	35	
	Non-Detect Count	21	36	2	32	56	55	56	34	13	12	13	54	10	58	38	51	33	58	19	
	Non-Detect %	60	62	3	55	97	95	97	97	37	34	37	95	29	100	66	88	94	100	54	
	Minimum	0.033	0.00031	0.0051	0.0028	0.00065	0.0028	0.00088	0.0078	0.0029	0.03	0.0061	0.00024	0.009	--	0.0010	0.0012	0.0056	--	0.014	
	Maximum	0.085	0.00590	0.1900	0.0200	0.00150	0.0088	0.00940	0.0078	0.0500	19.00	0.1000	0.00042	0.041	--	0.0097	0.0022	0.0063	--	0.190	
	Mean	0.052	0.00249	0.1402	0.0112	0.00108	0.0062	0.00514	0.0078	0.0109	0.94	0.0211	0.00032	0.017	--	0.0021	0.0015	0.0060	--	0.095	
	Median	0.051	0.00205	0.1500	0.0120	0.00108	0.0070	0.00514	0.0078	0.0084	0.11	0.0165	0.00029	0.016	--	0.0018	0.0014	0.0060	--	0.089	
	Standard Deviation	0.015	0.00163	0.0351	0.0043	0.00060	0.0031	0.00602	--	0.0099	3.94	0.0196	0.00009	0.006	--	0.0019	0.0004	0.0005	--	0.052	
	Coef. Of Variation	0.30	0.65	0.25	0.38	0.56	0.50	1.17	--	0.91	4.21	0.93	0.29	0.32	--	0.89	0.26	0.08	--	0.55	
MCC-4	Count	42	64	64	64	64	64	42	42	42	42	63	42	65	64	64	42	64	42		
	Non-Detect Count	12	59	12	39	61	62	57	40	37	12	12	61	1	56	56	43	42	64	36	
	Non-Detect %	29	92	19	61	95	97	89	95	88	29	29	97	2	86	88	67	100	100	86	
	Minimum	0.032	0.00032	0.019	0.0026	0.00045	0.0012	0.0026	0.0059	0.0027	0.06	0.0044	0.0003	0.55	0.0024	0.0015	0.0013	--	--	0.0084	
	Maximum	17.000	0.00630	0.0200	0.1300	0.00067	0.0019	0.0500	0.0081	0.0078	13.00	0.4100	0.0006	1.30	0.1900	0.0220	0.0054	--	--	0.0900	
	Mean	1.663	0.00276	0.0034	0.0195	0.00057															

**TABLE 4-2c**  
**GROUNDWATER STATISTICAL RESULTS FOR ORGANIC COMPOUNDS**

Well Name	Statistical Parameter	SVOC															VOC				
		2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Chrysene	Dibenzofuran	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	1,2,4-Trimethylbenzene	Benzene	Ethylbenzene	Toluene	Xylenes, total
SP1&2- Alert-B	Count	7	7	7	7	7	6	7	7	7	7	7	7	7	7	7	18	18	18	18	18
	Non-Detect Count	7	7	7	7	7	6	7	7	7	7	7	7	7	7	7	18	18	18	18	18
	Non-Detect %	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mean	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Median	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Standard Deviation	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Coef. Of Variation	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

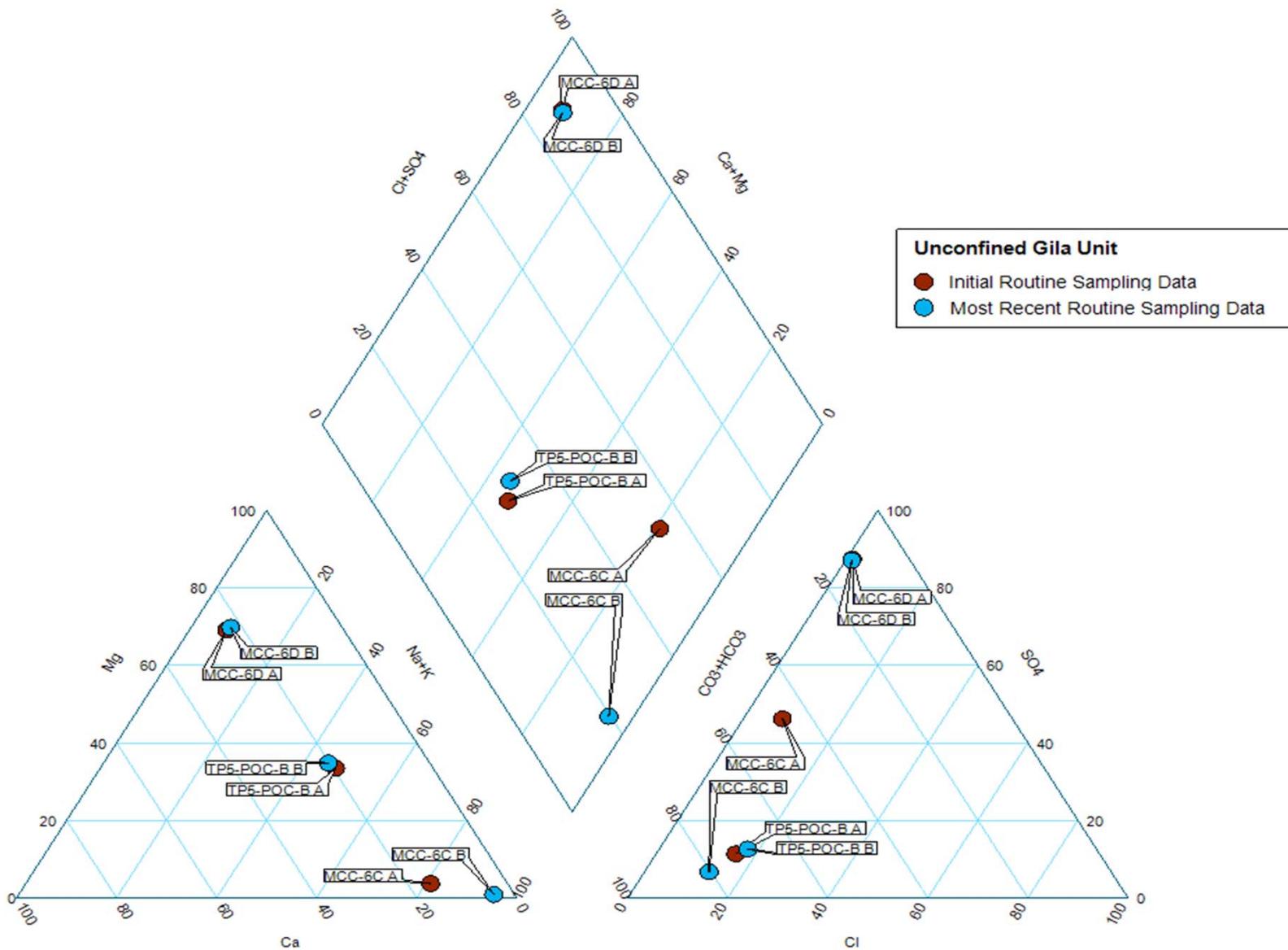
Notes:

units - ug/L (micrograms per liter) unless otherwise indicated

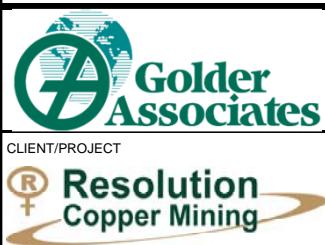
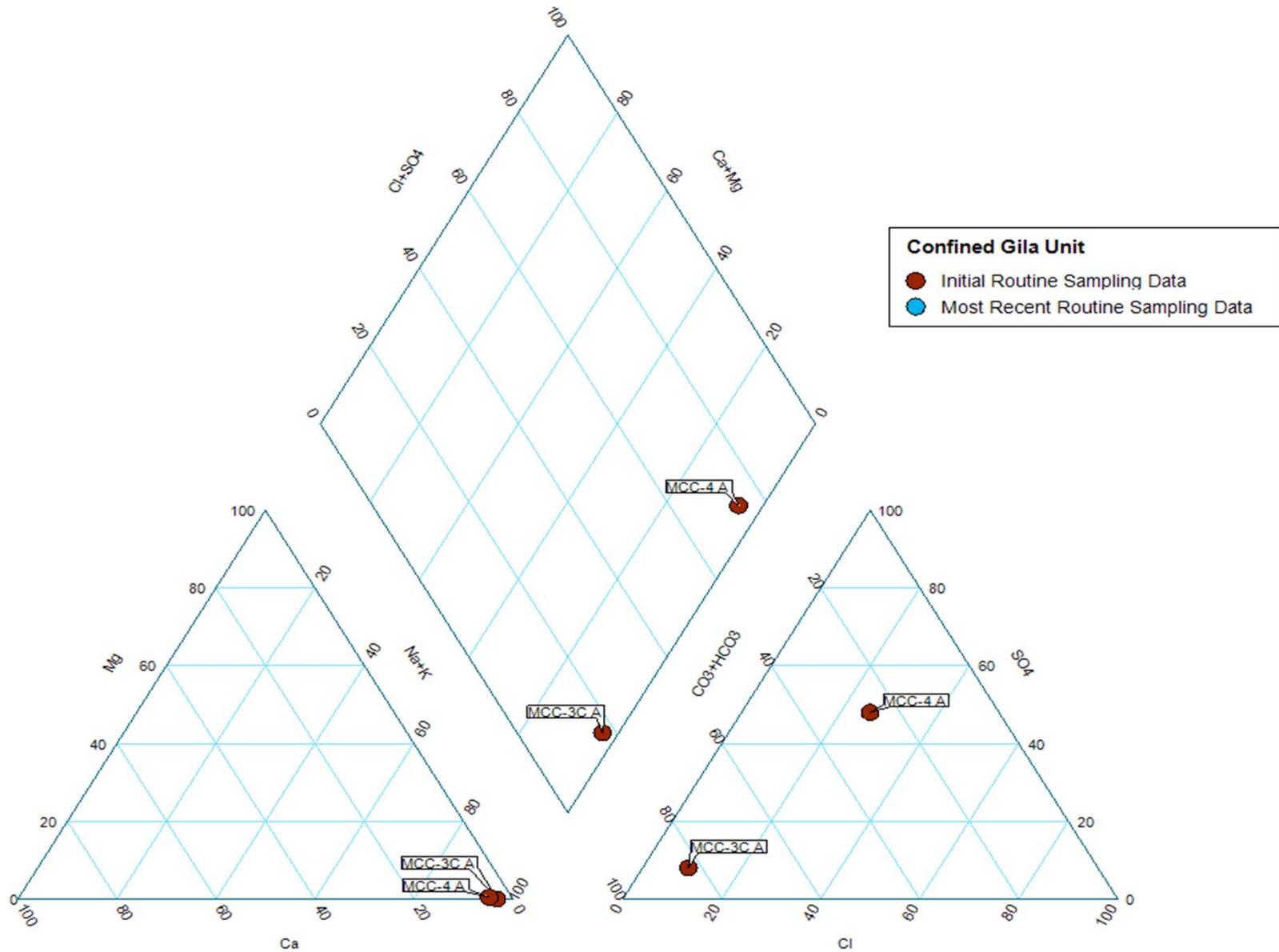
SVOC = semi-volatile organic compounds

VOC = volatile organic compounds

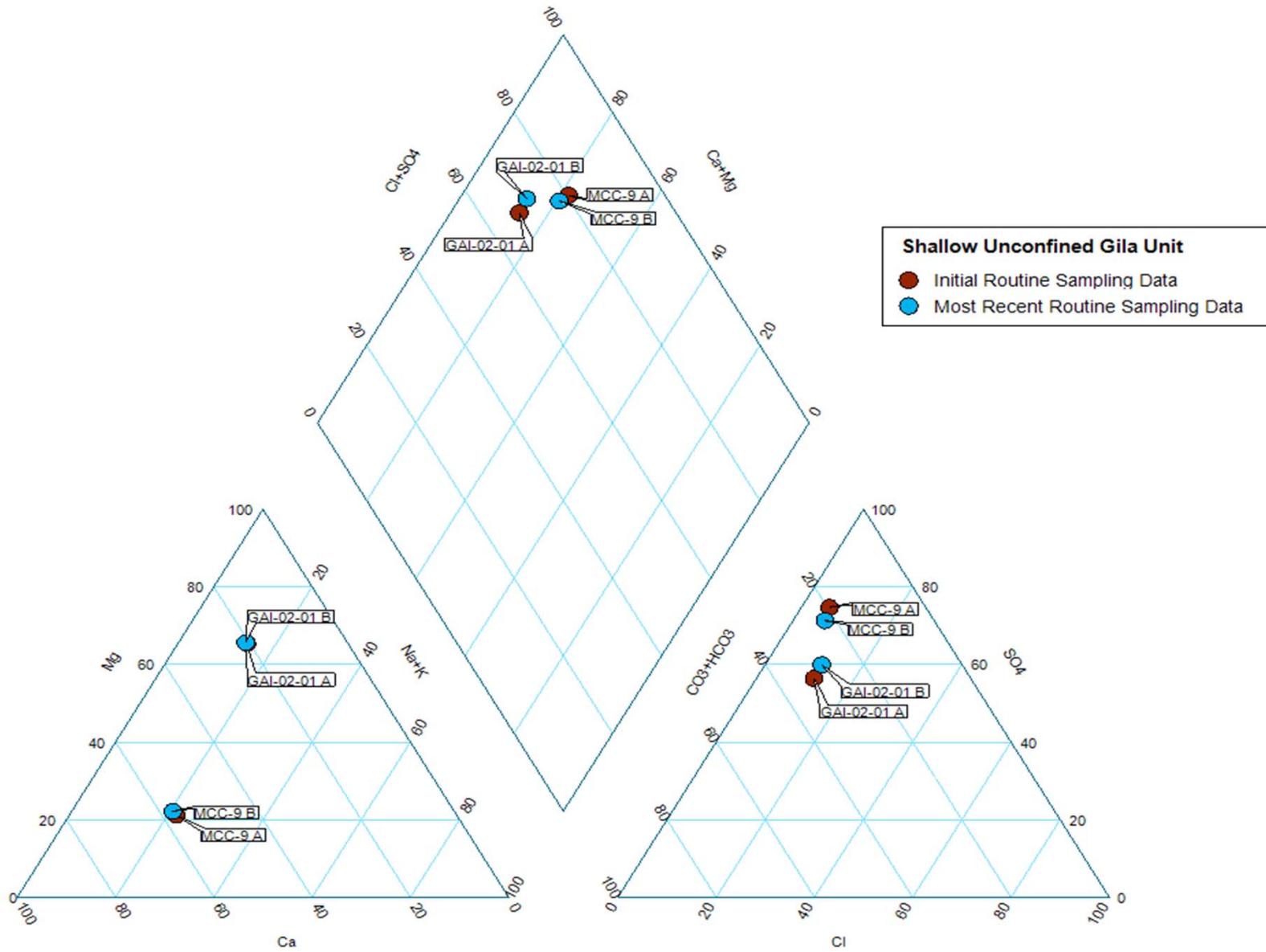
**ATTACHMENT 5**  
**PIPER DIAGRAMS**



CLIENT/PROJECT	DRAWN CB	DATE 3/15/2013	JOB NO. 123-92566
	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 5-1



		TITLE			
<b>Confined Gila Unit</b>					
CLIENT/PROJECT	Groundwater Assessment West Plant Site, Superior Mine, Superior, Arizona	DRAWN	CB	DATE	3/15/2013
		CHECKED	JM	SCALE	NA
		REVIEWED		FILE NO.	NA
					JOB NO. 123-92566
					DWG. NO. NA
					FIGURE NO. 5-2



Tucson, Arizona

CLIENT/PROJECT



Groundwater Assessment  
West Plant Site, Superior Mine,  
Superior, Arizona

TITLE

## Shallow Unconfined Gila Unit

DRAWN

CB

DATE

3/15/2013

JOB NO.

123-92566

CHECKED

JM

SCALE

NA

DWG. NO.

NA

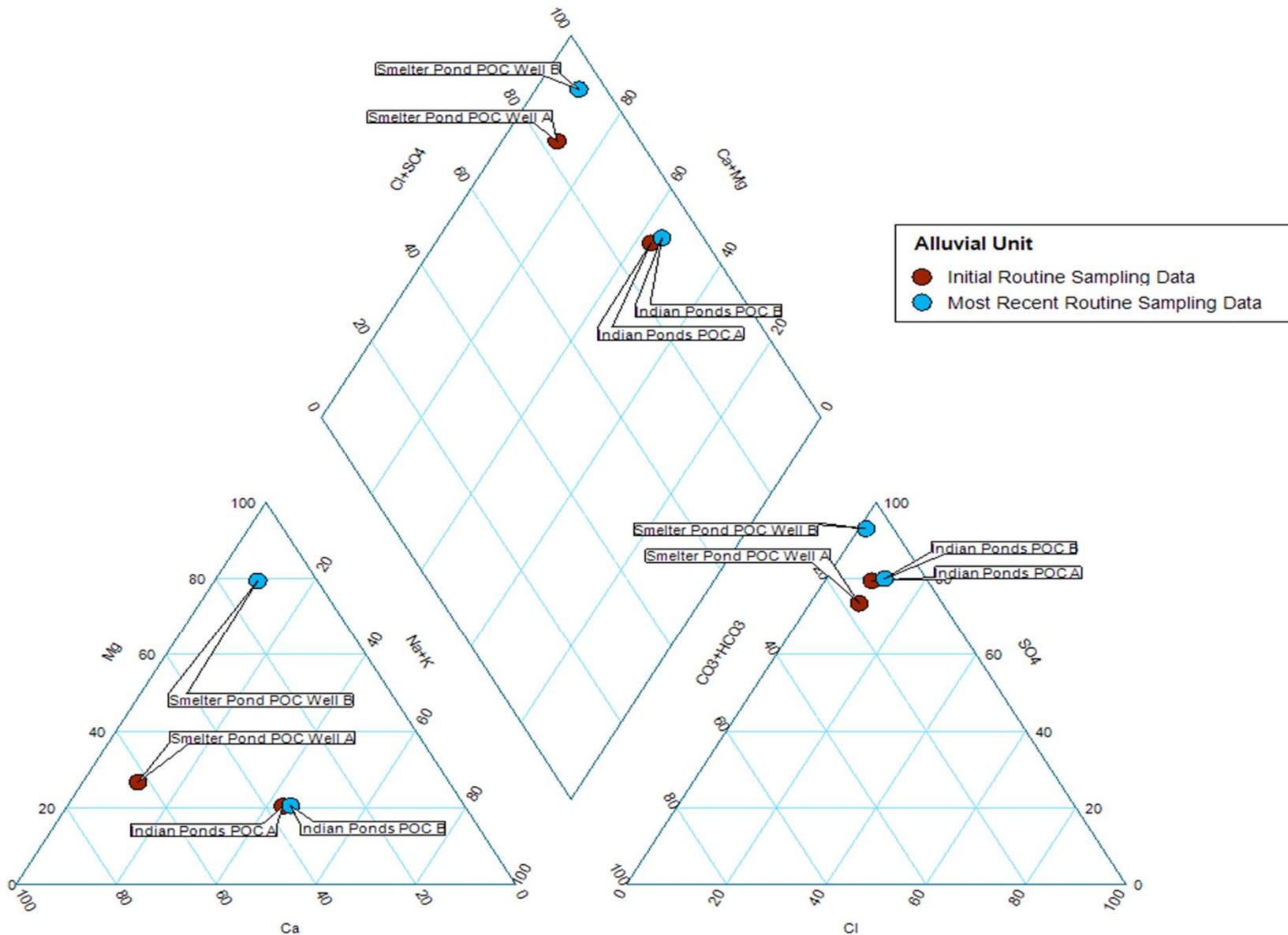
REVIEWED

FILE NO.

NA

FIGURE NO.

5-3



Tucson, Arizona

CLIENT/PROJECT



Groundwater Assessment  
West Plant Site, Superior Mine,  
Superior, Arizona

TITLE

## Alluvial Unit

DRAWN

CB

DATE

3/15/2013

JOB NO.

123-92566

CHECKED

JM

SCALE

NA

DWG. NO.

NA

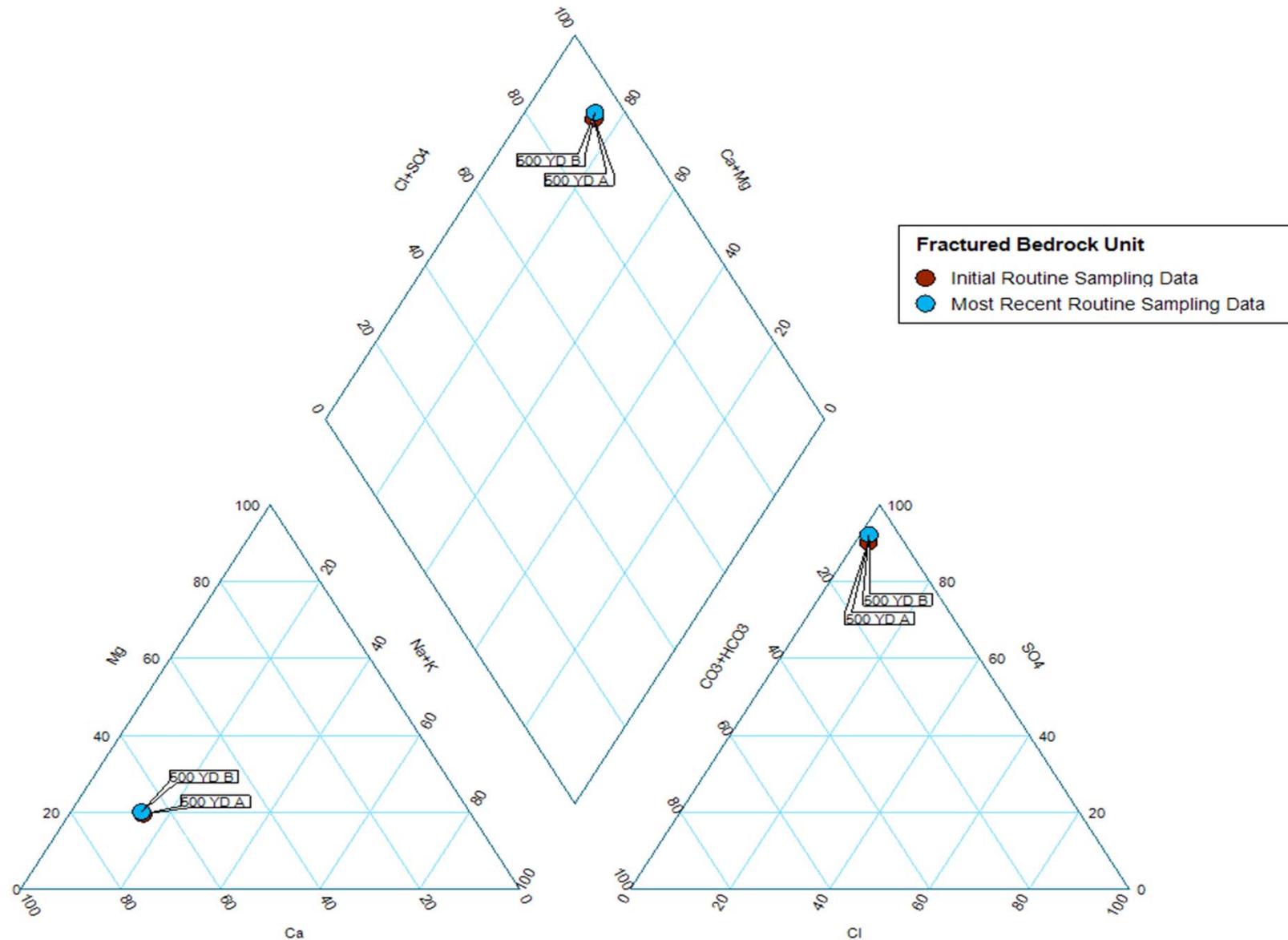
REVIEWED

FILE NO.

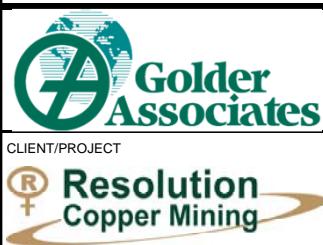
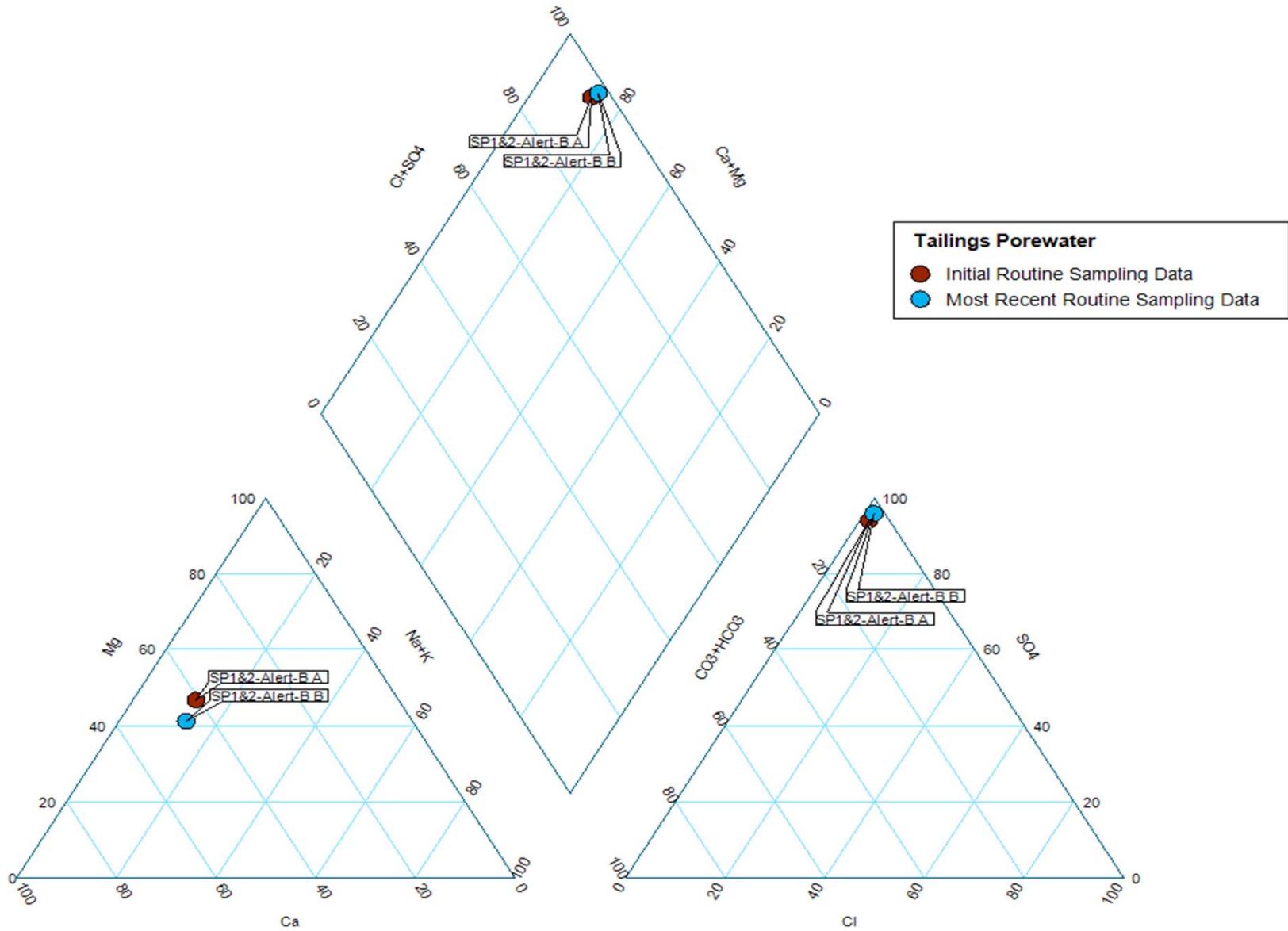
NA

FIGURE NO.

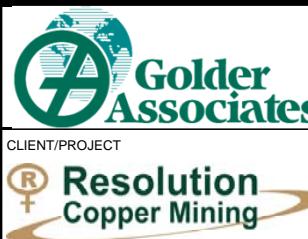
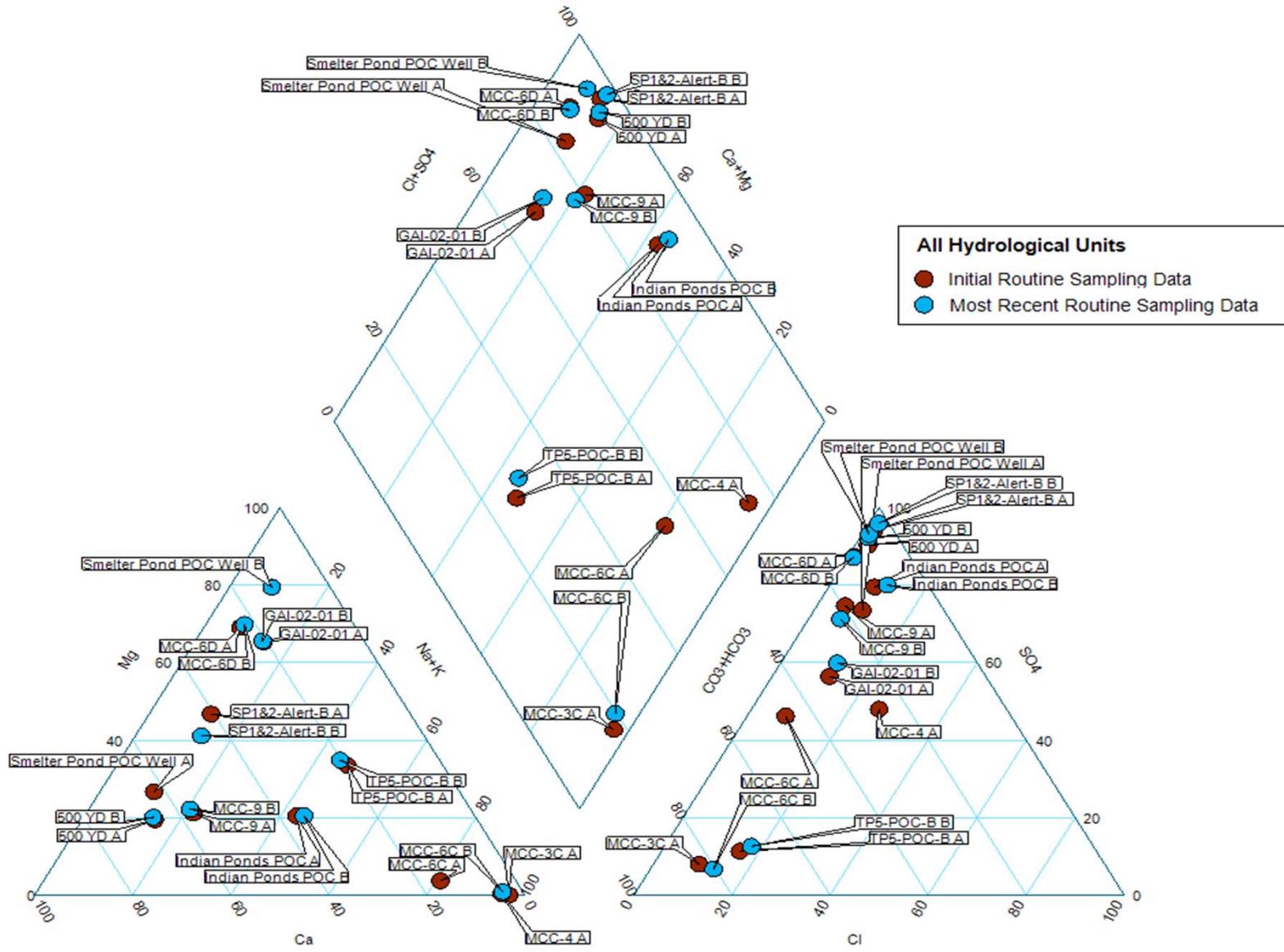
5-4



 <b>Golder Associates</b> Tucson, Arizona	TITLE		
	<b>Fractured Bedrock Unit</b>		
CLIENT/PROJECT <b>Resolution Copper Mining</b>	DRAWN CB	DATE 3/15/2013	JOB NO. 123-92566
Groundwater Assessment West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 5-5



		TITLE			
		<b>Tailings Porewater</b>			
CLIENT/PROJECT	Groundwater Assessment West Plant Site, Superior Mine, Superior, Arizona	DRAWN	CB	DATE	3/15/2013
		CHECKED	JM	SCALE	NA
		REVIEWED		FILE NO.	NA
					JOB NO. 123-92566
					DWG. NO. NA
					FIGURE NO. 5-6



CLIENT/PROJECT



Groundwater Assessment  
West Plant Site, Superior Mine,  
Superior, Arizona

TITLE

## All Hydrological Units

DRAWN

CB

DATE

3/15/2013

JOB NO.

123-92566

CHECKED

JM

SCALE

NA

DWG. NO.

NA

REVIEWED

FILE NO.

NA

FIGURE NO.

5-7

**ATTACHMENT 6**  
**STATISTICAL ANALYSIS**

**SEASONAL KENDALL & SEN'S  
PROGRAMS AND INPUT/OUTPUT FILES  
(ON ATTACHED DVD)**

## **SEN'S SLOPE ESTIMATOR GRAPHS**

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 2:27:15 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

**Ca**

**General Statistics**

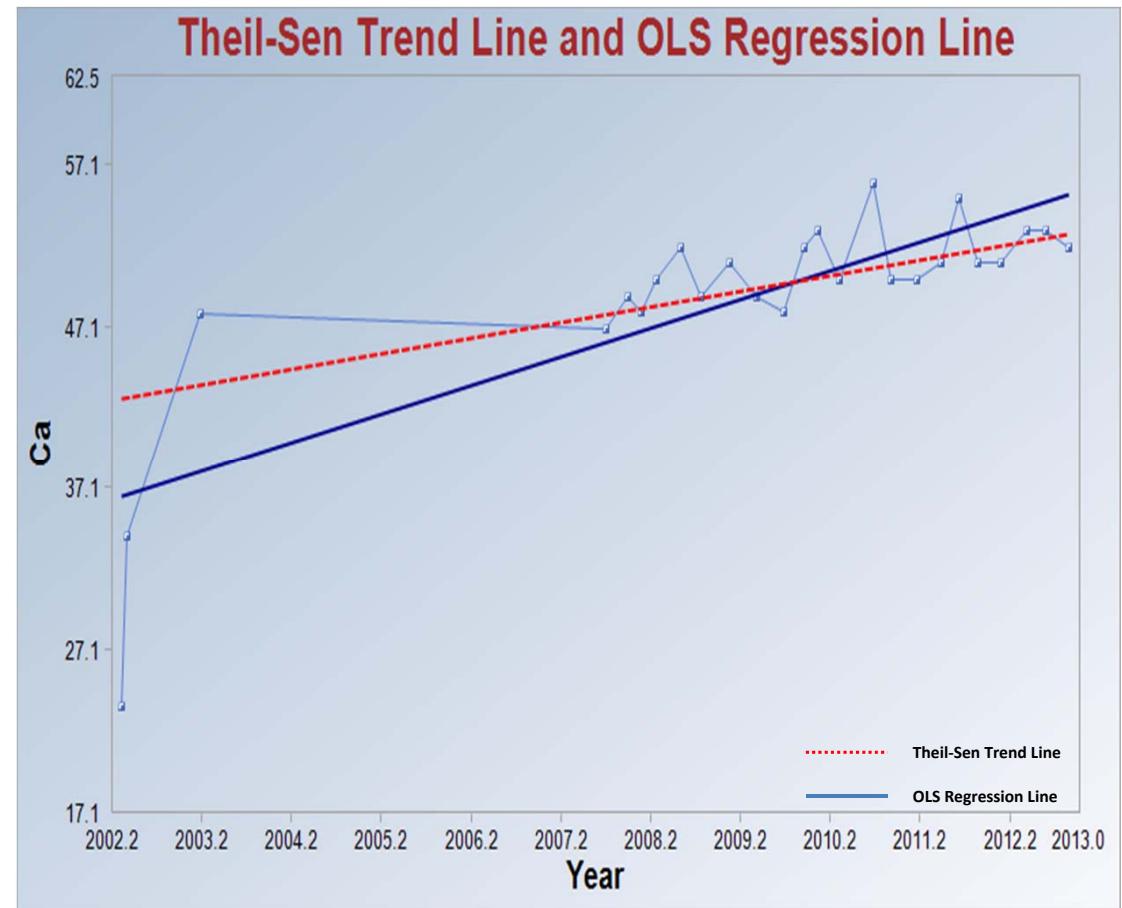
Number of Events 25  
 Number of Values 25  
 Minimum 23.6  
 Maximum 56  
 Mean 49.02  
 Geometric Mean 48.42  
 Median 50  
 Standard Deviation 6.628  
 SEM 1.326

**Approximate inference for Theil-Sen Trend Test**

Mann-Kendall Statistic (S) 174  
 Standard Deviation of S 42.47  
 Number of Slopes 300  
 Theil-Sen Slope 0.971  
 Theil-Sen Intercept -1901  
 M1 108.4  
 M2 191.6  
 95% LCL of Slope (0.025) 0.559  
 95% UCL of Slope (0.975) 1.72

M1' 115.1  
 One-sided 95% lower limit of Slope 0.614

**Statistically significant evidence of an increasing trend at the specified level of significance.**



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

GAI-02-01 - Calcium

FIGURE NO.

6-1

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 2:53:04 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

Cl

**General Statistics**

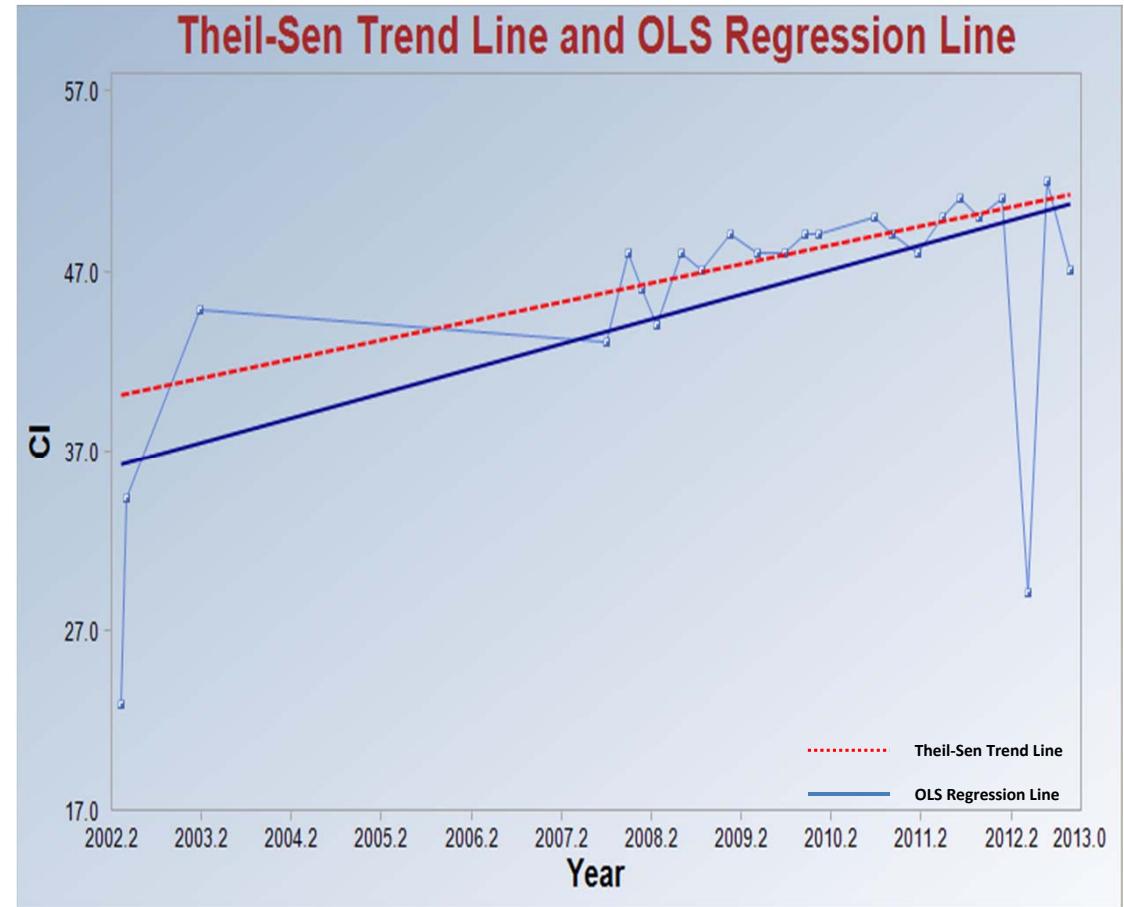
Number of Events 24  
 Number of Values 24  
 Minimum 22.8  
 Maximum 52  
 Mean 45.75  
 Geometric Mean 45.04  
 Median 48  
 Standard Deviation 7.129  
 SEM 1.455

**Approximate inference for Theil-Sen Trend Test**

Mann-Kendall Statistic (S) 153  
 Standard Deviation of S 39.93  
 Number of Slopes 276  
 Theil-Sen Slope 1.055  
 Theil-Sen Intercept -2073  
 M1 98.87  
 M2 177.1  
 95% LCL of Slope (0.025) 0.629  
 95% UCL of Slope (0.975) 1.593

M1' 105.2  
 One-sided 95% lower limit of Slope 0.667

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

GAI-02-01 - Chloride

FIGURE NO.

6-2

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 2:57:03 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

### HCO<sub>3</sub>-

#### General Statistics

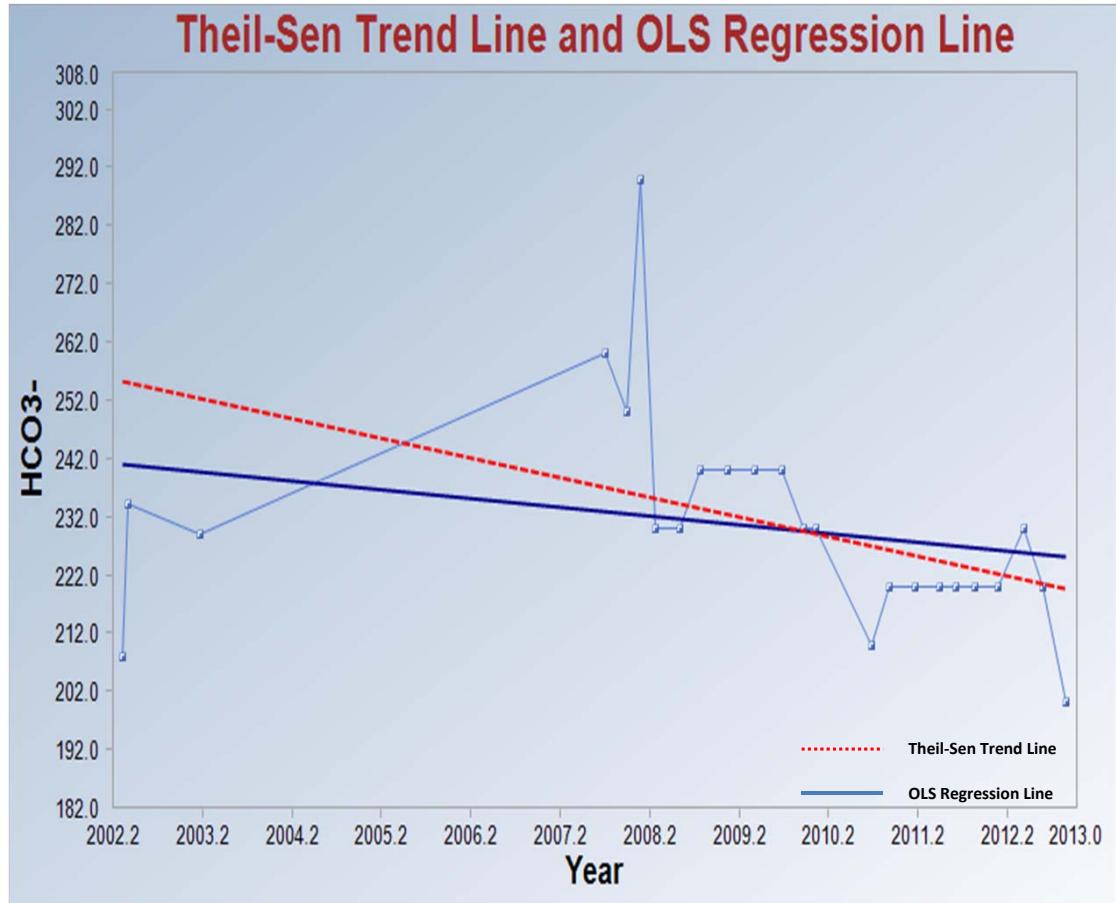
Number of Events 24  
 Number of Values 24  
 Minimum 200  
 Maximum 290  
 Mean 230.5  
 Geometric Mean 229.8  
 Median 230  
 Standard Deviation 18.41  
 SEM 3.758

#### Approximate inference for Theil-Sen Trend Test

Mann-Kendall Statistic (S) -109  
 Standard Deviation of S 39.44  
 Number of Slopes 276  
 Theil-Sen Slope -3.385  
 Theil-Sen Intercept 7034  
 M1 99.35  
 M2 176.7  
 95% LCL of Slope (0.025) -7.811  
 95% UCL of Slope (0.975) 0

M1' 170.4  
 One-sided 95% lower limit of Slope -0.665

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

GAI-02-01 - Bicarbonate,

FIGURE NO.

6-3

**Theil-Sen Trend Test Analysis**

User Selected Options	
Date/Time of Computation	2/20/2013 2:50:19 PM
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

Mg

**General Statistics**

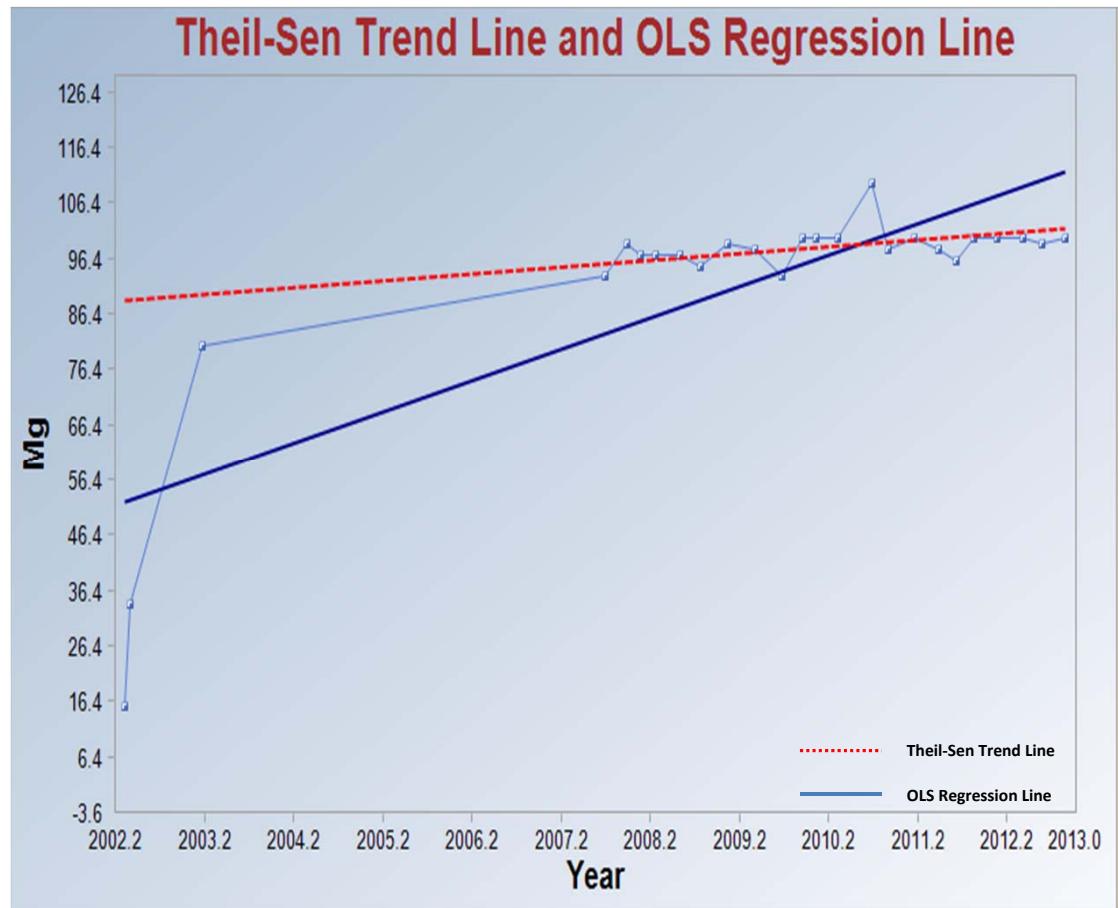
Number of Events	25
Number of Values	25
Minimum	15.3
Maximum	110
Mean	91.95
Geometric Mean	86.95
Median	98
Standard Deviation	20.99
SEM	4.198

**Approximate inference for Theil-Sen Trend Test**

Mann-Kendall Statistic (S)	152
Standard Deviation of S	41.9
Number of Slopes	300
Theil-Sen Slope	1.223
Theil-Sen Intercept	-2361
M1	108.9
M2	191.1
95% LCL of Slope (0.025)	0.382
95% UCL of Slope (0.975)	2.253

M1' 115.5  
One-sided 95% lower limit of Slope 0.486

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

GAI-02-01 - Magnesium

FIGURE NO.

6-4

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 2:42:44 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

**SO4**

**General Statistics**

Number of Events 24  
 Number of Values 24  
 Minimum 152  
 Maximum 360  
 Mean 298.6  
 Geometric Mean 294  
 Median 310  
 Standard Deviation 48.06  
 SEM 9.81

**Approximate inference for Theil-Sen Trend Test**

Mann-Kendall Statistic (S) 223  
 Standard Deviation of S 40.01  
 Number of Slopes 276  
 Theil-Sen Slope 14.54  
 Theil-Sen Intercept -28905  
 M1 98.79  
 M2 177.2  
 95% LCL of Slope (0.025) 11.57  
 95% UCL of Slope (0.975) 18.04

M1' 105.1  
 One-sided 95% lower limit of Slope 12.11

**Statistically significant evidence of an increasing trend at the specified level of significance.**



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

GAI-02-01 - Sulfate

FIGURE NO.

6-5

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 2:49:18 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

### TDS

#### General Statistics

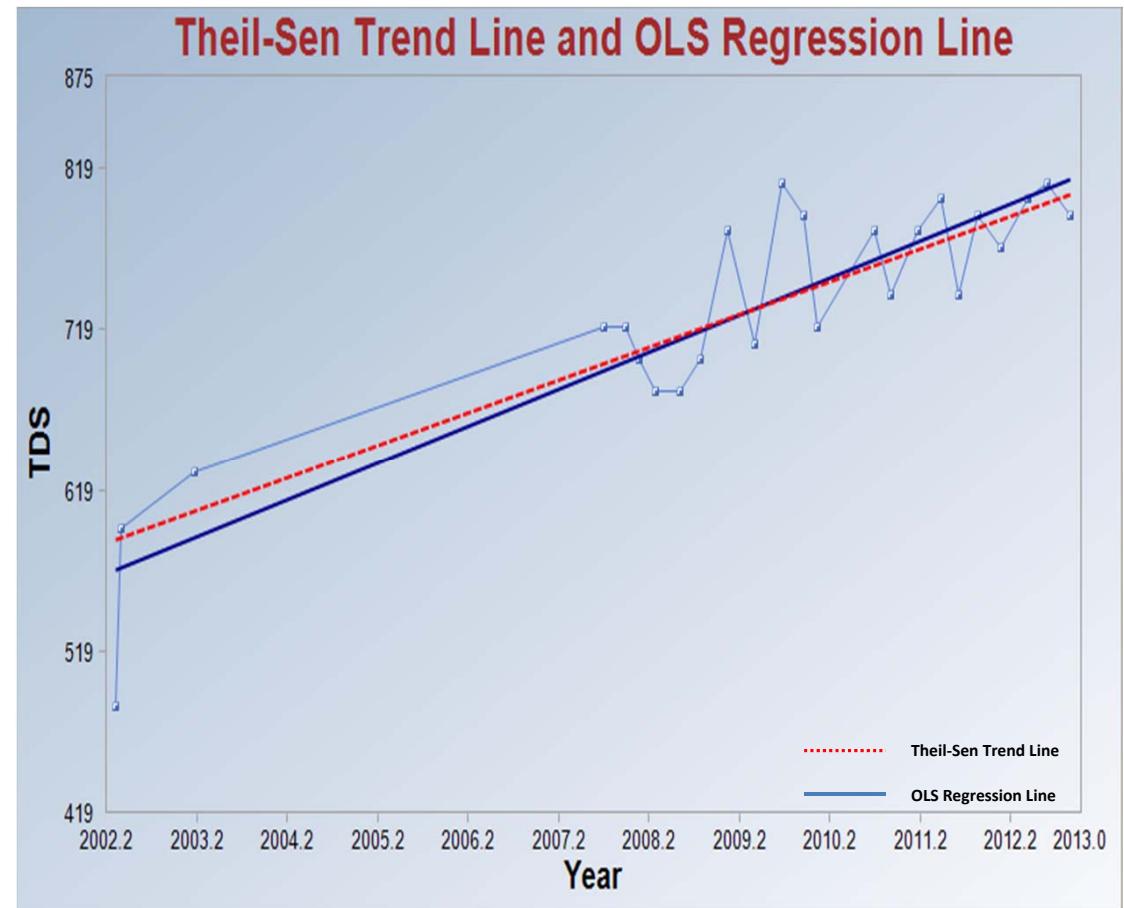
Number of Events 24  
 Number of Values 24  
 Minimum 484  
 Maximum 810  
 Mean 730  
 Geometric Mean 725.4  
 Median 740  
 Standard Deviation 77.72  
 SEM 15.87

#### Approximate inference for Theil-Sen Trend Test

Mann-Kendall Statistic (S) 170  
 Standard Deviation of S 40.12  
 Number of Slopes 276  
 Theil-Sen Slope 20.26  
 Theil-Sen Intercept -39985  
 M1 98.69  
 M2 177.3  
 95% LCL of Slope (0.025) 14.4  
 95% UCL of Slope (0.975) 26.43

M1' 105  
 One-sided 95% lower limit of Slope 15.71

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

GAI-02-01 - Total Dissolved Solids

FIGURE NO.

6-6

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 3:19:18 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

F

**General Statistics**

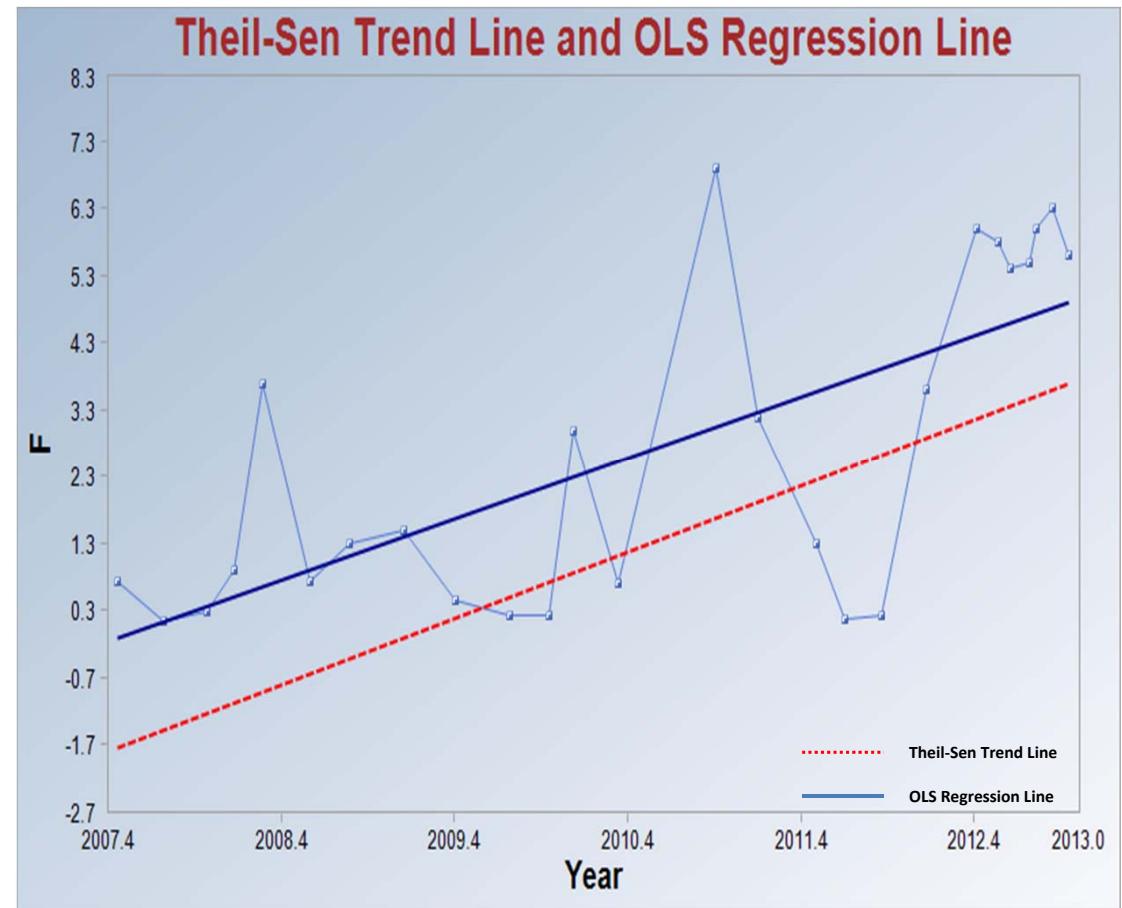
Number of Events 26  
 Number of Values 26  
 Minimum 0.14  
 Maximum 6.9  
 Mean 2.691  
 Geometric Mean 1.408  
 Median 1.4  
 Standard Deviation 2.448  
 SEM 0.48

**Approximate inference for Theil-Sen Trend Test**

Mann-Kendall Statistic (S) 141  
 Standard Deviation of S 45.35  
 Number of Slopes 325  
 Theil-Sen Slope 0.992  
 Theil-Sen Intercept -1994  
 M1 118.1  
 M2 206.9  
 95% LCL of Slope (0.025) 0.413  
 95% UCL of Slope (0.975) 1.234

M1' 125.2  
 One-sided 95% lower limit of Slope 0.559

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

Smelter Pond - Fluoride

FIGURE NO.

6-7

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 3:05:54 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

### HCO<sub>3</sub>-

#### General Statistics

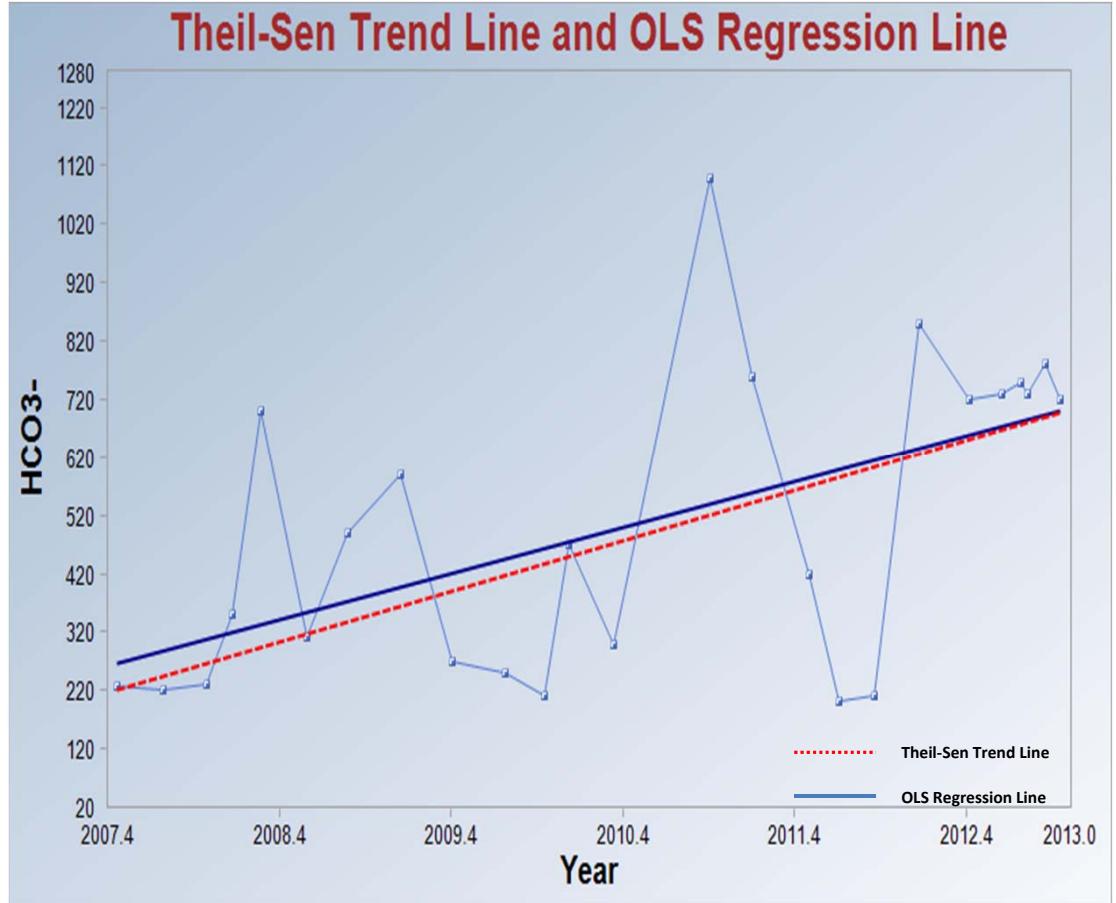
Number of Events 25  
 Number of Values 25  
 Minimum 200  
 Maximum 1100  
 Mean 503.5  
 Geometric Mean 436.9  
 Median 470  
 Standard Deviation 261.9  
 SEM 52.39

#### Approximate inference for Theil-Sen Trend Test

Mann-Kendall Statistic (S) 105  
 Standard Deviation of S 42.78  
 Number of Slopes 300  
 Theil-Sen Slope 86.7  
 Theil-Sen Intercept -173821  
 M1 108.1  
 M2 191.9  
 95% LCL of Slope (0.025) 12.01  
 95% UCL of Slope (0.975) 113.7

M1' 114.8  
 One-sided 95% lower limit of Slope 27.47

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

Smelter Pond - Bicarbonate

FIGURE NO.

6-8

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 3:13:41 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

Na

**General Statistics**

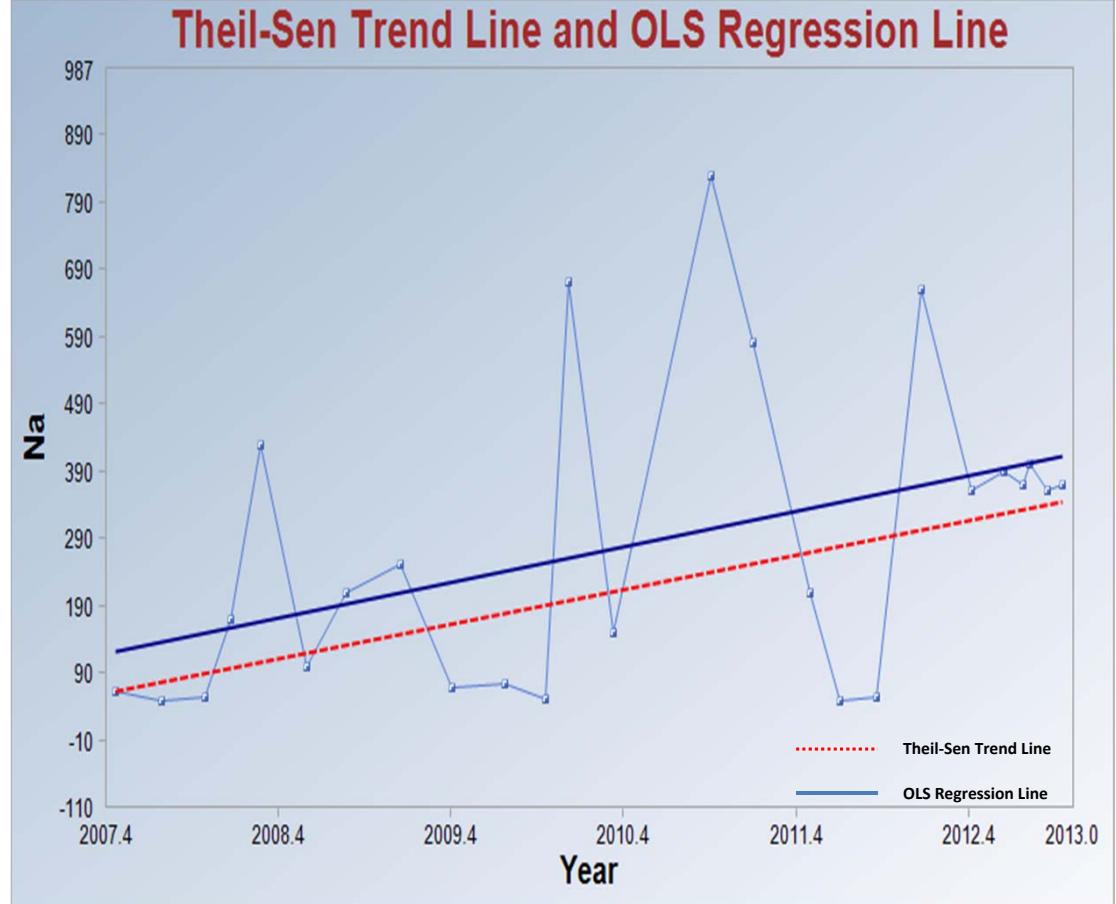
Number of Events 25  
 Number of Values 25  
 Minimum 47  
 Maximum 830  
 Mean 278.9  
 Geometric Mean 188.8  
 Median 210  
 Standard Deviation 226.9  
 SEM 45.37

**Approximate inference for Theil-Sen Trend Test**

Mann-Kendall Statistic (S) 87  
 Standard Deviation of S 42.78  
 Number of Slopes 300  
 Theil-Sen Slope 51.06  
 Theil-Sen Intercept -102443  
 M1 108.1  
 M2 191.9  
 95% LCL of Slope (0.025) 0.0771  
 95% UCL of Slope (0.975) 91.37

M1' 114.8  
 One-sided 95% lower limit of Slope 10.24

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

Smelter Pond - Sodium

FIGURE NO.

6-9

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 3:15:00 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

#### SO4

##### General Statistics

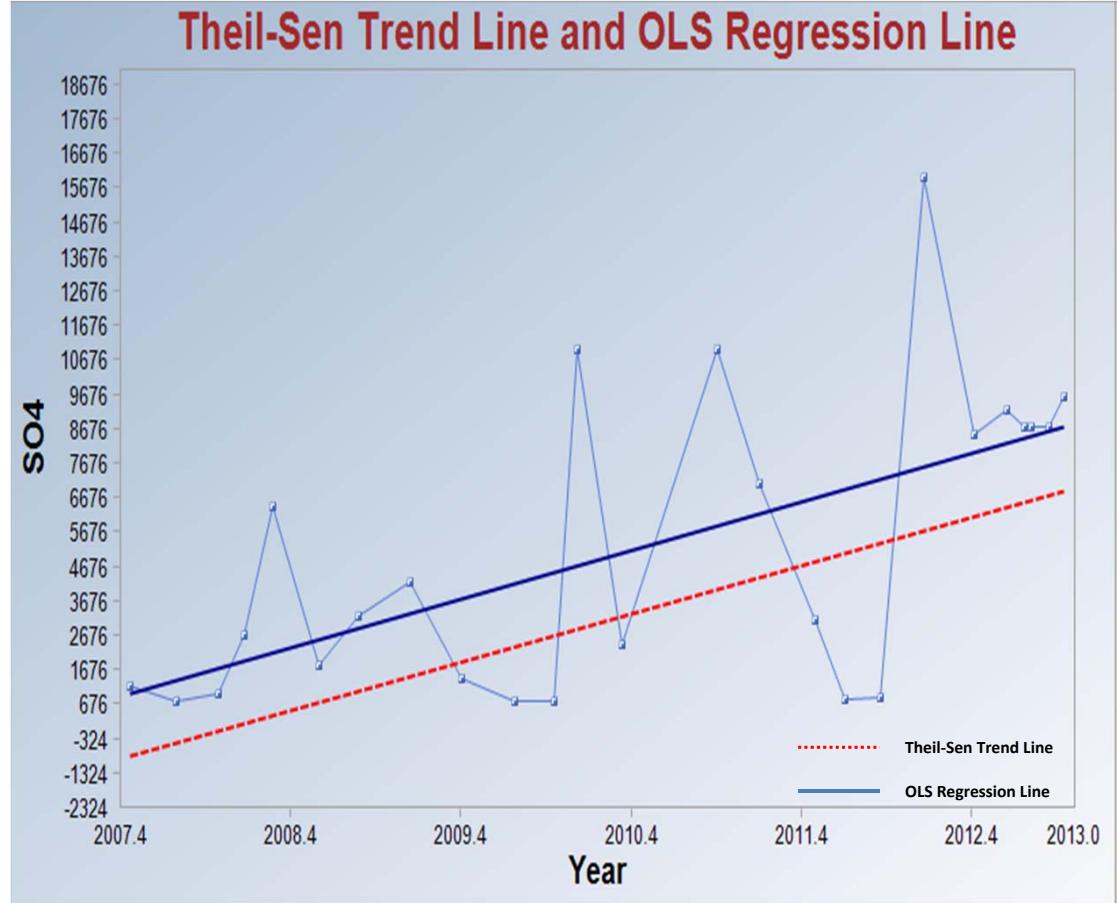
Number of Events 25  
 Number of Values 25  
 Minimum 730  
 Maximum 16000  
 Mean 5188  
 Geometric Mean 3299  
 Median 3200  
 Standard Deviation 4348  
 SEM 869.6

##### Approximate inference for Theil-Sen Trend Test

Mann-Kendall Statistic (S) 119  
 Standard Deviation of S 42.75  
 Number of Slopes 300  
 Theil-Sen Slope 1405  
 Theil-Sen Intercept -2820663  
 M1 108.1  
 M2 191.9  
 95% LCL of Slope (0.025) 428.6  
 95% UCL of Slope (0.975) 1917

M1' 114.8  
 One-sided 95% lower limit of Slope 519.6

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

Smelter Pond - Sulfate

FIGURE NO.

6-10

**Theil-Sen Trend Test Analysis**

User Selected Options  
 Date/Time of Computation 2/20/2013 3:10:46 PM  
 From File WorkSheet.wst  
 Full Precision OFF  
 Confidence Coefficient 0.95  
 Level of Significance 0.05

### TDS

#### General Statistics

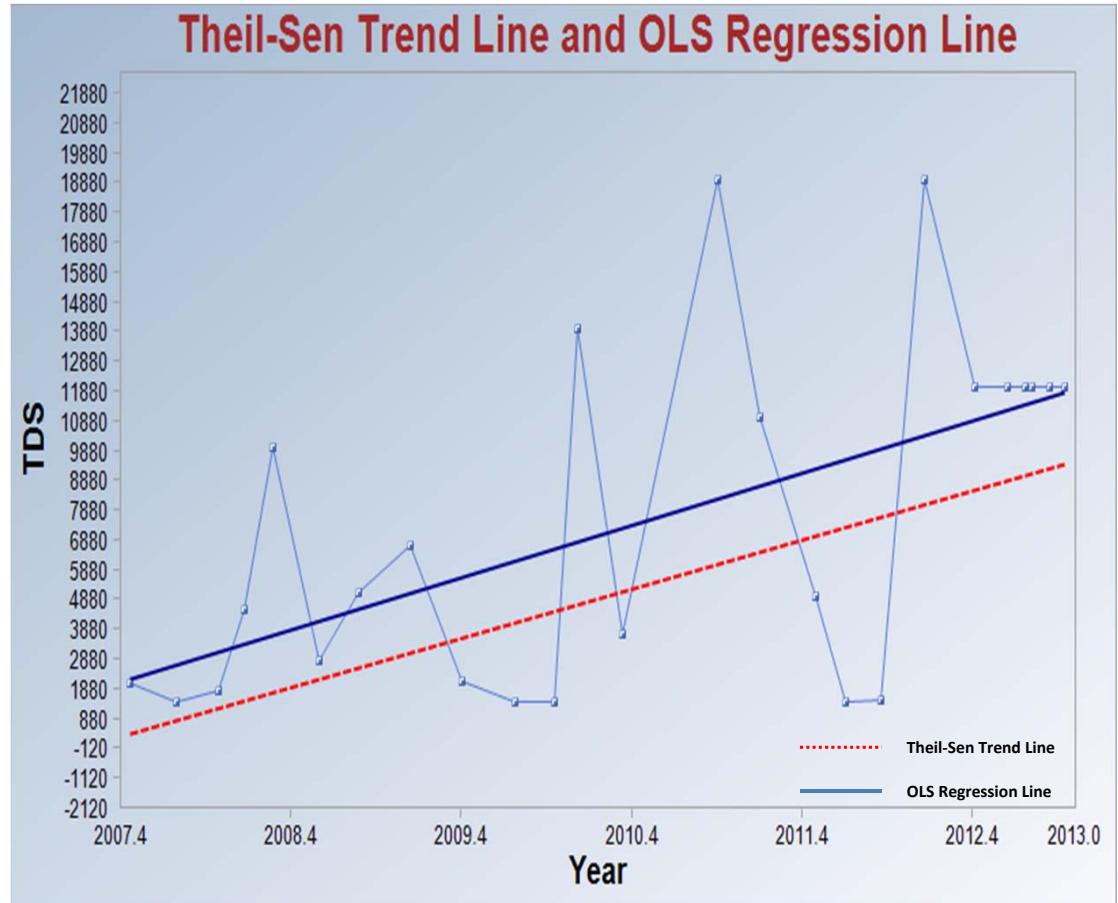
Number of Events 25  
 Number of Values 25  
 Minimum 1400  
 Maximum 19000  
 Mean 7435  
 Geometric Mean 5141  
 Median 5100  
 Standard Deviation 5704  
 SEM 1141

#### Approximate inference for Theil-Sen Trend Test

Mann-Kendall Statistic (S) 110  
 Standard Deviation of S 42.37  
 Number of Slopes 300  
 Theil-Sen Slope 1648  
 Theil-Sen Intercept -3308614  
 M1 108.5  
 M2 191.5  
 95% LCL of Slope (0.025) 34.81  
 95% UCL of Slope (0.975) 2344

M1' 115.2  
 One-sided 95% lower limit of Slope 431.4

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

Smelter Pond - Total Dissolved Solids

FIGURE NO.

6-11

**Theil-Sen Trend Test Analysis**

User Selected Options	
Date/Time of Computation	2/20/2013 4:44:02 PM
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

#### Field EC

##### General Statistics

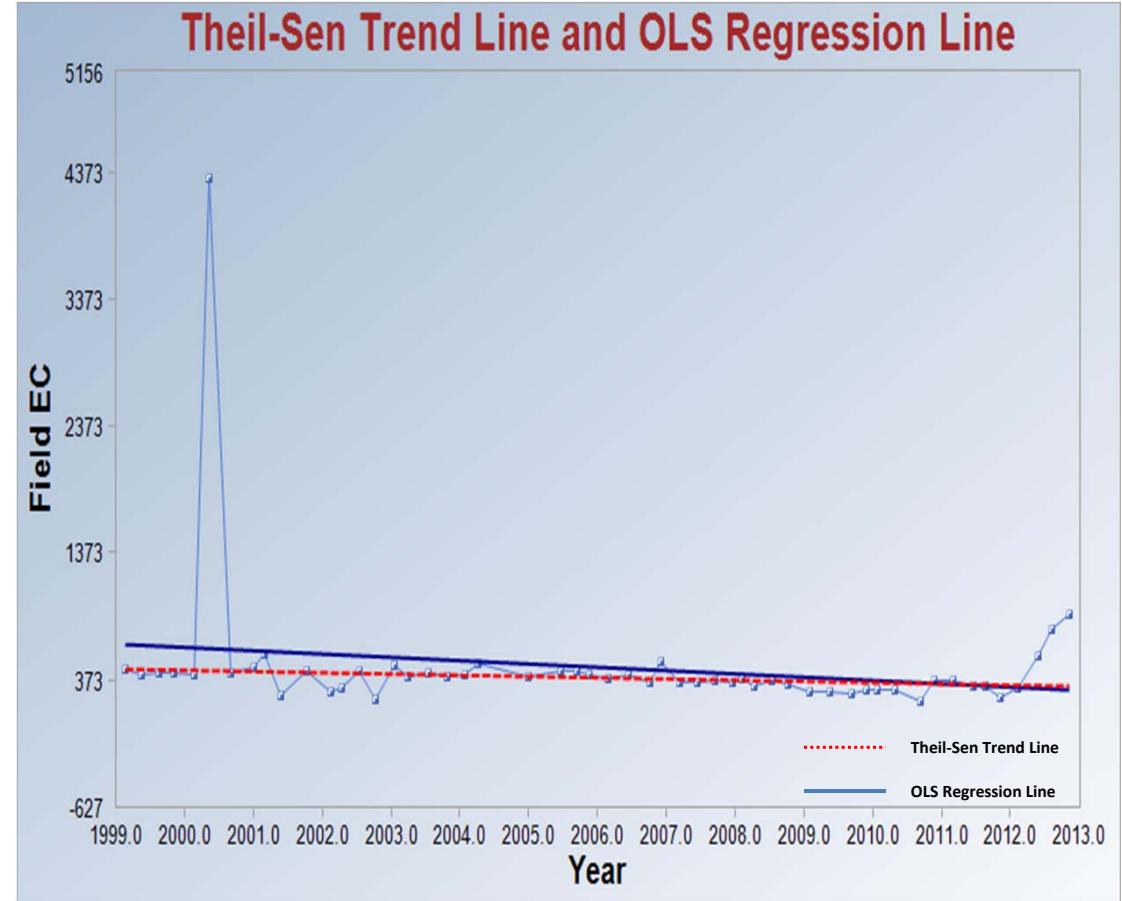
Number of Events	53
Number of Values	53
Minimum	198.8
Maximum	4330
Mean	468.5
Geometric Mean	396.6
Median	389
Standard Deviation	553.8
SEM	76.07

##### Approximate inference for Theil-Sen Trend Test

Mann-Kendall Statistic (S)	-412
Standard Deviation of S	130.3
Number of Slopes	1378
Theil-Sen Slope	-10.31
Theil-Sen Intercept	21075
M1	561.3
M2	816.7
95% LCL of Slope (0.025)	-15.13
95% UCL of Slope (0.975)	-5.454

M1' 796.2  
One-sided 95% lower limit of Slope -6.177

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

MCC-3C - Field Electrical Conductivity

FIGURE NO.

6-12

**Theil-Sen Trend Test Analysis**

User Selected Options	
Date/Time of Computation	2/20/2013 5:00:25 PM
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

#### As

##### General Statistics

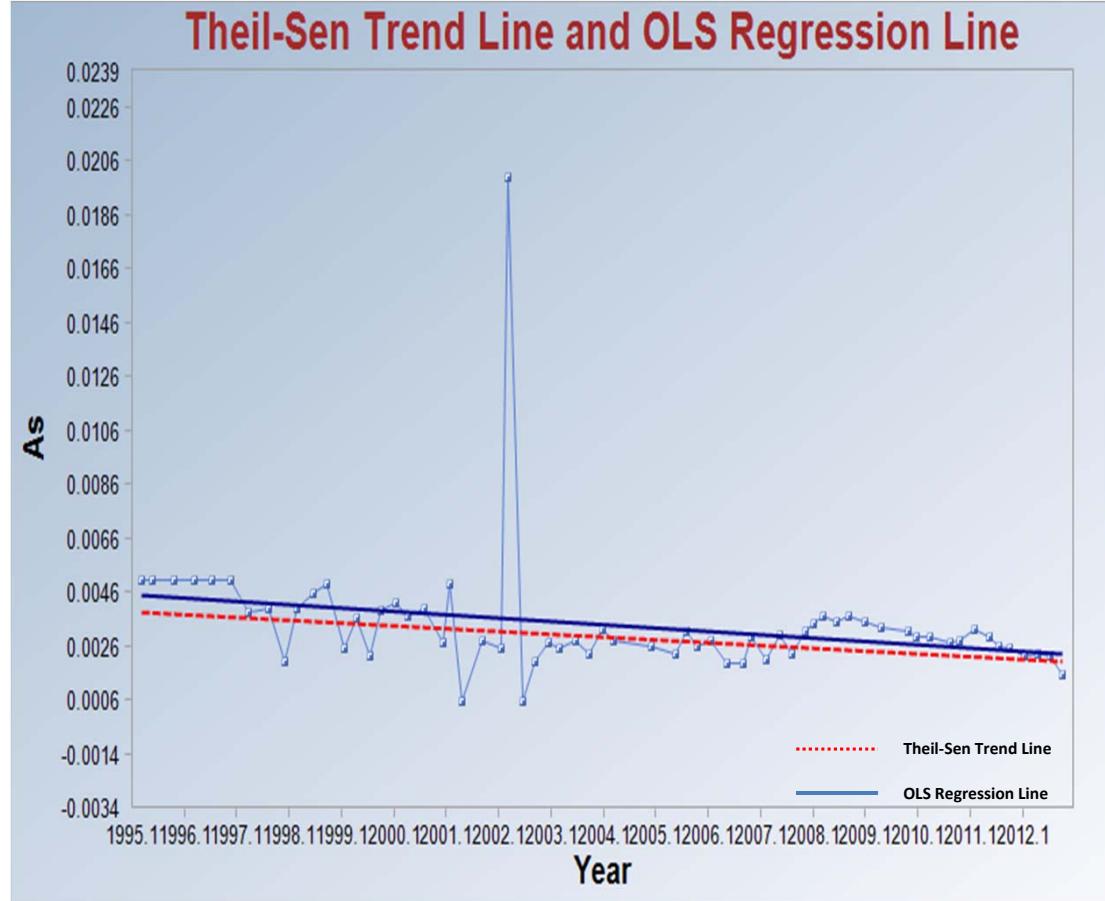
Number of Events	64
Number of Values	64
Minimum	5.00E-04
Maximum	0.02
Mean	0.00336
Geometric Mean	0.00297
Median	0.0029
Standard Deviation	0.00235
SEM	2.94E-04

##### Approximate inference for Theil-Sen Trend Test

Mann-Kendall Statistic (S)	-637
Standard Deviation of S	172.3
Number of Slopes	2016
Theil-Sen Slope	-1.06E-04
Theil-Sen Intercept	0.215
M1	839.1
M2	1177
95% LCL of Slope (0.025)	-1.48E-04
95% UCL of Slope (0.975)	-5.23E-05

M1' 1150  
One-sided 95% lower limit of Slope -5.98E-05

Statistically significant evidence of an increasing trend at the specified level of significance.



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

MCC-4 - Arsenic

FIGURE NO.

6-13

**Theil-Sen Trend Test Analysis**

User Selected Options	
Date/Time of Computation	2/20/2013 3:41:08 PM
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

### As

#### General Statistics

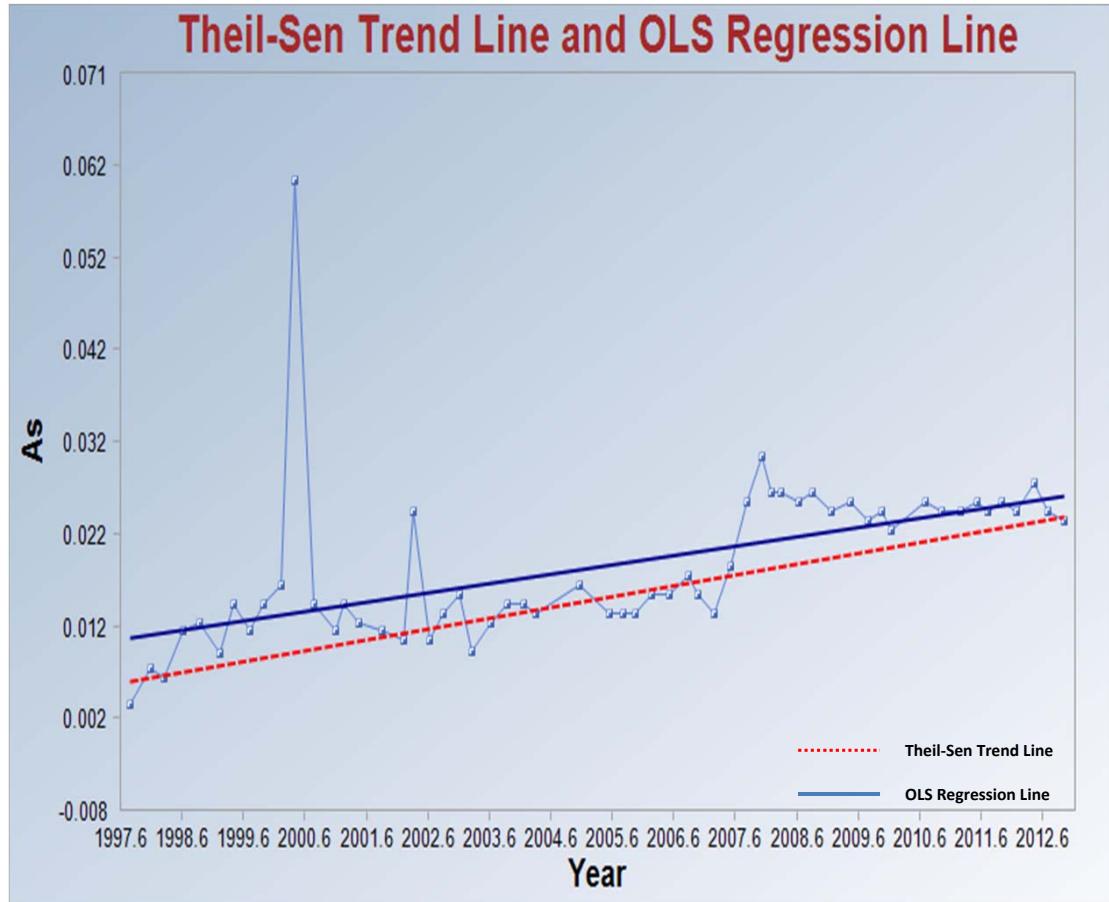
Number of Events	57
Number of Values	57
Minimum	0.003
Maximum	0.06
Mean	0.018
Geometric Mean	0.0162
Median	0.015
Standard Deviation	0.00868
SEM	0.00115

#### Approximate inference for Theil-Sen Trend Test

Mann-Kendall Statistic (S)	866
Standard Deviation of S	144.7
Number of Slopes	1596
Theil-Sen Slope	0.00117
Theil-Sen Intercept	-2.337
M1	656.2
M2	939.8
95% LCL of Slope (0.025)	9.32E-04
95% UCL of Slope (0.975)	0.0014

M1' 679  
One-sided 95% lower limit of Slope 9.80E-04

**Statistically significant evidence of an increasing trend at the specified level of significance.**



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

TITLE

MCC-6C - Arsenic,

FIGURE NO.

6-14

**Theil-Sen Trend Test Analysis**

User Selected Options	
Date/Time of Computation	2/20/2013 3:43:45 PM
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

#### Field EC

##### General Statistics

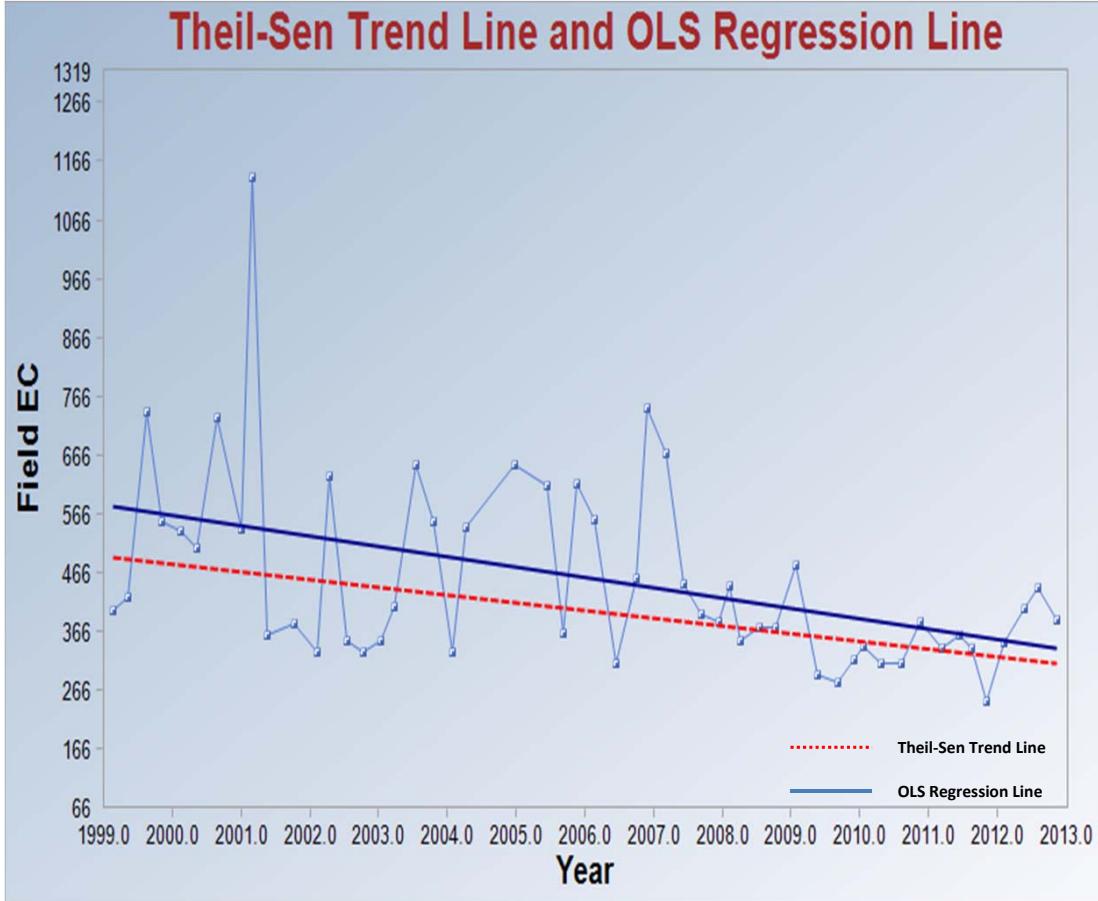
Number of Events	60
Number of Values	60
Minimum	245
Maximum	1140
Mean	443.2
Geometric Mean	421.9
Median	384
Standard Deviation	155.9
SEM	20.13

##### Approximate inference for Theil-Sen Trend Test

Mann-Kendall Statistic (S)	-515
Standard Deviation of S	156.7
Number of Slopes	1770
Theil-Sen Slope	N/A
Theil-Sen Intercept	N/A
M1	731.4
M2	1039
95% LCL of Slope (0.025)	-20.33
95% UCL of Slope (0.975)	-4.739

M1' 1014  
One-sided 95% lower limit of Slope -5.41

**Statistically significant evidence of an increasing trend at the specified level of significance.**



PROJECT/REPORT

Groundwater Assessment

JOB NO.

123-92566

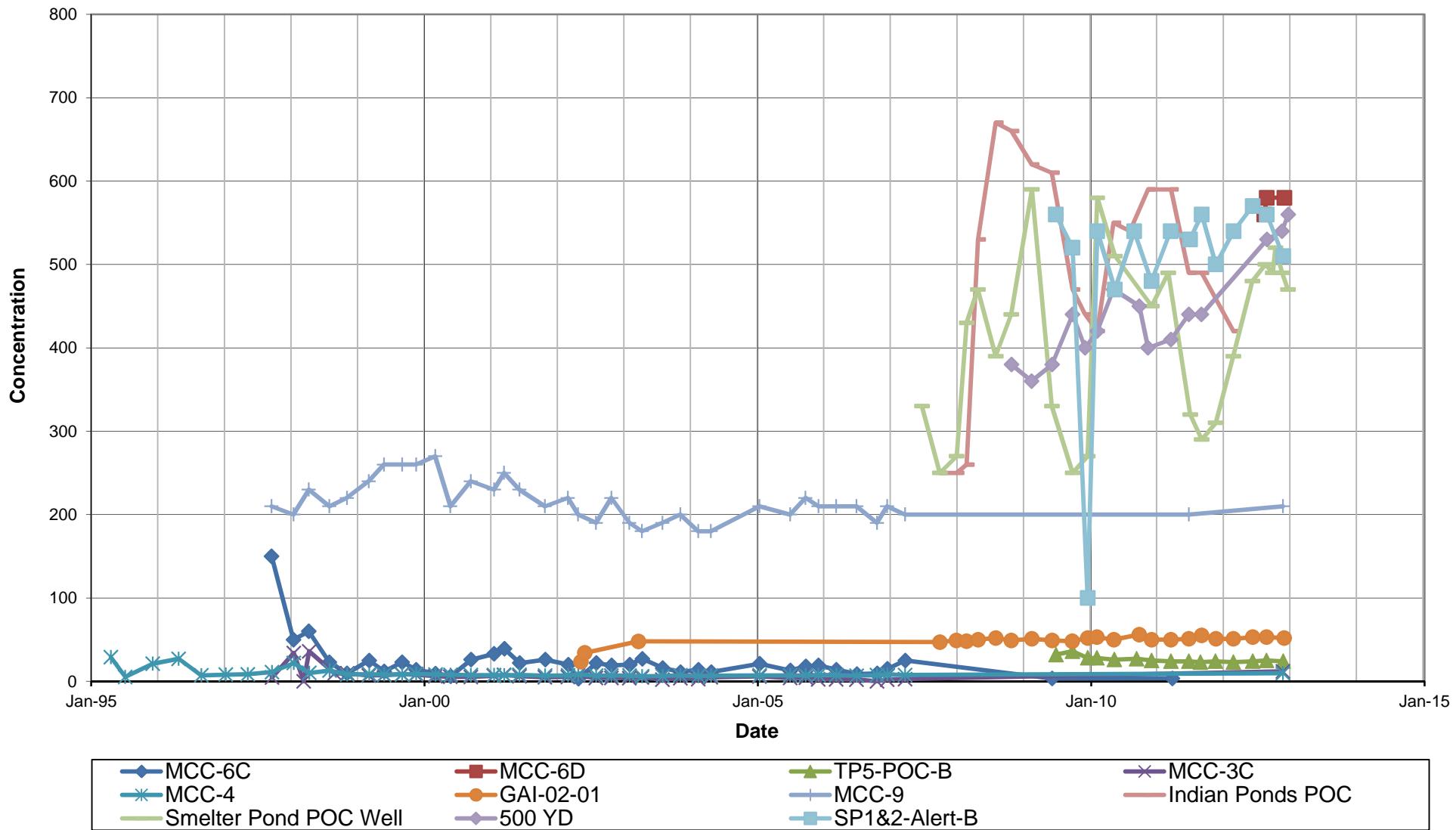
TITLE

MCC-6C - Electrical Conductivity

FIGURE NO.

6-15

**ATTACHMENT 7**  
**TIME SERIES GRAPHS**



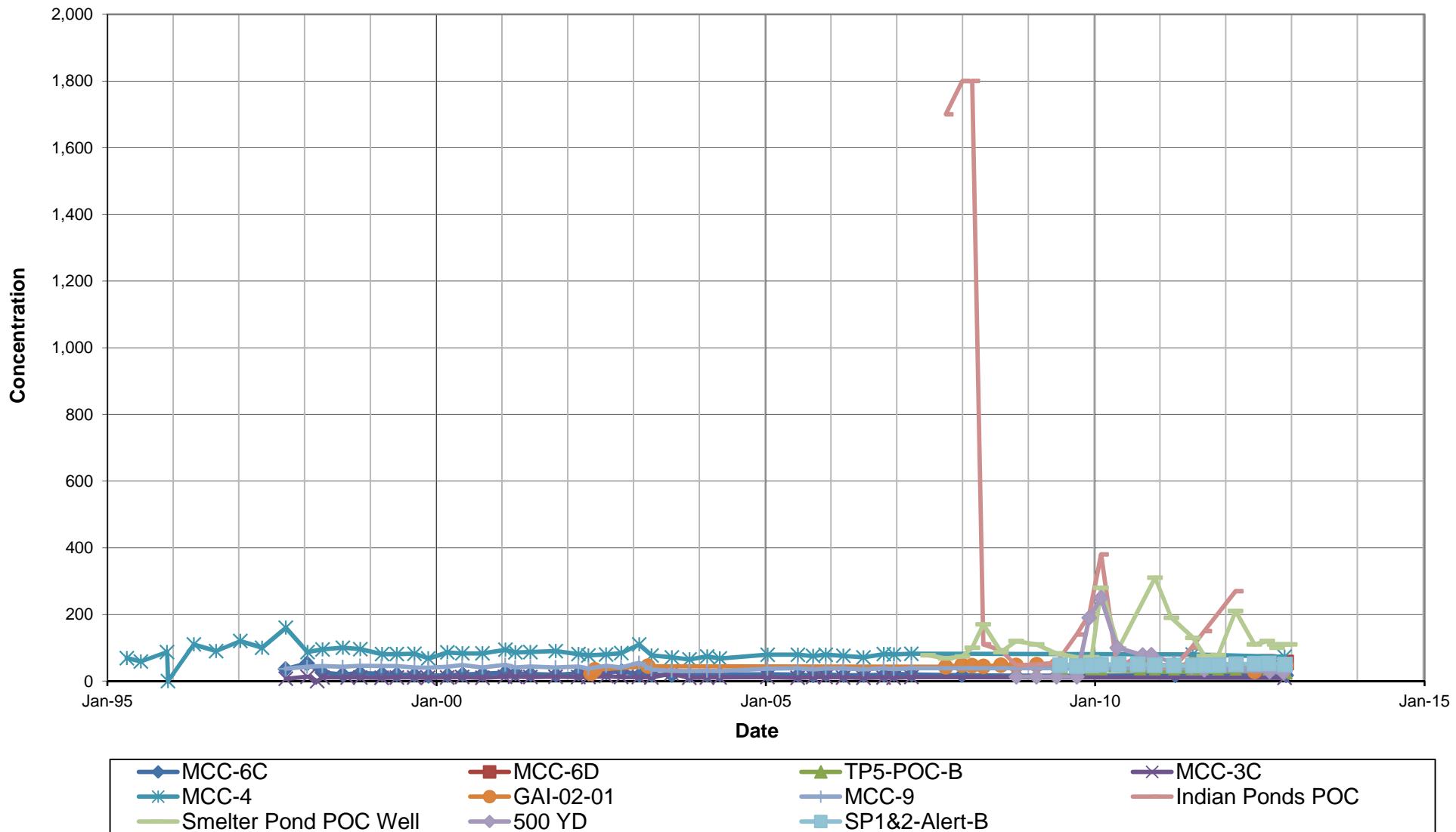
**Golder Associates** Tucson, Arizona  
CLIENT/PROJECT  
**Resolution Copper Mining**

Groundwater Assessment,  
West Plant Site, Superior Mine,  
Superior, Arizona

TITLE

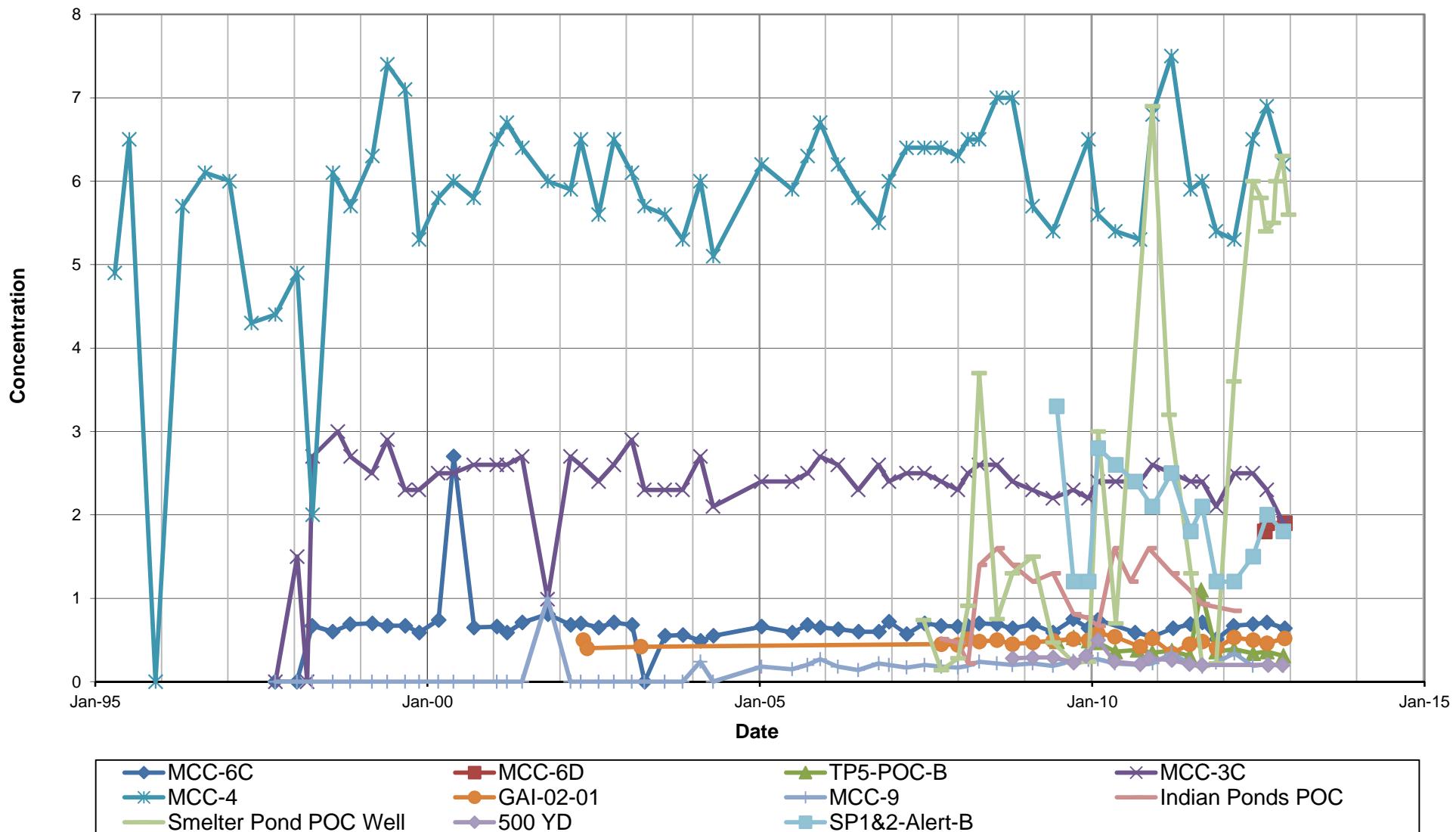
Calcium (mg/L)

DRAWN	CB	DATE	3/18/2013	JOB NO.	123-92566
CHECKED	JM	SCALE	NA	DWG. NO.	NA
REVIEWED		FILE NO.	NA	FIGURE NO.	7-1



Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.

TITLE		Chloride (mg/L)			
 Golder Associates	Tucson, Arizona				
CLIENT/PROJECT	Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	DRAWN	CB	DATE	3/18/2013
		CHECKED	JM	SCALE	NA
		REVIEWED		FILE NO.	NA
				JOB NO.	123-92566
				DEQ/NLO.	NA
				FIGURE NO.	7-2



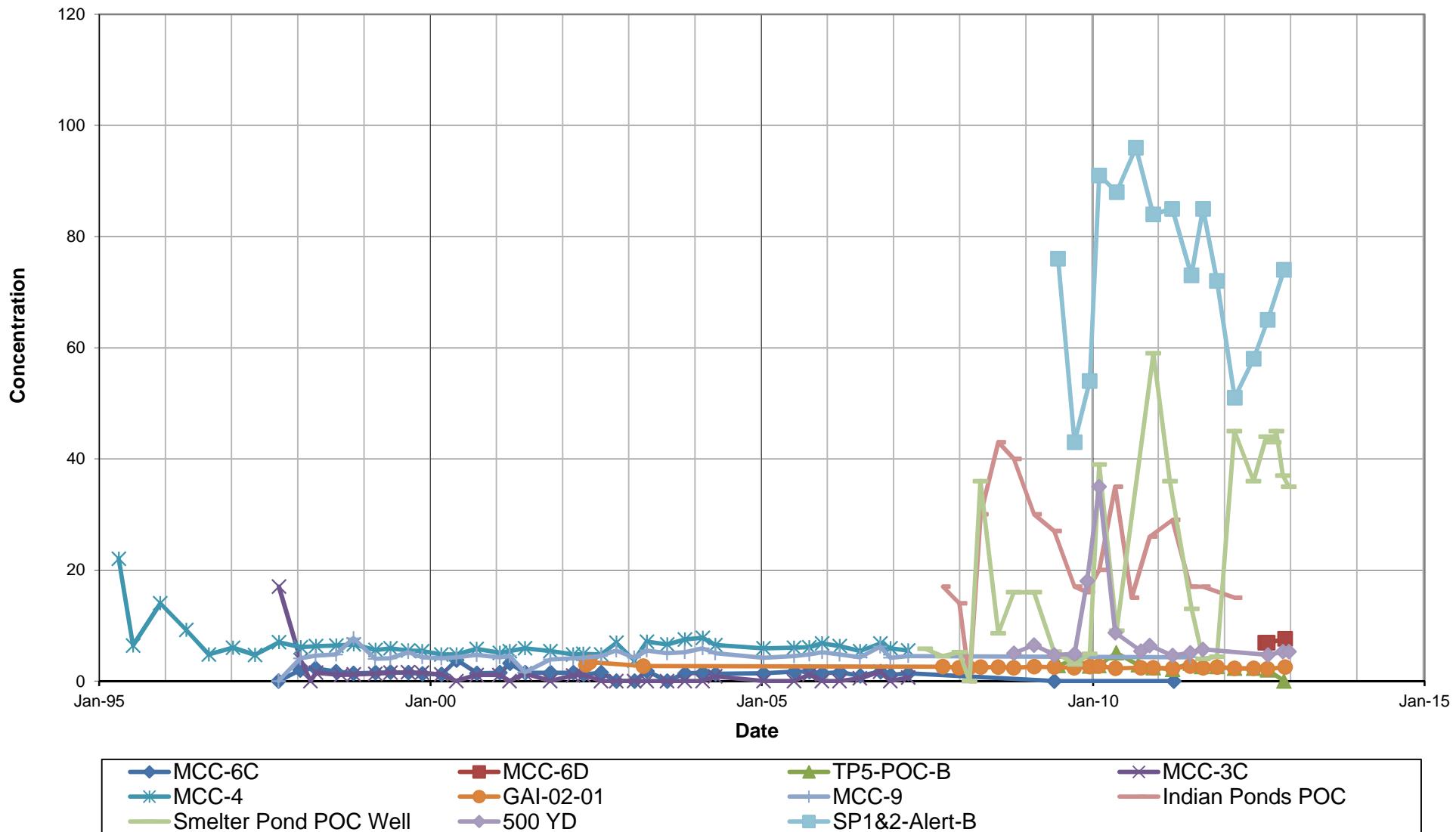
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



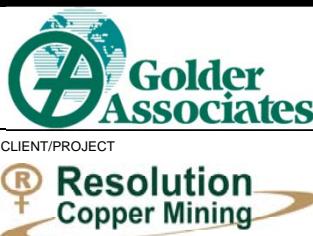
TITLE

**Fluoride (mg/L)**

CLIENT/PROJECT <b>Resolution Copper Mining</b>	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-3



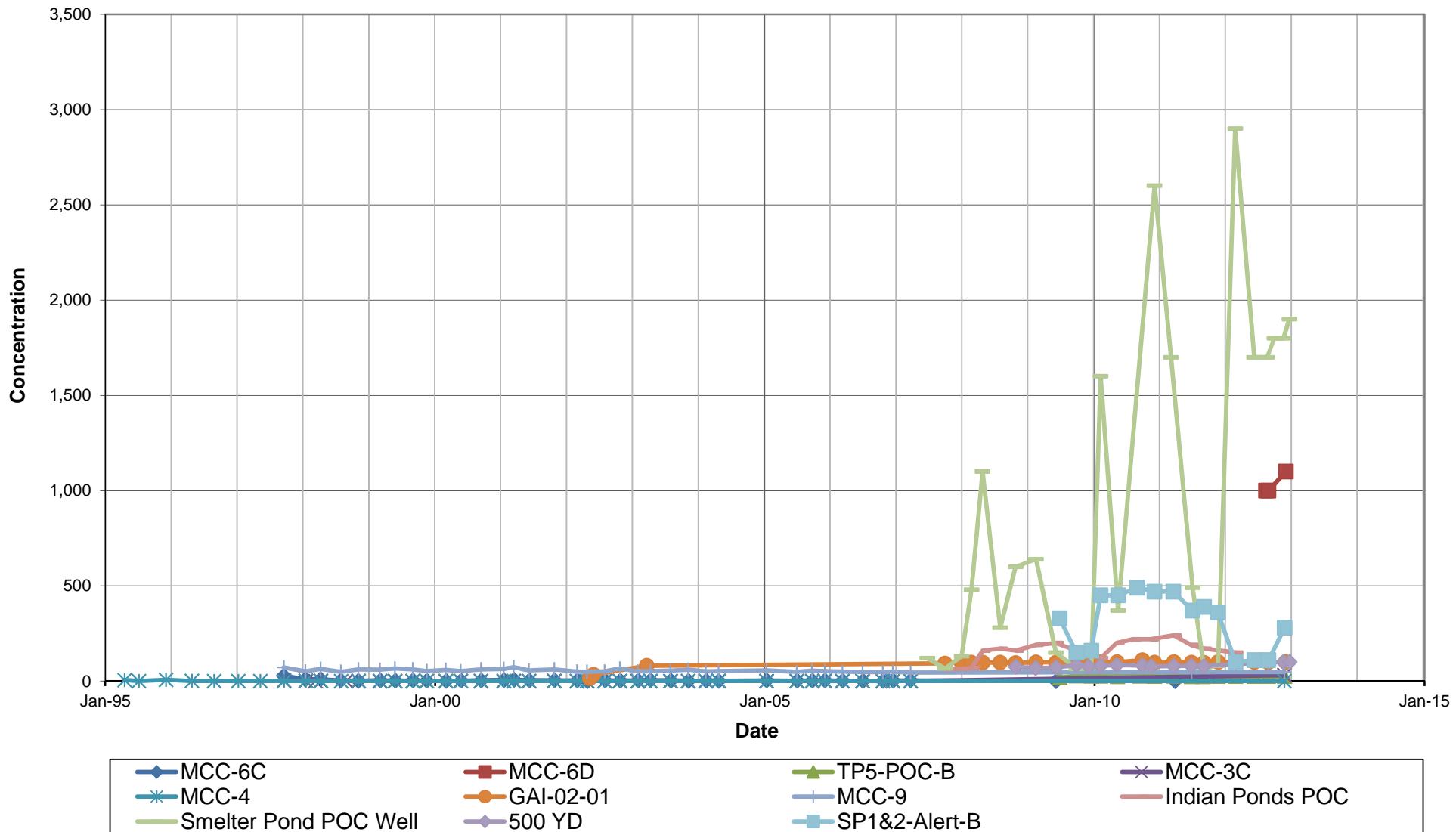
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



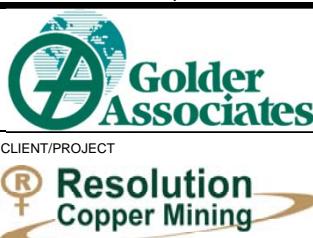
TITLE

**Potassium (mg/L)**

CLIENT/PROJECT <b>Resolution Copper Mining</b>	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-4



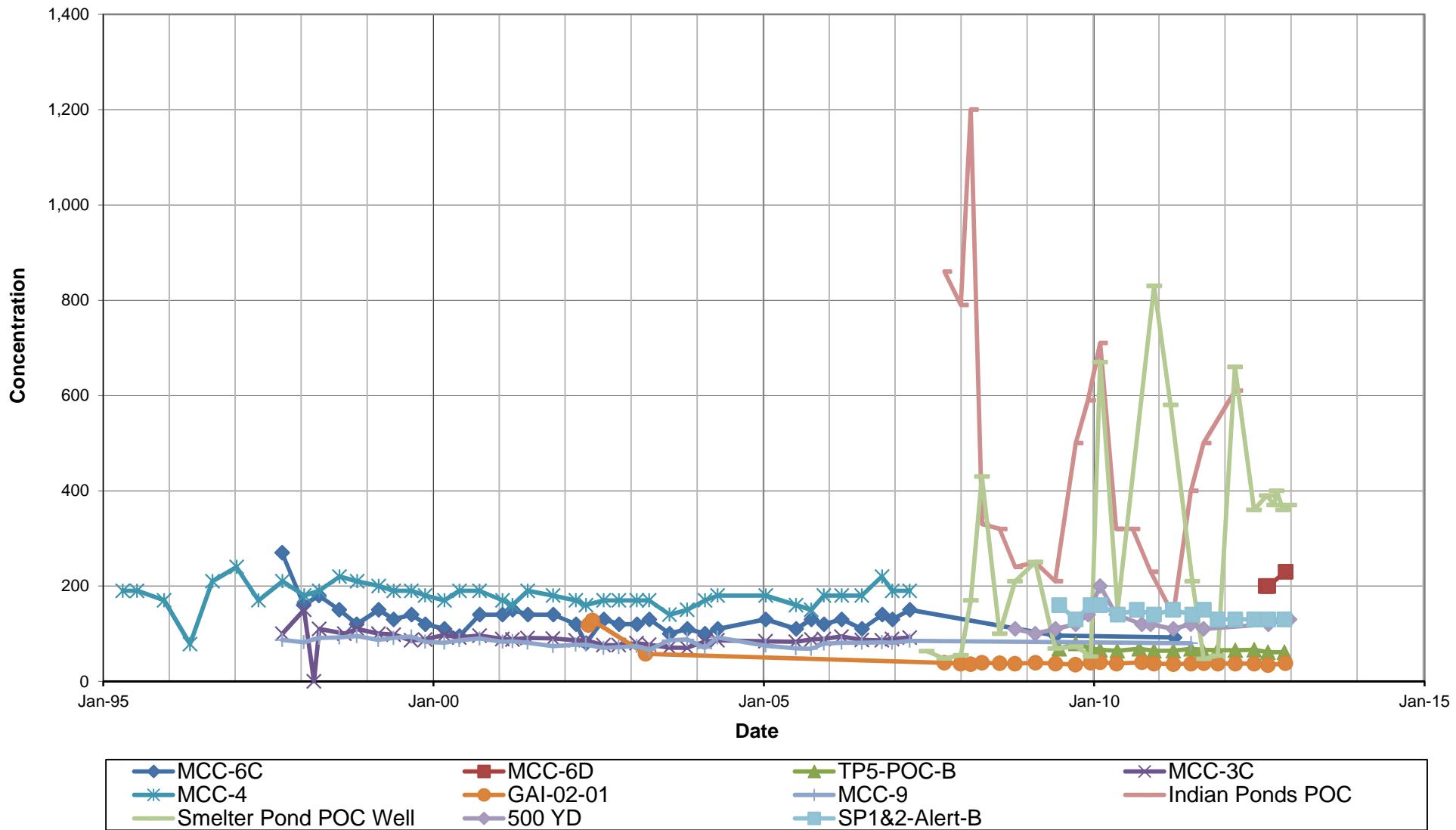
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



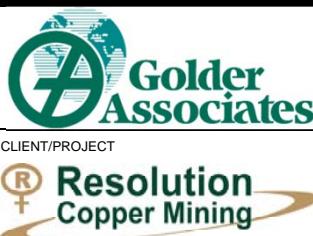
TITLE

### Magnesium (mg/L)

CLIENT/PROJECT	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-5



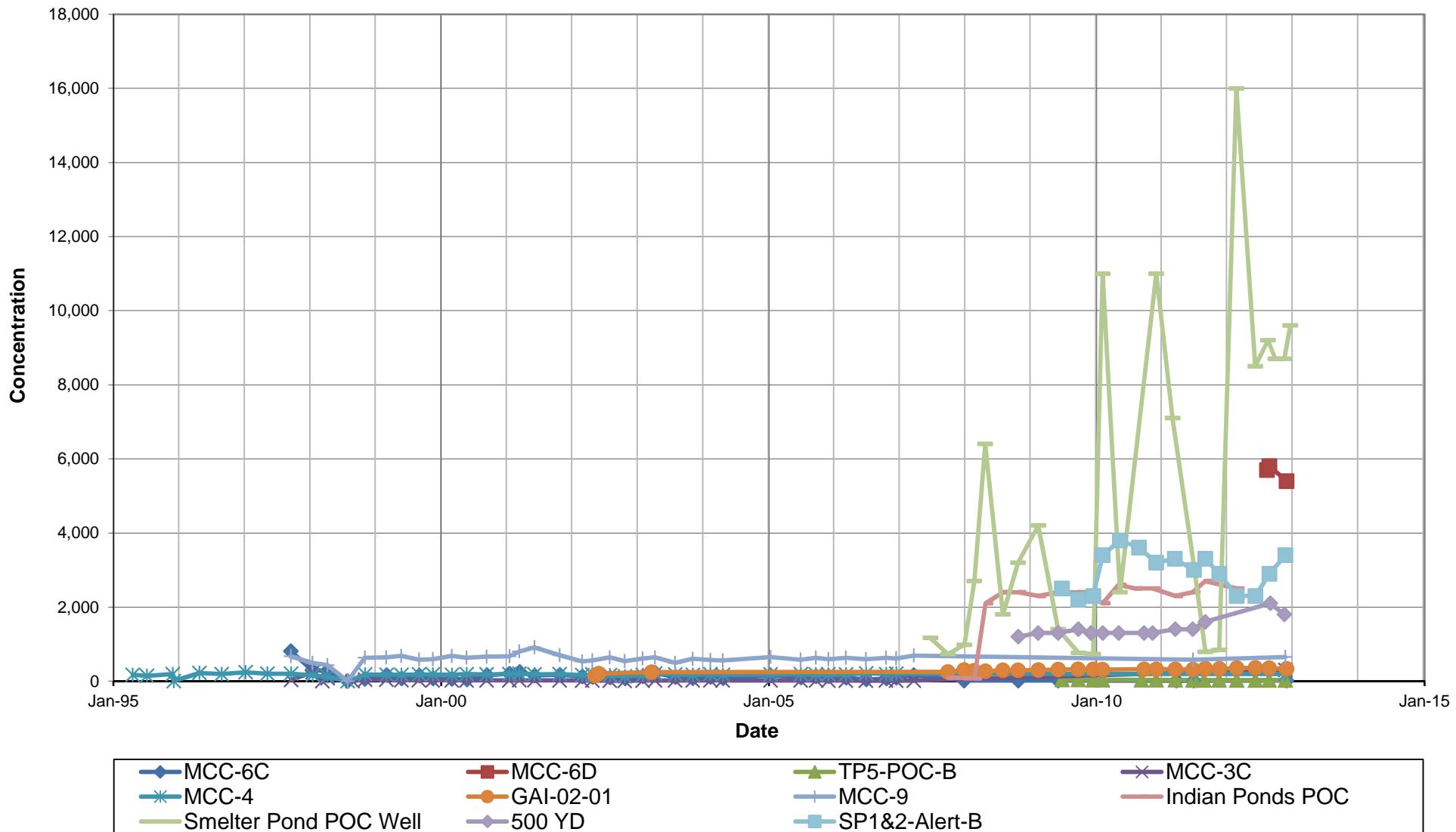
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



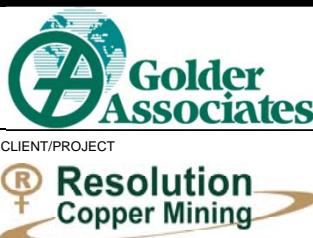
TITLE

Sodium (mg/L)

CLIENT/PROJECT <b>Resolution Copper Mining</b>	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-6



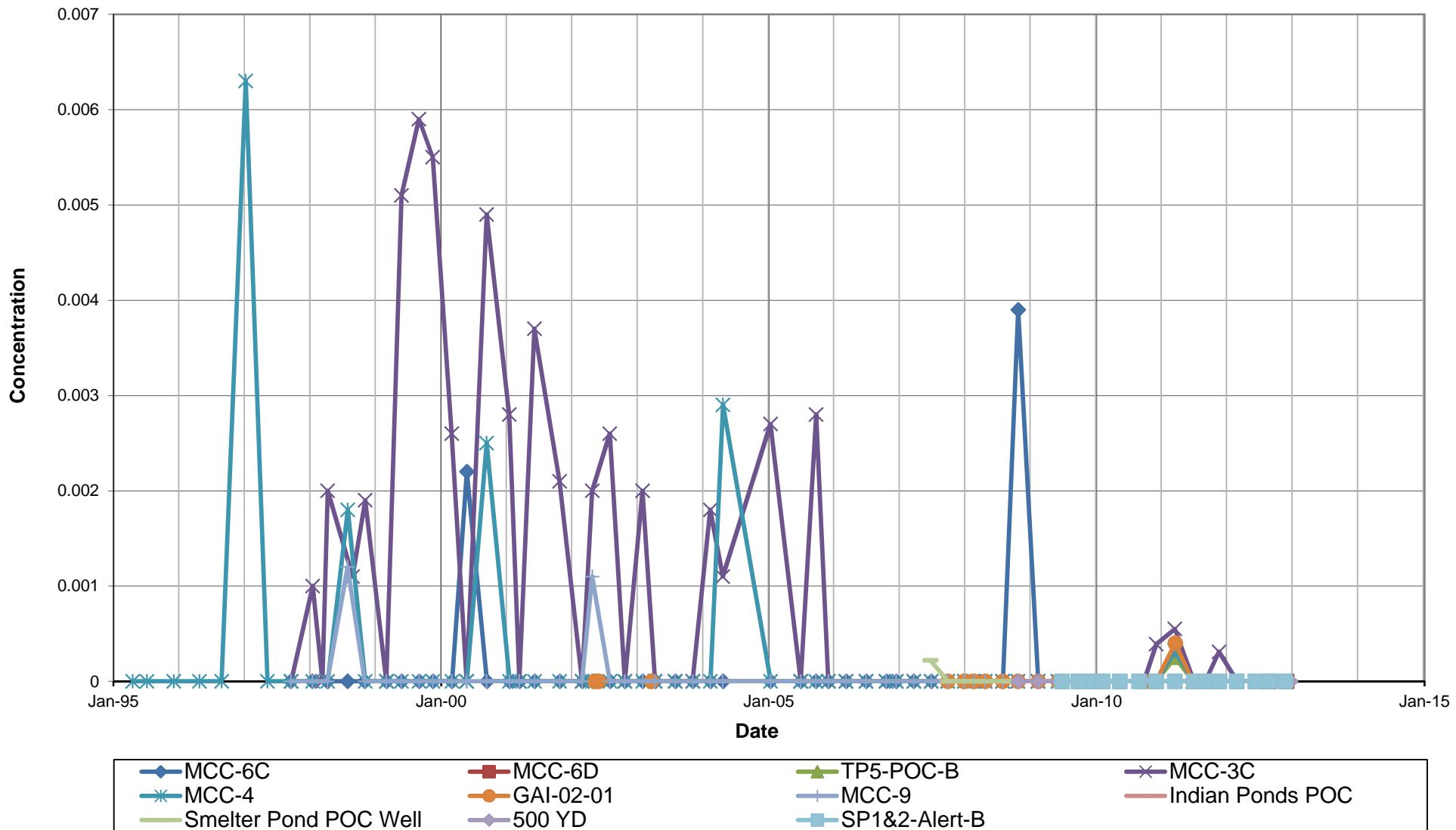
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



TITLE

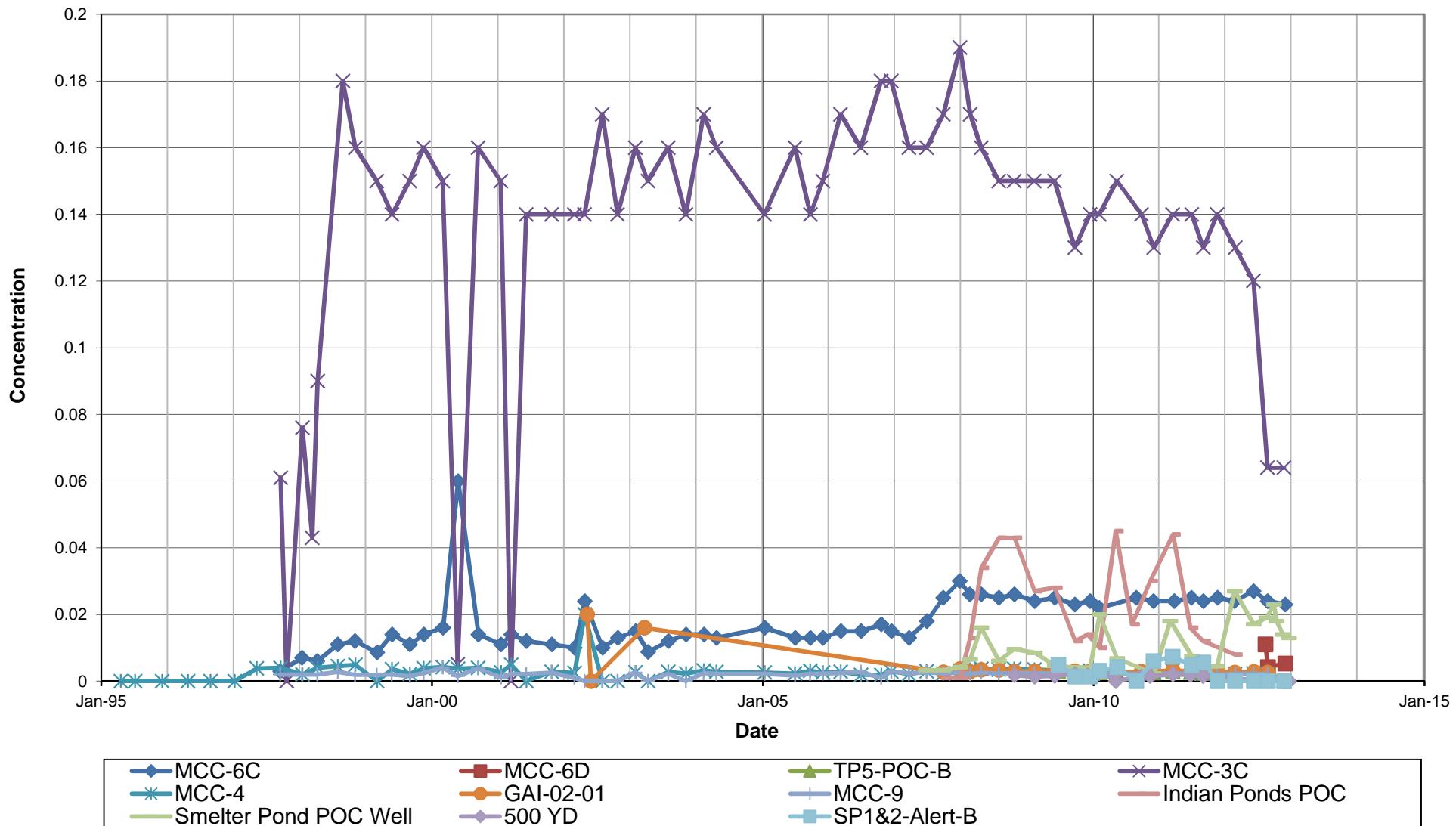
### Sulfate (mg/L)

CLIENT/PROJECT <b>Resolution Copper Mining</b>	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-7



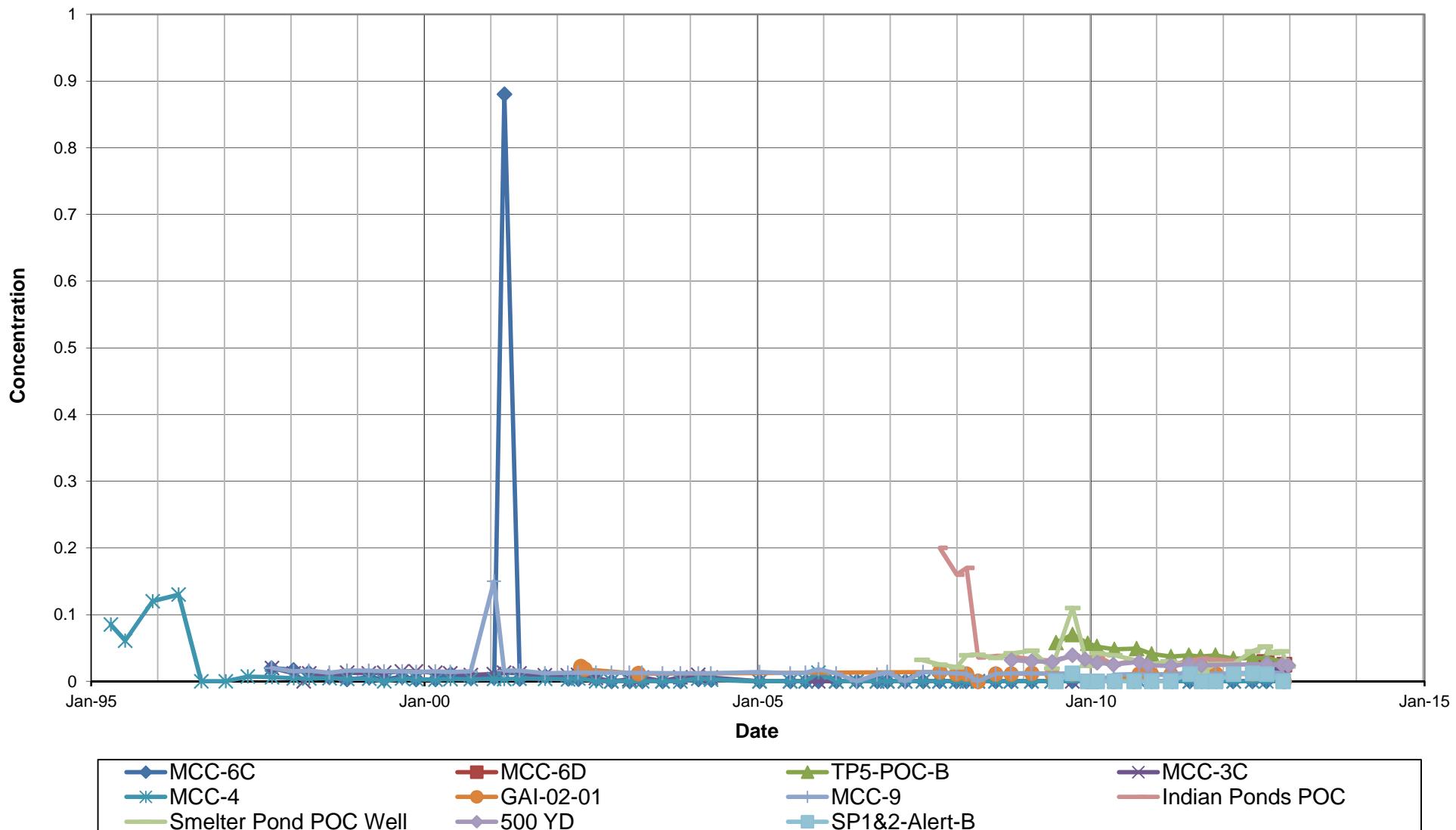
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.

 <b>Golder Associates</b> Tucson, Arizona   Resolution Copper Mining	TITLE			
	DRAWN	CB	DATE	3/18/2013
	CHECKED	JM	SCALE	NA
	REVIEWED		FILE NO.	NA
<b>Antimony (mg/L)</b>				
CLIENT/PROJECT Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona		JOB NO.	123-92566	
		DWG. NO.	NA	
		FIGURE NO.	7-8	



Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.

 <b>Golder Associates</b> Tucson, Arizona		<b>TITLE</b> <b>Arsenic (mg/L)</b>			
CLIENT/PROJECT	Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	DRAWN	CB	DATE	3/18/2013
		CHECKED	JM	SCALE	NA
		REVIEWED		FILE NO.	NA
				JOB NO.	123-92566
				DWG. NO.	NA
				FIGURE NO.	7-9



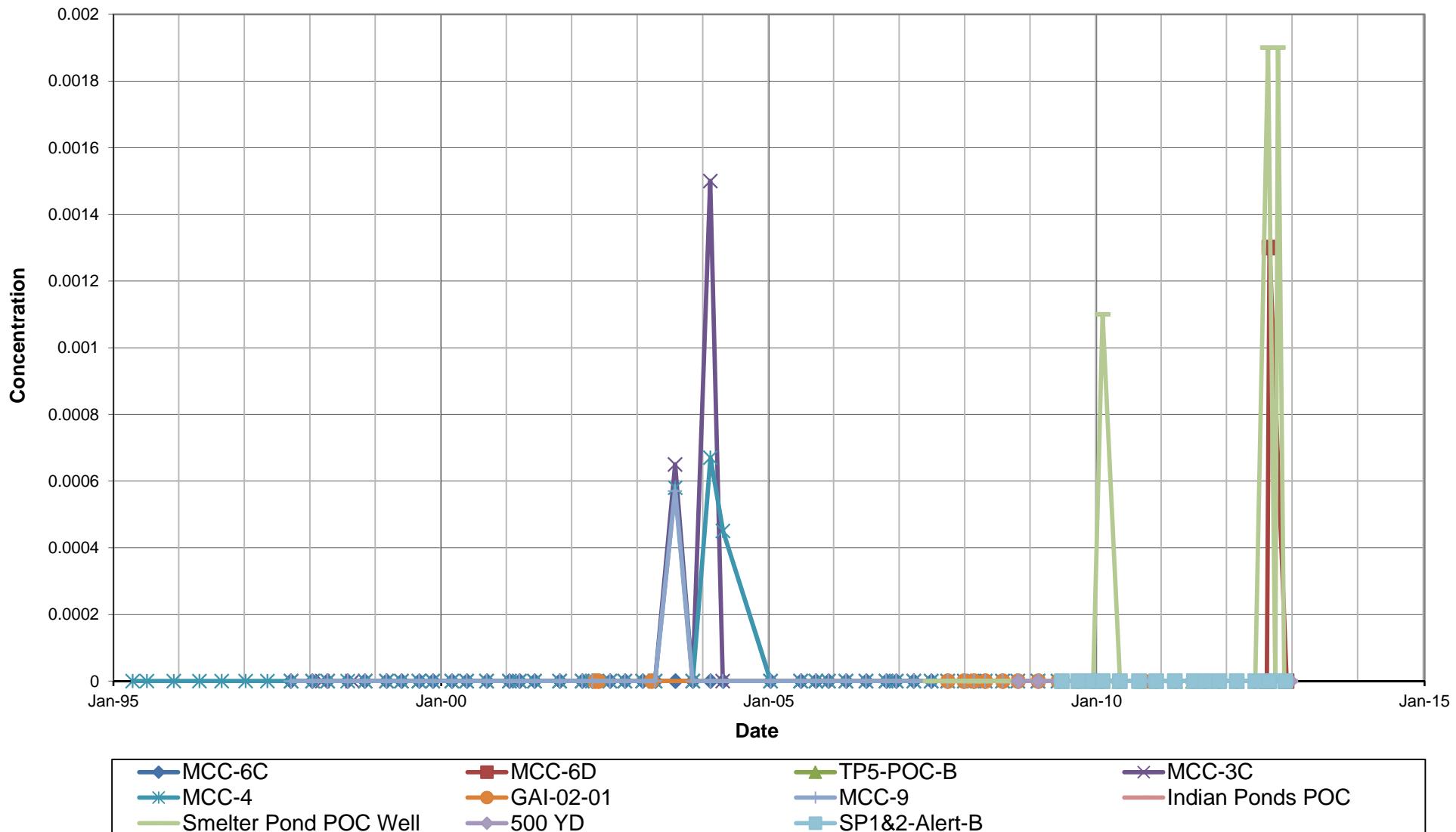
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



TITLE

**Barium (mg/L)**

CLIENT/PROJECT <b>Resolution Copper Mining</b>	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-10



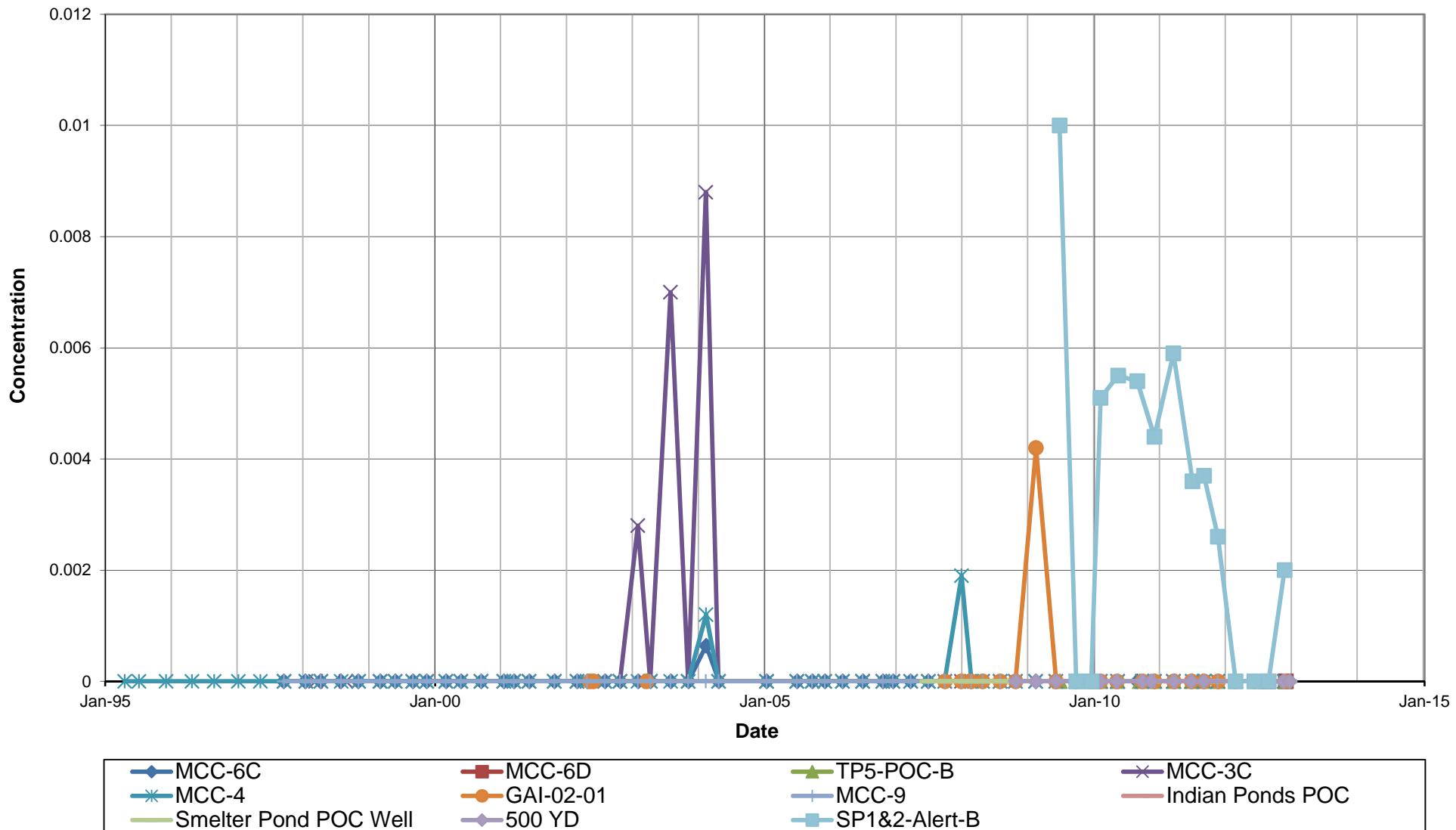
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



TITLE

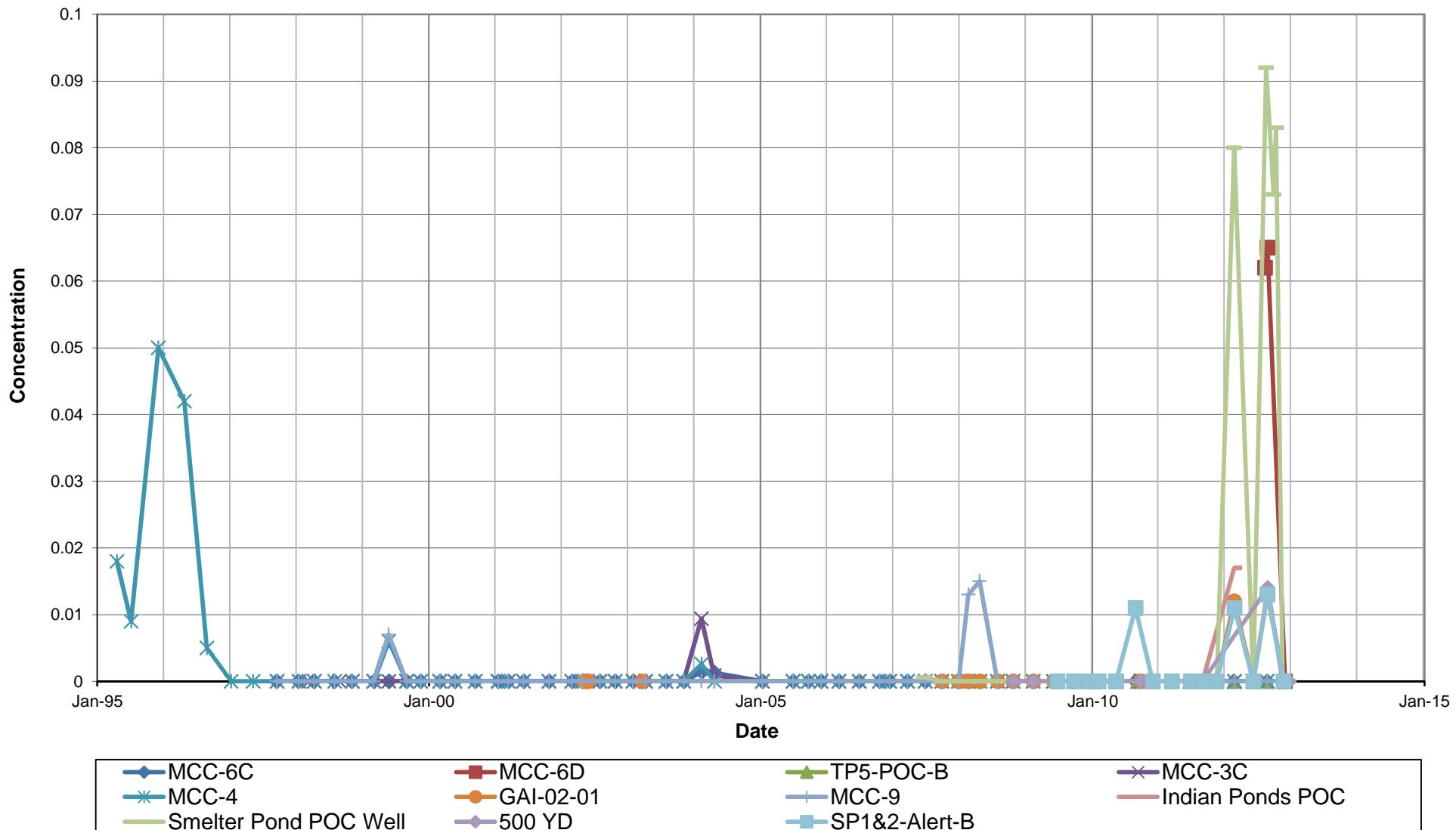
### Beryllium (mg/L)

CLIENT/PROJECT	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-11

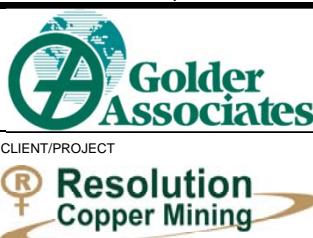


Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.

 <b>Golder Associates</b> Tucson, Arizona   Resolution Copper Mining	<b>TITLE</b> <b>Cadmium (mg/L)</b>			
	DRAWN	CB	DATE	3/18/2013
	CHECKED	JM	SCALE	NA
	REVIEWED		FILE NO.	NA



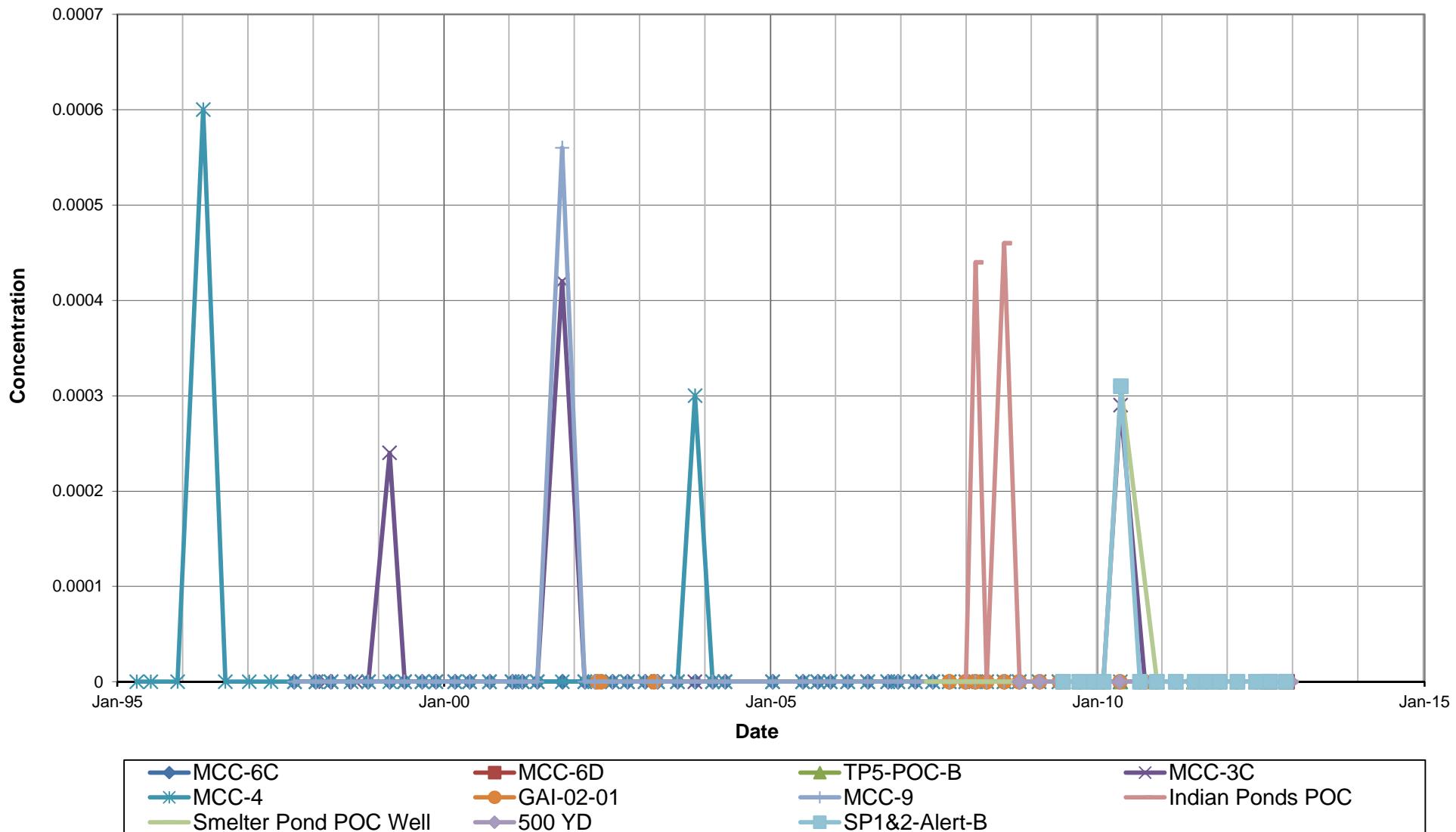
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



**TITLE**

**Chromium (mg/L)**

CLIENT/PROJECT <b>Resolution Copper Mining</b>	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-13



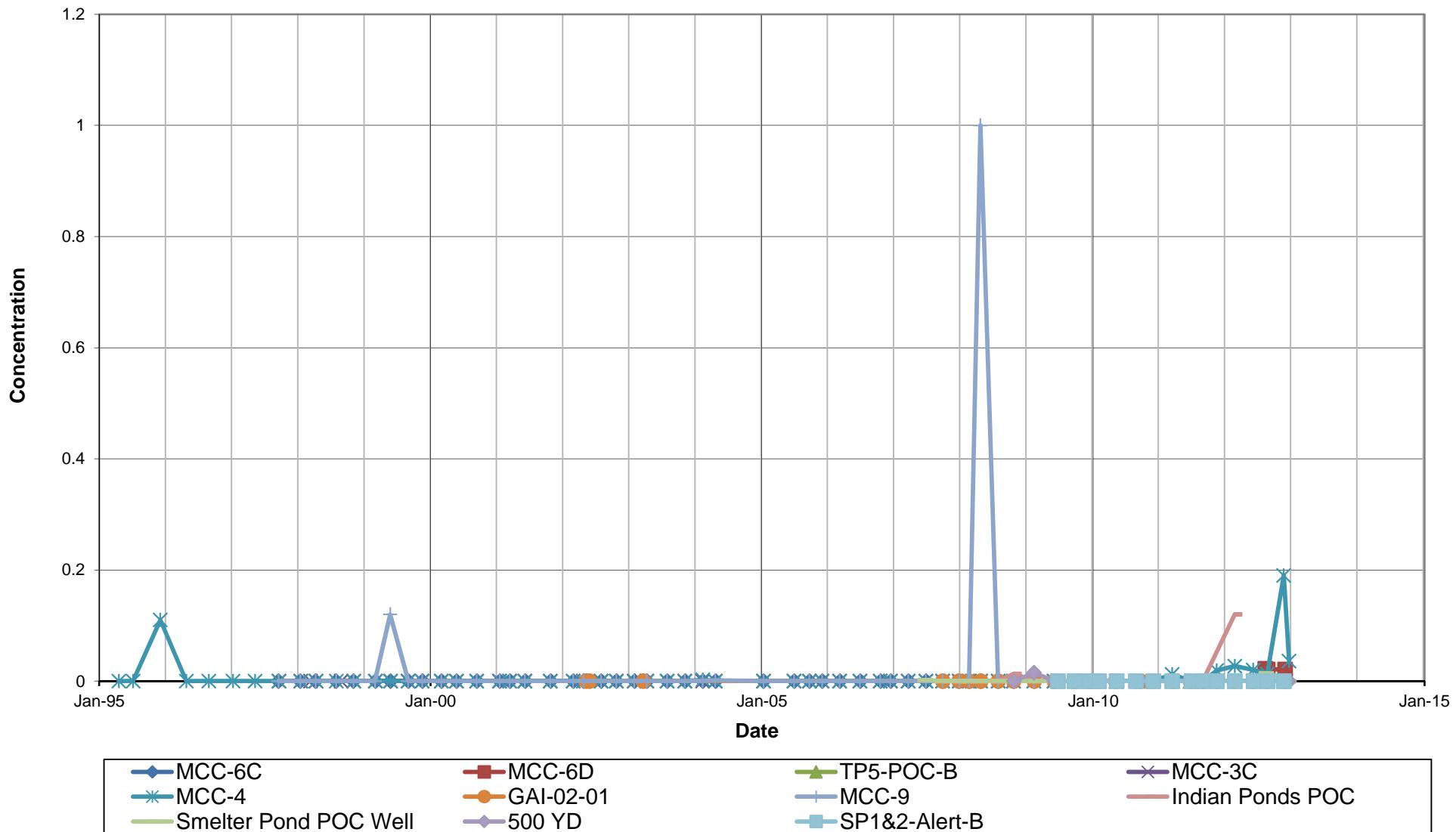
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



TITLE

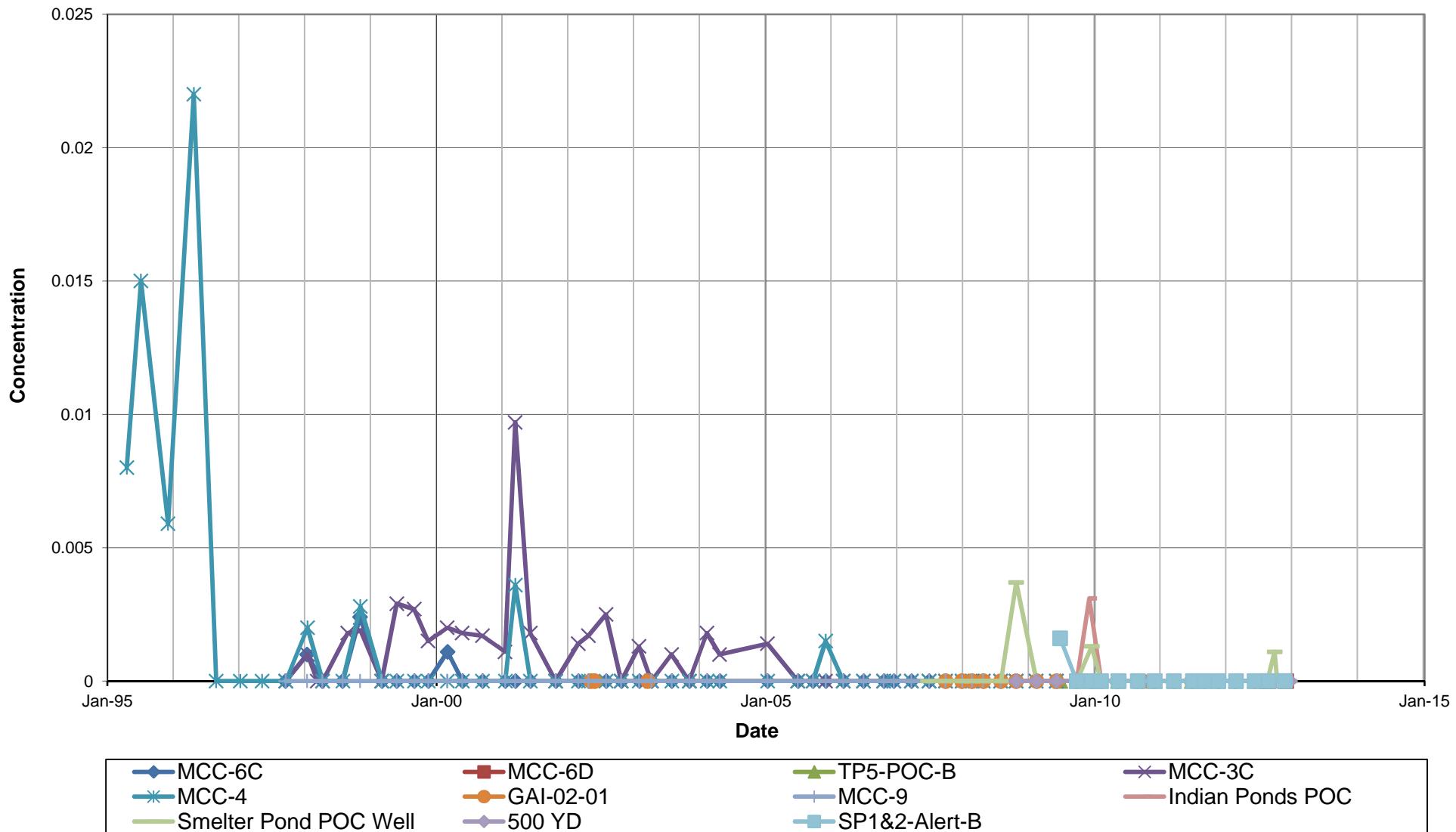
### Mercury (mg/L)

CLIENT/PROJECT	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-14

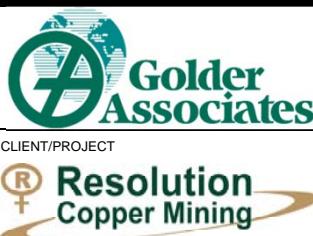


Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.

 <b>Golder Associates</b> Tucson, Arizona   Resolution Copper Mining	TITLE			
	DRAWN	CB	DATE	3/18/2013
	CHECKED	JM	SCALE	NA
	REVIEWED		FILE NO.	NA
<b>Nickel (mg/L)</b>				
CLIENT/PROJECT Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona				
DRAWN CB DATE 3/18/2013 JOB NO. 123-92566 CHECKED JM SCALE NA DWG. NO. NA REVIEWED FILE NO. NA FIGURE NO. 7-15				



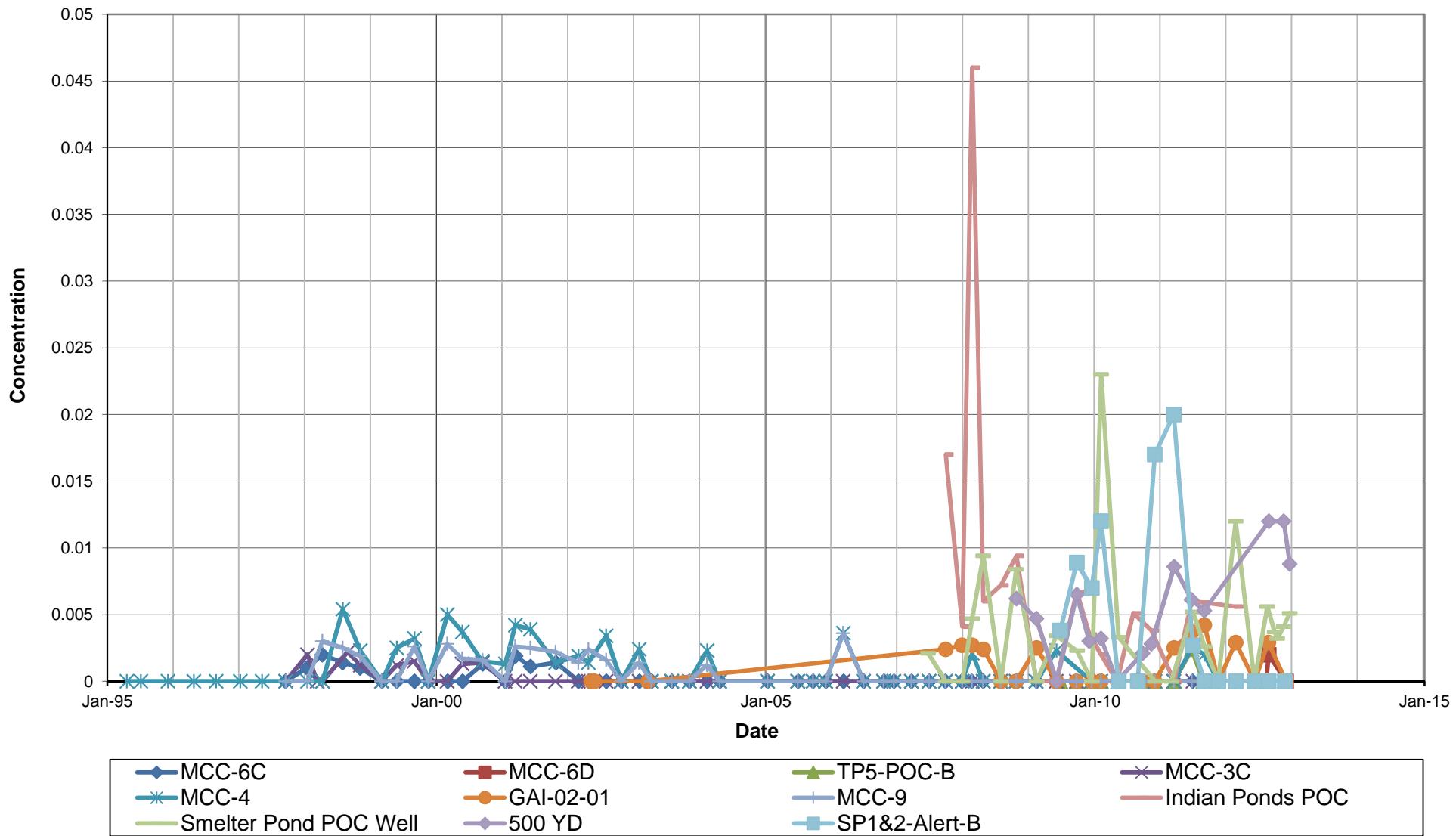
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



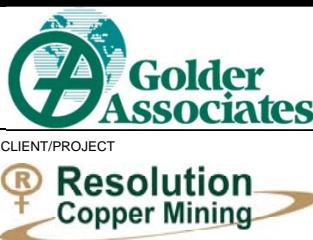
TITLE

**Lead (mg/L)**

CLIENT/PROJECT	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-16



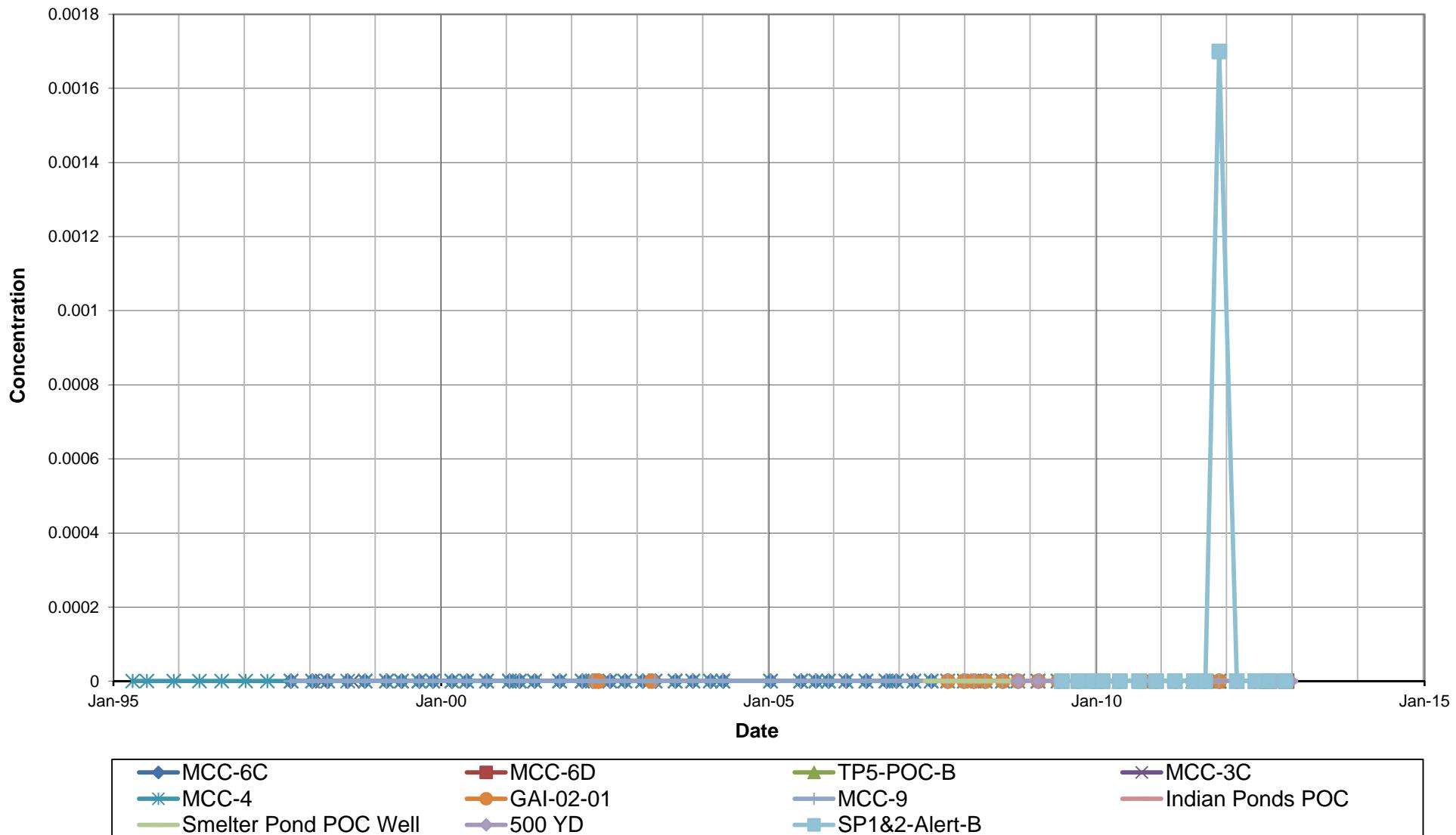
Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



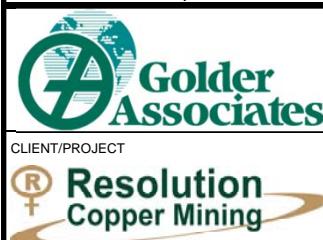
TITLE

Selenium (mg/L)

CLIENT/PROJECT	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-17



Non detected analytical results are indicated on the graph as zero, see table for actual reporting limit.



**TITLE**

**Thallium (mg/L)**

CLIENT/PROJECT	DRAWN CB	DATE 3/18/2013	JOB NO. 123-92566
Groundwater Assessment, West Plant Site, Superior Mine, Superior, Arizona	CHECKED JM	SCALE NA	DWG. NO. NA
	REVIEWED	FILE NO. NA	FIGURE NO. 7-18

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

[solutions@golder.com](mailto:solutions@golder.com)  
[www.golder.com](http://www.golder.com)

**Golder Associates Inc.  
4730 N. Oracle Road, Suite 210  
Tucson, AZ 85705 USA  
Tel: (520) 888-8818  
Fax: (520) 888-8817**



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# 500 YARD POC WELL

AZ STATE PLANE CENTRAL NAD 83

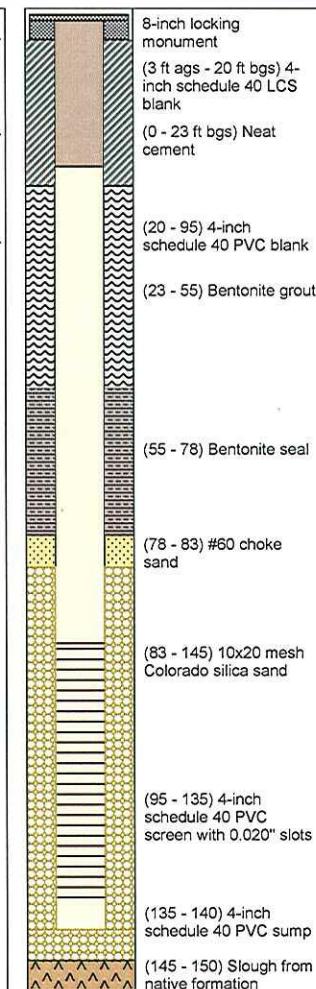
NORTHING: 837352 ELEVATION (TOC): 2998.67

EASTING: 950758

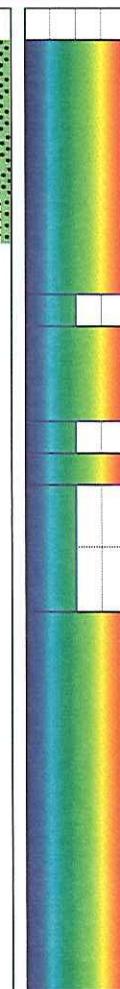
## LITHOLOGY



## AS-BUILT



CUTTINGS SIZE	REACTION TO HCl	
FINES	MEDIUM COARSE	NONE WEAK MOD STRONG



BOREHOLE No.	500 YARD POC WELL	TOTAL DEPTH DRILLED	150 ft bgs	SCALE	AS SHOWN	TITLE  <b>BOREHOLE LOG AND AS-BUILT DRAWING</b>
ADWR REG No.	55-907035	BIT DIAMETER	8.75"	DATE	06/07/07	
LOCATION	SUPERIOR, AZ	DRILLING FLUID	AIR	DESIGN	JCR	
CLIENT	RESOLUTION COPPER MINE	LOGGED BY	KKH	CHECK	JJM	
DRILLING CO	YELLOW JACKET DRILLING	DATE STARTED	06/01/07	REVIEW	KJ	
DRILLING EQUIPMENT	SPEEDSTAR 50K-CH	DATE FINISHED	06/04/07	REV	1 FILE 500 YARD POC WELL.LDF	
DRILLING METHOD	AIR ROTARY CASING HAMMER	COMMENTS	USCS SCALE, MUNSELL COLOR CHART	PROJECT No.	073-92522	



**Arizona Department of Water Resources**  
**Information Management Unit**  
**P.O. Box 458 • Phoenix, Arizona 85001-0458**  
**(602) 771-8627 • (800) 352-8488**  
**www.water.az.gov**

**Well Driller Report  
and  
Well Log**

**COPY**

THIS REPORT MUST BE FILED WITHIN **30 DAYS** OF COMPLETING THE WELL.

PLEASE PRINT CLEARLY USING BLACK OR BLUE INK

FILE NUMBER <b>D(1-12)35 DAB</b>
WELL REGISTRATION NUMBER <b>55 - 907035</b>
PERMIT NUMBER (IF ISSUED)

**SECTION 1: DRILLING AUTHORIZATION**

**Drilling Firm**

NAME <b>YELLOW JACKET DRILLING SERVICES L L C</b>	DWR LICENSE NUMBER <b>78</b>
ADDRESS <b>P.O. BOX 801</b>	TELEPHONE NUMBER <b>602-453-3252</b>
CITY / STATE / ZIP <b>GILBERT, AZ, 85299-0801</b>	FAX <b>602 - 453 - 3258</b>

**SECTION 2: REGISTRY INFORMATION**

**Well Owner**

FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL <b>Resolution Copper Company</b>	WELL LOCATION ADDRESS (IF ANY) <b>102 MAGMA HEIGHTS Rd. Superior</b>						
MAILING ADDRESS <b>102 Magma Heights</b>	TOWNSHIP (N/S) <b>1S</b>	RANGE (E/W) <b>12 E</b>	SECTION <b>35</b>	160 ACRE <b>SE 1/4</b>	40 ACRE <b>NE 1/4</b>	10 ACRE <b>NW 1/4</b>	
CITY / STATE / ZIP <b>Superior, AZ, 85273</b>	LATITUDE <b>33</b>	LONGITUDE <b>117 . 969 N</b>		LONGITUDE <b>111 . 05 W</b>			
CONTACT PERSON NAME AND TITLE <b>Casey McKeon</b>	METHOD OF LATITUDE/LONGITUDE (CHECK ONE) <input checked="" type="checkbox"/> *GPS: Hand-Held <input type="checkbox"/> USGS Quad Map <input type="checkbox"/> Conventional Survey <input type="checkbox"/> *GPS: Survey-Grade						
TELEPHONE NUMBER <b>520 689-9374</b>	FAX <b>520 - 689 - 9304</b>	LAND SURFACE ELEVATION AT WELL <b>2992</b> Feet Above Sea Level					
WELL NAME (e.g., MW-1, PZ-3, lot 25 Well, Smith Well, etc.) <b>500 yd. well</b>	METHOD OF ELEVATION (CHECK ONE) <input type="checkbox"/> USGS Quad Map <input type="checkbox"/> Conventional Survey <input type="checkbox"/> *GPS: Hand-Held <input type="checkbox"/> *GPS: Survey-Grade						
*IF GPS WAS USED, GEOGRAPHIC COORDINATE DATUM (CHECK ONE) <input checked="" type="checkbox"/> NAD-83 <input type="checkbox"/> Other (please specify)							
COUNTY <b>Pinal</b>		ASSESSOR'S PARCEL ID NUMBER (MOST RECENT) BOOK _____ MAP _____ PARCEL _____					

**SECTION 3: WELL CONSTRUCTION DETAILS**

**Drilling Method**

- Air Rotary
- Bored or Augered
- Cable Tool
- Dual Rotary
- Mud Rotary
- Reverse Circulation
- Driven
- Jetted
- Air Percussion / Odex Tubing
- Other (please specify)

**Method of Well Development**

- Airlift
- Bail
- Surge Block
- Surge Pump
- Other (please specify)

**Condition of Well**

- Capped
- Pump Installed

**Method of Sealing at Reduction Points**

- None
- Packed
- Swedged
- Welded
- Other (please specify)

**Construction Dates**

DATE WELL CONSTRUCTION STARTED  
**6/1/07**

DATE WELL CONSTRUCTION COMPLETED  
**6/4/07**

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

SIGNATURE OF QUALIFYING PARTY

DATE

**7.1.07**

## **Well Driller Report and Well Log**

WELL REGISTRATION NUMBER  
**55 - 907035**

**SECTION 4: WELL CONSTRUCTION DESIGN (AS BUILT) (attach additional page if needed)**

## Depth

**DEPTH OF BORING**

150

### Feet Below Land Surface

**DEPTH OF COMPLETED WELL**

140

#### Feet Below Land Surface

## Water Level Information

#### **STATIC WATER LEVEL**

Not Encountered Feet Below Land Surface

**DATE MEASURED**

**TIME MEASURED**

THE FLOWING WELL METHOD OF FLOW REGULATION

*(also*

## **Well Driller Report and Well Log**

**WELL REGISTRATION NUMBER**  
**55 - 907035**

## **SECTION 5. GEOLOGIC LOG OF WELL**

## **Well Driller Report and Well Log**

WELL REGISTRATION NUMBER  
**55 - 907035**

## **SECTION 6 WELL SITE PLAN**

**NAME OF WELL OWNER**

Resolution Copper Company

COUNTY ASSESSOR'S PARCEL ID NUMBER (MOST RECENT)  
BOOK \_\_\_\_\_ | MAP \_\_\_\_\_

BOOK

MUR

PARCEI

- ❖ Please draw the following: (1) the boundaries of property on which the well was located; (2) the well location; (3) the locations of all septic tank systems and sewer systems on the property or within 100 feet of the well location, even if on neighboring properties; and (4) any permanent structures on the property that may aid in locating the well.
  - ❖ Please indicate the distance between the well location and any septic tank system or sewer system.



**Arizona Department of Water Resources**  
**Water Management Support Section**  
**P.O. Box 458 • Phoenix, Arizona 85001-0458**  
**(602) 771-8500 • (800) 352-8488**  
**www.azwater.gov**

**Notice of Intent to  
Drill, Deepen, or Modify a  
Monitor / Piezometer / Environmental Well**

**FEE**

- ❖ Review instructions prior to completing form in black or blue ink.
- ❖ You must include with your Notice:
- \$150 check or money order for the filing fee.
- Well construction diagram, labeling all specifications listed in Section 6.
- ❖ Authority for fee: A.R.S. § 45-596.

**\*\* PLEASE PRINT CLEARLY \*\***

AMA / INA	B	SB	FILE NUMBER
RECEIVED	DATE	WS	WELL REGISTRATION NUMBER
ISSUED	DATE	WQAR CERCLA	55 -

**SECTION 1. REGISTRY INFORMATION**

Well Type	Proposed Action	Location of Well					
CHECK ONE	CHECK ONE	WELL LOCATION ADDRESS (IF ANY)					
<input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Piezometer <input type="checkbox"/> Vadose Zone <input type="checkbox"/> Air Sparging <input type="checkbox"/> Soil Vapor Extraction <input type="checkbox"/> Other (please specify):	<input checked="" type="checkbox"/> Drill New Well <input type="checkbox"/> Deepen <input type="checkbox"/> Modify <i>If Deepening or Modifying:</i> WELL REGISTRATION NUMBER 55 -	TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
		15	12E	35	SE 1/4	NE 1/4	NW 1/4
		COUNTY ASSESSOR'S PARCEL ID NUMBER					
		BOOK	MAP	PARCEL			
		COUNTY WHERE WELL IS LOCATED					
		PINAL					

**SECTION 2. OWNER INFORMATION**

Well Owner	Landowner (if different from Well Owner)		
FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL	FULL NAME OF COMPANY, GOVERNMENT AGENCY, OR INDIVIDUAL		
RESOLUTION COPPER COMPANY			
MAILING ADDRESS	MAILING ADDRESS		
102 MAGMA HEIGHTS			
CITY / STATE / ZIP CODE	CITY / STATE / ZIP CODE		
SUPERIOR AZ 85273			
CONTACT PERSON NAME AND TITLE	CONTACT PERSON NAME AND TITLE		
CASEY MCKEON			
TELEPHONE NUMBER	FAX	TELEPHONE NUMBER	FAX
520-689-9374	520.689-9304		

**SECTION 3. DRILLING AUTHORIZATION**

Drilling Firm	Consultant (if applicable)		
NAME	CONSULTING FIRM		
GOLDER ASSOCIATES			
DWR LICENSE NUMBER	ROC LICENSE CATEGORY	CONTACT PERSON NAME	
		JOHN J. MALUSA	
TELEPHONE NUMBER	FAX	TELEPHONE NUMBER	FAX
		520-888-8818	520-888-8817
E-MAIL ADDRESS	E-MAIL ADDRESS		
	jmalusa@golder.com		

**SECTION 4.**

Questions	Yes	No	Explanation:
1. Are all annular spaces between the casing(s) and the borehole for the placement of grout at least 2 inches?	✓		2-inch annular spaces are special standards required for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
2. Is the screened or perforated interval of casing greater than 100 feet in length?		✓	100-foot maximum screen intervals are a special standard for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
3. Are you requesting a variance to use thermoplastic casing in lieu of steel casing in the surface seal?		✓	The wells must be constructed in a vault as defined in A.A.C. R12-15-801(27).
4. Is there another well name or identification number associated with this well? (e.g., MW-1, PZ2, 06-04, etc.)		✓	IF YES, PLEASE STATE
5. Have construction plans been coordinated with the Arizona Department of Environmental Quality?	✓		IF YES, PLEASE STATE AGENCY CONTACT & PHONE NUMBER KRISTIE KILGORE - WQ DIVISION 602-771-4632
6. For monitor wells, is dedicated pump equipment to be installed?	✓		IF YES, PLEASE STATE DESIGN PUMP CAPACITY 15 Gallons per Minute
7. Is this well a new well located in an Active Management Area AND intended to pump water for the purpose of remediating groundwater?		✓	IF YES, UNLESS THE WELL IS A REPLACEMENT WELL AND THE TOTAL NUMBER OF OPERABLE WELLS ON THE SITE IS NOT INCREASING, YOU MUST ALSO FILE A SUPPLEMENTAL FORM A.R.S. § 45-454(C) & (F). (See Instructions)
8. Will the well registration number be stamped on the vault cover or on the upper part of the casing?		✓	IF NO, WHERE WILL THE REGISTRATION NUMBER BE PLACED? ETCHED INTO CEMENT PAD PRIOR TO DRYING

**SECTION 5. WELL CONSTRUCTION DETAILS**

<b>Drill Method</b>	<b>Method of Well Development</b>	<b>Grout Emplacement Method</b>
CHECK ONE  <input type="checkbox"/> Air Rotary <input type="checkbox"/> Bored or Augered <input type="checkbox"/> Cable Tool <input type="checkbox"/> Dual Rotary <input type="checkbox"/> Mud Rotary <input type="checkbox"/> Reverse Circulation <input type="checkbox"/> Driven <input type="checkbox"/> Jetted <input checked="" type="checkbox"/> Air Percussion / Odex Tubing <input type="checkbox"/> Other (please specify):  <u>MAY 18, 2007</u> DATE CONSTRUCTION TO BEGIN	CHECK ONE  <input type="checkbox"/> Airlift <input checked="" type="checkbox"/> Bail <input type="checkbox"/> Surge Block <input type="checkbox"/> Surge Pump <input type="checkbox"/> Other (please specify):	CHECK ONE  <input type="checkbox"/> Gravity <input type="checkbox"/> Pressure Grout <input checked="" type="checkbox"/> Tremie <input type="checkbox"/> Other (please specify):
<b>Method of Sealing at Reduction Points</b>		<b>Surface or Conductor Casing</b>
CHECK ONE  <input checked="" type="checkbox"/> None <input type="checkbox"/> Welded <input type="checkbox"/> Swaged <input type="checkbox"/> Packed <input type="checkbox"/> Other (please specify):		CHECK ONE  <input type="checkbox"/> Flush Mount in a vault <input checked="" type="checkbox"/> Extend 1' above grade

**SECTION 6. PROPOSED WELL CONSTRUCTION PLAN** (attach additional page if needed)

Attach a well construction diagram labeling all specifications below.

<b>Borehole</b>			<b>Casing</b>											
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (T)			PERFORATION TYPE (T)			SLOT SIZE IF ANY (inches)		
FROM (feet)	TO (feet)		FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP		SHUTTER SCREEN	MILLS KNIFE
0	150	8	0	20	4	✓								
			20	100	4		✓			✓				
			100	140	4		✓					✓		0.020

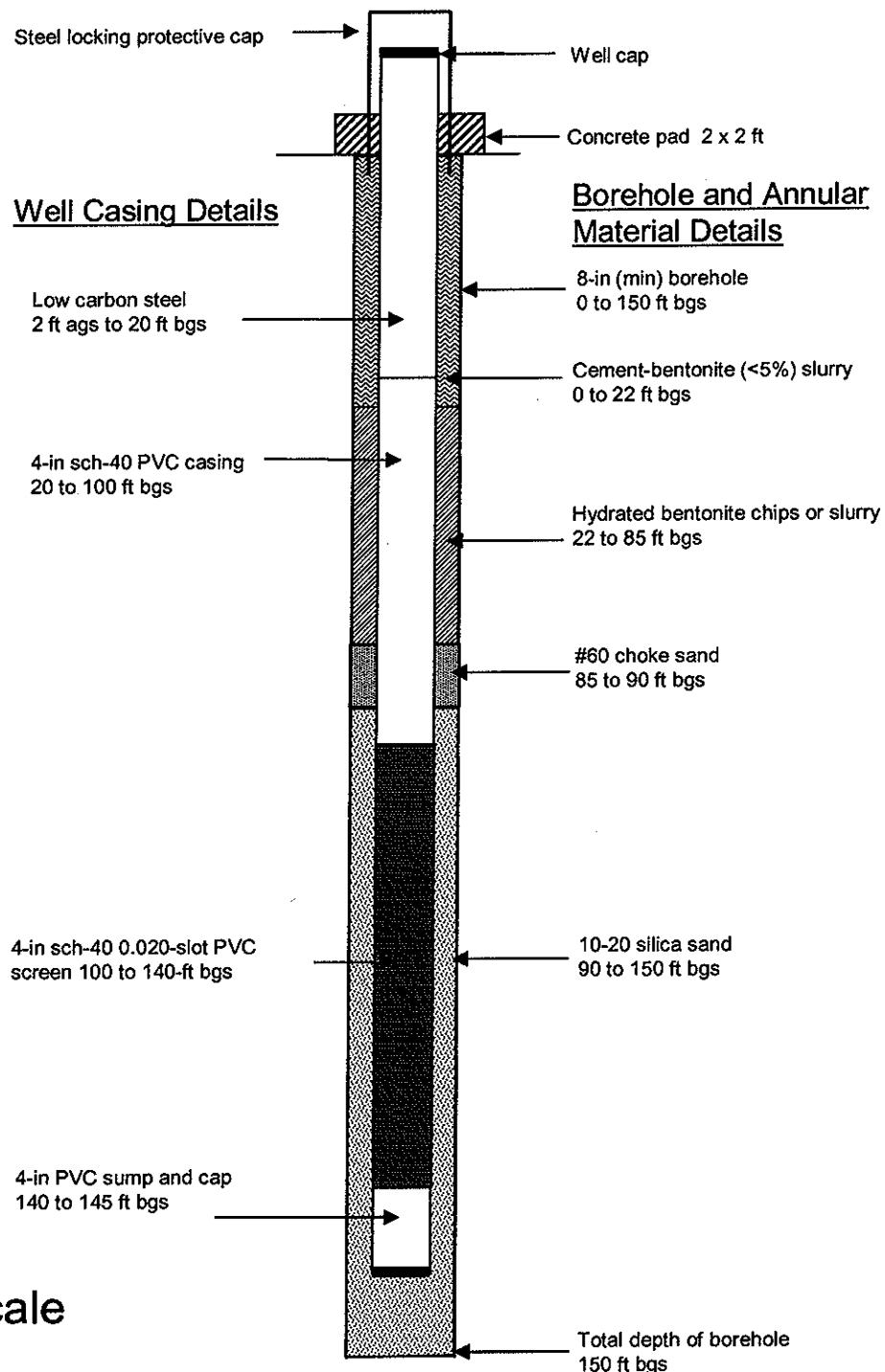
<b>Annular Material</b>													
DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (T)								FILTER PACK			
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	GROUT	BENTONITE	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	SAND	GRAVEL	SIZE
0	22				✓								
22	85						✓						
85	90									#60 CHOKE SAND			
90	150												✓ 10-20

IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS	EXPECTED DEPTH TO WATER <i>Unknown</i>
	Feet Below Ground Surface

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.		
TYPE OR PRINT NAME AND TITLE <i>Casey McKeon, Environmental Supervisor</i>	SIGNATURE OF WELL OWNER <i>Casey McKeon</i>	DATE <i>5-11-07</i>
TYPE OR PRINT NAME AND TITLE	SIGNATURE OF LANDOWNER, IF APPLICABLE (SEE INSTRUCTIONS)	

# Well Construction Schematic

## Proposed 500 Yard Point of Compliance Well



Not to Scale

Notes:  
ft ags = feet above ground surface  
ft bgs = feet below ground surface

Project number: 053-2519-100.000

## RECORD OF MONITORING WELL INSTALLATION

GAI-02-01

PROJECT NUMBER: 023-2552

BOREHOLE LOCATION: APPROX. 200' SE OF TAILINGS POND 6 DAM

COORDINATES N: E: EL: 3007

SHEET: 1 OF 7

PROJECT: SUPERIOR MONITOR WELLS

BORING DATE: 04/23/02

DEPTH (feet)	DESCRIPTION (Gravel/Sand/Fine)	GRAPHIC LOG	PASTE		MONITORING WELL COMPLETION		DRILLING NOTES	DEPTH (feet)
			ASTM CLASS.	HCl REACTIVITY	pH	COND. ( $\mu$ S/cm)		
0	Well-graded sand with gravel, light brown/tan with variably colored clast; sand and gravel, poorly-graded, angular to sub-rounded, clast composed of schist granite, metavolcanics and limestone; dry.  (40/60/TR)		SW	S	7.95	124	 B" LOCKING MONUMENT 2' STICK UP 4" SCH. 40 LOW CARBON STEEL (2' AGS-19.2' BGS) CEMENT (0'-20') SCH. 40-80 STEEL ADAPTOR (19.2'-20')	0
10	Well-graded sand with gravel, light brown/tan with variably colored clast; sand and gravel, poorly-graded, angular to sub-rounded, clast composed of schist granite, metavolcanics and limestone; dry.  (40/60/TR)		SW	S	8.27	120		10
20	Well-graded sand with gravel, light gray/brown; no plasticity, well-graded in all size fractions; sand, dry.  (30/65/5)		SW	S	9.33	98		20
30	Well-graded sand with gravel, light grey/brown; no plasticity, well-graded in all size fractions; sand, well-graded; dry.  (30/65/5)		SW	S	9.26	181	BENTONITE SLURRY (20'-145')	30
40	Silty sand with gravel; light brown, no plasticity; well-graded sand and gravel fraction; predominantly angular to sub-angular; dry.  (30/55/15)		SM	S	9.44	195	8" BORHOLE (0'-440')	40
50	Silty sand with gravel; light gray/brown, predominantly fine sand and silt; dry.  (15/65/20)		SM	S	9.32	195		50
60	Silty sand with gravel; light gray/brown, predominantly fine sand and silt; dry.  (15/65/20)		SM	S	9.58	130	4" SCH. 80 PVC CASING (20'-165.8')	60
70								70

DRILL RIG: SCHRAMM/ DUAL WALL REVERSE CIRCULATION

LOGGED: JJM

DRILLING CONTRACTOR: LAYNE CHRISTENSEN

CHECKED:

DRILLER: MARK HALAGER

DATE:



## RECORD OF MONITORING WELL INSTALLATION

GAI-02-01

PROJECT NUMBER: 023-2552

BOREHOLE LOCATION: APPROX. 200' SE OF TAILINGS POND 6 DAM

COORDINATES N: E: EL: 3007

SHEET: 2 OF 7

PROJECT: SUPERIOR MONITOR WELLS

BORING DATE: 04/23/02

DEPTH (feet)	DESCRIPTION (Gravel/Sand/Fine)	GRAPHIC LOG	PASTE		MONITORING WELL COMPLETION			DRILLING NOTES	DEPTH (feet)		
			ASTM CLASS.	HCl REACTIVITY	PH	COND. ( $\mu$ S/cm)	DESCRIPTION	WELL SKETCH			
70	Silty sand with gravel; light gray; no plasticity; sand poorly-graded; predominantly fine; gravel angular, mainly dark aphanitic volcanics; dry. (30/45/25)		SM	S	9.51	125			70		
80	Silty sand with gravel; light gray; no plasticity; sand poorly-graded; predominantly fine; gravel angular, mainly dark aphanitic volcanics; dry. (30/45/25)		SM	S	9.31	126	BENTONITE SLURRY (20'-145')		80		
90	Silty sand with gravel; light gray; no plasticity; sand, poorly-graded, predominantly fine; gravel fine, angular; dry. (40/40/20)		SM	S	9.28	141			90		
100	Silty sand with gravel; light gray; no plasticity; sand, poorly-graded, predominantly fine; gravel, fine, angular, dry. (40/50/10)		SM	S	9.20	140	8" BORHOLE (0'-440')		100		
110	Silty sand with gravel; light gray; no plasticity; sand, poorly-graded, predominantly fine; gravel, fine, angular, dry. (40/50/10)		SM	S	9.25	125			110		
120	Silty sand; light gray/brown with varied colored clast; sand, well-graded; gravel, fine, angular no plasticity; dry. (30/55/15)		SM	S	9.31	155	4" SCH. 80 PVC CASING (20'-165.8')		120		
130	Silty sand; light gray/brown with varied colored clast; sand, well-graded; gravel, fine, angular no plasticity; dry. (30/55/15)		SM	S	9.32	140		Temporarily shut down, no contract signed.	130		
140									140		

DRILL RIG: SCHRAMM/ DUAL WALL REVERSE CIRCULATION

LOGGED: JJM

K:\2002 Projects\023-2552\0232552A01.dwg

DRILLING CONTRACTOR: LAYNE CHRISTENSEN

CHECKED:

DRILLER: MARK HALAGER

DATE:



## RECORD OF MONITORING WELL INSTALLATION

GAI-02-01

PROJECT NUMBER: 023-2552

BOREHOLE LOCATION: APPROX. 200' SE OF TAILINGS POND 6 DAM

COORDINATES N: E: EL: 3007

SHEET: 3 OF 7

PROJECT: SUPERIOR MONITOR WELLS

BORING DATE: 04/23/02

DEPTH (feet)	DESCRIPTION (Gravel/Sand/Fine)	GRAPHIC LOG	ASTM CLASS.	HCl REACTIVITY	PASTE	PH	COND. ( $\mu$ S/cm)	MONITORING WELL COMPLETION		DRILLING NOTES	DEPTH (feet)
								DESCRIPTION	WELL SKETCH		
140	Silty sand; light gray/brown with varied colored clast; sand, well-graded; gravel, fine, angular no plasticity; dry. (30/55/15)	.....	SM	S	9.24	82.4		BENTONITE SLURRY (20'-145')		• 145' Slight dampness and dust reduction. • 147' Fracture or void in formation.	140
150	Silty sand; light gray/brown with varied colored clast; sand, well-graded; gravel, fine, angular no plasticity; dry. (30/55/15)	.....	SM	S	9.31	85		HYDRATED BENTONITE CHIPS (145'-147')  HYDRATED BENTONITE PELLETS (147'-150')  #50-70 SILICA CHOKE SAND (150'-152')			150
160	Silty sand; light gray/brown with varied colored clast; sand, well-graded; gravel, fine, angular no plasticity; dry. (30/55/15)	.....	SM	S	9.27	103		4" SCH. 80 PVC CASING (20'-165.8')		• approx. 165' Slight moisture occurring in cuttings blowing out of surface casing.	160
170	Well-graded sand with gravel and silt; light brown/gray, non-plastic; sand, angular to sub-rounded; gravel, fine, angular, dry. (30/60/10)	.....	SW-SM	S	9.58	58		4" SCH. 80 PVC 0.020 SLOT (165.8'-195.2')		▽ Static water level approx. 176' BGS (measured 05/07/02)	170
180	Slightly increase in gravel.  Well-graded sand with gravel and silt; light brown/gray, non-plastic; sand, angular to sub-rounded; gravel, fine, angular, dry. (40/60/10)	.....	SW-SM	S	9.50	71		#10-20 SILICA SAND (152'-206')		Slightly decrease in fines, possibly due to fines adhering to inside of drill pipe.	180
190	Well-graded sand with gravel; light gray/brown; sand well-graded; gravel fine, angular; fine fraction reduced; dry. (40/55/5)	.....	SW	S	9.52	60		4" SCH. 80 PVC SUMP (195.2'-200.3')  4" SCH. 80 PVC END CAP (200.3'-200.5')			190
200	Well-graded sand with gravel and silt; light brown/gray; non-plastic; gravel fine, angular; dry. (30/50/10)	.....	SW-SM	S	9.50	65		HYDRATED BENTONITE CHIPS (206'-208')  HYDRATED BENTONITE PELLETS (208'-211')			200
210											210

DRILL RIG: SCHRAMM/ DUAL WALL REVERSE CIRCULATION

LOGGED: JJM

DRILLING CONTRACTOR: LAYNE CHRISTENSEN

CHECKED:

DRILLER: MARK HALAGER

DATE:



## RECORD OF MONITORING WELL INSTALLATION

GAI-02-01

PROJECT NUMBER: 023-2552

BOREHOLE LOCATION: APPROX. 200' SE OF TAILINGS POND 6 DAM

COORDINATES N: E: EL: 3007

SHEET: 4 OF 7

PROJECT: SUPERIOR MONITOR WELLS

BORING DATE: 04/23/02

DEPTH (feet)	DESCRIPTION (Gravel/Sand/Fine)	GRAPHIC LOG	PASTE		MONITORING WELL COMPLETION		DRILLING NOTES	DEPTH (feet)
			ASTM CLASS.	HCl REACTIVITY	pH	COND. ( $\mu\text{S}/\text{cm}$ )		
210	Well-graded sand with gravel and silt; light brown/gray; non-plastic; gravel fine, angular; dry, cuttings from cyclone are slightly moist. (40/45/10)		SW-SM	S	9.48	90.3	HYDRATED BENTONITE PELLETS (208'-211')	210
220	Silty sand with gravel; sand, poorly graded, predominantly fine; gravel, fine, angular; moist. (35/50/15)		SM	S	9.22	111		220
230	Silty sand with gravel; sand, poorly graded, predominantly fine; gravel, fine, angular; moist. (35/50/15)		SM	S	8.82	119	BENTONITE SLURRY (211'-440")	230
240	Poorly graded sand with silt; sand, predominantly fine to very fine; gravel, fine, angular; moist. (10/80/10)		SP-SM	S	9.31	152		240
250	Poorly graded sand with silt; sand, predominantly fine to very fine; gravel, fine, angular; moist. (10/80/10)		SP-SM	S	9.22	135	8" BORHOLE (0'-440")	250
260	Silty sand; light brown/gray, sand, poorly graded, fine; gravel, fine, angular; fine fraction is silt; moist. (10/60/30)		SM	S	9.51	95.4		260
270	Silty sand; light brown/gray, sand, poorly graded, fine; gravel, fine, angular; fine fraction is silt; slight decrease in silt; moist. (10/70/20)		SM	S	9.45	140		270
280								280

DRILL RIG: SCHRAMM/ DUAL WALL REVERSE CIRCULATION

LOGGED: JJM

DRILLING CONTRACTOR: LAYNE CHRISTENSEN

CHECKED:

DRILLER: MARK HALAGER

DATE:



## RECORD OF MONITORING WELL INSTALLATION

GAI-02-01

PROJECT NUMBER: 023-2552

BOREHOLE LOCATION: APPROX. 200' SE OF TAILINGS POND 6 DAM

COORDINATES N: E: EL: 3007

SHEET: 5 OF 7

PROJECT: SUPERIOR MONITOR WELLS

BORING DATE: 04/23/02

DEPTH (feet)	DESCRIPTION (Gravel/Sand/Fine)	GRAPHIC LOG	PASTE			MONITORING WELL COMPLETION		DRILLING NOTES	DEPTH (feet)
			ASTM CLASS.	HCl REACTIVITY	pH	COND. ( $\mu$ S/cm)	DESCRIPTION	WELL SKETCH	
280	Well-graded sand with gravel and silt; light brown/gray; sand, well-graded, sub-angular, sub-rounded; gravel, fine, angular; moist. (30/65/5)		SW	S	9.63	189			280
290	Silty sand; light brown; sand poorly graded, predominantly fine; gravel, fine, angular; fines composed of silt, non-plastic; moist. (5/75/20)		SM	S	9.35	170			290
300	Silty sand; light brown; sand poorly graded, predominantly fine; gravel, fine, angular; fines composed of silt, non-plastic; moist. (5/75/20)		SM	S	9.45	160	BENTONITE SLURRY (211'-440')		300
310	Silty sand; light brown; sand poorly graded, predominantly fine; gravel, fine, angular; fines composed of silt, non-plastic; moist. (5/75/20)		SM	S	9.51	180			310
320	Silty sand; light brown; sand poorly graded, predominantly fine; gravel, fine, angular; fines composed of silt, non-plastic; moist. (5/75/20)		SM	S	9.62	196	8" BORHOLE (0'-440')		320
330	Poorly graded sand; light brown; sand, fine to very fine; trace gravel, angular; fines composed of silt, non-plastic; moist. (TR/95/5)		SP	S	9.55	225			330
340	Silty sand; light brown; sand, well-graded; fines predominantly silt, non-plastic; moist. (TR/80/20)		SM	S	9.53	224			340
350									350

DRILL RIG: SCHRAMM/ DUAL WALL REVERSE CIRCULATION

LOGGED: JJM

DRILLING CONTRACTOR: LAYNE CHRISTENSEN

CHECKED:

DRILLER: MARK HALAGER

DATE:



## RECORD OF MONITORING WELL INSTALLATION

GAI-02-01

PROJECT NUMBER: 023-2552

BOREHOLE LOCATION: APPROX. 200' SE OF TAILINGS POND 6 DAM

COORDINATES N: E: EL: 3007

SHEET: 6 OF 7

PROJECT: SUPERIOR MONITOR WELLS

BORING DATE: 04/23/02

DEPTH (feet)	DESCRIPTION (Gravel/Sand/Fine)	GRAPHIC LOG	PASTE		MONITORING WELL COMPLETION		DRILLING NOTES	DEPTH (feet)
			ASTM CLASS.	HCl REACTIVITY	pH	COND. ( $\mu\text{S}/\text{cm}$ )	DESCRIPTION	
350	Silty sand; brown; sand, poorly-graded, predominantly fine; fine fraction, predominantly silt with trace of low plasticity clay; moist. (0/75/25)		SM	S	9.50	84.6		350
360	Silty sand; brown; sand, poorly graded, predominantly fine; fine fraction, predominantly silt with trace of low plasticity clay; moist. (TR/60/40)		SM	S	9.55	187		360
370	Sandy silt; strong brown; sand, well-graded; fine fraction predominantly silt with approx. 30% low plasticity clay; moist. (TR/40/60)		ML	S	9.53	320	BENTONITE SLURRY (211'-440')	370
380	Sandy silt; strong brown; sand, well-graded; fine fraction predominantly silt with approx. 30% low plasticity clay; moist. (TR/40/60)		ML	S	9.52	341		380
390	Sandy silt; strong brown; sand, well-graded; fine fraction predominantly silt with approx. 30% low plasticity clay; moist. (TR/40/60)		ML	S	9.51	325	8" BORHOLE (0'-440')	390
400	Silt with sand; brown; sand, well-graded; fine fraction predominantly silt with approx. 40% low plasticity clay; moist. (0/15/85)		ML	S	9.46	311	GILA CONGLOMERATE (INTERBEDDED SILTSTONE/MUDSTONE)	400
410	Silt with sand; brown; sand, well-graded; fine fraction predominantly silt with approx. 40% low plasticity clay; moist. (0/15/85)		ML	S	9.52	260	First seen, trace of low plasticity clay.	410
420								420

DRILL RIG: SCHRAMM/ DUAL WALL REVERSE CIRCULATION

LOGGED: JJM

K:\2002 Projects\023-2552\0232552A001.dwg

DRILLING CONTRACTOR: LAYNE CHRISTENSEN

CHECKED:

DRILLER: MARK HALAGER

DATE:



## RECORD OF MONITORING WELL INSTALLATION

GAI-02-01

PROJECT NUMBER: 023-2552

BOREHOLE LOCATION: APPROX. 200' SE OF TAILINGS POND 6 DAM

COORDINATES N: E: EL: 3007

SHEET: 7 OF 7

PROJECT: SUPERIOR MONITOR WELLS

BORING DATE: 04/23/02

DEPTH (feet)	DESCRIPTION (Gravel/Sand/Fine)	GRAPHIC LOG	ASTM CLASS.	HCl REACTIVITY	PASTE		MONITORING WELL COMPLETION DESCRIPTION	WELL SKETCH	DRILLING NOTES	DEPTH (feet)
					pH	COND. ( $\mu\text{S}/\text{cm}$ )				
420	Silt with sand; brown; sand, well-graded; fine fraction predominantly silt with approx. 40% low plasticity clay; moist. (0/10/90)		ML	S			BENTONITE SLURRY (211'-440')		Not enough sample for paste pH and cond.	420
430	Silt with sand; brown; sand, well-graded; fine fraction predominantly silt with approx. 40% low plasticity clay; moist. (0/10/90)		ML	S			8" BORHOLE (0'-440')		Not enough sample for paste pH and cond.	430
440									TD @ 440' BLS	440
380										380
390										390
400										400
410										410
420										420

DRILL RIG: SCHRAMM/ DUAL WALL REVERSE CIRCULATION

LOGGED: JJM

DRILLING CONTRACTOR: LAYNE CHRISTENSEN

CHECKED:

DRILLER: MARK HALAGER

DATE:



## RECORD OF MONITORING WELL INSTALLATION

GAI-02-02

PROJECT NUMBER: 023-2552

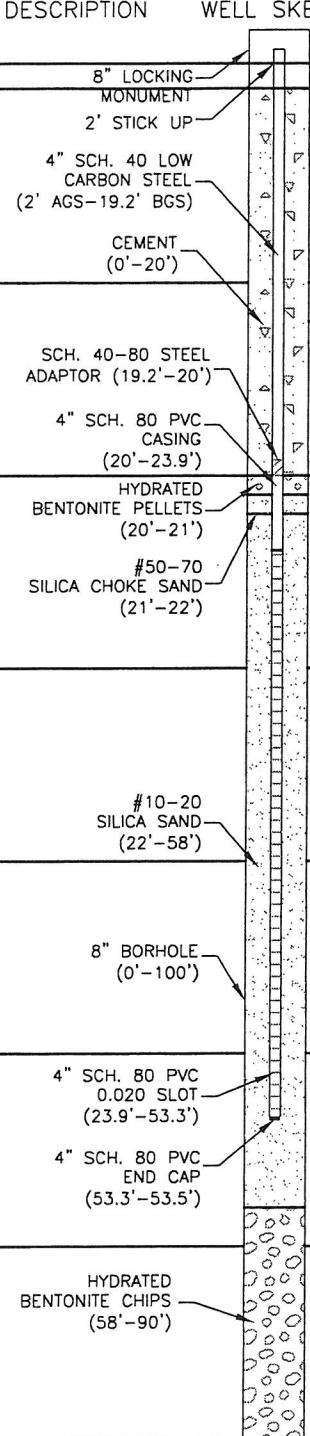
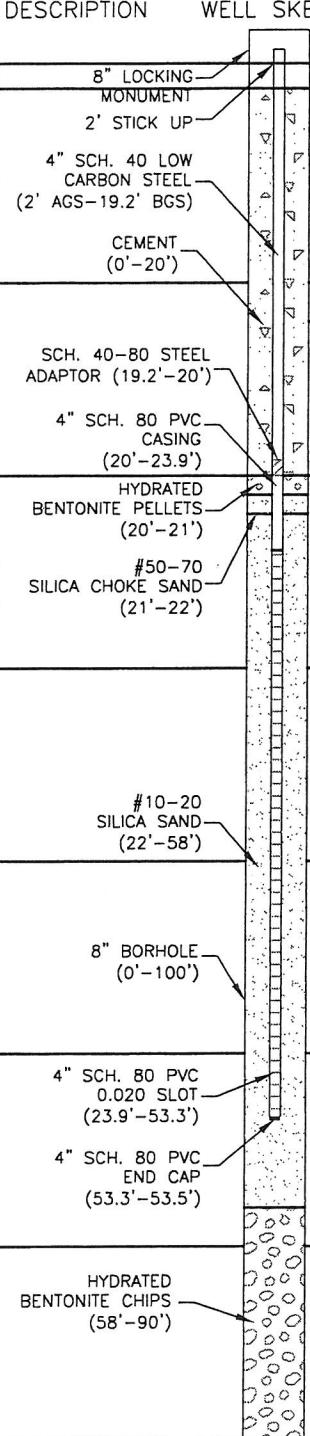
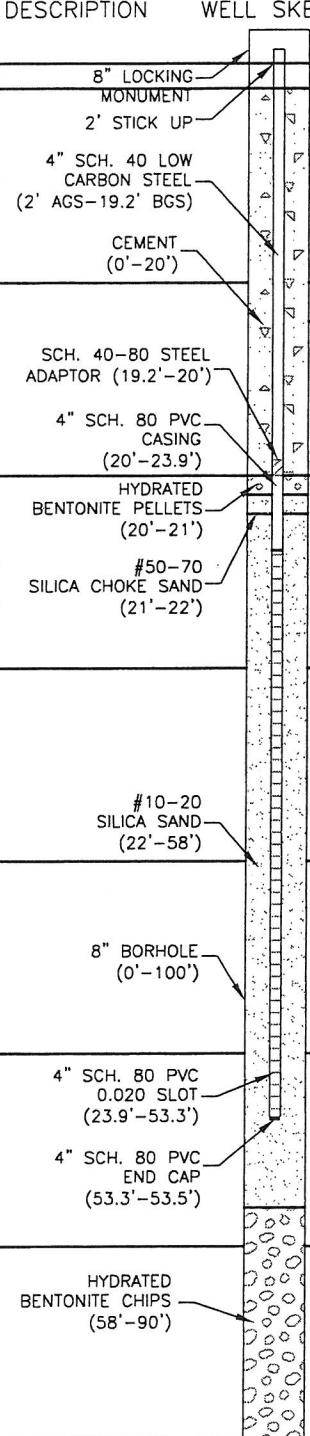
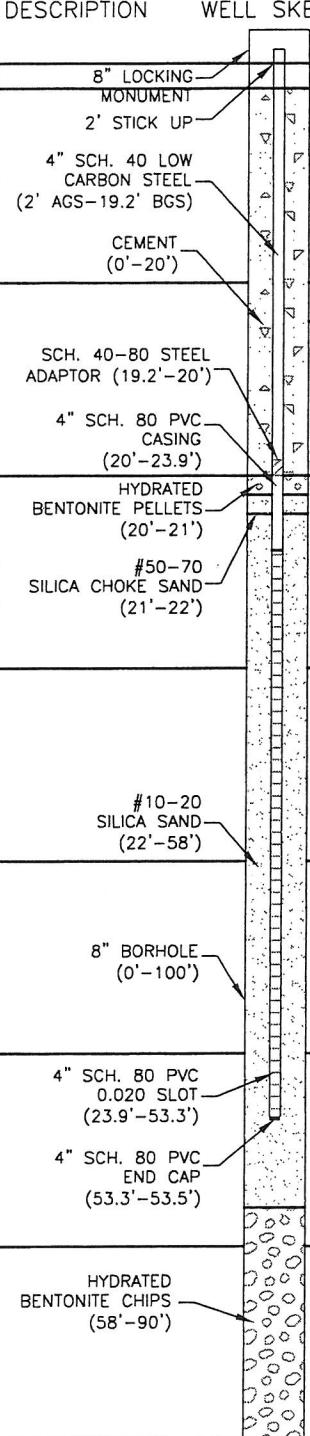
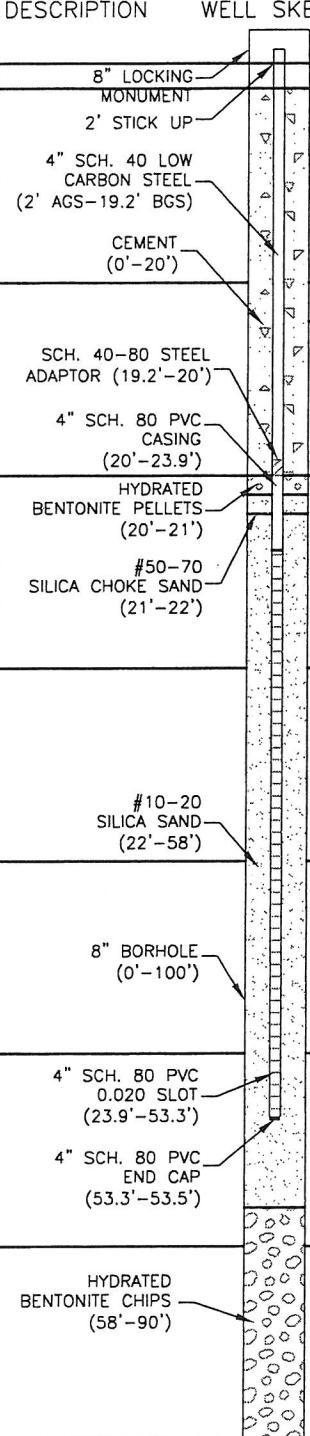
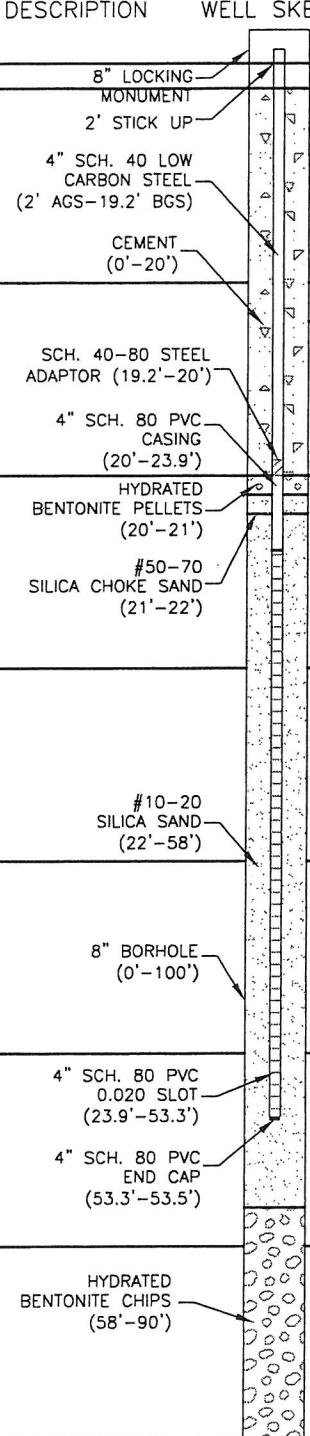
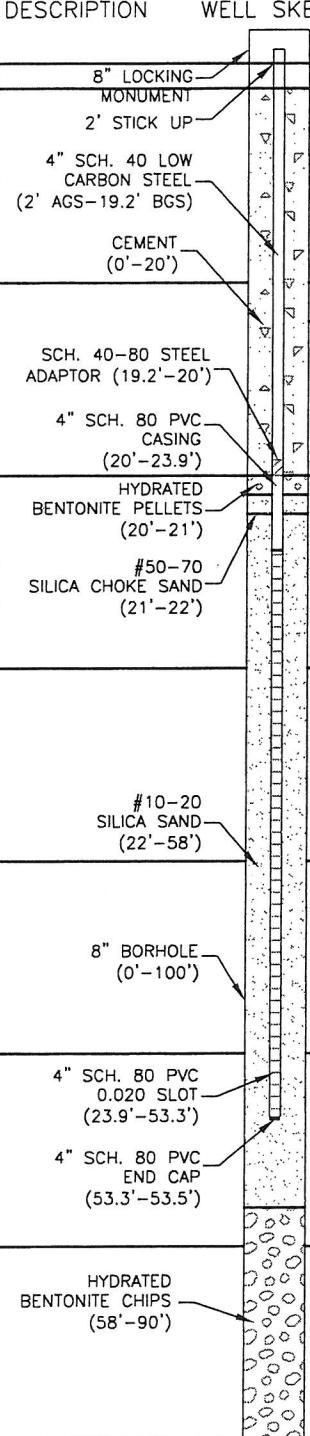
BOREHOLE LOCATION: S. OF SMELTER SITE &amp; ≈ 100' N. OF DIESEL AST.

COORDINATES N: E: EL: 2775

SHEET: 1 OF 2

PROJECT: SUPERIOR MONITOR WELLS

BORING DATE: 05/01/02

DEPTH (feet)	DESCRIPTION (Gravel/Sand/Fine)	GRAPHIC LOG	PASTE		MONITORING WELL COMPLETION		DRILLING NOTES	DEPTH (feet)
			ASTM CLASS	HCl REACTIVITY	pH	COND. ( $\mu\text{S}/\text{cm}$ )		
0	Fill/diversion berm to keep surface flow from adjacent diesel AST.  Lean clay; yellow, orange, brown; gravel, some variable lithology seen in gila conglomerate plus slag; clay, lean, low-medium plasticity with approx. 30 % silt; moist.  (10/TR/90)		CL	S	5.43	781		0
10	Silty sand with gravel; pinkish brown with some dark discoloration from diesel; gravel, fine, sub-angular, highly variable lithology; sand, well-graded; fines, predominantly silt with trace of clay; slightly moist.  (20/60/20)		SM	S	6.92	312		10
20	Silty sand with gravel; brown; no plasticity; gravel, well-graded, sub-angular to sub-rounded; sand, poorly graded, predominantly fine; moist.  (20/65/15)		SM	S	9.57	352		20
30	Silty sand; slight reddish brown (same color as opaque leep tuff); fines, predominantly silt with trace of clay, no plasticity; sand, poorly graded, predominantly fine; moist.  (5/80/15)		SM	S	8.91	207		30
40	Silty sand; slight reddish brown (same color as opaque leep tuff); fines, predominantly silt with trace of clay, no plasticity; sand, poorly graded, predominantly fine; moist.  (5/80/15)		SM	S	9.25	140		40
50	Silty sand; slight reddish brown (same color as opaque leep tuff); fines, predominantly silt with trace of clay, no plasticity; sand, poorly graded, predominantly fine; moist.  (5/80/15)		SM	S	9.15	184		50
60	Silty sand with gravel; brown; gravel, poorly-graded, predominantly fine; sand, poorly-graded, predominantly fine; fines, approx. 50% silt, 50% clay, little to no plasticity; moist.  (20/50/30)		SM	S	9.13	208		60
70								70

DRILL RIG: SCHRAMM/ DUAL WALL REVERSE CIRCULATION

LOGGED: JJM

DRILLING CONTRACTOR: LAYNE CHRISTENSEN

CHECKED:

DRILLER: MARK HALAGER

DATE:



## RECORD OF MONITORING WELL INSTALLATION

GAI-02-02

PROJECT NUMBER: 023-2552

BOREHOLE LOCATION: S. OF SMELTER SITE &amp; ≈ 100' N. OF DIESEL AST.

COORDINATES N: E: EL: 2775

SHEET: 2 OF 2

PROJECT: SUPERIOR MONITOR WELLS

BORING DATE: 05/01/02

DEPTH (feet)	DESCRIPTION (Gravel/Sand/Fine)	GRAPHIC LOG	PASTE		MONITORING WELL COMPLETION		DRILLING NOTES	DEPTH (feet)
			ASTM CLASS.	HCl REACTIVITY	pH	COND. ( $\mu\text{S}/\text{cm}$ )		
70	Sandy silt; brown; gravel, poorly-graded, fine; sand, poorly-graded, predominantly fine; fines, predominantly silt with approx. 40% clay, low plasticity; moist. (10/30/60)		ML	S	9.54	152	8" BORHOLE (0'-100') HYDRATED BENTONITE CHIPS (58'-90')	70
80	Sandy lean clay; brown; sand, poorly-graded, fine; fine fraction, predominantly low plasticity clay with approx. 30% silt; moist (0/30/70)		CL	S	9.31	160	First clayey "chips" @ 85' BGS - gradational mudstone contact.	80
90	Lean clay with sand; reddish brown; sand, poorly-graded, fine; fine fraction, predominantly low to medium plasticity clay, silt fraction approx. 30%; moist. (0/15/85)		CL	S	9.48	205	GILA CONCRETIONE (INTERBEDDED SILTSTONE/MUDSTONE) SLOUGH (90'-100')	90
100							TD @ 100' BLS.	100
110								110
120								120
130								130
140								140

DRILL RIG: SCHRAMM/ DUAL WALL REVERSE CIRCULATION

LOGGED: JJM

DRILLING CONTRACTOR: LAYNE CHRISTENSEN

CHECKED:

DRILLER: MARK HALAGER

DATE:



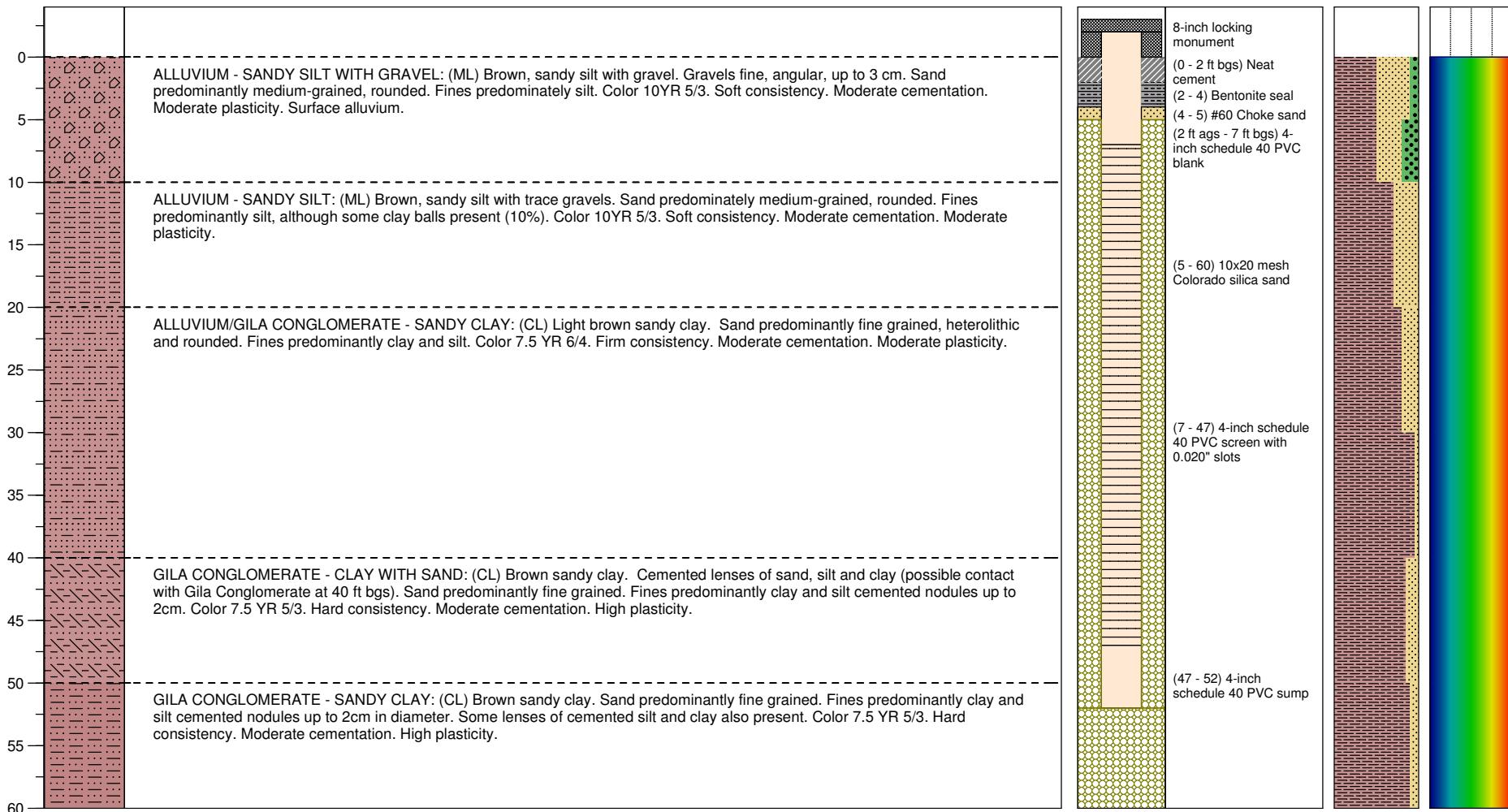
# INDIAN PONDS POC WELL

AZ STATE PLANE CENTRAL NAD 83

NORTHING: 832934 ELEVATION (TOC):2674.25

EASTING: 945033

## LITHOLOGY



BOREHOLE No.	INDIAN PONDS POC WELL	TOTAL DEPTH DRILLED	60 ft bgs	SCALE	AS SHOWN	TITLE  <b>BOREHOLE LOG AND AS-BUILT DRAWING</b>
ADWR REG No.	55-907037	BIT DIAMETER	8.75"	DATE	06/07/07	
LOCATION	SUPERIOR, AZ	DRILLING FLUID	AIR	DESIGN	JCR	
CLIENT	RESOLUTION COPPER MINE	LOGGED BY	KKH	CHECK	JJM	
DRILLING CO	YELLOW JACKET DRILLING	DATE STARTED	05/31/07	REVIEW	KJ	
DRILLING EQUIPMENT	SPEEDSTAR 50K-CH	DATE FINISHED	05/31/07	REV	1 FILE INDIAN PONDS POC WELL.LDF	
DRILLING METHOD	AIR ROTARY CASING HAMMER	COMMENTS	USCS SCALE, MUNSELL COLOR CHART	PROJECT No.	073-92522	

**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: BHP Superior

Project Number: 3800.05

Soil Boring

Monitoring Well

Boring/Well Number:

MCC-1

Sheet 1 of 4

Boring Location: <u>331809.82N(Lat) 1110653.44W(Long)</u>		Elevation and Datum: <u>2964.0 msl</u>
Drilling Contractor: <u>Boyles Brothers</u>	Driller:	Date Started: <u>3/23/95</u> Date Finished: <u>3/27/95</u>
Drilling Equipment: <u>Schramm</u>	Borehole Diameter: <u>7.5"</u>	Completed Depth: (feet) <u>483.0</u> Water Depth: (feet) <u>153.2</u>
<b>WELL CONSTRUCTION</b>		
Sampling Method: California Method <input type="checkbox"/> Shelby Tube <input type="checkbox"/> Split Spoon <input type="checkbox"/>		Type and Diameter of Well Casing: <u>4-inch Low Carbon Steel</u>
Drilling Method: <u>Air Rotary</u>	Drilling Fluid: <u>Air</u>	Slot Size: <u>0.02"</u> Filter Material: <u>10-20 CSSI</u>
Backfill Material: <u>Type 5 Cement Grout</u>	Development Method: <u>Pump and Surge</u>	
Logged By: <u>Jim Clarke</u>	Checked By:	

Depth (feet)	USC Soil Type	Description	Blow Counts	Graphic Log		Readings PPM	Remarks
				Sample No.	Sample		
		FILL MATERIAL Composed of cobbles, boulders and gravels.					
20		GILA CONGLOMERATE Strongly cemented, dense, dry, with clasts composed of schist, granite, metavolcanics and limestone.					
40							
60							
80		Local increase in sand at 65 feet bbls.					
100							4-inch low carbon steel casing from 0 to 443 feet bbls

**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: **BHP Superior**

Project Number: **3800.05**

Soil Boring

Monitoring Well

Boring/Well Number:

**MCC-1**

Sheet **2** of **4**

Depth (feet)	USC Soil Type	Description	Blow Counts	Graphic Log			Readings PPM	Remarks
				Sample No.	Sample	Lithology		
120								
125		First water encountered during drilling at 135 feet bsl.						
130		GILA CONGLOMERATE						
135		Gray-brown, damp, very dense, gravelly sand. Rock composed of 70% sand and 30% gravel.						
140		GILA CONGLOMERATE						
145		Gray-brown, slightly damp, well cemented, very dense, sandy gravel. Rock composed of 70% gravel and 30% sand.						
150		Measured Groundwater Level (July, 1998) = 154.15'.						
160								
170								
180		GILA CONGLOMERATE as above with an increase in sand (60% sand, 40% gravel). Cuttings are still slightly damp with no indication of water.						
190		Increase in gravel content (90% gravel, 10% sand).						
200								
210								
220								
230								
240								
250								
260								
		Rock contains 50% sand.						
		Rock appears dry and is dominated by very fine sand and silt reaching 80%, angular rock fragments reaching						
								4-inch low carbon steel casing from 0 to 443 feet bsl

**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: BHP Superior

Project Number: 3800.05

Soil Boring

Monitoring Well



Boring/Well Number:

MCC-1

Sheet 3 of 4

Depth (feet)	USC Soil Type	Description	Blow Counts	Graphic Log			Readings PPM	Remarks
				Sample No.	Sample	Lithology		
20%								
280		Rock contains significant small, well rounded pebbles grading to no pebbles at 300 feet with 80% fine sand and silt with 20% angular rock fragments.						
300								
310		Interbedded sandy interval at 310 feet bsl.						
320								
330		Interbedded sandy interval at 330 feet bsl.						
340								
350		Rock contains very fractured/angular clasts with 35-45% sand.						
360		GILA CONGLOMERATE as above with a decrease in sand fraction.						
360		Unit is very sandy (~90%) and dry.						
370		Significant increase in rock fragments (approximately 60%) with a dry, sandy matrix.						
370		Same as above except small rock fragments.						
380		Increase in rock fragments (80%). Appears dry with a steady decrease in the sand fraction.						
380		Increase in sand content with no increase in moisture.						
390		Increase in sand fraction (fine to medium grained, ~80%). slight moisture content.						
390		Slight moisture, sand content ~25%, rounded pebbles with fractured rocks observed.						
400		Rock fragments greatly reduced to ~5%. very fine sand and silt observed with slight moisture content.						
400		Rock fragments and rounded pebbles comprise ~60% of the rock, sand and silt. slight moisture detected.						
400		Increase in sand fraction to ~70% with slight moisture.						
410		Rounded small pebbles with some rock fragments, slightly darker color, sand and silt content ~60%. slight						

**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: BHP Superior

Project Number: 3800.05

Soil Boring

Monitoring Well

Boring/Well Number:

MCC-1

Sheet 4 of 4

Depth (feet)	USC Soil Type	Description	Blow Counts	Graphic Log		Readings PPM	Remarks	
				Sample No.	Sample	Lithology	Well	
420		moisture.						Bentonite seal from 400 to 450 feet bls
		GILA CONGLOMERATE as above with an increase in water content.						
440		GILA CONGLOMERATE as above with a decrease in water content and slightly more sand.						
		GILA CONGLOMERATE as above with slightly less sand.						
		GILA CONGLOMERATE as above with well rounded to sub rounded pebbles.						
		GILA CONGLOMERATE as above with an increase in moisture content, clay/silt coatings on chips, and comprised of 80% chips and sub-rounded pebbles.						
460		Moist with an increase in sand to ~70%.						
		Increase in pebble content, silt and fine sands reach 50-60%, rock coated with fines.						
480		Unit is saturated, contains very clean, subangular to subrounded gravel and rock fragments with little to none sand or silt.						
		GILA CONGLOMERATE as above with increased silt but no sand.						
		Unit comprised of 80% silt and clay with rock fragments and small sub-angular pebbles. Decrease in water content.						
		GILA CONGLOMERATE as above with an increase in pebble and rock fragment fraction.						
		Unit is moist and comprised predominantly of silt and clay (80%), pebbles and rock fragments (15%), and sand (1-5%).						
								Total cased depth = 483 feet bls
								Total depth hole at 500 feet bls

**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: BHP Superior

Project Number: 3800.05

Soil Boring

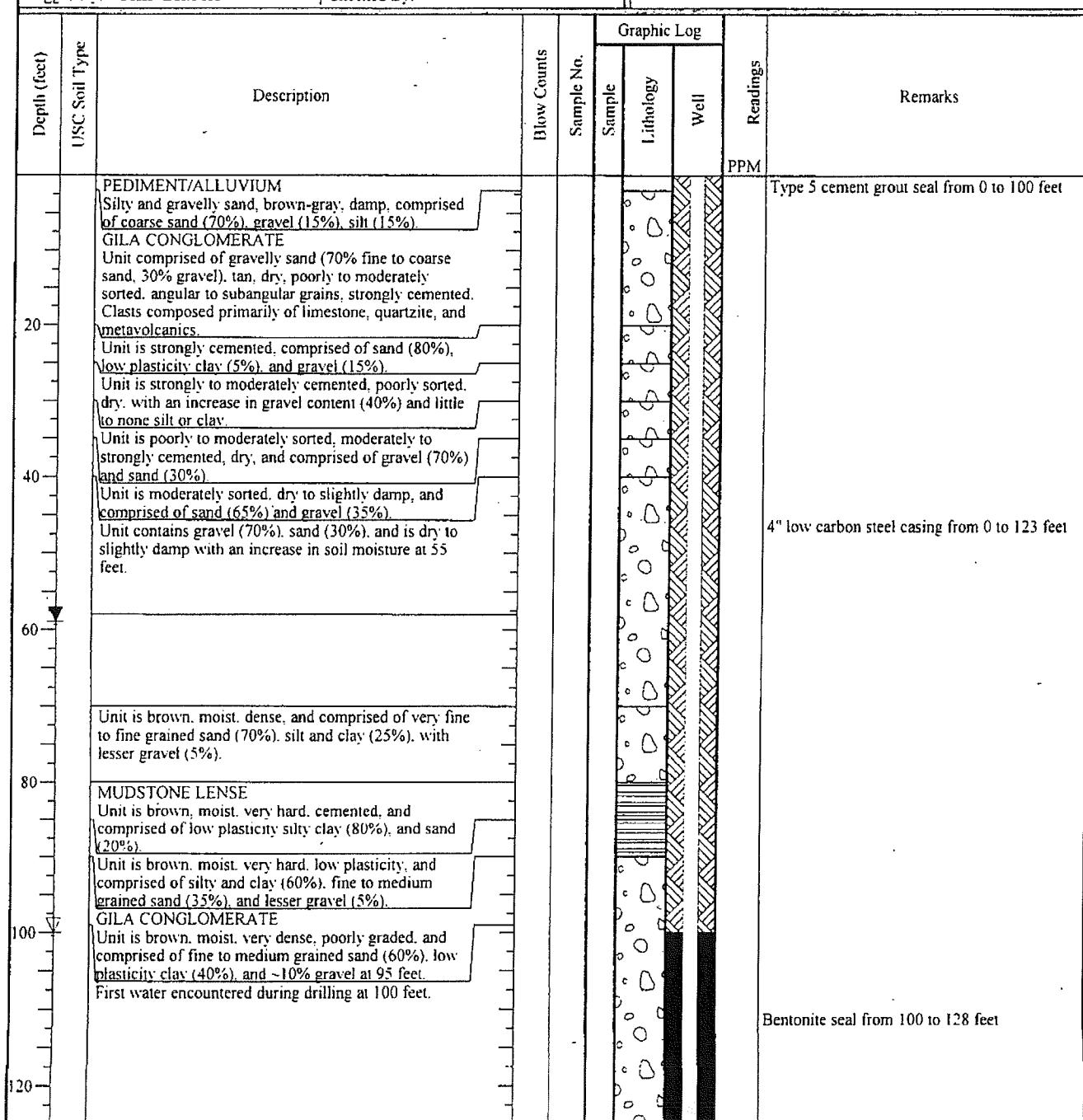
Monitoring Well

Boring/Well Number:

MCC-2

Sheet 1 of 2

Boring Location: <u>331741.85N(Lat) 1110640.75W(Long)</u>		Elevation and Datum: <u>2851.3 msl</u>	
Drilling Contractor: <b>Boyles Brothers</b>	Driller:	Date Started: <u>3/31/95</u>	Date Finished: <u>4/1/95</u>
Drilling Equipment: <b>Schramm</b>	Borehole Diameter: <u>7.5"</u>	Completed Depth: (feet) <u>225.0</u>	Water Depth: (feet) <u>59.0</u>
Sampling Method: California Method <input type="checkbox"/>	Shelby Tube <input type="checkbox"/>	Split Spoon <input type="checkbox"/>	
Drilling Method: <b>Air Rotary</b>		Drilling Fluid: <b>Air</b>	
Backfill Material: <b>Type 5 Cement Grout</b>		Slot Size: <u>0.02"</u>	Filter Material: <u>10-20 CSSI</u>
Logged By: <u>Jim Clarke</u>	Checked By:	Development Method: <b>Pump and Surge</b>	



**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: BHP Superior

Project Number: 3800.05

Soil Boring

Monitoring Well

Boring/Well Number:

MCC-2

Sheet 2 of 2

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log			Readings PPM	Remarks
					Sample	Lithology	Well		
140									4" PVC casing from 123 to 133 feet
160		Unit is brown, moist, very hard, and comprised of low plasticity clay (65%), very fine to medium grained sand (35%), and cemented nodules. Unit is brown, moist, very hard, and comprised of very fine to medium grained sand (60%), and silt and clay (40%).							4" slotted PVC screen (0.02" slot size) from 133 to 183 feet
180									Total cased depth = 183 feet
200		MUDSTONE Unit is red-brown, moist, low to moderate plasticity, and composed of silty clay.  Cemented clay nodules at 200 feet.							10-20 Mesh Colorado Silica sand pack from 128 to 220 feet
220									Stopped drilling at 225 feet

**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: BHP Superior

Project Number: 3800.05

Soil Boring

Monitoring Well

Boring/Well Number:

MCC-3A

Sheet 1 of 1

Boring Location: 331740.23N(Lat) 1110619.18W(Long)

Elevation and Datum: 2798.2 msl

Drilling Contractor: Boyles Brothers

Driller:

Date Started: 3/20/95

Date Finished: 3/21/95

Drilling Equipment: Schramm

Borehole Diameter: 7.5"

Completed Depth: (feet) 93.0

Water Depth: (feet) 10.4

Sampling Method: California Method

Shelby Tube  Split Spoon

**WELL CONSTRUCTION**

Drilling Method: Air Rotary

Drilling Fluid: Air

Type and Diameter of Well Casing: 4" LCS(0-25), 4" PVC(25-35)

Backfill Material: Type 5 Cement Grout

Slot Size: 0.02" Filter Material: 10-20 CSSI

Logged By: Jim Clarke

Checked By:

Development Method: Pump and Surge

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log		Readings PPM	Remarks
					Sample	Lithology		
0		FILL/TAILINGS Silty and clayey sand, gray-brown, wet, 60% sand, 40% fines, non cemented.						Type 5 cement grout seal from 0 to 28 feet
10		Measured Groundwater Level (July, 1998) = 26.84 feet bbls.						
20		ALLUVIUM						4" low carbon steel casing from 0 to 25 feet
28		First water encountered during drilling at 28 feet bbls.						
30		GILA CONGLOMERATE Unit is competent and contains rounded clasts of limestone in a sandy, silty, clay matrix.						Bentonite seal from 28 to 32 feet 4" PVC casing from 25 to 35 feet
35		MUDSTONE/CLAY						
40								
50								4" Schedule 80 PVC screen (0.02" slot size) from 35 to 85 feet
60		GILA CONGLOMERATE Unit is competent and contains rounded clasts of limestone in a sandy, silty, clay matrix.						10-20 Mesh Colorado Silica sand pack from 32 to 91 feet
70		MUDSTONE/CLAY						
80		GILA CONGLOMERATE Unit is competent and contains rounded clasts of limestone in a sandy, silty, clay matrix.						Total cased depth = 85 feet
90								Stopped drilling at 91 feet

**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: BHP Superior

Project Number: 3800.05

Soil Boring

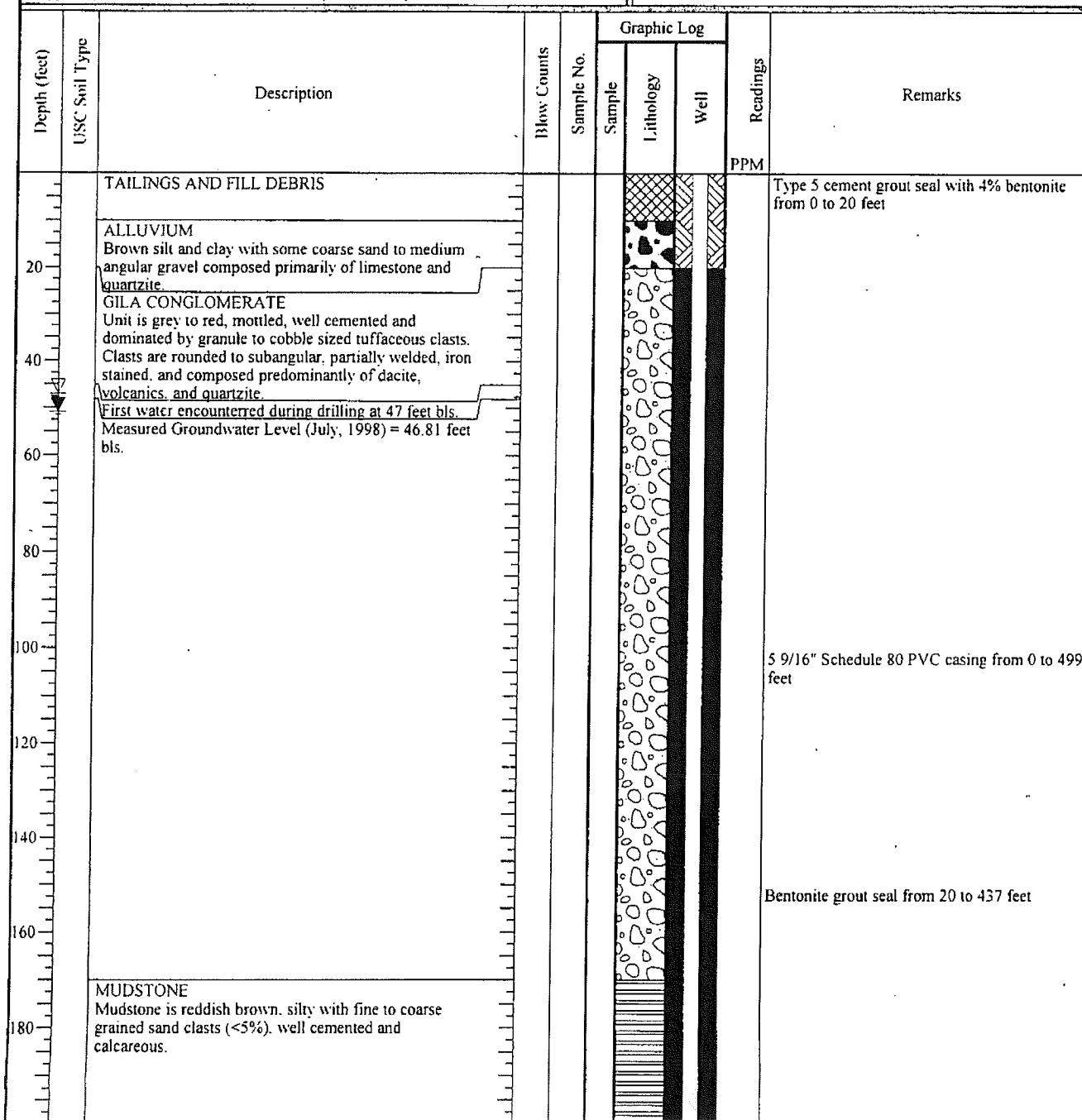
Monitoring Well

Boring/Well Number:

**MCC-3C**

Sheet 1 of 3

Boring Location: <b>331740.15N(Lat) 1110619.29W(Long)</b>		Elevation and Datum: <b>2798.4 msl</b>	
Drilling Contractor: <b>Stewart Brothers</b>	Driller:	Date Started: <b>8/12/97</b>	Date Finished: <b>8/16/97</b>
Drilling Equipment: <b>Gardner-Denver 15W</b>	Borehole Diameter: <b>9 7/8"</b>	Completed Depth: (feet) <b>590.0</b>	Water Depth: (feet) <b>50.9</b>
Sampling Method: California Method <input type="checkbox"/> Shelby Tube <input type="checkbox"/> Split Spoon <input type="checkbox"/>		<b>WELL CONSTRUCTION</b>	
Drilling Method: <b>Air Rotary</b>		Type and Diameter of Well Casing: <b>5 9/16" Schedule 80 PVC (0-499)</b>	
Backfill Material: <b>Type 5 Cement Grout with 4% bentonite</b>		Slot Size: <b>0.02"</b>	Filter Material: <b>10-20 CSSI</b>
Logged By: <b>Mike Bostic</b>	Checked By:	Development Method: <b>Pump and Surge</b>	



**BROWN AND CALDWELL**  
Phoenix, Arizona

## BORING LOG

Project Name: BHP Superior

Project Number: 3800.05

**AND CALL**  
Phoenix, Arizona.

MCC-3C

3800.05

Project N

BINoculars.

Monitoring Well

Boring/Well Number:

Project Number: 3800.05

MCC-3C

3800.05

Sheet 2 of 3

**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: BHP Superior

Project Number: 3800.05

**MCC-3C**

Sheet 3 of 3

Soil Boring

Monitoring Well

Boring/Well Number:

U.S.C. Soil Type	Depth (feet)	Description	Blow Counts	Graphic Log			Readings PPM	Remarks
				Sample No.	Sample	Lithology		
	457	predominantly of dacite, basalt, quartzite, and limestone.						gcl from 457 to 487 feet
	480							20-40 Mesh sand pack from 487 to 492 feet
	500							10-20 Mesh Colorado Silica sand pack from 492 to 590 feet
	520	GILA CONGLOMERATE as previously described.						5 9/16" Schedule 80 PVC screen (0.02" slot size) from 499 to 579 feet
	540							
	560							
	580							Total cased depth = 579 feet
								Stopped drilling at 590 feet

# BROWN AND CALDWELL

Phoenix, Arizona

# BORING LOG

Project Name: BHP Superior

Project Number: 3800.05

Soil Boring

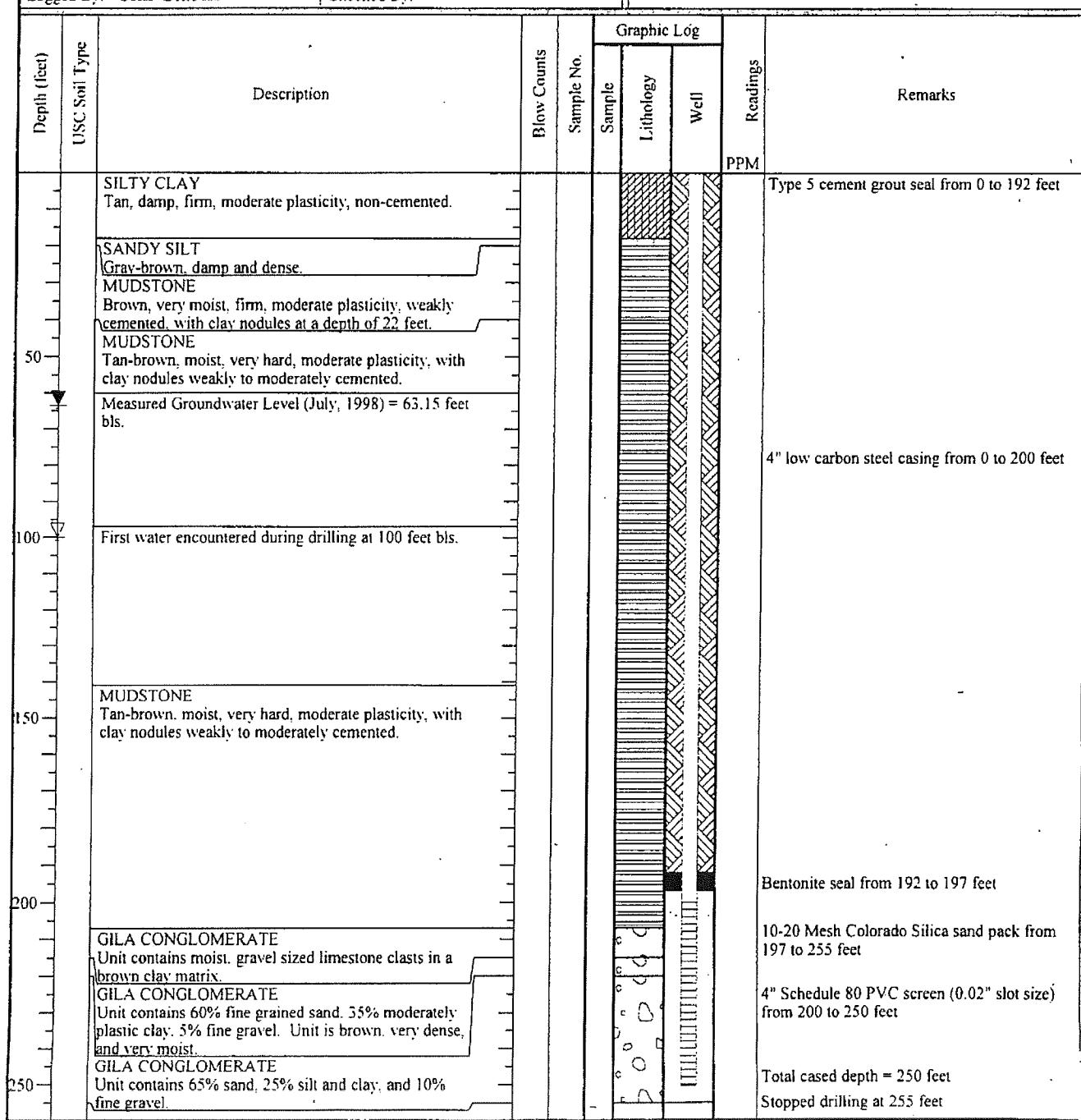
Monitoring Well

Boring/Well Number:

**MCC-4**

Sheet 1 of 1

Boring Location: <b>331713.99N(Lat) 1110700.67W(Long)</b>		Elevation and Datum: <b>2674.0 msl</b>	
Drilling Contractor: <b>Boyles Brothers</b>	Driller:	Date Started: <b>3/21/95</b>	Date Finished: <b>3/23/95</b>
Drilling Equipment: <b>Schramm</b>	Borehole Diameter: <b>7.5"</b>	Completed Depth: (feet) <b>255.0</b>	Water Depth: (feet) <b>63.5</b>
<b>WELL CONSTRUCTION</b>			
Sampling Method: California Method <input type="checkbox"/> Shelby Tube <input type="checkbox"/> Split Spoon <input type="checkbox"/>		Type and Diameter of Well Casing: <b>4" Low Carbon Steel</b>	
Drilling Method: <b>Air Rotary</b>	Drilling Fluid: <b>Air</b>	Slot Size: <b>0.02"</b>	Filter Material: <b>10-20 CSSI</b>
Backfill Material: <b>Type 5 Cement Grout</b>		Development Method: <b>Pump and Surge</b>	
Logged By: <b>Jim Clarke</b>	Checked By:		



**BROWN AND CALDWELL**  
Phoenix, Arizona

**AND** **OR**  
Phoenix, Arizona

## BORING LOG

Project Name: BHP Superior

Project Number: 3800.05

### **Soil Borings**

### Monitoring Well

Boring @ Wall Number 2

MCC-6A

24 1 6 1

Boring Location: 331756.47N(Lat) 1110703.15W(Long)		Elevation and Datum: 2811.1 msl								
Drilling Contractor: Water Development		Driller:								
Drilling Equipment: Dresser T70W		Borehole Diameter: 10 5/8"								
Sampling Method: California Method <input type="checkbox"/> Shelby Tube <input type="checkbox"/> Split Spoon <input type="checkbox"/>		Date Started: 7/17/96 Date Finished: 7/24/96								
Drilling Method: Air Rotary		Completed Depth: (feet) 223.0 Water Depth: (feet) 23.6								
Backfill Material: Type 5 Cement Grout										
Logged By: John Eliades		Checked By:								
Depth (feet)	USC Soil Type	Description		Blow Counts	Sample No.	Sample	Graphic Log		Readings PPM	Remarks
		Lithology	Well							
0		GILA CONGLOMERATE Unit is brown (10yr 4/3), moderately sorted, with medium grained clasts composed predominantly of dark quartzites, igneous mafics, basalt, limestone, and traces of schist and dusky red dacite. The unit reacts strongly with HCl, suggesting calcareous cementation. Measured Groundwater Level (July, 1998) = 23.90 feet bbls.							Type 5 cement grout seal from 0 to 151 feet	
42		First water encountered during drilling at 42 feet bbls.							4.77" ID Schedule 80 PVC casing from 0 to 60 feet	
151									20-40 Mesh sand pack from 151 to 155 feet	
155									10-20 Mesh Colorado Silica sand pack from 155 to 220 feet	
160									4.77" ID Schedule 80 PVC screen (0.02" slot size) from 160 to 220 feet	
220									Total cased depth = 220 feet Stopped drilling at 222 feet	

**BROWN AND CALDWELL**  
Phoenix, Arizona

## BORING LOG

Project Name: **BHP Superior**

Project Number: 3800.05

## Soil Resin

Monitoring Well

Boring/Well Number:

Model Number: MCC-6B

MCC-6B

Sheet 1 of 3

**BROWN AND CALDWELL**  
Phoenix, Arizona

## BORING LOG

Project Name: BHP Superior

Project Number: 3800.05

SEARCHED  INDEXED

Project Number: 3800.05

### **Soil Boring**

1

### **Monitoring Well**

X

Boring/Well Number:

MCC-6B

Sheet 2 of 3

**BROWN AND CALDWELL**  
Phoenix, Arizona

Phoenix, Arizona

## BORING LOG

Project Name: BHP Superior

Project Number: 3800.05

Soil Borings

1

### **Monitoring Well**

1

Boring/Well Number:

MCC-6B

Sheet 3 of 3

**BROWN AND CALDWELL**

Phoenix, Arizona

**BORING LOG**

 Project Name: **BHP Superior**

 Project Number: **3800.05**

 Soil Boring 

 Monitoring Well 

Boring/Well Number:

**MCC-6C**

 Sheet **1** of **1**

Boring Location: <b>331756.30N(Lat) 1110703.20W(Long)</b>		Elevation and Datum: <b>2811.4 msl</b>	
Drilling Contractor: <b>Stewart Brothers</b>	Driller:	Date Started: <b>8/19/97</b>	Date Finished: <b>8/20/97</b>
Drilling Equipment: <b>Gardner-Denver 15W</b>	Borehole Diameter: <b>9 7/8"</b>	Completed Depth: (feet) <b>122.0</b>	Water Depth: (feet) <b>38.3</b>
Sampling Method: California Method <input type="checkbox"/> Shelby Tube <input type="checkbox"/> Split Spoon <input type="checkbox"/>			<b>WELL CONSTRUCTION</b>
Drilling Method: <b>Air Rotary</b>			Type and Diameter of Well Casing: <b>4.5" Schedule 40 PVC</b>
Backfill Material: <b>Type 5 Cement Grout with 4% bentonite</b>			Slot Size: <b>0.02"</b> Filter Material: <b>10-20 CSSI</b>
Logged By: <b>Mike Bostic</b>	Checked By:	Development Method: <b>Bail/Swab and pump</b>	

Depth (feet)	USC Soil Type	Description	Blow Counts	Graphic Log			Readings PPM	Remarks
				Sample No.	Sample	Lithology		
20		GILA CONGLOMERATE Unit is red to brown and weakly consolidated in a calcareous, fine to coarse sand matrix. Clasts are poorly sorted, subangular to subrounded, and composed of dacite, basalt, limestone, sandstone, quartzite and schist.						Type 5 cement with 4% bentonite grout seal from 0 to 66 feet
40		Measured Groundwater Level (July, 1998) = 45.89 feet bbls.						4.5" ID Schedule 40 PVC casing from 0 to 76 feet
44		First water encountered during drilling at 44 feet bbls.						
60		SANDSTONE LENSE (50 to 60 feet) Lense consists of fine to very coarse grained sand and is very weakly consolidated.						20-40 Mesh sand pack from 66 to 72 feet
80								10-20 Mesh Colorado Silica sand pack from 72 to 122 feet
90		SANDSTONE LENSE (90 to 120 feet) Lense consists of fine to very coarse grained sand and is very weakly consolidated.						4.5" Schedule 40 PVC screen (0.02" slot size) from 76 to 116 feet
100								Total cased depth = 116 feet
120								Stopped drilling at 122 feet

# MCC-6D

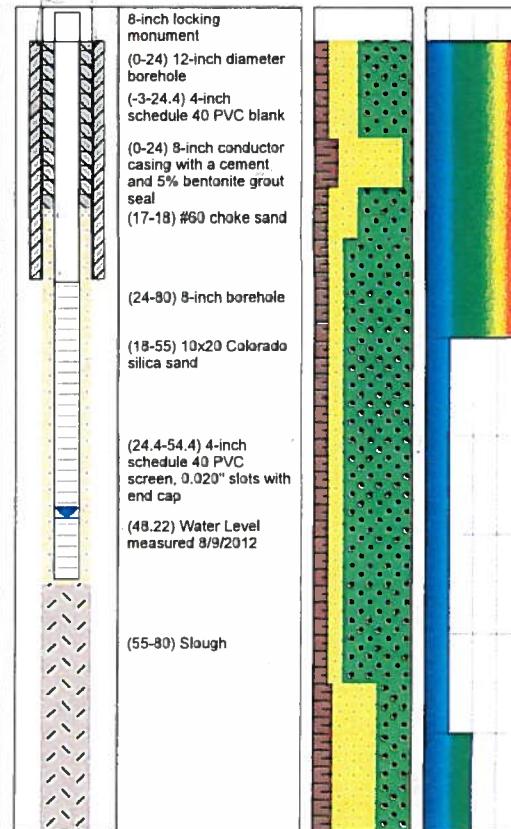
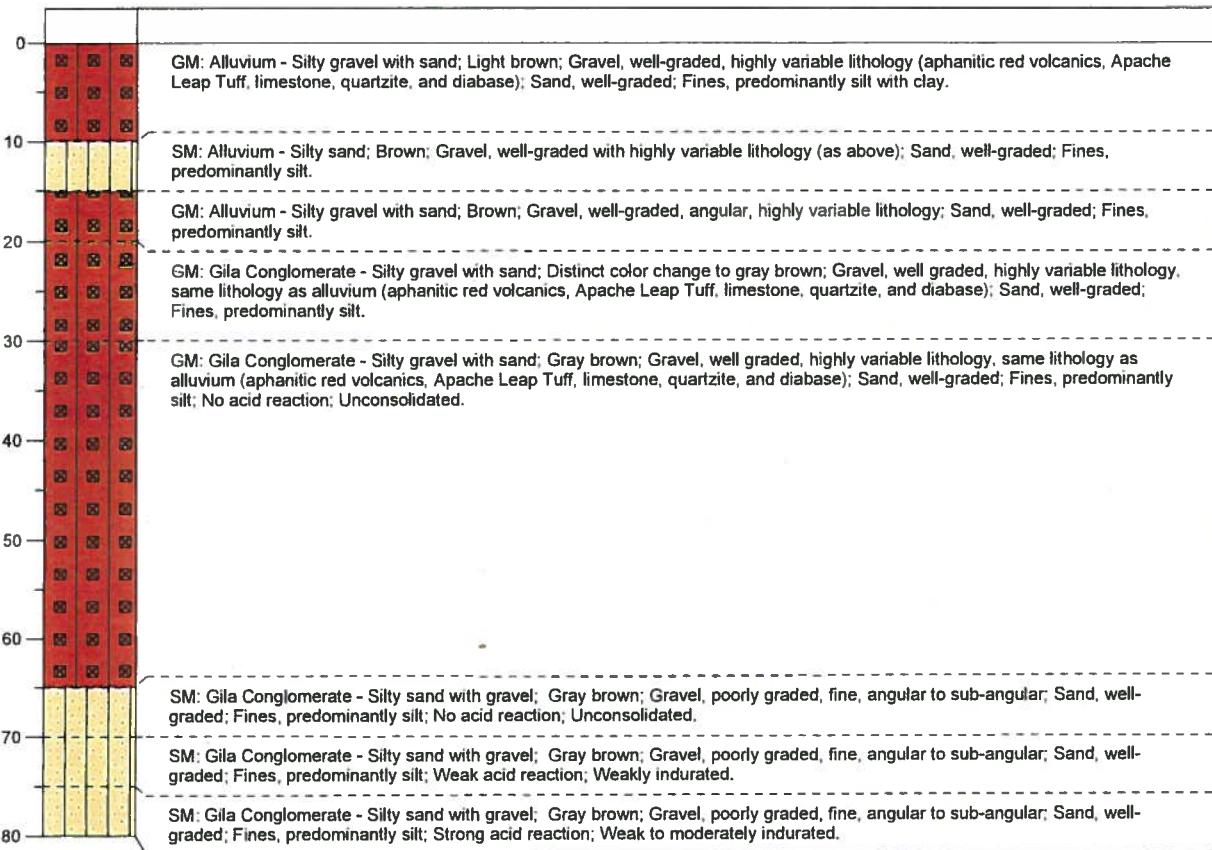
Horizontal Datum, NAD 83; Vertical Datum NGVD29

LATITUDE: N33°17'57.63803" ELEVATION (TOC FT AMSL): 2817.72  
LONGITUDE: W111°07'02.03028"

## LITHOLOGY

## AS-BUILT

CUTTINGS SIZE	REACTION TO HCl
FINES	MEDIUM COARSE
NONE	WEAK MOD STRONG



BOREHOLE No. MCC-6D	TOTAL DEPTH DRILLED 80 FEET	SCALE	AS SHOWN	TITLE <b>BOREHOLE LOG AND AS BUILT DRAWING</b>
ADWR REG No. 55-914374	BIT DIAMETER 11.75" DOWN TO 24"; 8" FROM 24 TO 80	DATE	7/25/2012	
LOCATION SUPERIOR, AZ	DRILLING FLUID AIR	DESIGN	CAP	
CLIENT RESOLUTION COPPER MINE	LOGGED BY JJM	CHECK	JJM	
DRILLING CO YELLOW JACKET DRILLING	DATE STARTED 6/8/2012	REVIEW	KJ	
DRILLING EQUIPMENT SPEEDSTAR 50K-CH	DATE FINISHED 8/3/2012	REV	0 FILE MCC-6D.DAT	
DRILLING METHOD AIR ROTARY	COMMENTS AGS = ABOVE GROUND SURFACE BGS = BELOW GROUND SURFACE	PROJECT No.	123-92513	
		Golder Associates	FIGURE 2	

**BROWN AND CALDWELL**  
Phoenix, Arizona

**BORING LOG**

Project Name: BHP Superior

Project Number: 3800.05

Soil Boring

Monitoring Well

Boring/Well Number:

MCC-9

Sheet 1 of 1

Boring Location: <b>331732.98N(Lat) 1110626.19W(Long)</b>		Elevation and Datum: <b>2769.2 msl</b>	
Drilling Contractor: <b>Stewart Brothers</b>	Driller:	Date Started: <b>8/18/97</b>	Date Finished: <b>8/19/97</b>
Drilling Equipment: <b>Gardner-Denver 15W</b>	Borehole Diameter: <b>9 7/8"</b>	Completed Depth: (feet) <b>60.0</b>	Water Depth: (feet) <b>10.0</b>
Sampling Method: California Method <input type="checkbox"/> Shelby Tube <input type="checkbox"/> Split Spoon <input type="checkbox"/>			<b>WELL CONSTRUCTION</b>
Drilling Method: <b>Air Rotary</b>			Type and Diameter of Well Casing: <b>4.5" Schedule 40 PVC</b>
Backfill Material: <b>Type 5 Cement Grout with 4% bentonite</b>		Slot Size: <b>0.02"</b>	Filter Material: <b>10-20 CSSI</b>
Logged By: <b>Mike Bostic</b>	Checked By:	Development Method: <b>Bail/Swab and pump</b>	

Depth (feet)	USC Soil Type	Description	Blow Counts	Graphic Log			Readings	Remarks	
				Sample No.	Sample	Lithology	Well	PPM	
10		ALLUVIUM AND FILL  First water encountered during drilling at 10 feet bsl. Measured Groundwater Level (July, 1998) = 13.32 feet bsl.							Type 5 cement with 4% bentonite gel grout seal from 0 to 20 feet
20		GILA CONGLOMERATE Fine to coarse grained clasts in a tuffaceous, sandy matrix. Clasts composed of limestone, quartzite, and volcanics.							4.5" Schedule 40 PVC casing from 0 to 28 feet
30									20-40 Mesh sand pack from 20 to 23 feet
40									4.5" Schedule 40 PVC screen (0.02" slot size) from 28 to 48 feet
50									10-20 Mesh Colorado Silica sand pack from 28 to 60 feet
60									Total cased depth = 48 feet  Stopped drilling at 60 feet

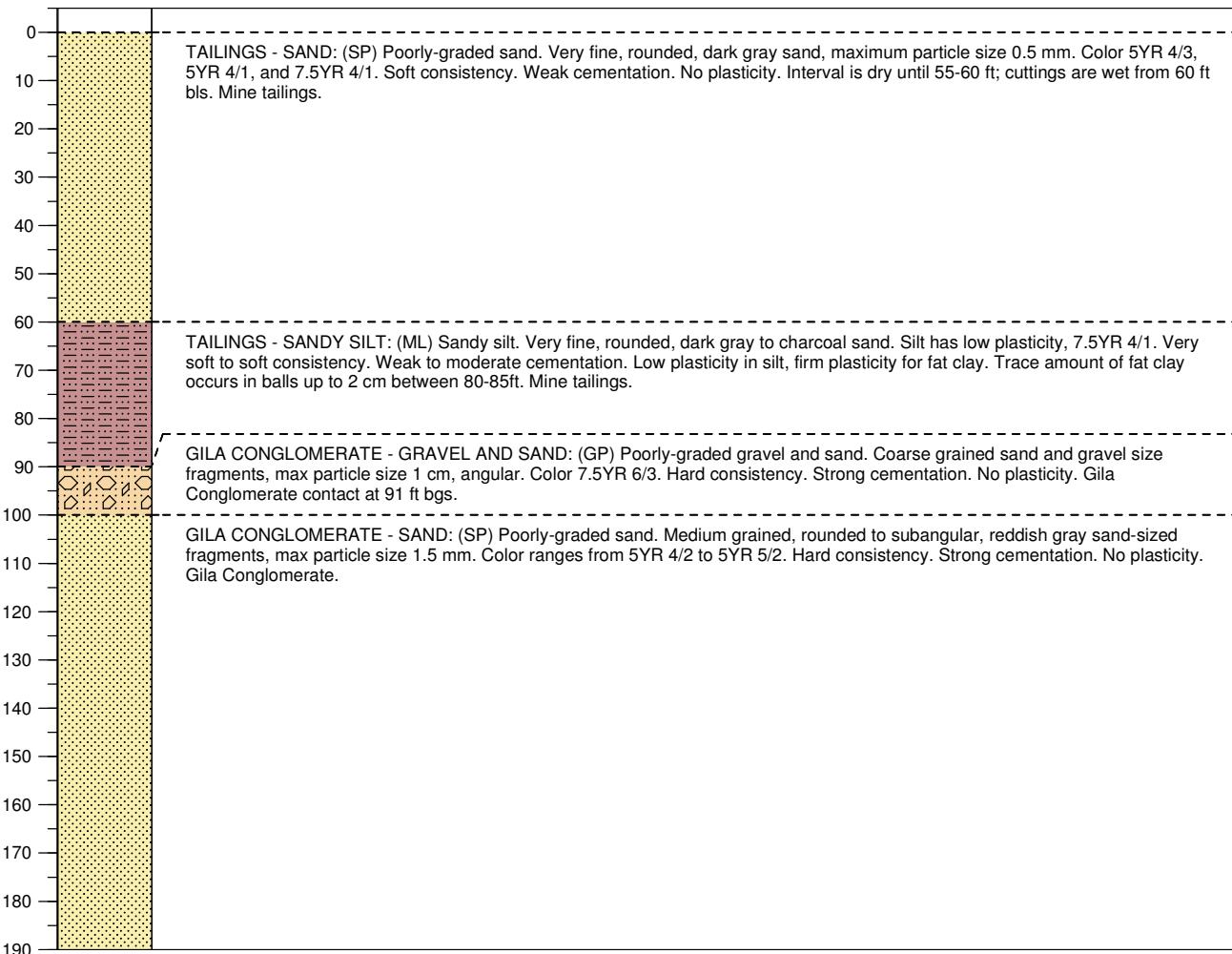
# SETTLING PONDS 1 & 2 ALERT WELL

AZ STATE PLANE CENTRAL NAD 83

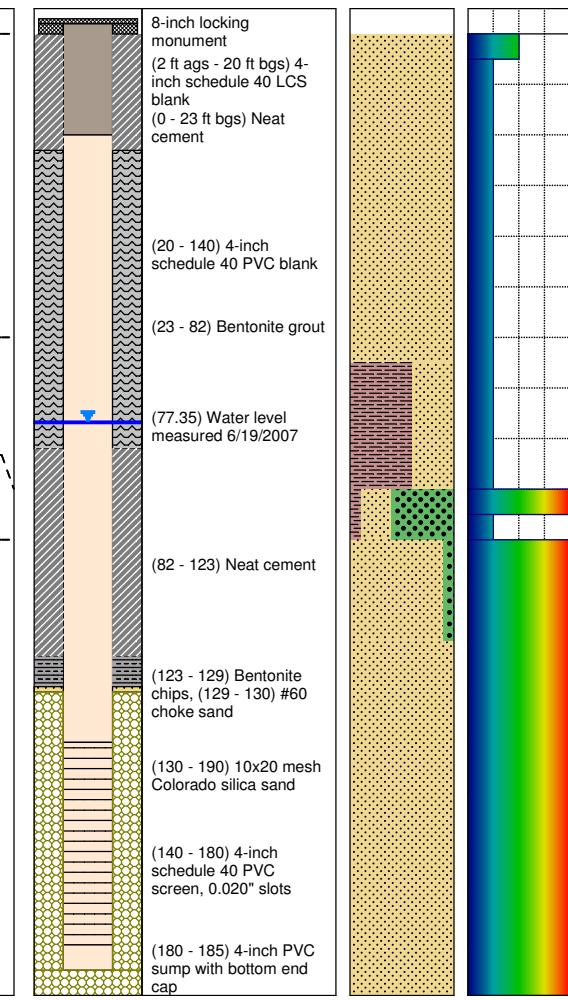
NORTHING: 837767 ELEVATION (TOC):2976.2

EASTING: 948296

## LITHOLOGY



## AS-BUILT



CUTTINGS SIZE	REACTION TO HCI					
FINES	MEDIUM	COARSE	NONE	WEAK	MOD	STRONG

BOREHOLE No.	SETTLING PONDS 1 & 2 ALERT WELL	TOTAL DEPTH DRILLED	190	SCALE	AS SHOWN	TITLE <b>BOREHOLE LOG AND AS-BUILT DRAWING</b>
ADWR REG No.	55-907034	BIT DIAMETER	8.75"	DATE	06/07/2007	
LOCATION	SUPERIOR, AZ	DRILLING FLUID	AIR	DESIGN	JCR	
CLIENT	RESOLUTION COPPER MINE	LOGGED BY	KKH	CHECK	JJM	
DRILLING CO	YELLOW JACKET DRILLING	DATE STARTED	05/22/07	REVIEW	KJ	
DRILLING EQUIPMENT	SPEEDSTAR 50K-CH	DATE FINISHED	05/23/07	REV	1	
DRILLING METHOD	AIR ROTARY CASING HAMMER	COMMENTS	USCS SCALE, MUNSELL COLOR CHART	FILE	ALERT WELL.LDF	
				PROJECT No.	073-92522	Golder Associates FIGURE 2-3



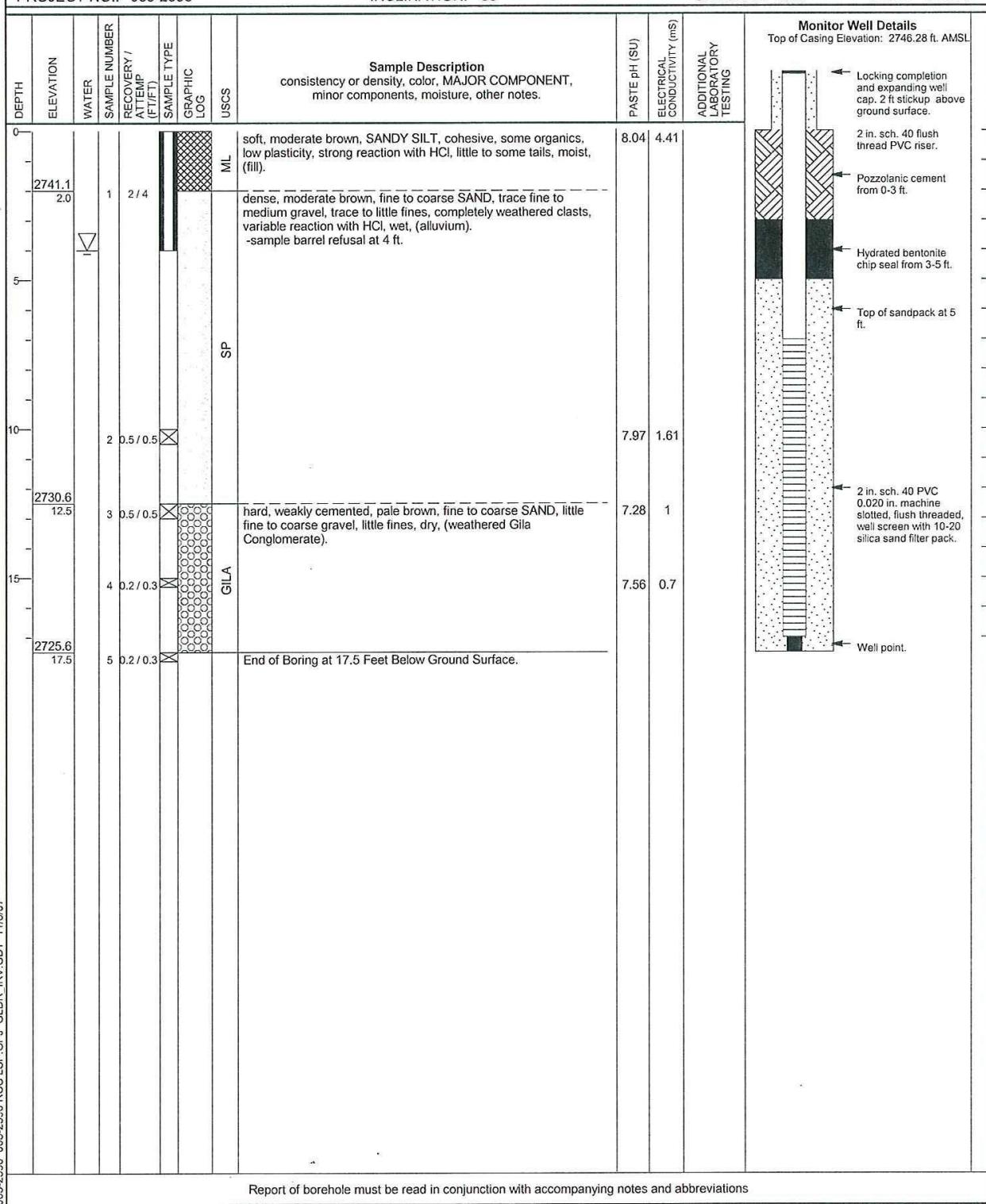
**FIGURE 2-4**

## **SMELTER POND POC WELL**

**CLIENT:** Resolution Copper Company  
**PROJECT:** Lower Smelter Pond  
**LOCATION:** Superior, Arizona  
**PROJECT NO.:** 063-2596

AZ STATE PLANE N: 834587  
CENTRAL NAD 83 E: 947379.3  
ELEVATION: 2743.149 FT AMSL  
INCLINATION: -90

SHEET: 1 OF 1  
DRILL RIG/METHOD: BK-81/4.25" HSA  
LOGGED: JAC DATE: 2/13/07  
CHECKED: JAC DATE: 4/25/07



# SETTLING PONDS 1 & 2 REPLACEMENT ALERT WELL -"SP 1 & 2-Alert-B"

Horizontal Datum, NAD 83; Vertical Datum NGVD29

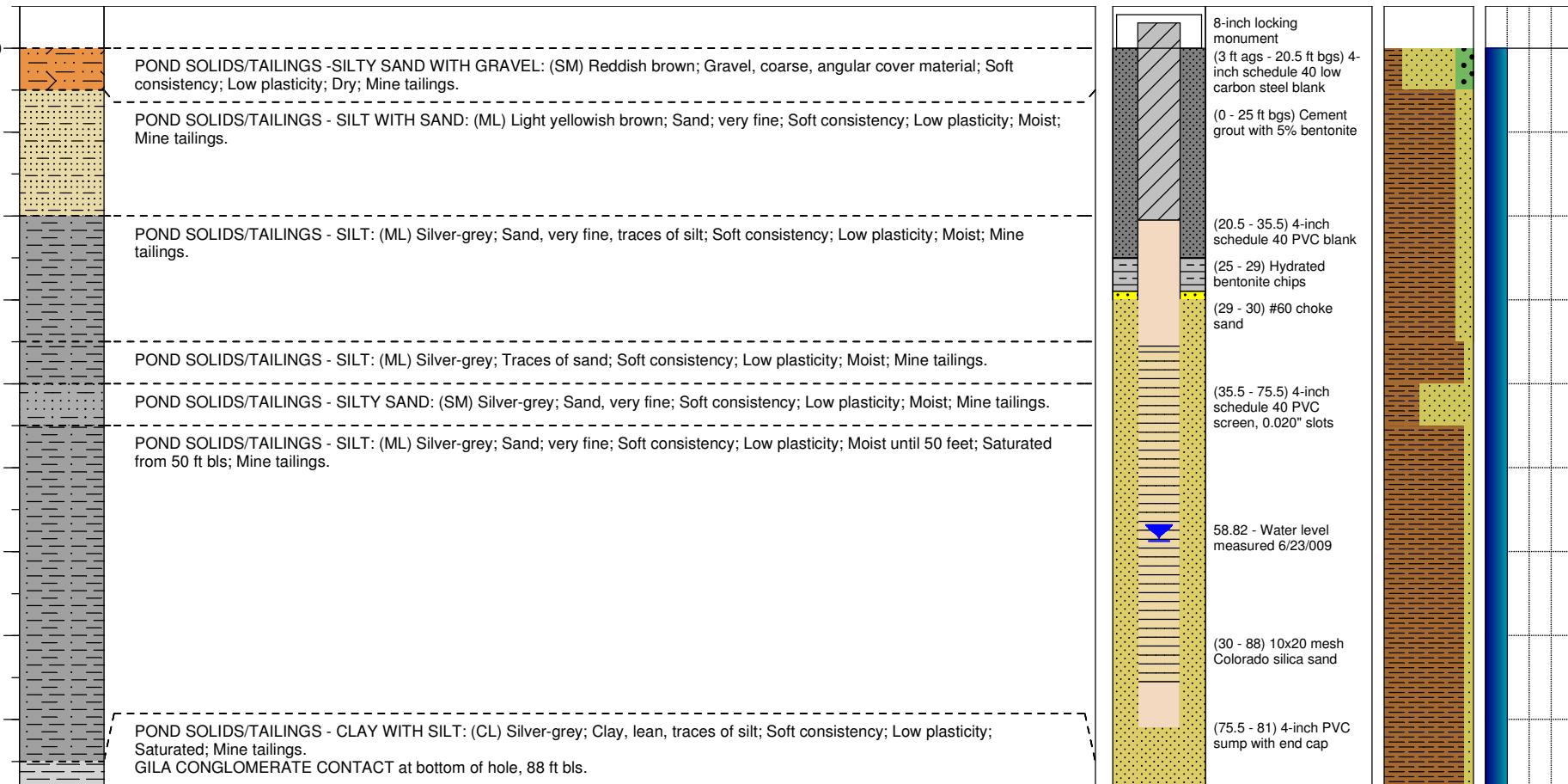
LATITUDE:33° 18' 1.380" ELEVATION (TOC):2977.45 feet

LONGITUDE:111° 6' 14.415"

## LITHOLOGY

## AS-BUILT

CUTTINGS SIZE	REACTION TO HCl		
	FINES	MEDIUM	COARSE
	NONE	WEAK	MOD STRONG



BOREHOLE No. SP 1 & 2- Alert-B		TOTAL DEPTH DRILLED 88	SCALE AS SHOWN	TITLE <b>BOREHOLE LOG AND AS-BUILT DRAWING</b>	
ADWR REG No. 55-910699		BIT DIAMETER 8.75"	DATE 06/08/2009		
LOCATION SUPERIOR, AZ		DRILLING FLUID AIR	DESIGN CAP		
CLIENT RESOLUTION COPPER MINE		LOGGED BY JJM	CHECK JJM		
DRILLING CO YELLOW JACKET DRILLING		DATE STARTED 05/6/09	REVIEW KJ		
DRILLING EQUIPMENT SPEEDSTAR 50K-CH	DATE FINISHED 05/6/09	REV 1	FILE REPLACEMENT ALERT WELL.LDFX		
DRILLING METHOD AIR ROTARY CASING HAMMER	COMMENTS ags= above ground surface; bgs= below ground surface	PROJECT No. 073-92522-10			
		 Golder Associates			
		FIGURE 2			

# TAILINGS POND 5 POC WELL

AZ STATE PLANE CENTRAL NAD 83

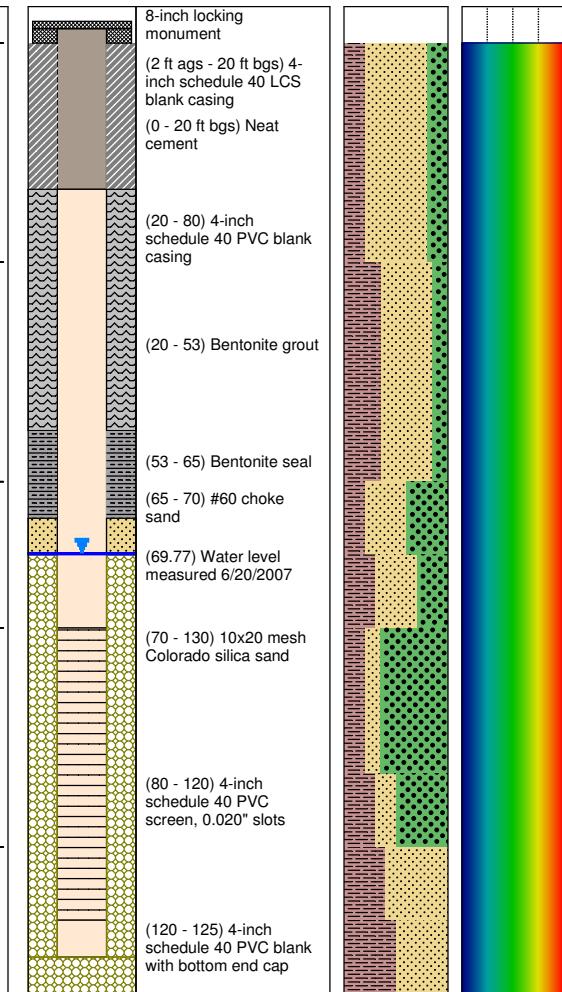
NORTHING: 837338 ELEVATION (TOC):2965.32

EASTING: 947439

## LITHOLOGY



## AS-BUILT



CUTTINGS SIZE	REACTION TO HCI					
FINES	MEDIUM	COARSE	NONE	WEAK	MOD	STRONG

BOREHOLE No.	TAILINGS POND 5 POC WELL	TOTAL DEPTH DRILLED	130 ft bgs	SCALE	AS SHOWN	TITLE <b>BOREHOLE LOG AND AS-BUILT DRAWING</b>
ADWR REG No.	55-907036	BIT DIAMETER	8.75"	DATE	06/07/07	
LOCATION	SUPERIOR, AZ	DRILLING FLUID	AIR	DESIGN	JCR	
CLIENT	RESOLUTION COPPER MINE	LOGGED BY	JJM AND KKH	CHECK	JJM	
DRILLING CO	YELLOW JACKET DRILLING	DATE STARTED	5/24/07	REVIEW	KJ	
DRILLING EQUIPMENT	SPEEDSTAR 50K-CH	DATE FINISHED	05/29/07	REV	1	
DRILLING METHOD	HAMMER, AIR ROTARY	COMMENTS	USCS SCALE, MUNSELL COLOR CHART	FILE	TP5 POC Well.ldf	
				PROJECT No.	073-92522	FIGURE 2-5

# TAILING POND 5 REPLACEMENT POC WELL-"TP5-POC-B"

Horizontal Datum, NAD 83; Vertical Datum NGVD29

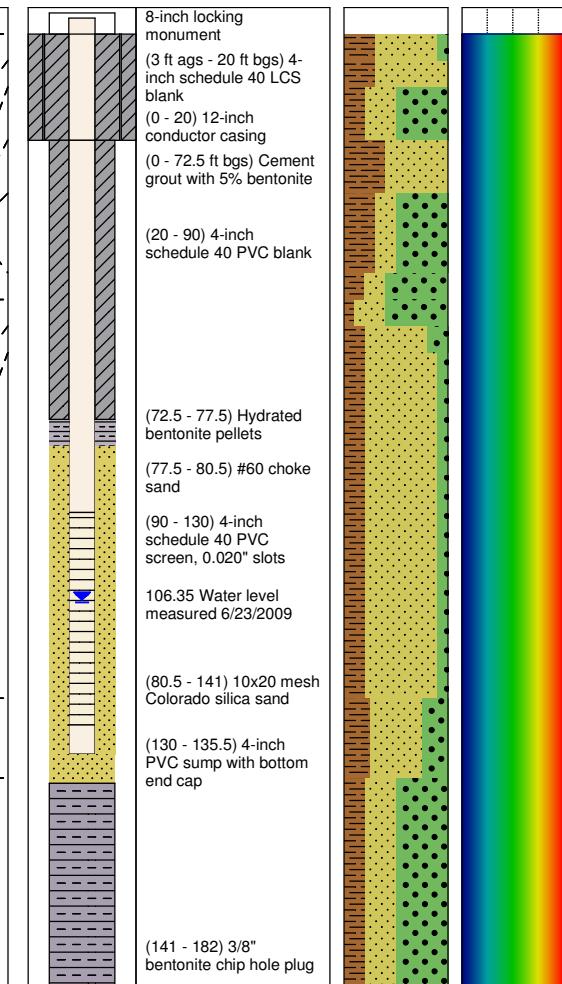
LATITUDE: 33° 18' 0.389" ELEVATION (TOC): 3024.58 feet

LONGITUDE: 111° 6' 25.805"

## LITHOLOGY



## AS-BUILT



BOREHOLE No. TP5-POC-B		TOTAL DEPTH DRILLED 180	SCALE	AS SHOWN	TITLE <b>BOREHOLE LOG AND AS-BUILT DRAWING</b>	
ADWR REG No. 55-910698		BIT DIAMETER 16.5 down to 20'; 8.75 from 20-182'	DATE	06/22/2009		
LOCATION SUPERIOR, AZ		DRILLING FLUID AIR	DESIGN	CAP		
CLIENT RESOLUTION COPPER MINE		LOGGED BY JJM	CHECK	JJM		
DRILLING CO YELLOW JACKET DRILLING		DATE STARTED 05/7/09	REVIEW	KJ		
DRILLING EQUIPMENT SPEEDSTAR 50K-CH		DATE FINISHED 06/16/09	REV	1		
DRILLING METHOD AIR ROTARY		COMMENTS ags: above ground surface; bgs: below ground surface	FILE REPLACEMENT TP5 WELL.LDFX PROJECT No. 073-92522-10			