ADDITIONAL CHARACTERIZATION REPORT

Mount Diablo Mercury Mine

2430 Morgan Territory Road
Contra Costa County, California

01-SUN-055

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1.0 INTRODUCTION

The Source Group, Inc. (SGI), on behalf of Sunoco, (R&M) Inc. (Sunoco), conducted additional investigations at the former Mount Diablo Mercury Mine in Contra Costa County, California (the Site or Mine), consistent with the Central Valley Regional Water Quality Control Board's (CVRWQCB) December 30, 2009 Revised Technical Reporting Order R5-2009-0869 (Rev. Order).

This work supplements SGI's *Characterization Report, Mount Diablo Mercury Mine* (Characterization Report; SGI 2010a), which identified data gaps and recommended work elements to complete characterization of the Site pursuant to the Rev. Order. CVRWQCB staff concurred with the proposed additional elements in its August 30, 2010 letter to Sunoco. SGI then presented a detailed scope of work in its *Additional Characterization Work Plan* (Work Plan; SGI, 2010b), including the following activities:

- Performance of a topographic survey;
- Installation of two groundwater monitoring wells: 1) a well within the Bradley Mining Company (Bradley) mine workings, specifically, in Bradley's 165-level lateral Adit, which exits to the surface within Bradley's historic mercury ore tailings piles (completed at a total depth of 85 feet below ground surface (bgs) and; 2) a well into the former Defense Minerals Exploration Agency (DMEA)/Cordero Mining Co. (Cordero) underground mine workings, specifically, into the Cordero 360-level lateral tunnel (completed at a total depth of 275 feet bgs);
- Sampling and analysis of groundwater and evaluation of gradients within these wells; and
- Surface water sampling to determine and/or confirm sources of mercury to Site surface waters to assist the CVRWQCB's evaluation of remedial alternatives.

CVRWQCB Staff concurred with the Work Plan's proposed scope of additional work in its October 26, 2010 letter to Sunoco. SGI successfully completed each task identified in the approved Work Plan on behalf of Sunoco, thereby completing the investigation required in the Rev. Order.

2.0 SITE BACKGROUND

2.1 Location and Current Use

The Site, which is located in an unincorporated area of Contra Costa County, California at the northeastern base of Mount Diablo, includes the former Mine and its historic working areas , and is generally described as the 80 acres of land on the southwest quadrant of the intersection of Marsh Creek Road and Morgan Territory Road as shown on Figure 1-1. The Site is adjoined to the south and west by lands of Mount Diablo State Park and to the north and east by Marsh Creek Road and Morgan Territory Road.

The Mine has reportedly been closed since around 1969. Most assay and process equipment has been removed from the Site, which still retains some abandoned wood structures that were part of the facility operations (Figure 2-1, aerial photograph of Mine). The Site is situated at an elevation of approximately 700 to 1100 feet above mean sea level (msl). Currently the Site owners, Jack and Carolyn Wessman, and their lessees, use the Site for residential purposes and cattle ranching.

2.2 Site Operational and Mining History

2.2.1 Pre-Cordero History

Mining operations first began at the Site in 1863. Between 1863 and 1936, various operators removed approximately 1,739 flasks of mercury from the Site. Bradley produced more than 10,000 flasks of mercury during its 15 years of mining operations at the Site between 1936 to 1951. At the end of Bradley's operations, the underground mine workings consisted of four levels in a steeply dipping shear zone. The Bradley workings were accessed by a main shaft and had an “adit” tunnel that exited to the surface on the 165-level (the 165-level Adit; Pampeyan, 1963).

Bradley generated 78,188 cubic yards of milled tailings and 24,815 cubic yards of waste rock from the mine tunnels (Ross 1940). The material generated by Bradley represents 97.3 percent of all waste material generated, and nearly 100% of all mill tailings, as documented in the attached Table 2-1. In addition to the materials generated from the Mine, Bradley also operated a rock quarry to the west of the Mine. Waste rock generated from Bradley's quarry operation is reported to have been placed in the area called the “Waste Dump” on maps produced by the California Division of Mines and Geology (Pampeyan, 1963). Historical records indicate that Bradley's mining and milling operations resulted in 97.3 percent of the currently existing waste and tailings piles at the Site; these waste piles match the waste pile configuration reflected in the 1953 California Division of Mines and Geology's Site mapping (Pampeyan, 1963). Figure 2-2 provides a map depicting the locations of the tailings and waste rock piles that Bradley generated on the Site. SGI's field confirmed locations of mercury mine tailings and waste rock are depicted in blue hatched outline and can be readily discerned as bare looking areas on the aerial photographs (Figure 2-2.) The waste dump that received Bradley's quarry waste rock is north (northern waste rock) and is circled in a dashed green outline. The northern waste rock area is physically different from the other Bradley waste areas as it has an extensive tree cover as reflected in Figure 2-2.

Following the period of extensive Bradley operations, Mt. Diablo Quicksilver Co., Ltd. (Mt. Diablo Quicksilver) next leased the Mine to Ronnie B. Smith and partners (Smith, 1951). Using surface (open pit) mining methods, Smith, et al. produced an estimated 125 flasks of mercury in a rotary furnace. In 1953, the DMEA granted Smith, et al. a loan to explore the deeper parts of the shear zone (Schuette, 1954). With DMEA's grant money, and under the DMEA's supervision, Smith, et al. constructed a 300-foot-deep shaft (historically referred to as the DMEA Shaft) during the period from August 15, 1953 to January 16, 1954 (Schuette, 1954). The DMEA Shaft and workings flooded on February 18, 1954 and, subsequently, Smith, et al. abandoned the project (Schuette, 1954).

2.2.2 Cordero Operational and Mining History

Cordero Mining Company (Cordero) rejected a DMEA contract and leased the Site from Mt. Diablo Quicksilver on November 1, 1954, and began reconditioning the DMEA Shaft in January 1955 before discontinuing operations in December 1955. The former Cordero lease area as presented in Figure 2-2 excludes a significant portion of the easterly areas of Bradley's exposed waste rock, the spring outflow area emanating from the 165-level Adit from which Bradley operated, and the current waste and settlement pond adjacent to Morgan Territory Road.

Cordero conducted its underground mining efforts from the pre-existing DMEA Shaft (Pampeyan and Sheahan, 1957). The area of this shaft and the interpreted potential surface work area is presented on Figure 2-3 (Cordero never conducted any surface mining at the Site). Records also indicate that Cordero conducted water handling and treatment operations extending from the DMEA Shaft to a location 1,350 feet to the west within the lease area (Sheahan, 1956 and WPCB, 1955). The total volume of waste rock generated by Cordero was approximately 1,228 cubic yards (Table 2-1). Cordero generated an estimated 100 to 200 tons of ore with a grade of 3 to 10 pounds of mercury per ton (Pampeyan and Sheahan, 1957), which equates to approximately 50 to 100 cubic yards of ore material.

The calculated total ore and waste rock generated by all documented mining activities prior to and including those of Cordero is approximately 105,848 cubic yards as referenced on Table 2-1. Based on these material calculations, waste rock and ore generated by Cordero represents less than 1.2 percent of the total volume of mined material at the entire Site.

The areas depicted on Figure 2-3 showing the DMEA Shaft and the waste rock dump area, and the water disposal area west of the DMEA Shaft, are the only documented potential Cordero work areas and represent the extent of known operations by Cordero.

2.2.3 Post-Cordero Activities

In 1956 the Nevada Scheelite Corp. leased the mine and installed a deep-well pump (550 gallons per minute) to remove water which had risen to a point 112 feet below the collar of the shaft. Since the downstream ranchers objected to the discharge of acid mine water into the creek this work was suspended. Attention was then directed to the open pit where some exploration was done using wagon drills. A small tonnage of retort-grade ore was developed. Since this was not sufficient to satisfy the requirements of the company the lease was relinquished (Division of Mines, 1958).

A June 1958 State Water Pollution Control Board (WPCB) inspection report states the Mine was leased to John E. Johnson and that he was operating it, but he apparently died later that year and the Site ceased operation. Welty and Randall Mining Co. subsequently operated an unidentified portion of the Site from approximately 1965 to 1969. They apparently re-worked mine tailings at the Site under a lease from Victoria Resources Company (Victoria Resources), which purchased the Mine from Mt. Diablo Quicksilver in May 1962. On or about December 9, 1969, Guadalupe Mining Co. (Guadalupe) purchased the Mine from Victoria Resources. It is unclear whether Guadalupe actually operated the Mine. In June 1974, the current owners, Jack and Carolyn Wessman and the Wessman Family Trust purchased the Site from Guadalupe. In 1977, the Wessmans sold the portion of the Site containing the settlement pond to Ellen and Frank Meyer, but subsequently repurchased it in 1989.

2.3 Previous Investigations

The potential for contamination of Marsh Creek from the Site has long been of concern, resulting in considerable sampling of Marsh Creek, Dunn Creek, Horse Creek, pond effluent, etc., over the past 50+ years (WPCB Document Log) by the following:

- CVRWQCB and its predecessor, the WPCB, as part of inspection visits to the Mine since the late 1930's;
- J.L. Iovenitti, Weiss Associates, and J. Wessman, as part of *Mount Diablo Mine Surface Impoundment Technical Report* dated June 30, 1989; and
- Professor Darell G. Slotton, U.C. Davis, as part of the *Marsh Creek Watershed Mercury Assessment Project* conducted in March 1996, July 1997, and June 1998.

The following sections summarize these previous investigations.

2.3.1 State Water Pollution Control Board / California Regional Water Quality Control Board Investigations

Beginning in the late 1930's, the CVRWQCB and its predecessor, the WPCB, periodically inspected the Site and collected surface water grab samples under varying conditions (ranging from high runoff periods, to periods of little or no runoff) from the following locations:

- Dunn Creek (at various locations);
- Horse Creek (upstream of pond outlet);
- Perkins Creek (above the confluence with Marsh Creek);
- Curry Creek (above the confluence with Marsh Creek);
- Marsh Creek (at various locations);
- Drainage from mine/tailings on Wessman property;
- Drainage from ponded area, north of tailings;
- Springs on State Park Land;
- Alkali Spring below and east of pond/dam;
- Mine pond;
- Zuur well;
- Prison Farm well; and
- Marsh Creek Springs Resort well.

These samples were analyzed for general water quality parameters and metals. The Characterization Report (SGI 2010a) includes a summary of these water sample results.

2.3.2 J.L. Iovenitti, Weiss Associates, and J. Wessman, *Mount Diablo Mine Surface Impoundment Technical Report*

In 1989, a technical report evaluating the geohydrochemical setting of the Site's surface impoundment, the source of contaminants in the surface impoundment, waste control alternatives, and preliminary cost estimates for these alternatives was prepared as part of the application to qualify for an exemption authorized by the Amendment to the Toxic Pits Cleanup Act of 1984 (Iovenitti, 1989). The report characterized the contaminants in the surface impoundment based on historical data obtained from 11 water samples collected from the surface impoundment from 1953 through 1988. The surface water samples were analyzed for general water quality parameters and metals. The results indicated that the metals concentrations detected in the water within the surface impoundment exceeded primary drinking water standards. As summarized in Appendix A to the Characterization Report (SGI, 2010a), in April and May of 1989, J.L. Iovenitti, a consulting geoscientist based in Pleasant Hill, California, collected nine surface water samples from Dunn

Creek (various locations), Ore House Spring, the creek above the Northern Pond, the Northern Pond, and the surface impoundment (two locations: Iovenitti, 1989)

2.3.3 Professor Darell G. Slotton, Marsh Creek Watershed Mercury Assessment Project

Contra Costa County sponsored a three-year study (1995, 1996, and 1997) of the Marsh Creek Watershed to comprehensively determine the sources of mercury in the Marsh Creek Watershed, both natural and anthropogenic. These studies also documented mercury concentrations in indicator species, surface water, and sediment to evaluate mercury bioavailability within the Marsh Creek Watershed. These studies were designed to characterize baseline conditions of the Marsh Creek Watershed and to evaluate the relative effectiveness of potential future remedial actions at the Mine.

The results of the 1995 study are summarized in a March 1996 report titled “Marsh Creek Watershed 1995 Mercury Assessment Project – Final Report” prepared by Darell G. Slotton, Shaun M. Ayers, and John E. Reuter (Slotton, et al, 1996). The 1995 study evaluated aspects of mercury loading within the Marsh Creek Watershed. As part of this Mercury Assessment Project, sampling was conducted at the Site, including the Lower Pond, the spring on State Park property, the spring emanating from the tailings pile, and other locations upstream in Dunn Creek and downstream along Marsh Creek. The chemical results of the Slotton et al. 1996 study in the area of the Site are summarized in Table 2-2.

The results of the 1996 study are summarized in a July 1997, report titled “Marsh Creek Watershed Mercury Assessment Project – Second Year (1996) Baseline Data Report” prepared by Darell G. Slotton, Shaun M. Ayers, and John E. Reuter (Slotton, et al, 1997). The 1996 study, (the second year of the three-year baseline study), evaluated mercury availability in indicator species and sediment within stream sites and the Marsh Creek Reservoir by collecting 175 individual and composite samples of invertebrates, sediment, and young fish from 13 stream sites and the Marsh Creek Reservoir (Slotton, et al., 1997).

The results of the 1997 study are summarized in a June 1998 report titled “Marsh Creek Watershed Mercury Assessment Project – Third Year (1997) Baseline Data Report with 3-Year Review of Selected Data” prepared by Darell G. Slotton, Shaun M. Ayers, and John E. Reuter (Slotton, et al, 1998). As with the 1996 study, the 1997 study (i.e., final year of the three-year baseline study) focused on evaluating mercury availability in indicator species and sediments within stream sites and the Marsh Creek Reservoir and involved the collection of 137 individual and composite samples of invertebrates, sediment, and young fish from 12 stream sites and the Marsh Creek Reservoir, (Slotton, et al., 1998).

Slotton, et al.’s three-year study and extensive sampling of the entire Marsh Creek Watershed (Slotton, 1996) specifically concluded that Initial work in 1995 documented that the Mt. Diablo

Mercury Mine region contributed the great majority of the entire watershed's mecury loading (95% with 88% directly traceable to the ongoing drainage from exposed tailings, i.e. Bradley Mining Company's waste) at the Site (Slotton, et. Al., 1996). Accordingly, Slotton's findings indicate that Bradley's exposed mine tailings piles are responsible for approximately 94.3% of the mercury discharge from the upper watershed that includes the mine.

2.4 Previous Remedial Actions

Since the operations of Cordero in 1955, multiple operators and property owners have been involved in actions that have modified some of the physical features of the Site. Most notably, the current property owner, Jack Wessman, over the period of his ownership since 1974, has conducted work in an effort to minimize the impact of exposed mine waste material to surface water runoff. This work has included earth moving at the Site involving the importation of a large quantity of fill material (reported by Jack Wessman to be on the order of 50,000 cubic yards), and the movement and grading of this fill material around the Site to cap mine waste.

Based on SGI's discussions with Jack Wessman during Site inspections in 2008, this work has specifically included: 1) infilling and capping of the original collapsed mine workings located to the north of the DMEA Shaft and Cordero work area, 2) filling of the DMEA Shaft and filling and capping of waste rock below the shaft toward the furnace, 3) filling and capping of a small pond located west of the DMEA Shaft, 4) grading of waste rock and tailings piles located to the east of and overlying the mine workings as part of surface drainage control actions, 5) re-configuring, enhancing and maintaining impoundments around the lower waste ponds, and 6) installing drains and drainage pipe for the purpose of redirecting surface rainfall runoff in the upper Mine area around the exposed tailings and waste rock into Dunn Creek directly bypassing flow through the Lower Pond.

Current surface drainage for the higher elevations of the Site, including the Cordero operations around the DMEA Shaft area, is captured and routed around the exposed tailings and waste rock, and around the Lower Pond, emptying directly into Dunn Creek at a location up-gradient of the Lower Pond.

In response to an Order from the United States Environmental Protection Agency (USEPA), Sunoco conducted an emergency stabilization of the southeastern wall of the Lower Pond's impoundment dam to prevent continued storm flow erosion of the impoundment in 2008/2009. This work was documented in the SGI report titled "Final Summary Report for Removal Action to Stabilize the Impoundment Berm, January 28, 2009".

3.0 FIELD ACTIVITIES

In accordance with the Work Plan, field activities presented herein were performed and details of these activities are presented in the following sections.

3.1 Topographic Site Survey

A licensed surveyor performed a Site survey, which included determining exact locations of a number of features associated with the Mine. These features were selected for survey so that they could be referenced to historical maps depicting subterranean adits and laterals targeted for well installations.

A topographic survey was performed at a two-foot contour interval for the Site produced from aerial photography stereo pairs of the Site from a project specific flyover event conducted by HJW Geospatial. The topographic map included as Figure 3-1 was used in monitoring well placement. In general, historic structures still in existence were used to georeference the location of former underground mine workings with current surface features to ensure accurate placement of the monitoring wells.

3.2 Surface Water Sampling

On October 20, 2010, February 17 and June 14, 2011, SGI collected surface water samples from various locations around the Site per the Work Plan to identify and quantify sources of mercury and other chemicals in runoff water and confirm the results of the previous surface water sampling conducted by SGI in April and May of 2010.

Surface water samples were collected at the following locations (as available) during all five sampling events (including the April and May 2010 events which were included in the Characterization Report, SGI 2010a):

- Bradley tailings piles (including SW-01, SW-02, and SW-03);
- Springs (including the Adit Spring [SW-15], Mount Diablo State Park Spring [Park Spring, SW-04], and the Ore House Spring [SW-14]);
- Runoff water observed moving between the Bradley tailings piles and the Lower Pond (SW-05);
- Storm Water Retention Ponds (including the Upper Pond [SW-06], the Middle Pond [SW-10], and the Lower Pond [SW-09]);
- Dunn Creek (including downstream of the Lower Pond [SW-07], between the Middle Pond and My Creek [SW-08], and upstream of My Creek [SW-16]); and

- My Creek (including upstream, within, and downstream of the northern waste rock area [SW-12, SW-11, and SW-13, respectively]).

Upstream surface water sampling locations SW-12 and SW-16 are considered background locations as they are located upstream of all identified former mining activities in the upper watershed. Sampling location SW-04, the natural and undisturbed spring on State Park property, is considered representative of natural background conditions of spring water flow in the area of the mine. The 16 surface water sampling locations (SW-01 to SW-16) are presented on Figure 3-2. A sample location key is summarized in Table 3-1.

3.2.1 Sample Collection Procedures

Samples were collected in clean laboratory-supplied containers by allowing flowing surface water to enter into the container. In some cases (generally resulting from a lack of access), a clean sample container was used to initially capture the water s`ample, which was then subsequently decanted into the appropriate container. If water was observed emerging from the wet area, the sample was collected as close to the origin as possible. Each sample was capped, labeled, and placed in a cooler with ice and transported to California-certified Accutest Laboratory located in San Jose, California (Accutest). Chain-of-custody procedures were followed at all times. Chain-of-custody documentation is included with the laboratory reports in Appendix A.

3.2.2 Equipment Decontamination

No reusable sampling equipment was employed during the collection of the samples. Following the collection of each sample, all sampling equipment, such as gloves, were properly disposed of and not reused for any subsequent sample collection.

3.2.3 Laboratory Analysis

The surface water samples were analyzed for the following parameters:

- Total Mercury;
- Dissolved Mercury;
- Methyl Mercury;
- pH;
- Alkalinity (Bicarbonate, Carbonate and total);
- Dissolved Organic Carbon;
- Specific Conductivity;

- Total Dissolved Solids;
- Hardness (as $CaCO_3$);
- Turbidity;
- Dissolved Silica;
- Cations - B, K, Fe, Mn, Mg, Ca, Na, Si;
- Anions - Cl, F, SO_4, Br, NO_3, Zn, As; and
- Remaining Priority Pollutant Metals - Sb, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, T.

Analytical results for surface water samples are included in Table 3-2.

3.3 Monitoring Well Installation and Sampling

On May 2 through May 9, 2011, Boart Longyear (Boart) of Yuba City, California mobilized to the Site and under the supervision of SGI, installed monitoring wells in the Bradley 165-level Adit (ADIT-1) and the DMEA/Cordero 360-level lateral tunnel (DMEA-1). Details of well construction and sampling activities are presented below. Locations of these wells are presented in Figures 3-2 and 3-3.

Well DMEA-1 was installed to intercept the DMEA/Cordero underground workings, specifically the 360-level lateral tunnel. Well ADIT-1 was installed to intercept the Bradley underground workings, specifically the 165-level Adit. Both wells were screened across the apparent intervals of their respective tunnel systems. Figure 3-3 shows the well locations in relation to the tunnel systems. Figure 3-4 shows the tunnel workings in cross-section including elevation indications of the different tunnel levels.

As presented in Figure 3-4, the 165-level and 360-level are located at approximate elevations feet above msl of 787 and 620, respectively. Based on this map and surface elevation measurements, the approximate depths estimated to encounter the two tunnels were 76 feet bgs for ADIT-1 and 278 feet bgs for DMEA-1. The tunnel zone for well ADIT-1 was encountered at approximately the expected depth (72 feet bgs). For well DMEA-1, the tunnel was encountered higher than expected at approximately 244 feet bgs, and was also greater in height (over 20 feet thick), than expected. Both of these observations suggest that the roof of the tunnel was encountered, but has collapsed over time.

3.3.1 Soil Boring Advancement

Prior to well installation, soil borings were advanced using a sonic drill rig. The sonic drilling technology combines harmonics (vibration) and rotation as the basis for tool advancement. Sonic drilling uses water as the fluid medium. Drilling was conducted using an inner casing (core barrel) followed by an outer casing. A 4-inch diameter core barrel and 9- and 8-inch diameter outer casing were used. The drilling procedure occurred as follows:

- The core barrel was advanced 10 feet into the subsurface, followed by the 9-inch diameter outer casing;
- The core barrel was removed from the borehole and the soil/rock was logged then transferred to a bin for disposal;
- The core barrel was then put back into the borehole and advanced another 10 feet; and
- An additional 10 foot length of outer casing was added to the outer casing that is in the ground and was drilled to meet the bottom of the core barrel.

This process continued until total depth was reached for each well. ADIT-1 was completed to a total depth of 85 feet bgs and DMEA-1 was drilled to a total depth of 275 feet bgs. The boring/well logs for these wells are presented in Appendix B.

3.3.2 Well Construction

ADIT-1 and DMEA-1 were constructed using 4-inch diameter schedule 80 polyvinyl chloride (PVC) well casings and 0.010-inch machined slot screen. ADIT-1 was screened with a filter pack of #3 Monterey sand around the well screen, extending from 65 to 80 feet bgs. Ten feet of blank PVC was installed in the bottom of the borehole for the purpose of trapping sediment. DMEA-1 was screened from 240 to 265 feet bgs, also with 10 feet of blank PVC for trapping sediment. Since a void was encountered in this screen interval during drilling, a packer was set at 230 feet bgs and no filter pack was placed around the screen. Hydrated bentonite was placed above the filter pack or packer. Neat cement-grout was then placed above the bentonite to the surface. Wells were completed using stovepipe well boxes set in a concrete pad. Well construction details are presented in Table 3-3. Well logs are presented in Appendix B.

3.3.3 Well Development

On May 24, 2011, Boart mobilized to the Site to develop the two new groundwater monitoring wells. The wells were developed by surging and purging until the water in each was relatively free of sediment. Well development water was temporarily stored in 4,000-gallon poly tanks pending profiling and offsite disposal.

3.3.4 Transducer Deployment

Subsequent to the installation of ADIT-1 and DMEA-1, In-Situ brand Level Troll 500 data logging transducers were installed in each well on June 15, 2011. Each transducer was set to record water temperature and water pressure (as water column height) hourly. Data was downloaded during groundwater sampling events on June 29, July 21, and August 16, 2011. During each visit, depth to water was measured manually with a Solinst Model 101 water level meter. A reading from each transducer coincident with the manual depth to water measurement provided the reference distance from the transducer sensor to the surveyed top of casing measurement point. The manual data allowed all subsequent data collected by each transducer to be translated from elevation of water above the transducer sensor to absolute water level elevation in feet above mean sea level.

3.3.5 Groundwater Monitoring and Sample Collection Procedures

On June 15, and July 21, 2011, monitoring wells were gauged to the nearest 0.01 foot bgs and sampled. Groundwater samples were collected using the low-flow sampling method. Well water was purged at a low-flow rate of approximately one (1) liter per minute while monitoring the stability of the water quality parameters (i.e., pH, temperature, electrical conductivity [EC] dissolved oxygen [DO], and oxidation-reduction potential [ORP]). A submersible pump attached to a flow-through cell using disposable tubing was used to purge wells and groundwater parameters were monitored using a YSI 660 water quality meter. Parameters were allowed to stabilize before groundwater samples were collected. Field data sheets for gauging and sampling the monitoring wells are presented in Appendix C.

Upon completion of well purging, groundwater samples were collected through the pump and decanted into laboratory-supplied containers. Each sample was capped, labeled, and placed in a cooler with ice, and transported to Accutest. Chain-of-custody procedures were followed at all times. Chain-of-custody documentation is included with the laboratory reports in Appendix A.

3.3.6 Equipment Decontamination

All non-disposable gauging and sampling equipment, including the pump and the flow-through cell, were decontaminated between wells using a non-phosphate detergent and distilled water. All tubing used to connect the pump to the flow-through cell was replaced between each well.

3.3.7 Laboratory Analysis

Groundwater samples were analyzed for the same parameters as surface water samples, as listed in Section 3.2.3 above. The groundwater samples were additionally analyzed for dissolved arsenic. Analytical results for groundwater samples are included in Table 3-4.

3.3.8 Well Survey

Subsequent to well installations on June 14, 2011, a licensed professional surveyed the ground elevation, measuring point elevation, and location of each groundwater monitoring well (Appendix D).

3.3.9 Waste Handling

Soil cuttings, well development, decontamination, and purge water generated during the drilling and sampling processes were properly placed in a soil bin and/or 4,000 gallon baker tanks onsite pending characterization and offsite disposal. A total of 4,753 gallons of waste water were transported by Clean Harbors on July 14, 2011 and August 10, 2011 for disposal at the Clean Harbors recycling facility in San Jose, California and 15 cubic yards of soil was transported by Clean Harbors on September 8, 2011 to the Clean Harbors facility in Buttonwillow, California. Copies of the waste manifests are included in Appendix E.

4.0 INVESTIGATION RESULTS

The August 2010 Characterization Report (SGI 2010a) detailed the results of a field survey of the Site which included the mapping of tailings and waste piles, the mapping of surface water flows, the identification of springs and associated flows, and the history of flows to and from the ponds. Based on the results, sixteen surface water sampling locations were identified and sampled in April and May, 2010, the analytical results of which were also presented in the Characterization Report. Sampling events that occurred subsequent to the Characterization Report (October 2010, and in February and June 2011) increased the overall surface water data set and our understanding of the Site water flow pathways. For example, surface water sampling point SW-01 was previously believed to flow from the Adit Spring, while later observations and water quality data now suggest that it is runoff from Bradley tailings or waste rock piles. Therefore, based on the full suite of water sampling results, along with water chemistry data obtained from the wells installed in the underground workings, the presentation of the data has been altered for this report relative to the Characterization Report, which grouped waters by chemical signature. This report traces the various waters by physical flow pathway in and around the Site, and compares the history and chemical alterations along the various flow paths using the full suite of available data. The results of this additional investigation are detailed below.

4.1 Site Survey Results

A new topographic survey was conducted of the Site and immediate surroundings. The resulting map (Figure 3-1) shows the topography of the Site in two-foot contour intervals and surface features of the former mine site. The source survey map, including the entire surveyed area, is included in Appendix F. This topographic map was used along with historic structures still in existence to georeference the location of former underground mine workings relative to current surface features in order to correctly place the installation of the two monitoring wells to intercept specific locations within the underground workings.

4.2 Water Level Monitoring Results

Following the installation of monitoring wells ADIT-1 and DMEA-1, both were surveyed for location and measuring point elevation relative to mean sea level, allowing for the installation of groundwater transducers. Groundwater elevation monitoring data showed consistently higher elevations in the Cordero workings well (DMEA-1) relative to the Bradley workings well (ADIT-1). Specifically, water elevation in DMEA-1 was, on average, 0.28 feet higher than the water elevation in ADIT-1 based on data collected between June 14 and August 16, 2011. A graphical representation of water levels in the two monitoring wells is included as Figure 4-1. Water levels in both ADIT-1 and DMEA-1 have declined approximately 2.7 feet since the start of data collection.

4.3 Connection between Bradley and Cordero Tunnels

The Bradley workings and the 165-level Adit were excavated long before the existence of Cordero workings. The Bradley tunnels were advanced into a shear zone within a silica-carbonate rock formation containing mercury ore. Groundwater was encountered within the silica-carbonate rock formation and along the fractures and brecciated rock within the shear zone. As a consequence, Bradley had to continuously remove water from the tunnels to avoid flooding. One reason Bradley installed the 165-level Adit was to facilitate the removal of water from the mine workings. Once Bradley closed down the underground workings in 1951, groundwater infiltration flooded the tunnels and escaped out through the 165-level Adit. Though the adit portal was subsequently buried beneath tailings and waste rock, water continued to flow, the surface expression of which became known as Adit Spring.

Subsequent to the departure of Bradley from the Site, Cordero excavated a series of workings from the DMEA shaft toward the same shear zone encountered by the Bradley workings. The DMEA shaft itself was installed within a dry mudstone and sandstone formation, which Cordero had to tunnel through to reach the silica-carbonate formation and the shear zone. Groundwater was encountered at the transition between the mudstone/sandstone formation and the silica-carbonate formation, and pumping was necessary to keep the tunnels dry. Eventually, the Cordero workings were directly connected to the Bradley workings above via a subvertical shaft called the Main Winze.

The Cordero tunnels encountered the same water bearing zone as the Bradley tunnels (i.e., the two tunnel systems tapped into rock formations under the same hydraulic pressure). This was demonstrated by recent water level monitoring which showed the hydraulic head of the water in the Cordero tunnel system is on average only three and a quarter inches higher than that of the Bradley tunnel near the 165-level Adit. The lower head measured in the Adit-1 monitoring well is indicative of naturally expected conditions of decreasing head down-gradient towards the ultimate discharge point at the mouth of the Adit-1 tunnel.

Most of the tunneling, including the Main Winze, and ore removal from the shear zone was done by the Bradley Mining Company. Cordero approached the shear zone with its tunnels and connected to the Main Winze, which had already penetrated the shear zone, but conducted no bulk mining activities within the shear zone and thus exposed very little additional surface area. The ADIT-1 monitoring well data shows that the Cordero workings do not contribute any mercury to the Bradley workings above.

4.4 Water Flow Pathways and Related Water Chemistry Analytical Results

Waters associated with the Site and immediate surroundings that have been studied as part of this investigation include surface flows, subterranean flows (i.e., flow within the former mine workings), precipitation captured as surface flow, and springs. The flow of these waters can be generally classified as following one of three pathways from a source to the final disposition of all waters from the Site which is downstream flow in Dunn Creek:

- Water sourced from underground mine workings;
- Water sourced from precipitation falling across the Site, then flowing as surface water over and through mine tailings and waste rock found at the Site; and
- Water that flows near or on the Site, but generally does not contact any mine tailings or waste rock.

The first pathway is followed by water sourced from the underground workings of the Mine. This water emanates from the underground workings through the Bradley 165-level Adit, and then through Bradley's tailings and waste rock piles to the surface at a point commonly called Adit Spring (SW-15). From there, it runs downhill as surface flow over more mine tailings and travertine deposits (SW-5) before entering into the main catchment pond (Lower Pond, SW-9). The second pathway is followed by precipitation that falls across the Site, which then immediately flows as surface water over and through Bradley's mine tailings, waste rock and the natural geologic formations found at the Site. Some of the water flows through the Bradley tailings located in the south east section of the Site (SW-2, SW-3), above the Lower Pond, which largely receives these waters. Other waters, largely from the mine workings area, have either been channeled by the current landowner to bypass flow to the Lower Pond or flow north toward My Creek. A third pathway is followed by surface water that flows through the Site but generally does not contact any mine tailings. This includes the waters from Dunn Creek and My Creek, along with waters sourced from the Ore House Spring and the Park Spring (SW-6). A chart showing the nature of the three flow pathways is shown on Figure 4-2. The following sections detail what is known about these three flow paths based on surface water and groundwater samples collected at various points around the Site during the site investigation. Surface water sample locations are shown on Figure 3-2, and Table 3-1 contains a surface water sample location key. Mercury and arsenic, being the primary contaminants of concern, were specifically examined, and Stiff Diagrams were employed to facilitate comparisons of water chemistry. Tables 3-2 and 3-4 are summaries of chemical analytical results from surface water sampling and groundwater sampling, respectively. The full set of Stiff Diagrams for all water chemistry results is included in Appendix G.

4.4.1 Water Sourced From Underground Mine Workings

Bradley mined several levels of underground workings, one of which included a 300-foot long adit on the 165-level that daylighted on the east sloping hill overlooking the current Lower Pond (Figure 2-1). This adit was used to give mine water a pathway out of the workings. Following abandonment of the underground workings, tailing and waste rock deposition buried the adit opening. However, water continued to flow from the buried adit through the tailings and waste rock, the surface expression of which flowed year round and was known as Adit Spring. The presence of a natural spring was documented in this area as part of a geologic site investigation documented in 1938 (Knox, 1938). The presence of a natural spring in this area is also documented geologically by the presence of calcareous deposits down slope of this spring area noted both by Knox and Pampeyan (Knox, 1938 and Pampeyan, 1963).

The Cordero underground workings were completed after the Bradley workings. During the tunneling process, a physical connection between the two workings was established through the Main Winze which connected the Cordero workings (i.e., the 360-level) to the 270-level of the Bradley workings. As part of the current Site investigation, a monitoring well has been installed in the former Cordero workings (DMEA-1) and in the Bradley workings at the level of the former adit opening (ADIT-1).

The water sourced from the Mine has been sampled at several locations along the flow path from the Mine to the Lower Pond. The Mine workings themselves are sampled at the DMEA-1 and ADIT-1 wells. Water from the Adit Spring, the point on the east facing hill above the Lower Pond where water from the Bradley 165-level Adit daylights, is sampled at point SW-15. Surface water flowing down slope from the Adit Spring is sampled just above the Lower Pond at point SW-05. Finally, the Lower Pond itself is sampled at point SW-09 (near the outflow to Dunn Creek). See Figure 3-2 for a map showing the sampling locations.

4.4.1.1 Mercury Results

There were no detectable concentrations of total or dissolved mercury found in the samples from the Cordero workings (DMEA-1). Accordingly, no mercury is contributed from the Cordero workings into the 165-level Adit. Dissolved mercury was also not detected in the Bradley workings (ADIT-1). However, the maximum total mercury concentration detected in ADIT-1 was 22.7 micrograms per liter (µg/L). Water from the Bradley workings emerges from the 165-level Adit, flows through the tailings and daylights approximately at the SW-15 sampling location. Surface water samples collected at this point contained total and dissolved mercury with maximum concentrations of 153 µg/L and 55.6 µg/L, respectively. This shows that water from the Bradley underground workings picks up a significant quantity of mercury from the tailings after emerging from the 165-level Adit. Further down the slope toward the Lower Pond, sampling at the SW-05 location also showed elevated concentrations of total and dissolved phase mercury, though only at maximum concentrations of 108 µg/L and 39.7 µg/L, respectively. The Lower Pond (SW-09), sampled near its outflow to Dunn Creek, had maximum concentrations of total and dissolved mercury of 149 µg/L and 143 µg/L, respectively. In summary, water from the Bradley workings contains low quantities of total mercury, but picks up significant quantities of it when daylighting through the Bradley tailings piles at the Adit Spring location. This mercury laden water then flows down hill and into the Lower Pond where the mercury then accumulates.

Mercury results for surface water and monitoring well samples are included in Tables 3-2 and 3-4, respectively. Mercury results for both surface water and groundwater samples are presented in Figure 4-3.

4.4.1.2 Arsenic Results

Elevated arsenic concentrations were detected in groundwater sampled from both ADIT-1 and DMEA-1. The maximum concentrations detected were 1,720 µg/L and 1,570 µg/L, respectively. Elevated concentrations of arsenic were also detected at the Adit Spring sampling location (SW-15) and on the lower slope of the hill above the Lower Pond (SW-05) at maximum concentrations of 182 µg/L and 282 µg/L, respectively. Concentrations of arsenic above detection limits were not found in samples from the Lower Pond (SW-09). In summary, elevated concentrations of arsenic exist within the underground workings which appear to largely precipitate out upon exiting the 165-level Adit.

4.4.1.3 General Water Chemistry Results

The water chemistry of the Bradley and Cordero workings was sampled via ADIT-1 and DMEA-1, respectively, in June and again in July, 2011. The resulting chemical analysis of the waters from both the Bradley and Cordero workings showed they were generally slightly acidic, contain almost no bicarbonate, and had high sulfate content. However, the July 2011 sample from DMEA-1 was different, exhibiting elevated sodium, chloride and bicarbonate concentrations, a nearly neutral pH, and lower sulfide concentrations. The difference in chemistry is illustrated on Figure 4-4. It is unknown why the water chemistry of the sample from DMEA-1 was altered relative to the June 2011 sample. However, if this different chemical signature had any effect on the water in the Bradley workings, it did not significantly alter the chemistry of the water in the Bradley workings as shown in the July sample from ADIT-1, as would be expected if there is a significant and ongoing flow of water from the Cordero workings to the Bradley workings. The chemistry of the waters collected from the SW-15 Adit Spring location were very similar to the chemistry of the waters from the Bradley mine workings in all respects, reinforcing the link between the two. The chemistry of the waters collected from the SW-05 location, just above the Lower Pond, shows a range of chemical configurations relative to the ADIT-1 and SW-15 samples. One alteration common to all samples is an increase in bicarbonate and pH, showing that the travertine deposits act as a neutralizing agent for the slightly acidic waters from the Mine. In summary, the chemistry of the waters along the flow path from the Mine to the Lower Ponds suggests that source water from the Bradley mine workings is largely unaffected by water from the Cordero mine workings, and shows that the water from Adit Spring is derived from the mine in an acidic state, then is neutralized and chemically altered as it flows over the travertine deposits before entering into the Lower Pond.

4.4.2 Water Sourced From Precipitation Percolating Through Mine Tailings and Waste Rock

Piles of mine tailings and waste rock are prominent features of the Site. Tailings and waste rock from the Bradley mining operations are found in large piles in the south-east portion of the Site on the east facing slopes overlooking the Lower Pond. Waste rock from the Cordero mining operation is also known to have been deposited in the northern waste rock area along the north edge of the Site overlooking My Creek. The former mine workings themselves are located in the central portion of the Site, including the area in which surface mining was conducted by Bradley and other operators.

To determine the chemistry of overland flow sourced from precipitation falling on the Site (including delayed drainage from rainwater landing on, then percolating through, tailings and waste rock piles), surface water samples were collected from several places around the Site. To sample runoff from the Bradley tailings and waste rock piles, samples SW-01, SW-02 and SW-03 were collected. SW-01 was initially thought to be the source of the Adit Spring. Subsequent sampling events showed that the SW-01 only flows during rain events and is upslope of the perennial Adit Spring, and thus represents rainwater that has flowed over or through Bradley tailings and waste rock piles. SW-06 is the designation for the sample from the Upper Pond. The current land owner has completed several surface water runoff drainage control projects that have channeled rain water from the central portion of the Site into culverts and then into the Upper Pond. Water from the Upper Pond flows downhill and is collected in the Middle Pond, water from which is collected as SW-10. Finally, rainwater runoff from the northern waste rock area collects and flows into My Creek. Water samples of My Creek adjacent to and downstream of the northern waste rock area are collected at points SW-11 and SW-13, respectively. See Figure 3-2 for a map showing the sampling locations.

4.4.2.1 Mercury Results

No dissolved mercury and only minor concentrations of total mercury (2.2 µg/L) were detected in SW-01 surface water samples. In contrast, maximum total mercury concentrations in surface water samples SW-02 and SW-03 were 179 µg/L and 74 µg/L, respectively, while maximum dissolved mercury concentrations were 175 µg/L and 35 µg/L. These data collection locations were chosen in order to sample surface water runoff after its passage through the Bradley tailings piles, confirming their continued mercury loading potential. Sample location SW-06 (Upper Pond) had maximum total and dissolved mercury concentrations of 31.9 µg/L and 13.8 µg/L, respectively. This shows that rain water runoff from the central part of the Site encounters mercury laden materials along the flow path to the Upper Pond. The Middle Pond sample designation is SW-10, and it receives waters from the Upper Pond and some local surface water runoff. The maximum total and dissolved mercury concentrations detected in SW-10 are 18 µg/L and 0.59 µg/L respectively, significantly less than is found in the Upper Pond. A majority of the water in the

Middle Pond is runoff from the Upper Pond; however, the lower mercury concentrations suggest that mercury settles out in the Upper Pond or is otherwise filtered out on the way to the Middle Pond. No concentrations of total or dissolved mercury were detected in surface water samples at the SW-11 and SW-13 locations, strongly supporting the notion that the northern waste rock area contains only waste rock and not mercury laden tailings material.

4.4.2.2 Arsenic Results

Arsenic was detected in tailings pile runoff samples SW-02 and SW-03 at maximum concentrations of 119 µg/L and 1,570 µg/L, respectively. Arsenic was also detected in the Upper Pond (SW-06) and Middle pond (SW-10) at maximum concentrations of 53.2 µg/L and 23.8 µg/L, respectively. Concentrations of arsenic were not detected in tailings pile runoff sample SW-01 and in My Creek samples SW-11 and SW-13.

4.4.2.3 General Water Chemistry Results

The chemistry of the two water samples collected from the SW-01 location both contain low concentrations of the range of tested anions and cations relative to water samples collected at other locations (e.g., SW-02 and SW-03). This suggests that the water collected at the SW-01 location did not travel a sufficient distance across or through tailings or waste rock before being collected (i.e., the water collected at the SW-01 location was not sourced from the Bradley 165-level Adit). The waters collected at the SW-02 and SW-03 locations share several chemical similarities, including low to negligible concentrations of sodium and chloride, higher concentrations of sulfate and very low pH values (all less than 3.9) with the associated lack of bicarbonate. This chemical signature found at the SW-02 and SW-03 locations is similar to that found in the sample collected in ADIT-1, indicative of all of the waters being in contact with similar materials, though the water from the 165-level Adit generally has higher pH and greater relative quantities of sodium and chloride. The chemical composition of the water samples collected from the Upper Pond (SW-06) were also similar to those found in the Bradley 165-level Adit and at SW-02 and SW-03, also suggestive of contact with similar materials. However, the chemistry of the water in the Middle Pond (SW-10) is highly variable and generally shows much lower concentration of cations and anions relative to the samples from SW-02, SW-03 and SW-06. This shows that, although water from the Upper Pond drains to the Middle Pond, it makes up only a small fraction of the largely clean water that accumulates in the Middle Pond. Tested cation and anion concentrations were much lower in the samples from SW-11 and SW-13, indicating a lack of travel through tailings and/or waste rock. The chemical signatures of the waters from these two locations are also significantly different from those found at SW-02, SW-03, SW-06, SW-15 and ADIT-1, having the highest equivalent concentration of bicarbonate and basic (greater than 8) pH.

4.4.3 Water Flows Not in Contact with Mine Tailings or Waste Rock

Water samples have been collected from several sources near the Site that have come into contact with neither tailings nor waste rock derived from former mining operations. These include My Creek and Dunn Creek above the Site, the Park Spring along the southern border of the Site, and Ore House Spring in the central portion of the Site. The upstream sample point on My Creek is designated SW-12 and the upstream sample point on Dunn Creek is designated SW-16. Park Spring is designated SW-04 and the Ore House Spring is called SW-14. The water from My Creek flows into Dunn Creek and is sampled again at a point upstream of the ponds at a point designated as SW-08. Dunn Creek flows adjacent to both the Middle and Lower Ponds before continuing downstream offsite. During high water events, it is likely that exchange of water can occur through both over topping of the ponds or through the berms between Dunn Creek and the ponds.

4.4.3.1 Mercury Results

In general, concentrations of mercury at all four sample locations were generally low to undetectable. No detectable concentrations of total or dissolved mercury were found in the samples from My Creek. No concentrations of total mercury and only a single concentration of 0.31 µg/L of dissolved mercury was detected in Dunn Creek. The maximum concentrations of total and dissolved mercury were detected in Park Spring at concentrations of 0.63 µg/L and 0.51 µg/L, respectively. No dissolved mercury was detected in the Ore House Spring, while the maximum concentration of total mercury detected was 1.3 µg/L.

4.4.3.2 Arsenic Results

Arsenic was not detected in any of the samples collected from the Park Spring, the Ore House Spring, My Creek, or Dunn Creek.

4.4.3.3 General Water Chemistry Results

Water samples from Park Spring (SW-04) exhibited elevated concentrations of the range of tested anions and cations, a nearly neutral pH, and low concentrations of bicarbonate. This spring is sourced upgradient from the Site, but may be related to the same groundwater that infiltrates the underground workings. Water samples from the Ore House Spring (SW-14) exhibited low concentrations of the range of tested anions and cations, a pH of approximately 6, and low concentrations of bicarbonate, all suggestive of a flow path that is not through tailings of waste rock piles. The upgradient samples from both My Creek (SW-12) and Dunn Creek (SW-16), and the sample from Dunn Creek above the Middle Pond (SW-08) had pH levels above 7.5 and contained elevated concentrations of bicarbonate relative to the other cations and anions on the Stiff Diagrams. Overall, though, cation and anion concentrations were very low relative to the tailings pile runoff samples.

4.5 Water Quality Criteria Evaluation

The analytical results of the surface water samples collected during all previous sampling events were compared to water quality criteria developed for bodies of freshwater by the California CVRWQCB (2008) and the USEPA (2009). Additionally, there are an alternate set of criteria related to human health for the consumption of water and organisms and for the consumption of organisms only. These water quality criteria are found on Tables 3-2 and 3-4 along with the analytical results from sampling events. Analytical results that exceed one or more of the water quality criteria are shown in bold font.

The freshwater criteria for total mercury is 0.91 µg/L, which has been exceeded by samples obtained from the Bradley workings (ADIT-1), the Ore House Spring (SW-14), the Adit Spring (SW-15), all three ponds (SW-06, SW-09, and SW-10), the Bradley tailing piles sample locations (SW-01, SW-02 and SW-03), and the flow of water from the Adit Spring just before entering the Lower Pond (SW-05). The water quality criteria for consumption related to human health is much lower than the analytical method used was able to detect (i.e., analytical results for total mercury less than 0.20 µg/L were not available, while the human health consumption criteria was even lower, 0.05 µg/L for water plus organism and 0.051 µg/L for organism only).

The criteria for arsenic in freshwater is 150 µg/L, which was exceeded by samples from both the Bradley and Cordero workings (ADIT-1 and DMEA-1), the Adit Spring (SW-15) and from sample locations SW-03 and SW-05. It is likely that there is naturally occurring arsenic in the local rocks, and that the pulverized Bradley tailings piles have exacerbated the release of arsenic into the environment. The water quality criteria for consumption related to human health for arsenic were again much lower than the analytical method used was able to detect (i.e., analytical results for arsenic less than 10 µg/L were not available, while the human health consumption criteria was 0.018 µg/L for water plus organism and 0.14 µg/L for organism only).

Freshwater water quality criteria also exists for tested constituents, including pH, alkalinity, total dissolved solids, cadmium, chloride, chromium, iron, lead, nickel, selenium, and zinc. With the possible exceptions of cadmium, lead, and selenium (based on their elevated detection limit thresholds relative to the water quality criteria), all of these constituents exceeded their water quality criteria in one or more samples collected during the surface water sampling events.

4.6 Point of Compliance Water Quality

All of the water from the Site eventually flows as water in Dunn Creek downstream of the Lower Pond. This water has been sampled as point SW-07 as part of the Site investigation, and is the natural point of compliance sampling location for future Site monitoring. General chemistry results have been non-consistent as is illustrated in the Stiff Diagrams for the sample location (Appendix G). This is a result of variances in flows both from the Site and in Dunn Creek, reflective of the seasonal nature of large precipitation events. In winter, rain events fill Dunn Creek resulting in a dilution of the waters flowing from the Site. Flow from the Site is greatly reduced during the generally dry summer months, though there is typically no baseflow in Dunn Creek to dilute it. However, across the range of flows that have been sampled during this site investigation, no mercury (total or dissolved) or arsenic have been detected at concentrations that have exceeded the freshwater criteria. Freshwater criteria that have been exceeded by waters from sample location SW-07 include methyl mercury, alkalinity, total dissolved solids, chloride, iron, and nickel. With the exception of methyl mercury, all of these compounds were also found at concentrations exceeding the freshwater criteria in the samples collected from the Park Spring sample location (SW-04). The Park Spring is an offsite source of water with no known connection to the Mine. The waters from this spring are reflective of natural chemistry of waters that would flow from the area around the mine. Park Spring water contains concentrations in excess of the freshwater criteria of similar constituents to that of Dunn Creek immediately downgradient of the Site, which indicates that these exceedences would occur independent of any impacts caused by former Mine operations.

5.0 INVESTIGATION SUMMARY AND CONCLUSIONS

The investigation activities described in this report have included the following:

- Additional background site mapping using a topographic survey;
- Installation and sampling of wells completed within the former tunnel systems of the Bradley 165-level and the DMEA 360-level; and
- Surface water sampling at a total of sixteen locations.

The data collected during this phase of investigation have enabled a more complete understanding of the relationships between different water sources and overland flow patterns at the Site. Specifically, water sampling results from the two monitoring wells (ADIT-1 and DMEA-1) has enabled comparison of these results to the surface water sampling events that have been carried out in 2010 and 2011. This comparison and evaluation has resulted in more holistic understanding of the sources of surface water present at the Site, which specifically falls into three general categories: water sourced from underground mine workings (i.e. the Bradley mine workings); water sourced from overland flow through mine tailings and waste rock; and surface water which does not come in contact with mine tailings.

As described in Section 4.1.1.3 the chemical signatures of the water present in DMEA-1 and ADIT-1 are generally similar to one another, with the exception that DMEA-1 contains no mercury. Both wells contain arsenic. A dissimilarity in chemical signature between the wells was noted during the July 2011 well sampling compared to the June 2011 sampling, indicating that water present in the 165-level Adit had not been significantly affected by the 360-level. This observation suggests that the connection between the two systems is likely muted and being overwhelmed by the other sources of water flowing into the 165-level Adit level, specifically the brecciated source rocks and the saturated zone of the nearby fault. Therefore, the contribution of groundwater flow directly from the 360-level to the 165-level is likely small and insignificant, with the majority of water emanating from Adit Spring sample location (SW-15) being sourced from the natural fractures and saturated fault zone present near the mine workings, and independent of the Cordero tunnel systems.

Water flowing across the Site is either sourced from springs (including the Adit Spring) or from rainwater. These sources result in the three flow patterns described in Section 4.4 which include water sourced from the former underground mine workings, water that is sourced from precipitation which travels through the Bradley tailings and waste rock, and background water sources that generally do not contact mine tailings or waste rock. Water sampling along the pathway from the Adit Spring to the pond indicate that mercury concentrations increase the longer they are in contact with the mine tailings, and are highest in the lower pond, after the most time in contact with the tailings. Arsenic concentrations generally decrease, indicating the tailings are not a source of additional arsenic in water at the Site. Rainwater which percolates into the tailings piles also picks up mercury and other compounds in its way to the pond. Sample locations SW-02 and SW-03 are representative of this pathway, but are similar in chemistry to SW-15. This observation shows they are all in contact with similar material, although not sourced from the same water. Water sampling locations SW-12, SW-16, and SW-4 are indicative of water that does not come into contact with former mine tailings. Samples collected from these locations are considered background concentrations and represent pre-mining site surface water conditions.

Surface sample location SW-07 is collected in Dunn Creek, downstream of surface water from the Site, and is considered a point-of-compliance sampling point. As such, the analytical results from this sampling location and all other surface sampling locations were compared to water quality criteria developed for bodies of freshwater by the CVRWQCB and the USEPA. The comparisons indicated several key points including:

- Mercury and arsenic are not present in location SW-07 above water quality criteria;
- Freshwater criteria are exceeded by waters from sample location SW-07 including methyl mercury, alkalinity, total dissolved solids, chloride, iron, and nickel; and
- With the exception of methyl mercury, all of these compounds are also detected at concentrations exceeding the freshwater criteria in the samples collected from the background Park Spring sample location (SW-04).

This point of compliance and water quality criteria evaluation shows that water downgradient of the Site exceeds water quality criteria only for compounds present in background samples above water quality criteria. Although mercury and other compounds from the mine are travelling into Dunn Creek, the contribution of the water from these sources is so small compared to other sources (i.e. Park Spring, runoff that does not come in contact with tailings), the presence of these compounds are reduced to background or near background levels at point of compliance sampling location SW-07.

The additional surface water samples collected have confirmed the results of previous samples collected earlier in 2010 and the Slotton data. These similar results support the conclusions of the Characterization Report that the majority (94.3 percent based on Slotton, 1995 calculations) of the mercury mass loading from the Site into Dunn Creek originates via surface runoff through the Bradley tailings piles, into the Lower Pond, and then into Dunn Creek.

The Site surface water sampling locations associated with runoff of surface water through the Bradley tailings piles and into the Lower Pond (SW-15, SW-02, SW-03, SW-05 and SW-09) fairly consistently exceeded water quality criteria for total and dissolved mercury, nickel, lead, and zinc, and less consistently exceeded the same criteria for methyl mercury, arsenic and chromium (e.g., Lower Pond sample location SW-09 had no methyl mercury, arsenic or chromium exceedences).

Data collected to date, including historical and current data, indicate that 1) the 360-level Cordero workings have little to no impact on the flow of water from the 165-level Adit workings that were mined by Bradley; 2) water emanating from the 165-level at sample location SW-15 and in ADIT-1 contains mercury concentrations above freshwater CVRWQCB and USEPA criteria, but does not contribute a significant enough flow into Dunn Creek to result in downgradient concentrations above the criteria; and 3) other compounds present in SW-07 (Dunn Creek) above these criteria area are also present in background water samples above water quality criteria. Data collected support conclusions by previous investigations that the key remedial focus at the Site is mitigating contact of surface and mine water with the Bradley tailings piles through removal and/or capping.

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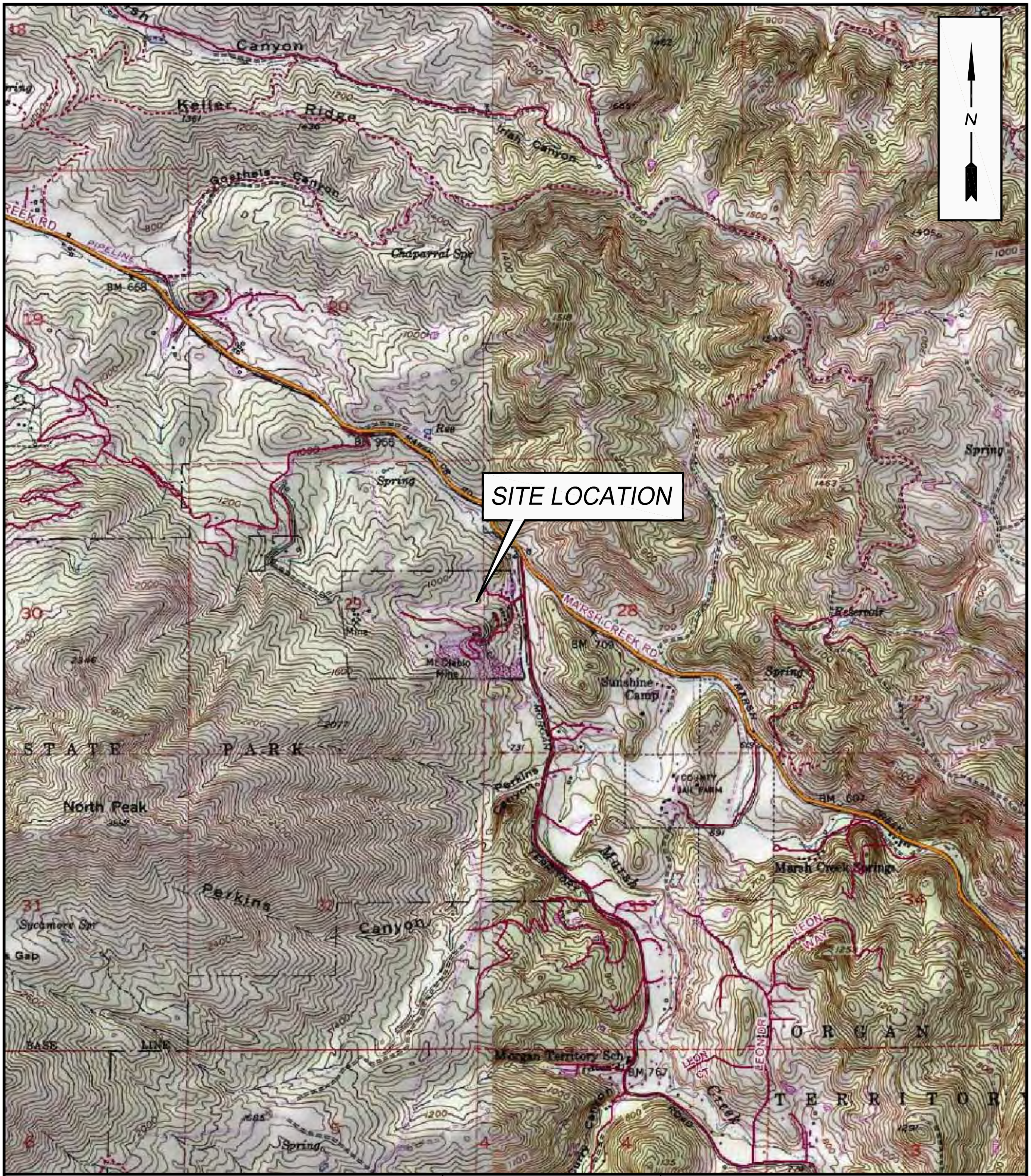
FIGURES



THE SOURCE GROUP, INC. (SGI environmental)

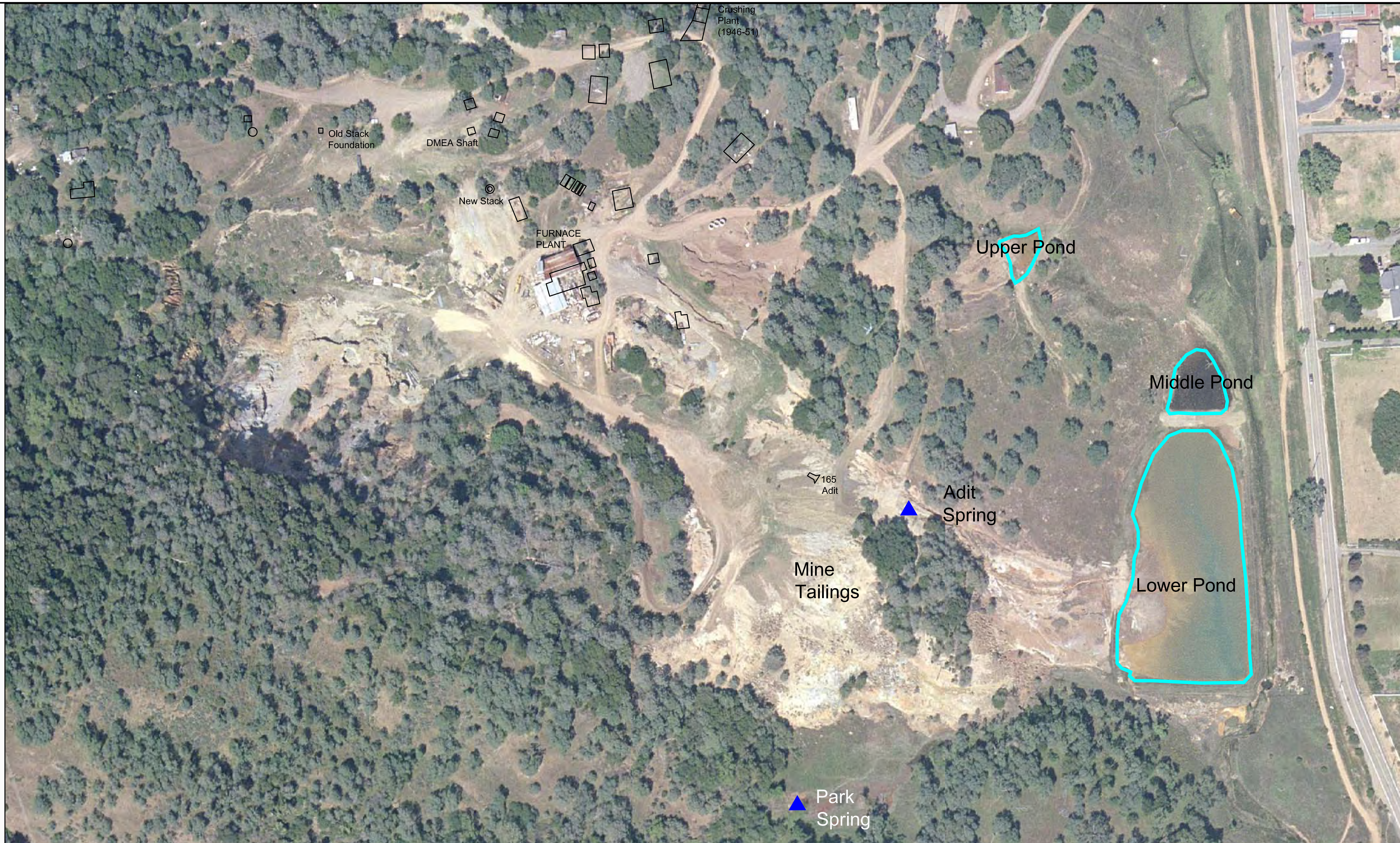
3451 C VINCENT ROAD
PLEASANT HILL, CA 94523

MAP SOURCE: U.S.G.S.

SCALE: 0 MILES 0.5

SITE LOCATION MAP

SITE:	DATE:
SUNOCO MT. DIABLO MERCURY MINE	12/05/08
LOCATION: 2430 MORGAN TERRITORY ROAD CLAYTON, CALIFORNIA	**FIGURE:** 1-1



LEGEND
Mine Structure (1953)
Spring
Pond (2004 Outline)

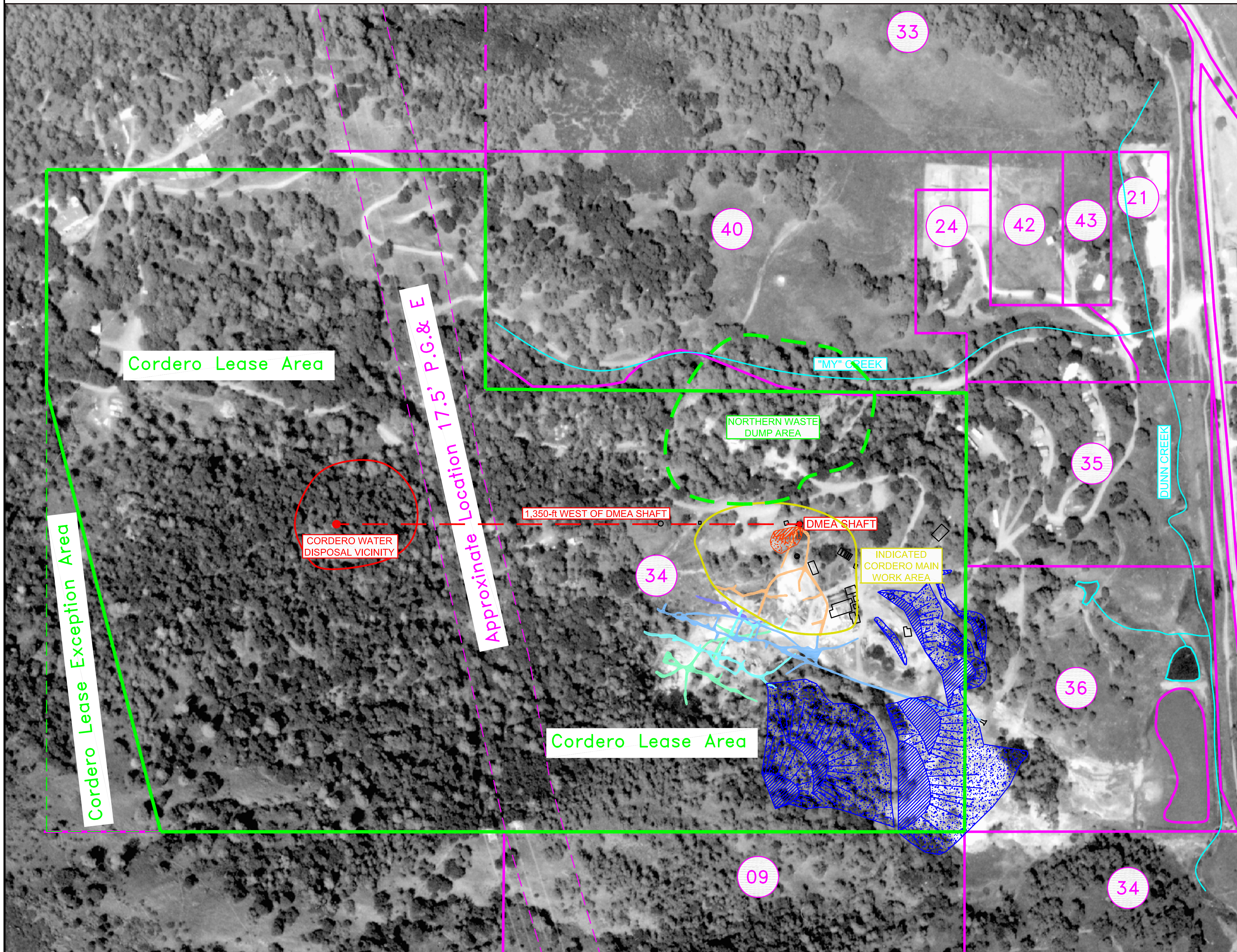
SGI environmental
THE SOURCE GROUP, INC.
3451C VINCENT ROAD
PLEASANT HILL, CA 94523

SCALE
0 150 300
SCALE IN FEET

MT. DIABLO MERCURY MINE
CONTRA COSTA COUNTY, CALIFORNIA
(2004 AERIAL)

2004 AERIAL PHOTO OF
MT DIABLO MINE SITE

FILE NAME	DATE	DR. BY	APP. BY	PROJECT NO.	FIGURE NO.
Mine Features Map.dwg	5/4/09	JP	PH	01-SUN-050	2-1



LEGEND

- Mine Structure (1953)
- Tailings/Waste Rock (Pre Cordero)
- Waste Rock (DMEA/Cordero)

Underground Workings

- Adit Level
- 80-ft Level
- 165-ft Level
- 270-ft Level
- 360-ft Level (Cordero)

PROJECT NO.	DATE:	DRAWN BY:	APP. BY:
01-SUN-050	07/17/09	JP	PH

0 300 600
HORIZONTAL SCALE IN FEET

2004 AERIAL PHOTO SHOWING PARCEL AND CORDERO LEASE BOUNDARIES

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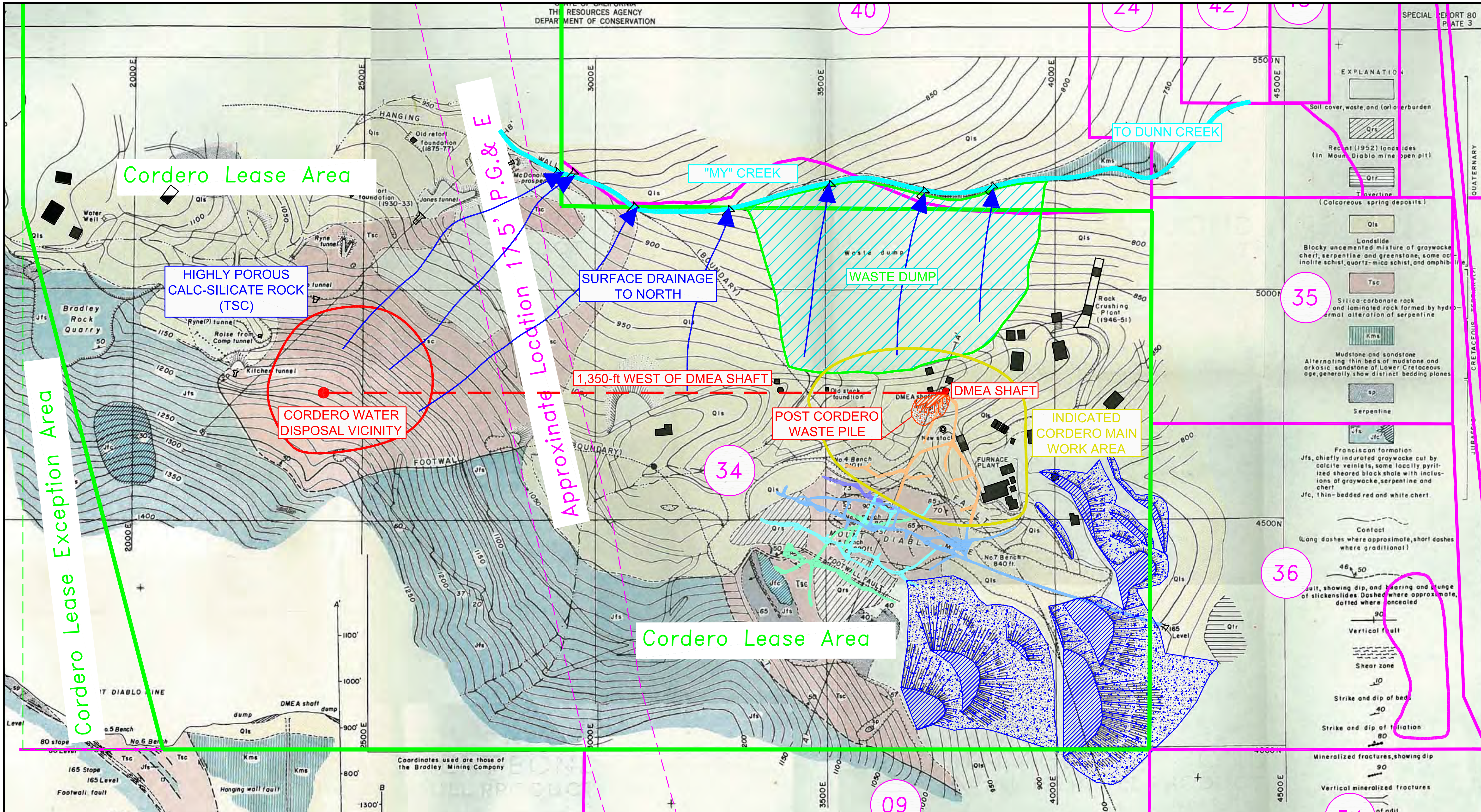
N

FIGURE: 2-2



LEGEND		Underground Workings	
	Mine Structure (1953)		Adit Level
	Tailings/Waste Rock (Pre Cordero)		80–ft Level
	Waste Rock (DMEA/Cordero)		165–ft Level
			270–ft Level
			360–ft Level (Cordero)

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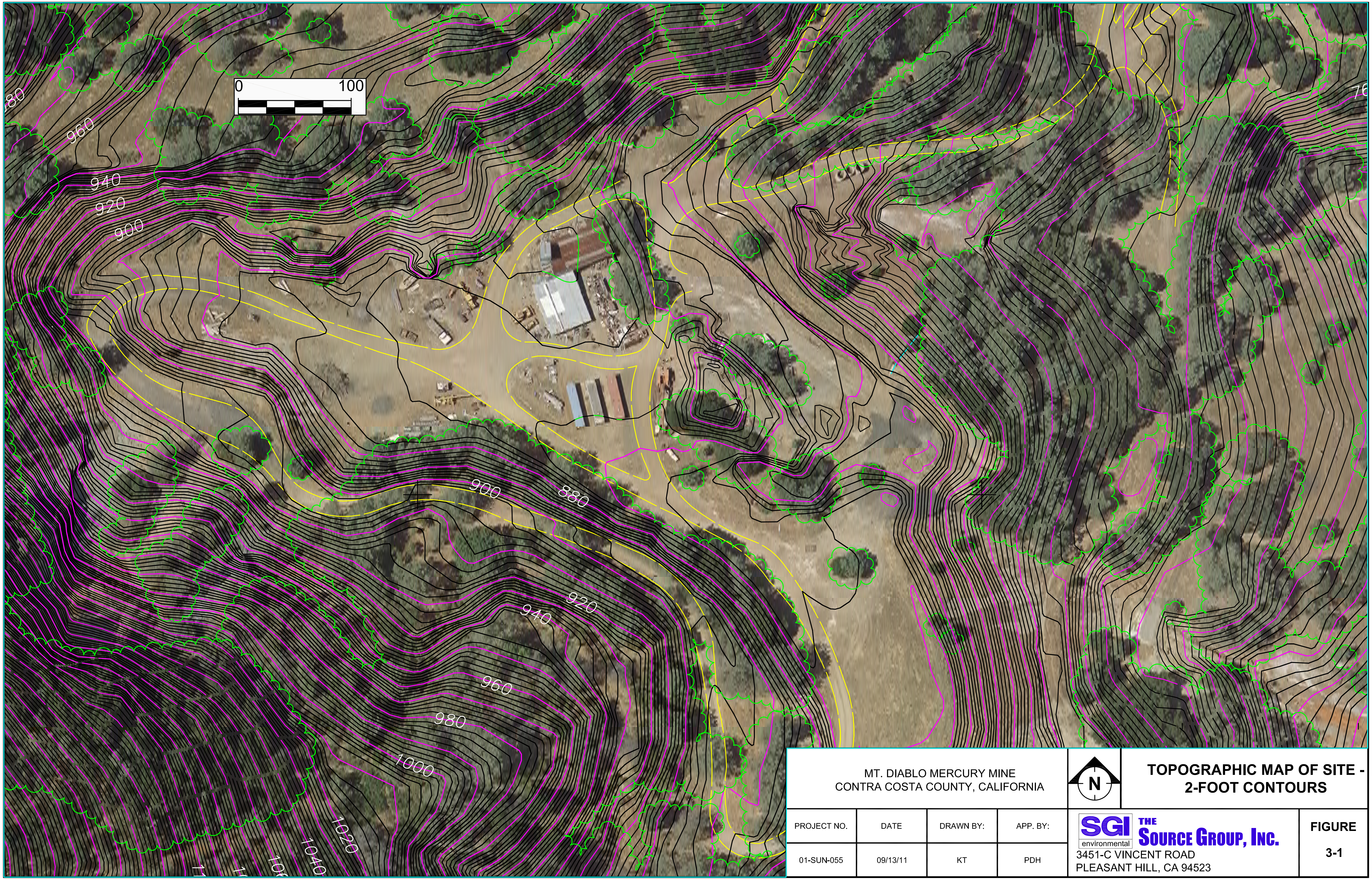
SCALE
0 200 400
SCALE IN FEET

MT. DIABLO MERCURY MINE
CONTRA COSTA COUNTY, CALIFORNIA
(2004 AERIAL)

DMEA MAP SHOWING PRE- AND POST- DMEA/CORDERO MINE FEATURES

FILE NAME	DATE	DR. BY	APP. BY	PROJECT NO.	EXHIBIT
Mine Features Map.dwg	4/14/09	JP	PH	01–SUN–050	2-3



MT. DIABLO MERCURY MINE
CONTRA COSTA COUNTY, CALIFORNIA

TOPOGRAPHIC MAP OF SITE - 2-FOOT CONTOURS

PROJECT NO.	DATE	DRAWN BY:	APP. BY:
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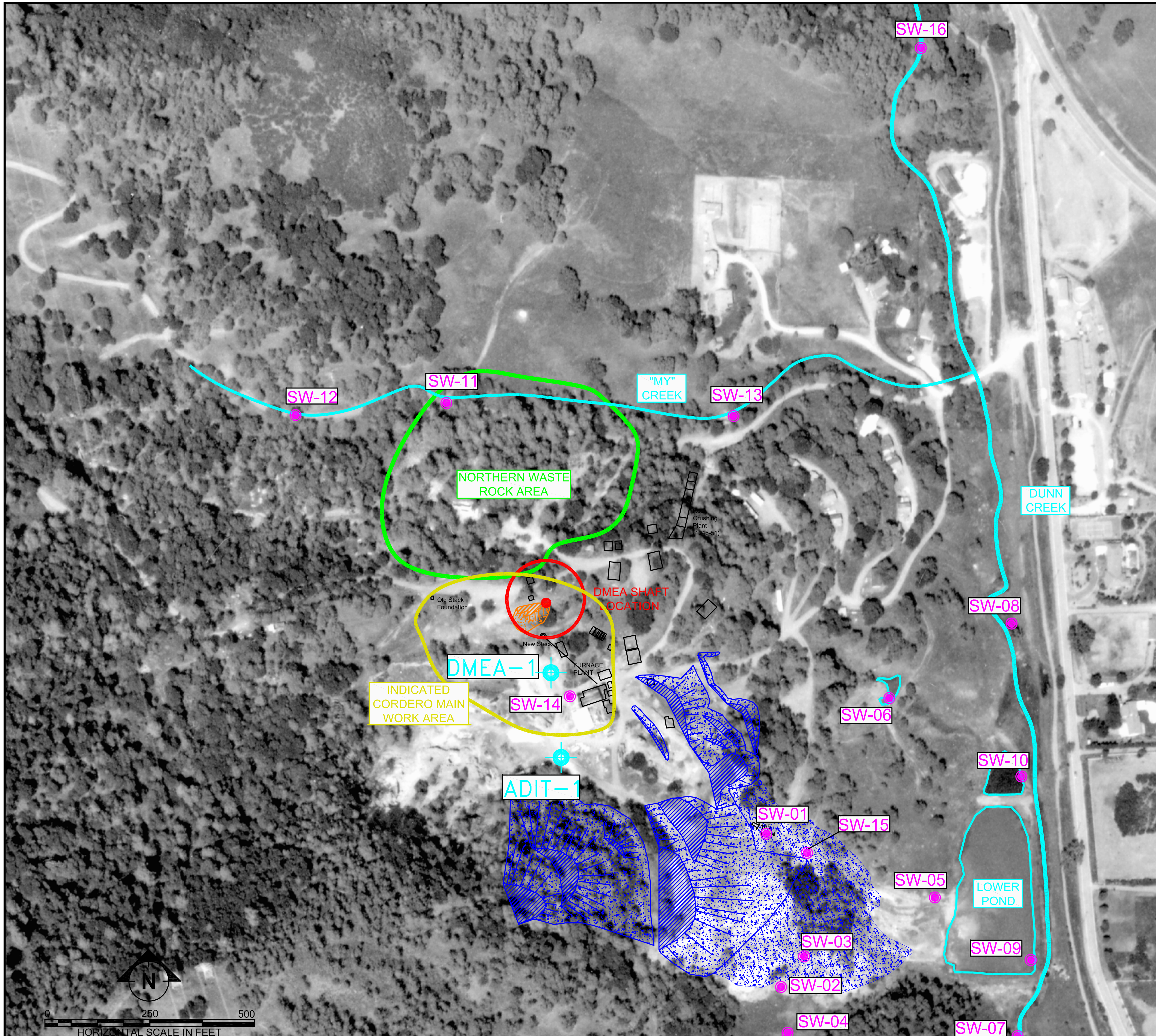
FIGURE 3-1



LEGEND

Mine Structure (1953)

Tailings/Waste Rock (Pre Cordero)

Waste Rock (DMEA/Cordero)

Surface Water Sample Location

Monitoring Well Location

SITE MAP WITH SURFACE WATER SAMPLING AND MONITORING WELL LOCATIONS

MT. DIABLO MERCURY MINE
CONTRA COSTA COUNTY, CALIFORNIA
(2004 AERIAL)

PROJECT NO.	DATE	DRAWN BY:	APP. BY:
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FIGURE 3-2

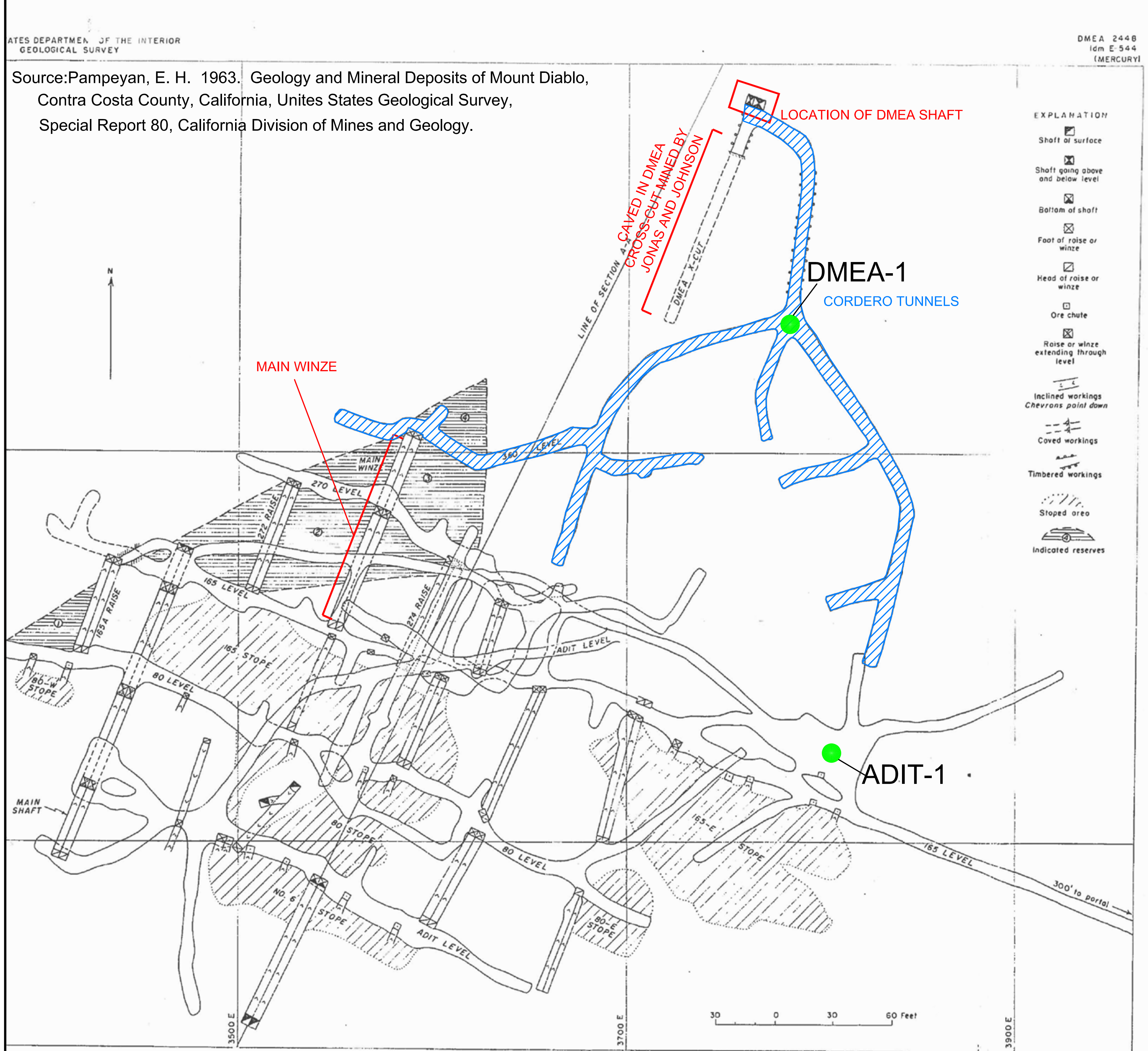

Figure 4. COMPOSITE MAP OF MILL WORKINGS, MT DIABLO MINE
CONTRA COSTA COUNTY, CALIFORNIA

LEGEND

Cordero Workings

ADIT-1

Monitoring Well Location

PROJECT NO.	DATE:	DRAWN BY:	APP. BY:
01-SUN-050	07/16/09	JP	PH

0 60 120
HORIZONTAL SCALE IN FEET

MONITORING WELL LOCATIONS WITH CORDERO AND BRADLEY TUNNEL SYSTEMS

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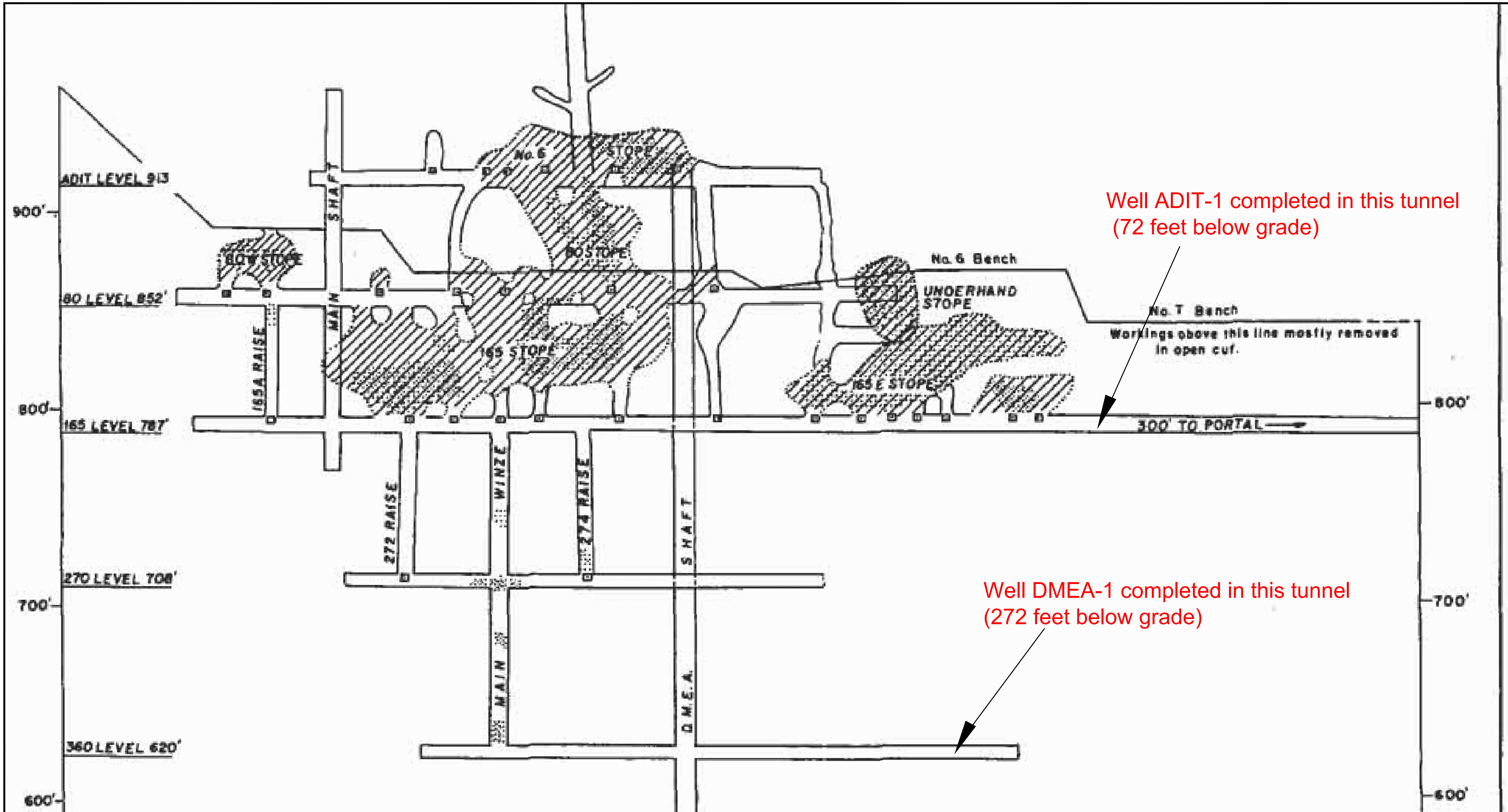
PLEASANT HILL, CA 94523

N

FIGURE:
3-3



Source: Pampeyan, E. H. 1963. Geology and Mineral Deposits of Mount Diablo, Contra Costa County, California, Unites States Geological Survey, Special Report 80, California Division of Mines and Geology.

PROJECT NO.	DATE:	DRAWN BY:	APP. BY:
01-SUN-055	10/10/11	KT	PDH

CROSS SECTION OF TUNNEL SYSTEMS

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FIGURE: 3-4

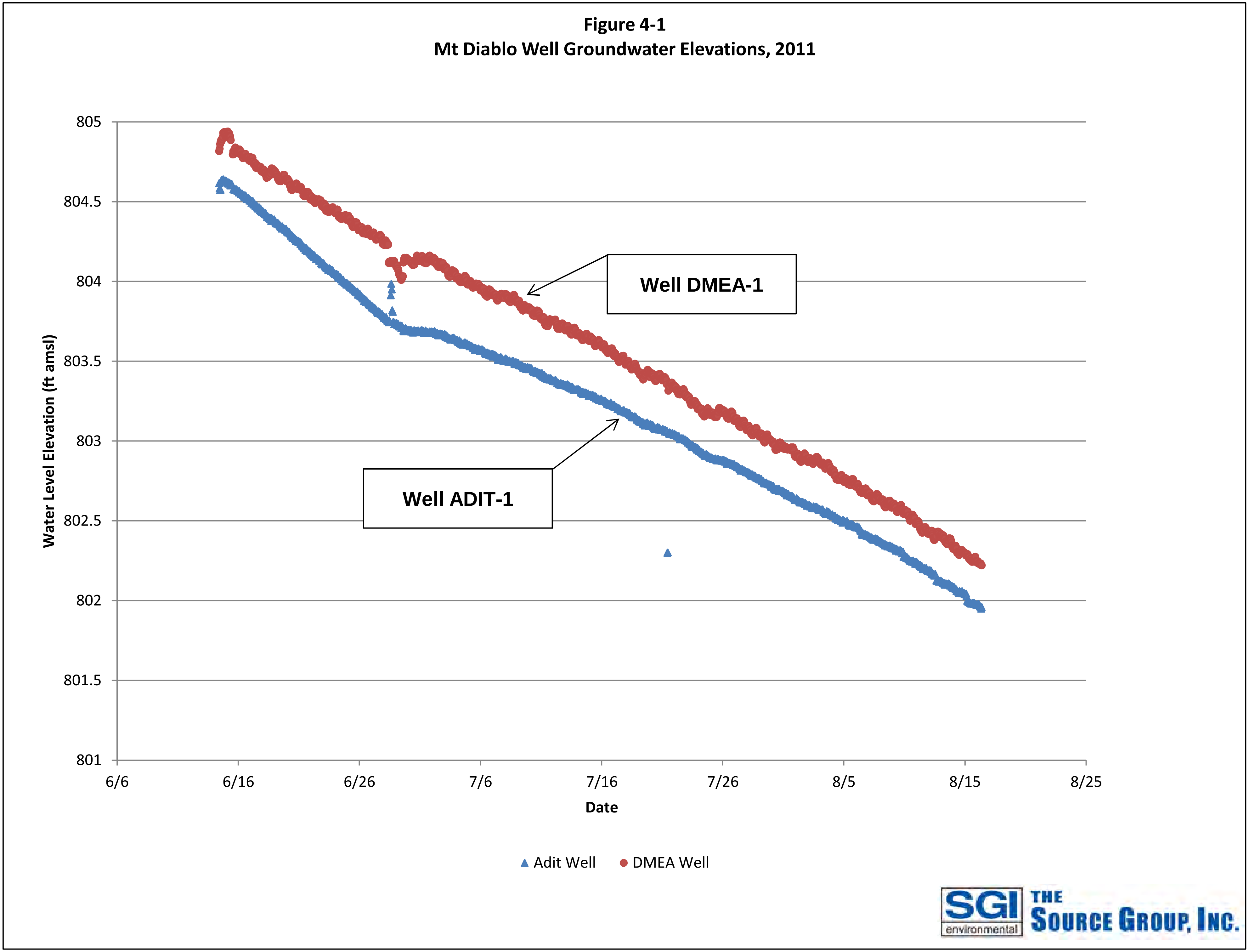
Figure 4-1
Mt Diablo Well Groundwater Elevations, 2011
805
804.5
804
803.5
803
802.5
802
801.5
801
Water Level Elevation (ft amsl)
6/6
6/16
6/26
7/6
7/16
7/26
8/5
8/15
8/25
Date
Well DMEA-1
Well ADIT-1
Adit Well
DMEA Well
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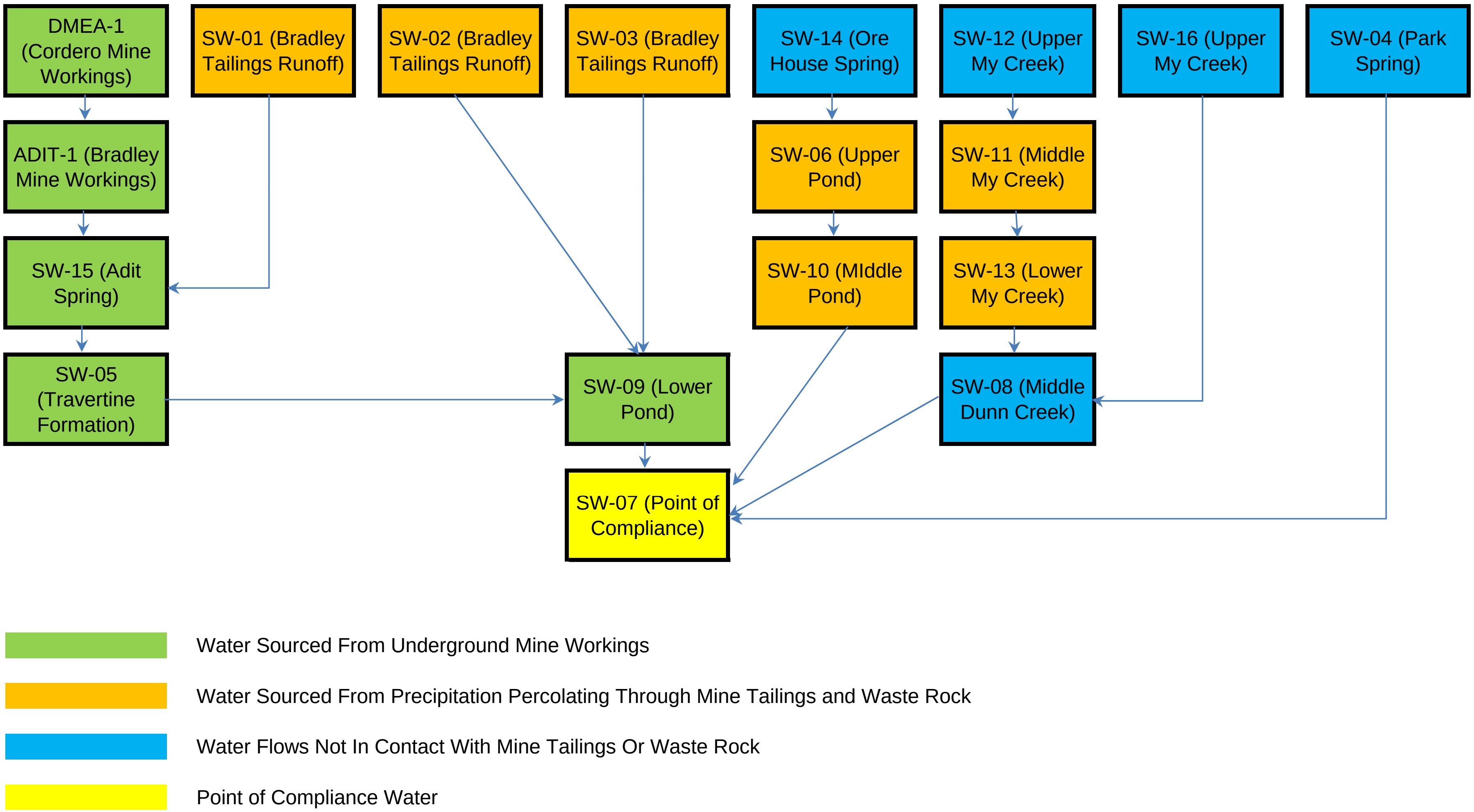
Figure 4-2
Site Water Flow Pathway Schematic



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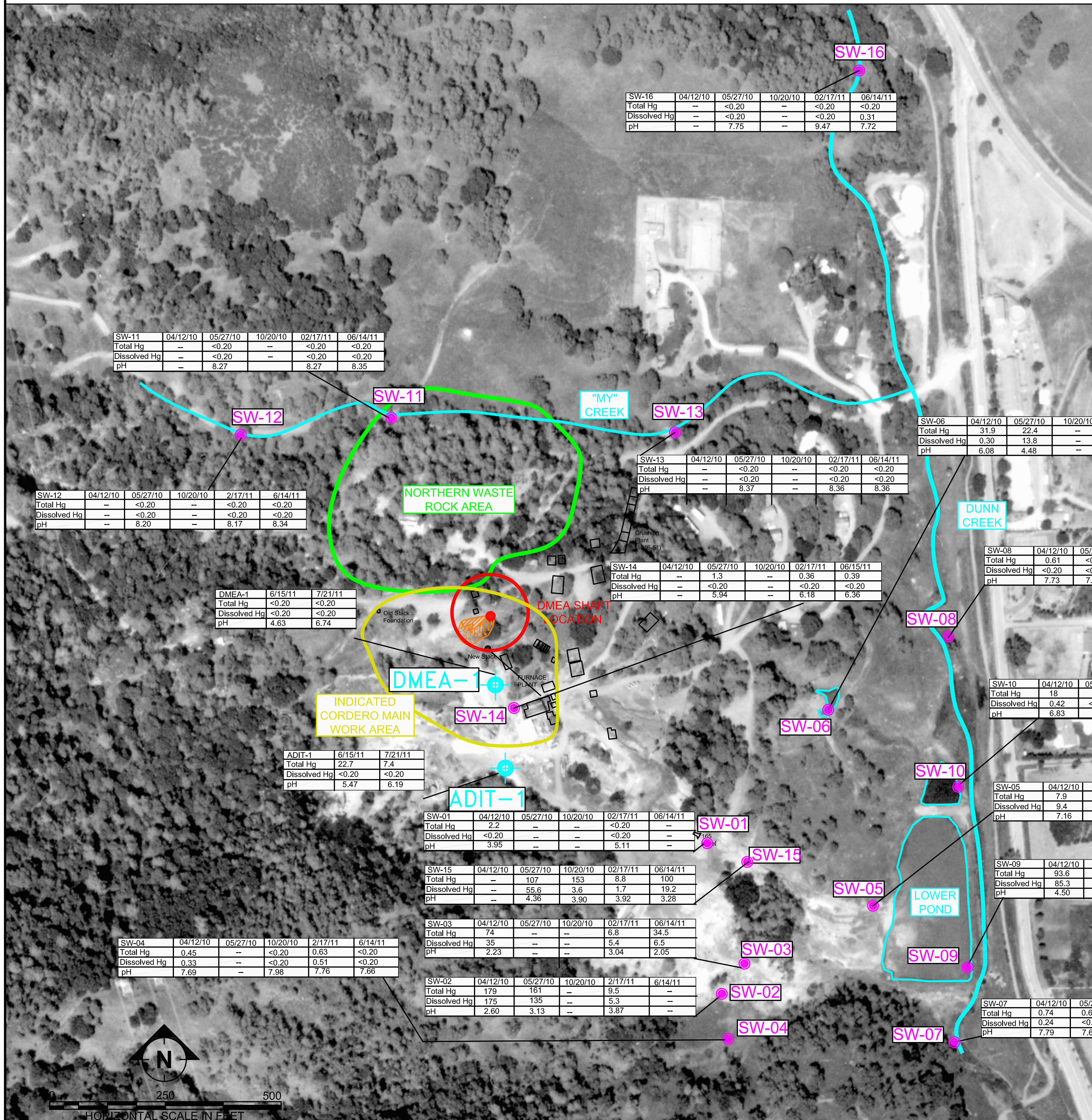

SW-16	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	--	<0.20	--	<0.20	<0.20
Dissolved Hg	--	<0.20	--	<0.20	0.31
pH	--	7.75	--	9.47	7.72

SW-11	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	--	<0.20	--	<0.20	<0.20
Dissolved Hg	--	<0.20	--	<0.20	<0.20
pH	--	8.27	--	8.27	8.35

SW-12	04/12/10	05/27/10	10/20/10	2/17/11	6/14/11
Total Hg	--	<0.20	--	<0.20	<0.20
Dissolved Hg	--	<0.20	--	<0.20	<0.20
pH	--	8.20	--	8.17	8.34

SW-13	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	--	<0.20	--	<0.20	<0.20
Dissolved Hg	--	<0.20	--	<0.20	<0.20
pH	--	8.37	--	8.36	8.36

SW-06	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	31.9	22.4	--	3.0	4.8
Dissolved Hg	0.30	13.8	--	0.32	3.5
pH	6.08	4.48	--	5.13	4.24

SW-08	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	0.61	<0.20	--	<0.20	<0.20
Dissolved Hg	<0.20	<0.20	--	0.47	<0.20
pH	7.73	7.91	--	7.55	7.82

SW-14	04/12/10	05/27/10	10/20/10	02/17/11	06/15/11
Total Hg	--	1.3	--	0.36	0.39
Dissolved Hg	--	<0.20	--	<0.20	<0.20
pH	--	5.94	--	6.18	6.36

DMEA-1	6/15/11	7/21/11
Total Hg	<0.20	<0.20
Dissolved Hg	<0.20	<0.20
pH	4.63	6.74

SW-10	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	18	0.21	--	0.70	<0.20
Dissolved Hg	0.42	<0.20	--	0.59	<0.20
pH	6.83	7.41	--	7.71	7.96

ADIT-1	6/15/11	7/21/11
Total Hg	22.7	7.4
Dissolved Hg	<0.20	<0.20
pH	5.47	6.19

SW-01	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	2.2	--	--	<0.20	--
Dissolved Hg	<0.20	--	--	<0.20	--
pH	3.95	--	--	5.11	--

SW-05	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	7.9	66.3	41.6	108	49.3
Dissolved Hg	9.4	39.7	35.4	5.0	0.031
pH	7.16	7.18	7.56	7.04	7.50

SW-15	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	--	107	153	8.8	100
Dissolved Hg	--	55.6	3.6	1.7	19.2
pH	--	4.36	3.90	3.92	3.28

SW-09	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	93.6	88	149	59.5	72.7
Dissolved Hg	85.3	55.1	143	54.0	36.8
pH	4.50	4.52	6.33	3.93	3.90

SW-03	04/12/10	05/27/10	10/20/10	02/17/11	06/14/11
Total Hg	74	--	--	6.8	34.5
Dissolved Hg	35	--	--	5.4	6.5
pH	2.23	--	--	3.04	2.05

SW-04	04/12/10	05/27/10	10/20/10	2/17/11	6/14/11
Total Hg	0.45	--	<0.20	0.63	<0.20
Dissolved Hg	0.33	--	<0.20	0.51	<0.20
pH	7.69	--	7.98	7.76	7.66

SW-02	04/12/10	05/27/10	10/20/10	2/17/11	6/14/11
Total Hg	179	161	--	9.5	--
Dissolved Hg	175	135	--	5.3	--
pH	2.60	3.13	--	3.87	--

SW-07	04/12/10	05/27/10	10/20/10	2/17/11	6/14/11
Total Hg	0.74	0.64	<0.20	<0.20	0.51
Dissolved Hg	0.24	<0.20	<0.20	<0.20	0.26
pH	7.79	7.69	7.27	7.57	7.68

LEGEND

Mine Structure (1953)

Surface Water Sample Location

Monitoring Well Location

Hg Mercury

<0.20 Analyte not detected at or above the laboratory reporting limit of 0.20 µg/L

NOTE

All concentrations reported in micrograms per liter (µg/L)

SURFACE WATER AND WELL SAMPLING RESULTS, MERCURY AND pH

MT. DIABLO MERCURY MINE
CONTRA COSTA COUNTY, CALIFORNIA
(2004 AERIAL)

PROJECT NO.	DATE	DRAWN BY:	APP. BY:
01-SUN-050	5/19/10	JP	PH

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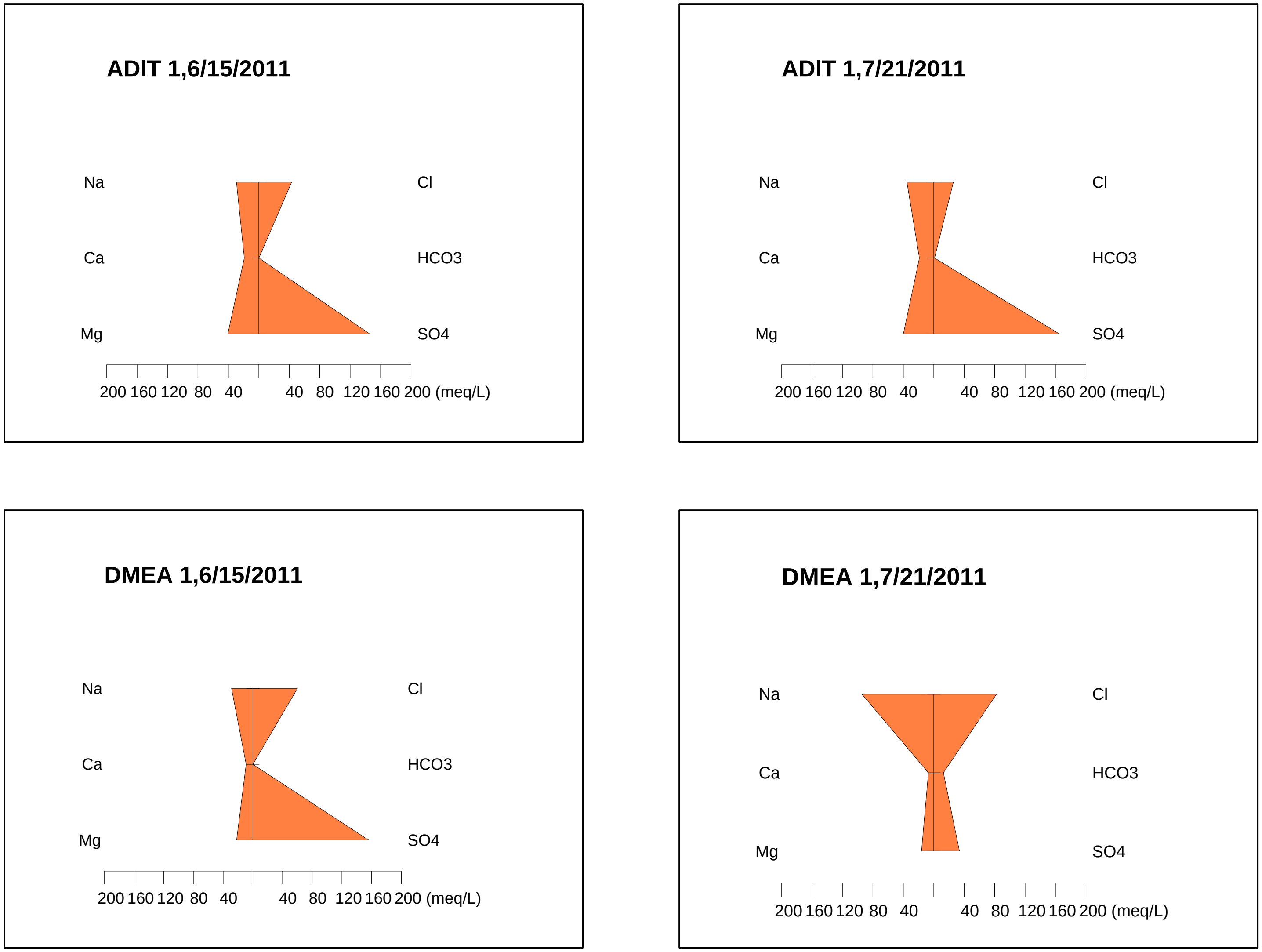
PLEASANT HILL, CA 94523

FIGURE 4-3

Figure 4-4
Monitoring Well Stiff Diagram Comparison



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TABLES

Table 2-1
Production Statistics
Mount Diablo Mercury Mine
Contra Costa County, California

PRODUCTION STATISTICS- MOUNT DIABLO MINE "MILL WORKINGS"					
Operator	**Date**	**Cubic Yards of Ore Milled**	**Waste rock from tunnels, crosscuts,raises,shafts and stopes (cubic yards)**	**Dewater volume (acre-feet)**	**Mercury Produced, flasks**
Welch	1863	shaft and placer	NA	none	NA
Unknown	1875-1877	NA	NA	NA	1000
Mt. Diablo Quicksilver MC, operator Ericson	1930-1936	NA	NA	NA	739
leased to Bradley MC	1936-1951	78,188[(1)]	24,815[(2)]	161[(3)]	10,455
leased Ronnie B. Smith	Sept 1951- June 1953	920[(4)]	NA	NA	125[(5)]
DMEA and Smith	June 1953 - Jan 1954	none	630[(6)]	minor	none
DMEA, Johnson and Jonas	Jan 1954 - Feb 1954	none	67[(7)]	NA	none
leased to Cordero MC	Nov 1954 - Dec 1955	none	1,228 [(8)]	19.5[(9)]	none
leased to Nevada Scheelite Corp.	1956	none	see note[(10)]	see note[(10)]	none
Total Cubic Yards of Material Taken Out			105,848 [(11)]		

Notes:

(1) Table 4, Ross 1958, reported 126,664 tons of ore milled. Converted here to cubic yards above based on conversion of 1.62 tons per cubic yard (cy)

(2) Total length of workings 4,570 ft (Pampeyan 1963. p 25) x 5 feet x 7 feet x bulking factor plus 20% = 7,108 cy less (2) and (3). Included 550 ft of shafts and raises (935 cy) and stopes of 19,000 cy (Pampeyan, Plate 5).

(3) Estimate 10 gpm for 10 years.

(4) Used the ratio of ore milled to flasks produced for Bradley to estimate the amount of ore milled by Smith.

(5) DMEA internal memo dated 2/4/57 ref doc no. 2:88/384

(6) 300-ft DMEA shaft 4.5 ft x 8.5 ft (Ross 1958) plus 77 ft of tunnel at 5 ft x 7 ft on the 360 level w/ bulking factor of 20%

(7) 43 ft of tunnel on the 360 level x 5 feet x 7 feet w/ bulking factor of 20%

(8) 790 ft of crosscuts and drifts on the 360 level (Pampeyan, and Sheahan 1957) x 5 feet x 7 feet w/ bulking factor of 20%.

(9) Best guess; 90 gpm for 27 days to dewater the mine (ref: DMEA payment records to Smith for same) and 200 days at 10 gpm.

(10) In 1956 the Nevada Scheelite Company leased the mine and installed a deep-well pump to remove water which had risen to a point 112 feet below the collar of the shaft. Since the downstream ranchers objected to the discharge of acid mine water into the creek this work was suspended. Attention was then directed to the open pit where some exploration was done using wagon drills. A small tonnage of retort-grade ore was developed. Since this was not sufficient to satisfy the requirements of the company the lease was relinquished (Division of Mines, 1958).

(11) Sum of Ore Milled and Waste Rock

Table 2-2
Summary of 1995 Mercury Data Collected by Slotton
Mount Diablo Mercury Mine
Contra Costa County, California

Site	Flow	Aqueous Total Mercury		Suspended Solids	
		Raw	**Filtered**	**All (TSS)**	**Solids Hg**
	(cfs)	*(µg/L)*	*(µg/L)*	*(mg/L)*	*(dry ppm)*
Upper Dunn Creek	5.20	0.0036	0.00273	1.50	0.60
Upper Horse Creek	0.08	0.0255	0.016	1.10	8.64
"My" Creek	2.10	0.381	0.0284	10.90	32.41
OreHouse Spring	0.01	1.94	0.071	11.40	164.00
Trickle coming from tailings	0.03	58.4	54.1	77.20	56.37
South Pond outlet	0.05	59.1	59.1	26.10	0.00
Horse Creek at tailings	0.32	25	21.9	104.00	29.80
Dunn Creek below mine confluence	7.80	0.949	0.226	13.50	53.60

Notes:
Data from study and report by Slotton et.al. (2006).
cfs = cubic feet per second.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
ppm = parts per million.

Table 3-1
2010/2011 Surface Water Sample Location Key
Mount Diablo Mercury Mine
Contra Costa County, California

Samples	Type	Location Description
SW-01	Precipitation Runoff	Precipitation runoff from Bradley tailings/waste rock piles
SW-02	Precipitation Runoff	Precipitation runoff from Bradley tailings/waste rock piles
SW-03	Precipitation Runoff	Precipitation runoff from Bradley tailings/waste rock piles
SW-04	Spring	Park Spring
SW-05	Surface Flow	Overland flow between Adit Spring and Lower Pond
SW-06	Surface Flow	Upper Pond
SW-07	Surface Flow	Dunn Creek downstream of Site (Point of Compliance Sampling Location)
SW-08	Surface Flow	Dunn Creek upstream of ponds, downstream of confluence with My Creek
SW-09	Surface Flow	Lower Pond
SW-10	Surface Flow	Middle Pond
SW-11	Surface Flow	My Creek adjacent to the Northern Waste Rock Area
SW-12	Surface Flow	Watershed runoff in My Creek upgradient of the Site (Background)
SW-13	Surface Flow	My Creek downstream of the Northern Waste Rock Area
SW-14	Spring	Ore House Spring
SW-15	Spring	Adit Spring (water effluent point from Bradley workings)
SW-16	Surface Flow	Watershed runoff in Dunn Creek upgradient of the Site (Background)

Table 3-2
Summary of Chemical Analyses Results
2010/2011 Surface Water Sampling
Mount Diablo Mercury Mine
Contra Costa County, California

			Water Quality Criteria[a]			Sample Location															
				Human Health for Consumption of		Background		Springs			My Creek Runoff		Mid-Dunn Creek	Ponds			Surface Water Runoff				Downstream
						My Creek	Dunn Creek	Park	Ore House	Adit	Pond	Weir		Upper	Lower	Middle	Bradley Tailings Piles			Adit Spring	Dunn Creek
Parameter	Unit	Date	Freshwater	Water + Organism	Organism Only	SW-12	SW-16	SW-04	SW-14	SW-15	SW-11	SW-13	SW-08	SW-06	SW-09	SW-10	SW-01	SW-02	SW-03	SW-05	SW-07
Mercury_total (Hg)	µg/L	4/12/2010	0.91	0.05	0.051	--	--	0.45	--	--	--	--	0.61	31.9	93.6	18	2.2	179	74	7.9	0.74
		5/27/2010				<0.20	<0.20	--	1.3	107	<0.20	<0.20	<0.20	22.4	88	0.21	--	161	--	66.3	0.64
		10/20/2010				--	--	<0.20	--	153	--	--	--	--	149	--	--	--	--	41.6	<0.20
		2/17/2011				<0.20	<0.20	0.63	0.36	8.8	<0.20	<0.20	<0.20	3.0	59.5	0.70	<0.20	9.5	6.8	108	<0.20
		6/14/2011				<0.20	<0.20	<0.20	0.39	100	<0.20	<0.20	<0.20	4.8	72.7	<0.20	--	--	34.5	49.3	0.51
Mercury_Dissolved (Hg)	µg/L	4/12/2010	0.77	0.05	0.051	--	--	0.33	--	--	--	--	<0.20	0.30	85.3	0.42	<0.20	175	35	9.4	0.24
		5/27/2010				<0.20	<0.20	--	<0.20	55.6	<0.20	<0.20	<0.20	13.8	55.1	<0.20	--	135	--	39.7	<0.20
		10/20/2010				--	--	<0.20	--	3.6	--	--	--	--	143	--	--	--	--	35.4	<0.20
		2/17/2011				<0.20	<0.20	0.51	<0.20	1.7	<0.20	<0.20	0.47	0.32	54.0	0.59	<0.20	5.3	5.4	5.0	<0.20
		6/14/2011				<0.20	0.31	<0.20	<0.20	19.2	<0.20	<0.20	<0.20	3.5	36.8	<0.20	--	--	6.5	33.1	0.26
Methyl Mercury	ng/L	4/12/2010	3[b]	0.3 mg/kg (fish tissue)	0.3 mg/kg (fish tissue)	--	--	0.328	--	--	--	--	0.389	0.350	0.523	0.480	0.061	0.976	0.398	1.04	0.736
		5/27/2010				0.104	0.0766	--	1.16	4.86	0.504	0.439	0.705	0.233	0.657	7.26	--	2.84	--	3.29	1.47
		10/20/2010				--	--	0.0615	--	1.57	--	--	--	--	0.721	--	--	--	--	0.841	6.56
		2/17/2011				0.38	0.98	0.31	2.70	0.90	0.70	0.30	2.5	1.4	0.87	0.65	0.65	0.86	1.6	4.0	1.3
		6/14/2011				0.13	0.11	0.62	4.1	5.7	1.3	0.36	0.96	0.56	0.48	1.70	--	--	0.26	0.96	0.68
pH	su	4/12/2010	6.5 - 9.0	5.0 - 9.0	--	--	--	7.69	--	--	--	--	7.73	6.08	4.50	6.83	3.95	2.60	2.23	7.16	7.79
		5/27/2010				8.20	7.75	--	5.94	4.36	8.27	8.37	7.91	4.48	4.52	7.41	--	3.13	--	7.18	7.69
		10/20/2010				--	--	7.98	--	3.90	--	--	--	--	6.33	--	--	--	--	7.56	7.27
		2/17/2011				8.17	9.47	7.76	6.18	3.92	8.27	8.36	7.55	5.13	3.93	7.71	5.11	3.87	3.04	7.04	7.57
		6/14/2011				8.34	7.72	7.66	6.36	3.28	8.35	8.36	7.82	4.24	3.90	7.96	--	--	2.05	7.50	7.68
Alkalinity, Bicarbonate	mg/L	4/12/2010	--	--	--	--	--	111	--	--	--	--	83.2	<5.0	<5.0	11.9	<5.0	<5.0	<5.0	127	77.4
		5/27/2010				223	139	--	39.8	<5.0	227	229	169	<5.0	<5.0	248	--	<5.0	--	187	179
		10/20/2010				--	--	932	--	<5.0	--	--	--	--	24	--	--	--	--	478	420
		2/17/2011				216	56.9	406	56.0	<5.0	220	216	54.0	<5.0	<5.0	82.0	<5.0	<5.0	<5.0	44.0	62.0
		6/14/2011				854	182	1,040	120	<5.0	848	247	218	<5.0	<5.0	212	--	--	<5.0	274	218
Alkalinity, Carbonate (CO3)	mg/L	4/12/2010	--	--	--	--	--	<5.0	--	--	--	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
		5/27/2010				<5.0	<5.0	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--	<5.0	--	<5.0	<5.0
		10/20/2010				--	--	<5.0	--	<5.0	--	--	--	--	<5.0	--	--	--	--	<5.0	--
		2/17/2011				<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
		6/14/2011				<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--	--	<5.0	<5.0	<5.0
Alkalinity, Total as CaCO3	mg/L	4/12/2010	20	--	--	--	--	111	--	--	--	--	83	<5.0	<5.0	12	<5.0	<5.0	<5.0	127	77
		5/27/2010				223	139	--	40	<5.0	227	233	169	<5.0	<5.0	248	--	<5.0	--	187	179
		10/20/2010				--	--	932	--	<5.0	--	--	--	--	24	--	--	--	--	478	420
		2/17/2011				216	56.9	406	56.0	<5.0	220	216	54.0	<5.0	<5.0	82.0	<5.0	<5.0	<5.0	44.0	62.0
		6/14/2011				854	182	1,040	120	<5.0	848	247	218	<5.0	<5.0	212	--	--	<5.0	274	218
Fluoride	mg/L	4/12/2010	--	--	--	--	--	<0.10	--	--	--	--	<0.10	<0.10	<0.50	0.12	<0.10	0.39	1.2	<0.50	<0.10
		5/27/2010				<0.10	<0.10	--	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	--	<0.10	--	<0.50	<0.10
		10/20/2010				--	--	2.8	<0.10	1.2	--	--	--	--	1.9	--	--	--	--	0.48	1.2
		2/17/2011				<0.10	0.11	<0.10	<0.10	<0.10	<0.10	0.16	0.11	0.13	<0.25	0.12	0.13	<0.10	<0.10	0.13	0.11
		6/14/2011				0.14	<0.10	<0.50	0.18	<0.50	0.13	0.15	<0.10	0.22	<0.50	0.14	--	--	4.2	<0.50	0.11
Dissolved Organic Carbon	mg/L	4/12/2010	--	--	--	--	--	8.3	--	--	--	--	8.9	4.5	25.7	4.8	2.4	4.9	7.6	2.8	8.3
		5/27/2010				2.6	4.2	--	3.7	11.3	2.4	2.6	4.1	6.1	2.7	5.2	--	9.2	--	5.8	4.3
		10/20/2010				--	--	5.1	--	7.7	--	--	--	--	1.8	--	--	--	--	3.4	6.5
		2/17/2011				2.8	11.6	5.2	4.2	3.2	2.8	3.3	9.8	6.0	2.5	6.1	5.9	2.2	3.3	2.0	9.5
		6/14/2011				1.4	2.2	3.3	3.4	3.9	1.7	1.8	2.6	5.3	1.7	6.3	--	--	14.5	2.8	3.3
Specific Conductivity	µmhos/cm	4/12/2010	--	--	--	--	--	468	--	--	--	--	212	346	8,050	422	341	5,160	9,710	9,220	236
		5/27/2010				494	335	--	414	11,400	494	526	414	2,430	9,810	711	--	3,860	--	14,200	774
		10/20/2010				--	--	19,100	--	12,100	--	--	--	--	30,100	--	--	--	--	17,400	22,200
		2/17/2011				485	216	6,350	450	653	492	498	205	880	8,800	1,080	404	269	1,530	2,300	364
		6/14/2011				550	444	16,200	537	9,360	543	592	588	2,380	8,990	1,400	--	--	17,000	14,900	2,640

Table 3-2
Summary of Chemical Analyses Results
2010/2011 Surface Water Sampling
Mount Diablo Mercury Mine
Contra Costa County, California

			Water Quality Criteria[a]			Sample Location															
				Human Health for Consumption of		Background		Springs			My Creek Runoff		Mid-Dunn Creek	Ponds			Surface Water Runoff				Downstream
						My Creek	Dunn Creek	Park	Ore House	Adit	Pond	Weir		Upper	Lower	Middle	Bradley Tailings Piles			Adit Spring	Dunn Creek
Parameter	**Unit**	**Date**	**Freshwater**	**Water + Organism**	**Organism Only**	**SW-12**	**SW-16**	**SW-04**	**SW-14**	**SW-15**	**SW-11**	**SW-13**	**SW-08**	**SW-06**	**SW-09**	**SW-10**	**SW-01**	**SW-02**	**SW-03**	**SW-05**	**SW-07**
Solids, Total Dissolved (TDS)	mg/L	4/12/2010	250	--	--	--	--	**291**	--	--	--	--	199	242	**6,120**	**267**	224	**4,450**	**16,000**	**6,790**	210
		5/27/2010				**261**	190	--	**276**	**9,110**	**273**	**301**	231	**2,000**	**7,800**	**447**	--	**3,060**	--	**9,980**	**465**
		10/20/2010				**--**	--	**12,200**	**--**	**11,100**	**--**	**--**	--	**--**	**20,700**	**--**	--	**--**	--	**11,900**	**14,700**
		2/17/2011				**261**	173	**4,090**	**292**	**374**	**267**	**274**	205	**611**	**6,630**	**714**	**270**	111	**1,070**	**1,590**	**250**
		6/14/2011				**281**	238	**10,900**	**343**	**8,570**	**293**	**356**	**319**	**1,970**	**7,880**	**945**	--	**--**	**28,500**	**12,100**	**1,730**
Turbidity	NTU	4/12/2010	--	--	--	--	--	49	--	--	--	--	190	180	14	125	13	7.7	84	127	178
		5/27/2010				1.5	46	--	5.6	2,650	2.7	3.0	27	1.0	19	7.1	--	261	--	298	13
		10/20/2010				--	--	<0.50	--	4,820	--	--	--	--	32	--	--	--	--	204	24
		2/17/2011				9.4	281	2.6	7.2	97.5	6.1	5.6	293	94.8	166	6.9	6.4	28.7	8.7	9.2	229
		6/14/2011				1.9	1.6	5.2	6.8	11.3	5.3	3.5	1.5	12.3	13.5	4.7	--	--	8.5	10.1	3.4
Hardness, Total as CaCO3	mg/L	4/12/2010	--	--	--	--	--	148	--	--	--	--	106	151	2,340	151	103	1,170	2,010	2,770	106
		5/27/2010				223	153	--	141	3,230	231	240	185	1,140	3,010	290	--	1,000	--	3,620	281
		10/20/2010				--	--	3,620	--	3,870	--	--	--	--	9,650	--	--	--	--	6,340	6,350
		2/17/2011				225	112	1,210	167	163	230	231	155	355	2,230	368	305	61.5	199	839	143
		6/14/2011				237	191	2,620	199	2,860	232	262	252	964	2,640	547	--	--	3,830	3,960	735
Silica, Dissolved (SiO2)	mg/L	4/12/2010	--	--	--	--	--	24.8	--	--	--	--	56.3	52	28	28.9	8.8	64	79.8	25.2	42.6
		5/27/2010				16.7	17.4	--	32.3	82.4	16.7	16.5	14.2	55	35.3	17	--	29.1	--	27.4	12.7
		10/20/2010				--	--	35.1	--	98.8	--	--	--	--	41.7	--	--	--	--	25.7	16.4
		2/17/2011				19.9	106	25.9	35.1	45.8	16.8	16.1	153	40.0	22.7	19.5	173	51.3	51.8	113	60.3
		6/14/2011				19.3	14.2	65.5	34.4	91.5	20.5	19.3	14.8	63.5	41.7	11.9	--	--	131	60.7	12.9
Chloride (Cl)	mg/L	4/12/2010	230	--	--	--	--	35.3	--	--	--	--	4.5	8.8	**1,220**	18.7	1.1	163	53.5	**1,490**	6.5
		5/27/2010				9.6	6.2	--	14.8	**1,570**	9.7	10.2	10.8	102	**1,750**	27.5	--	**333**	--	**2,370**	54
		10/20/2010				--	--	**2,890**	--	**1,220**	--	--	--	--	**4,980**	--	--	--	--	**2,700**	**3,770**
		2/17/2011				9.7	4.5	**1,100**	11.6	41.1	9.4	10.5	6.1	41.5	**1,460**	70.1	2	6.6	6.1	201	20.7
		6/14/2011				15.4	12.2	**2,970**	20.3	**1,010**	16.5	16.1	23.1	130	**1,310**	96	--	--	72.6	**2,620**	**335**
Bromide (Br)	mg/L	4/12/2010	--	--	--	--	--	<0.20	--	--	--	--	<0.20	<0.20	4.6	<0.20	<0.20	0.54	<0.40	5.7	<0.20
		5/27/2010				4.7	<0.20	--	<0.20	5.5	<0.20	<0.20	<0.20	0.38	5.9	<0.20	--	0.92	--	8.7	<0.20
		10/20/2010				--	--	10.5	--	4.3	--	--	--	--	17.8	--	--	--	--	9.7	12.4
		2/17/2011				<0.20	<0.20	3.4	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	5.0	0.21	<0.20	<0.20	<0.20	0.77	<0.20
		6/14/2011				<0.20	<0.20	9.9	<0.40	3.7	<0.40	<0.20	<0.20	<1.0	4.7	0.4	--	--	<2.0	9.6	1.1
Nitrogen, Nitrate (NO3)	mg/L	4/12/2010	--	10	--	--	--	0.56	--	--	--	--	0.18	0.48	1.8	<0.10	<0.10	1.6	<0.20	4.2	0.26
		5/27/2010				<0.10	0.23	--	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	1.8	<0.10	--	1.3	--	5.7	<0.10
		10/20/2010				--	--	*10.7*	--	<0.50	--	--	--	--	4.1	--	--	--	--	4.7	<0.50
		2/17/2011				<0.10	1.2	*10.9*	<0.10	<0.10	<0.10	<0.10	1.2	0.16	2.0	<0.10	0.40	<0.10	<0.10	1.3	1.2
		6/14/2011				<0.10	<0.10	4.1	<0.10	0.54	<0.10	<0.10	<0.10	<0.10	1.5	<0.10	--	--	1.3	1.8	0.7
Sulfate (SO4)	mg/L	4/12/2010	--	--	--	--	--	68.3	--	--	--	--	11.9	134	6,620	148	191	4,570	13,400	3,040	18.4
		5/27/2010				29.5	19.3	--	136	5,340	31.4	39.2	32.4	1,610	4,310	101	--	3,450	--	3,840	123
		10/20/2010				--	--	3,170	--	6,170	--	--	--	--	7,890	--	--	--	--	3,540	5,260
		2/17/2011				27.6	6.7	1,240	133	245	30.4	37.7	11.7	346	3,260	312	159	86.8	1,020	767	63.3
		6/14/2011				39.8	27.6	3,050	166	4,320	39.4	49.5	54.2	1,750	3,310	381	--	--	39,800	4,290	598
Antimony (Sb)	µg/L	4/12/2010	--	5.6	640	--	--	*<10*	--	--	--	--	*<10*	*61.5*	*<10*	*35.4*	*10.1*	*19.3*	*112*	*<10*	*<10*
		5/27/2010				*<10*	*<10*	--	*<10*	*62*	*<10*	*10.4*	*<10*	*<10*	*<10*	*<10*	--	*21.9*	--	*12*	*<10*
		10/20/2010				--	--	*<30*	--	*<150*	--	--	--	--	*<30*	--	--	--	--	*<30*	*<30*
		2/17/2011				*<30*	*<30*	*<30*	*<30*	*217*	*<30*	*<30*	*<30*	*55*	*<30*	*<30*	*<30*	*75.1*	*85.6*	*184*	*<30*
		6/14/2011				*<6.0*	*<6.0*	*<6.0*	*<6.0*	*<60*	*<6.0*	*<6.0*	*<6.0*	*24.6*	*<6.0*	*<6.0*	--	--	*<600*	*<60*	*<6.0*
Arsenic (As)	µg/L	4/12/2010	150	0.018	0.14	--	--	*<10*	--	--	--	--	*<10*	*53.2*	*<10*	*23.8*	*<10*	*119*	***530***	*<50*	*<10*
		5/27/2010				*<10*	*<10*	--	*<10*	***182***	*<10*	*<10*	*<10*	*<10*	*<10*	*<10*	--	*47.6*	--	*<10*	*<10*
		10/20/2010				--	--	*<30*	--	*<150*	--	--	--	--	*<30*	--	--	--	--	*<30*	*<30*
		2/17/2011				*<30*	*<30*	*<30*	*<30*	***164***	*<30*	*<30*	*<30*	*35.0*	*<30*	*<30*	*<30*	*81.0*	***162***	***282***	*<30*
		6/14/2011				*<10*	*<10*	*<10*	*<10*	*19*	*<10*	*<10*	*<10*	*12.6*	*<10*	*<10*	--	--	***1,570***	*31.5*	*<10*

Table 3-2
Summary of Chemical Analyses Results
2010/2011 Surface Water Sampling
Mount Diablo Mercury Mine
Contra Costa County, California

			Water Quality Criteria[a]			Sample Location															
				Human Health for Consumption of		Background		Springs			My Creek Runoff		Mid-Dunn Creek	Ponds			Surface Water Runoff				Downstream
						My Creek	Dunn Creek	Park	Ore House	Adit	Pond	Weir		Upper	Lower	Middle	Bradley Tailings Piles			Adit Spring	Dunn Creek
Parameter	**Unit**	**Date**	**Freshwater**	**Water + Organism**	**Organism Only**	**SW-12**	**SW-16**	**SW-04**	**SW-14**	**SW-15**	**SW-11**	**SW-13**	**SW-08**	**SW-06**	**SW-09**	**SW-10**	**SW-01**	**SW-02**	**SW-03**	**SW-05**	**SW-07**
Beryllium (Be)	µg/L	4/12/2010	--	--	--	--	--	<5.0	--	--	--	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	8.3	<5.0	<5.0
		5/27/2010				<5.0	<5.0	--	<5.0	5.2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--	<5.0	--	<5.0	<5.0
		10/20/2010				--	--	<5.0	--	<25	--	--	--	--	<5.0	--	--	--	--	<5.0	<5.0
		2/17/2011				<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
		6/14/2011				<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--	--	23.9	<5.0	<5.0
Boron (B)	µg/L	4/12/2010	--	--	--	--	--	2,680	--	--	--	--	226	712	73,500	1,350	72	13,900	2,660	98,700	304
		5/27/2010				941	171	--	761	98,900	971	953	486	8,660	86,800	1,920	--	18,000	--	139,000	3,120
		10/20/2010				--	--		--		--	--	--	--		--	--	--	--		
		2/17/2011				1,020	<200	66,300	806	2,550	1,000	964	183	2,640	75,200	4,870	108	505	296	20,900	1,020
		6/14/2011				1,190	268	183,000	849	65,000	1,220	1,270	913	8,780	79,000	6,460	--	--	4,500	170,000	20,000
Cadmium (Cd)	µg/L	4/12/2010	0.25	--	--	--	--	**<2.0**	--	--	--	--	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<6.0**	**<2.0**	**<2.0**
		5/27/2010				**<2.0**	**<2.0**	--	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	--	**<2.0**	--	**<2.0**	**<2.0**
		10/20/2010				--	--	**<2.0**	--	**10.5**	--	--	--	--	**4**	--	--	--	--	**<2.0**	**<2.0**
		2/17/2011				**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<3.0**	**<20**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<20**	**<2.0**
		6/14/2011				**<2.0**	**<2.0**	**<10**	**<2.0**	**<20**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<10**	**<2.0**	--	--	**<100**	**<20**	**<2.0**
Calcium (Ca)	µg/L	4/12/2010	--	--	--	--	--	23,600	--	--	--	--	21,700	18,800	319,000	20,200	18,700	130,000	124,000	449,000	22,100
		5/27/2010				47,100	38,200	--	22,800	357,000	48,300	49,700	41,400	133,000	409,000	55,900	--	178,000	--	549,000	52,000
		10/20/2010				--	--	250,000	--	372,000	--	--	--	--	763,000	--	--	--	--	792,000.0	401,000
		2/17/2011				47,700	20,000	150,000	27,700	23,000	48,300	48,000	24,800	43,200	273,000	53,900	51,900	10,900	16,300	207,000	25,600
		6/14/2011				49,500	48,400	309,000	36,600	312,000	47,100	52,800	54,700	114,000	386,000	85,900	--	--	239,000	614,000	113,000
Chromium (Cr)	µg/L	4/12/2010	74	--	--	--	--	18	--	--	--	--	31	53	26	25	12	**770**	**2,790**	11	22
		5/27/2010				<5.0	<5.0	--	<5.0	**240**	<5.0	<5.0	<5.0	<5.0	19	<5.0	--	**309**	--	28	<5.0
		10/20/2010				--	--	<5.0	--	**91**	--	--	--	--	<5.0	--	--	--	--	5	<5.0
		2/17/2011				<5.0	62.3	<5.0	<5.0	**156**	<5.0	<5.0	**107**	34.8	44.5	<5.0	**188**	**132**	**364**	**266**	28.5
		6/14/2011				<10	<10	<10	<10	65.4	<10	<10	<10	<10	53	<10	--	--	**6,900**	**99.3**	<10
Copper (Cu)	µg/L	4/12/2010	--	1300	--	--	--	6.9	--	--	--	--	33.6	33	50	15.6	12	235	632	21.6	22.8
		5/27/2010				<5.0	5.1	--	6.4	101	<5.0	<5.0	<5.0	34.2	43.2	<5.0	--	94.3	--	27.6	<5.0
		10/20/2010				--	--	<5.0	--	66.5	--	--	--	--	38.6	--	--	--	--	<5.0	<5.0
		2/17/2011				<5.0	78.5	<5.0	<5.0	36.4	<5.0	<5.0	129	26.0	36.2	<5.0	156	45.8	95.7	88.7	34.8
		6/14/2011				<10	<10	<10	<10	55.1	<10	<10	<10	42.2	77	<10	--	--	*1,470*	43.3	<10
Iron (Fe)	µg/L	4/12/2010	1000	--	--	--	--	**6,840**	--	--	--	--	**19,500**	**22,800**	**13,400**	**9,830**	**2,140**	**392,000**	**1,600,000**	**18,300**	**13,200**
		5/27/2010				<50	**2,260**	--	987	**411,000**	70	89.4	732	272	**11,100**	**1,330**	--	**83,800**	--	**22,900**	665
		10/20/2010				--	--	<250	--	**1,090,000**	--	--	--	--	**5,350**	--	--	--	--	**32,300**	**6,210**
		2/17/2011				**1,040**	**42,900**	**4,060**	679	**73,600**	321	304	**75,200**	**12,100**	**21,700**	**1,140**	**116,000**	**53,900**	**189,000**	**233,000**	**22,400**
		6/14/2011				<200	<200	**5,390**	**1,190**	**257,000**	595	<200	<200	**3,460**	**17,300**	**2,060**	--	--	**3,350,000**	**103,000**	**1,050**
Lead (Pb)	µg/L	4/12/2010	2.5	--	--	--	--	**<5.0**	--	--	--	--	**5.8**	**6.8**	**<5.0**	**<5.0**	**<5.0**	**<10**	**<20**	**<25**	**<5.0**
		5/27/2010				**<5.0**	**<5.0**	--	**<5.0**	**13.4**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	--	**7.6**	--	**<5.0**	**<5.0**
		10/20/2010				--	--	**<10**	--	**<50**	--	--	--	--	**<50**	--	--	--	--	**<10**	**<10**
		2/17/2011				**<10**	**13.0**	**<10**	**<10**	**<10**	**<10**	**<10**	**26.7**	**<10**	**<10**	**<10**	**46.5**	**<10**	**16.5**	**15.6**	**<10**
		6/14/2011				**<10**	**<10**	**<10**	**<10**	**10.8**	**<10**	**<10**	**<10**	**<10**	**<10**	**<10**	--	--	**64.5**	**<10**	**<10**
Magnesium (Mg)	µg/L	4/12/2010	--	--	--	--	--	21,700	--	--	--	--	12,500	25,300	374,000	24,500	13,700	205,000	414,000	400,000	12,300
		5/27/2010				25,700	13,900	--	20,400	567,000	26,900	28,200	19,800	195,000	482,000	36,500	--	136,000	--	546,000	36,700
		10/20/2010				--	--	727,000	--	715,000	--	--	--	--	1,880,000	--	--	--	--	1,060,000	1,300,000
		2/17/2011				25,600	15,000	203,000	23,800	25,700	26,500	27,100	22,600	59,900	377,000	56,700	42,600	8,320	38,500	78,200	19,100
		6/14/2011				27,600	17,100	450,000	26,100	506,000	27,700	31,600	28,100	165,000	408,000	80,800	--	--	786,000	589,000	110,000
Manganese (Mn)	µg/L	4/12/2010	--	--	100	--	--	80	--	--	--	--	*388*	*648*	*5,930*	*554*	*584*	*5,720*	*13,000*	*6,350*	*280*
		5/27/2010				<5.0	90	--	*194*	*16,000*	12	5.8	71	*3,410*	*6,950*	*623*	--	*3,410*	--	*6,240*	*381*
		10/20/2010				--	--	94	--	*24,100*	--	--	--	--	*14,000*	--	--	--	--	*3,770*	*10,400*
		2/17/2011				19.6	*1,150*	*350*	*151*	*921*	12.7	14.8	*2,030*	*1,190*	*5,640*	*434*	*2,310*	*262*	*1,170*	*2,150*	*694*
		6/14/2011				<15	19.4	*2,150*	*221*	*19,500*	42.5	<15	*104*	*3,700*	*8,630*	*226*	--	--	*25,400*	*6,900*	*1,570*

Table 3-2
Summary of Chemical Analyses Results
2010/2011 Surface Water Sampling
Mount Diablo Mercury Mine
Contra Costa County, California

			Water Quality Criteria[a]			Sample Location															
						Background		Springs			My Creek Runoff		Mid-Dunn Creek	Ponds			Surface Water Runoff				Downstream
				Human Health for Consumption of		My Creek	Dunn Creek	Park	Ore House	Adit	Pond	Weir		Upper	Lower	Middle	Bradley Tailings Piles			Adit Spring	Dunn Creek
Parameter	Unit	Date	Freshwater	Water + Organism	Organism Only	SW-12	SW-16	SW-04	SW-14	SW-15	SW-11	SW-13	SW-08	SW-06	SW-09	SW-10	SW-01	SW-02	SW-03	SW-05	SW-07
Nickel (Ni)	µg/L	4/12/2010	52	610	4600	--	--	**165**	--	--	--	--	44.7	***1,590***	***11,800***	***1,460***	***1,320***	***23,900***	***73,400***	***8,760***	**81.8**
		5/27/2010				<5.0	<5.0	--	**587**	***25,000***	<5.0	6.2	9.5	***16,600***	***16,000***	**263**	--	***11,000***	--	***9,060***	**345**
		10/20/2010				--	--	**349**	--	***37,700***	--	--	--	--	***23,900***	--	--	--	--	***4,650***	***635***
		2/17/2011				7.4	**62.5**	**387**	**524**	***1,530***	<5.0	7.7	**154**	***4,240***	***11,100***	***2,420***	***1,120***	**539**	***6,460***	***6,980***	**315**
		6/14/2011				<5.0	<5.0	***634***	**392**	***28,200***	<5.0	8.1	8.6	***11,700***	***17,900***	**279**	--	--	***165,000***	***12,500***	***986***
Potassium (K)	µg/L	4/12/2010	--	--	--	--	--	4,120	--	--	--	--	4,170	4,890	36,000	3,860	1,850	8,680	2,730	43,500	3,720
		5/27/2010				717	1,800	--	2,080	53,300	808	898	1,560	10,900	47,000	2,120	--	14,500	--	68,300	3,140
		10/20/2010				--	--	117,000	--	88,300	--	--	--	--	154,000	--	--	--	--	95,300	73,200
		2/17/2011				1,030	8,530	43,400	2,320	9,070	827	965	11,400	6,690	43,300	4,850	14,600	9,120	6,990	19,600	7,630
		6/14/2011				<10,000	<10,000	99,700	<10,000	32,600	<10,000	<10,000	<10,000	11,300	41,200	<10,000	--	--	<20,000	79,700	10,300
Selenium (Se)	µg/L	4/12/2010	5.0	170	4200	--	--	**<20**	--	--	--	--	**<20**	**<20**	**<20**	**<20**	**<20**	**<20**	**<60**	**<20**	**<20**
		5/27/2010				**<20**	**<20**	--	**<20**	**<40**	**<20**	**<20**	**<20**	**<20**	**<20**	**<20**	--	**<20**	--	**<20**	**<20**
		10/20/2010				--	--	**<30**	--	**<150**	--	--	--	--	**<30**	--	--	--	--	**<30**	**<30**
		2/17/2011				**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**	**<30**
		6/14/2011				**<10**	**<10**	**<10**	**<10**	**<10**	**<10**	**<10**	**<10**	**<10**	**<10**	**<10**	--	--	**<100**	**<10**	**<10**
Silicon (Si)	µg/L	4/12/2010	--	--	--	--	--	11,600	--	--	--	--	26,300	24,300	13,100	13,500	4,120	29,900	37,300	11,800	19,900
		5/27/2010				7,830	8,130	--	15,100	38,500	7,790	7,720	6,620	25,700	16,500	7,960	--	13,600	--	12,800	5,930
		10/20/2010				--	--	16,400	--	46,200	--	--	--	--	19,500	--	--	--	--	12,000	7,660
		2/17/2011				9,290	49,500	12,100	16,400	21,400	7,850	7,520	71,500	18,700	10,600	9,120	80,800	24,000	24,200	52,700	28,200
		6/14/2011				9,030	6,660	30,600	16,100	42,800	9,570	9,040	6,930	29,700	19,500	5,580	--	--	61,100	28,400	6,010
Silver (Ag)	µg/L	4/12/2010	--	--	--	--	--	<5.0	--	--	--	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<15	<5.0	<5.0
		5/27/2010				<5.0	<5.0	--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--	<5.0	--	<5.0	<5.0
		10/20/2010				--	--	<5.0	--	<25	--	--	--	--	<25	--	--	--	--	<25	<5.0
		2/17/2011				<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
		6/14/2011				<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--	--	104	<5.0	<5.0
Sodium (Na)	µg/L	4/12/2010	--	--	--	--	--	37,600	--	--	--	--	8,110	11,400	969,000	19,200	1,670	186,000	34,600	1,190,000	9,320
		5/27/2010				17,400	10,700	--	20,900	1,290,000	18,000	18,200	16,100	134,000	1,260,000	37,300	--	251,000	--	1,760,000	56,000
		10/20/2010				--	--	3,100,000	--	1,120,000	--	--	--	--	4,070,000	--	--	--	--	5,220,000	2,990,000
		2/17/2011				18,600	7,150	961,000	22,100	36,000	18,700	18,300	9,120	44,700	1,040,000	76,600	9,630	9,300	8,280	212,000	23,000
		6/14/2011				22,000	16,700	2,360,000	27,100	888,000	22,200	23,900	24,900	138,000	833,000	85,100	--	--	58,400	1,860,000	247,000
Thallium (Tl)	µg/L	4/12/2010	--	0.24	0.47	--	--	*<20*	--	--	--	--	*<20*	*<20*	*<20*	*<20*	*<20*	*<20*	*<60*	*<20*	*<20*
		5/27/2010				*<20*	*<20*	--	*<20*	*<20*	*<20*	*<20*	*<20*	*<20*	*<20*	*<20*	--	*<20*	--	*<20*	*<20*
		10/20/2010				--	--	*<30*	--	*<150*	--	--	--	--	*<150*	--	--	--	--	*<30*	*<3000*
		2/17/2011				*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*	*<30*
		6/14/2011				*<10*	*<10*	*<10*	*<10*	*<10*	*<10*	*<10*	*<10*	*<10*	*<10*	*<10*	--	--	*<500*	*<10*	*<10*
Zinc (Zn)	µg/L	4/12/2010	120	7400	26000	--	--	<10	--	--	--	--	48.7	78.1	**335**	52.1	28.2	**646**	**2,160**	**205**	33.9
		5/27/2010				<10	10.6	--	13.8	**1,180**	<10	<10	<10	**245**	**368**	<10	--	**276**	--	**180**	<10
		10/20/2010				--	--	<10	--	**1,440**	--	--	--	--	**682**	--	--	--	--	60.8	<10
		2/17/2011				<10	**126**	<10	15.4	87.5	<10	<10	**221**	**122**	**307**	25.1	**293**	36.8	**196**	**406**	69.8
		6/14/2011				<20	<20	<20	<20	**975**	<20	<20	<20	**285**	**499**	<20	--	--	**4,640**	**489**	<20

Notes:

Italic font indicates value is above the water quality criteria for human health for consumption of "water + organism" or "organism only".

Bold and font indicates value is above the water quality criteria for freshwater .

µg/L = microgram per liter. µmho/cm = micromhos per centimeter.

su = standard units NTU = nephelometric turbidity unit.

ng/L = nanogram per liter.

mg/L = milligram per liter.

a Values represent the lesser of the water quality criteria available from CRWQCB (2008b) and USEPA (2009).

b Value from CRWQCB – San Francisco Bay water quality criteria for methyl mercury in freshwater (CRWQCB, 2008a). Values were not available from CRWQCB (2008b) and USEPA (2009).

References:

CRWQCB. 2008a. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. Interim Final. May.

CRWQCB. 2008b. Central Valley Regional Water Quality Control Board, A Compilation of Water Quality Goals. July.

USEPA. 2009. National Recommended Water Quality Criteria. Office of Water. Office of Science and Technology.

Table 3-3
Monitoring Well Construction Details
Mount Diablo Mercury Mine
Contra Costa County, California

Well	Construction Date	Development Date	Survey Data[1]			Construction Details[2]		
			Northing	Easting	Top of Casing Elevation	Total Depth	Screen Interval	Top of Filter Pack
DMEA-1	5/6/2011	5/24/2011	2153804.33	6164062.04	331.50	275	240-265	NA
ADIT-1	5/5/2011	5/24/2011	2153602.60	6164086.06	332.02	85	65-80	56

Notes:

Wells were constructed of 4 - inch schedule 40 (ADIT-1) or schedule 80 (DMEA-1) PVC.
1 Elevations are in feet above mean sea level (msl).
2 Depths in feet below ground surface (bgs).

Table 3-4
Summary of Chemical Analyses Results-Monitoring Well Sampling
Mt. Diablo Mercury Mine
Contra Costa County, California

		Well ID	Water Quality Criteria[a]			ADIT-1	DMEA-1
			Freshwater	Human Health for Consumption of			
				Water + Organism	Organism Only		
Mercury_total (Hg)	ug/l	6/15/2011	0.91	0.05	0.051	22.7	<0.20
		7/21/2011				7.4	<0.20
Mercury_Dissolved (Hg)	ug/l	6/15/2011	0.77	0.05	0.051	<0.20	<0.20
		7/21/2011				<0.20	<0.20
Methyl Mercury	ng/l	6/15/2011	3[b]	0.3 mg/kg	0.3 mg/kg	0.35	<0.05
		7/21/2011		(fish tissue)	(fish tissue)	0.70	<0.05
pH	su	6/15/2011	6.5 - 9.0	5.0 - 9.0	--	5.47	4.63
		7/21/2011				6.19	6.74
Alkalinity, Bicarbonate	mg/l	6/15/2011	--	--	--	<5.0	<5.0
		7/21/2011				64.0	776
Alkalinity, Carbonate (CO3)	mg/l	6/15/2011	--	--	--	<5.0	<5.0
		7/21/2011				<5.0	<5.0
Alkalinity, Total as CaCO3	mg/l	6/15/2011	20	--	--	<5.0	<5.0
		7/21/2011				64.0	776
Fluoride	mg/l	6/15/2011	--	--	--	1.4	0.81
		7/21/2011				0.76	0.76
Dissolved Organic Carbon	mg/l	6/15/2011	--	--	--	2.8	1.4
		7/21/2011				2.4	1.4
Specific Conductivity	umhos/cm	6/15/2011	--	--	--	11,600	13,500
		7/21/2011				13,500	13,600
Solids, Total Dissolved (TDS)	mg/l	6/15/2011	250	--	--	12,600	9,960
		7/21/2011				12,700	8,320
Turbidity	NTU	6/15/2011	--	--	--	108	36.4
		7/21/2011				95.5	76.5
Hardness, Total as CaCO3	mg/l	6/15/2011	--	--	--	3,000	1,550
		7/21/2011				2,950	1,930
Silica, Dissolved (SiO2)	mg/l	6/15/2011	--	--	--	237	11
		7/21/2011				13.0	39.1
Chloride (Cl)	mg/l	6/15/2011	230	--	--	1,530	2,130
		7/21/2011				912	2,920
Bromide (Br)	mg/l	6/15/2011	--	--	--	2.4	7.5
		7/21/2011				3.3	10
Nitrogen, Nitrate (NO3)	mg/l	6/15/2011	--	10	--	<0.50	<0.50
		7/21/2011				<0.50	<0.50
Sulfate (SO4)	mg/l	6/15/2011	--	--	--	6,990	7,490
		7/21/2011				7,920	1,620
Antimony (Sb)	ug/l	6/15/2011	--	5.6	640	206	<12
		7/21/2011				<30	<18
Arsenic (As)	ug/l	6/15/2011	150	0.018	0.14	1,720	1,570
		7/21/2011				1,440	416
Dissolved Arsenic (As)	ug/l	6/15/2011	150	0.018	0.14	457	387
		7/21/2011				312	29.2
Beryllium (Be)	ug/l	6/15/2011	--	--	--	<25	<10
		7/21/2011				<25	<15
Boron (B)	ug/l	6/15/2011	--	--	--	89,000	143,000
		7/21/2011				99,200	169,000
Cadmium (Cd)	ug/l	6/15/2011	0.25	--	--	<40	<100
		7/21/2011				<10	33.7

Table 3-4
Summary of Chemical Analyses Results-Monitoring Well Sampling
Mt. Diablo Mercury Mine
Contra Costa County, California

		Well ID	Water Quality Criteria[a]			ADIT-1	DMEA-1
			Freshwater	Human Health for Consumption of			
				Water + Organism	Organism Only		
Calcium (Ca)	ug/l	6/15/2011	--	--	--	385,000	180,000
		7/21/2011				380,000	141,000
Chromium (Cr)	ug/l	6/15/2011	74	--	--	619	611
		7/21/2011				139	149
Copper (Cu)	ug/l	6/15/2011	--	1300	--	<50	<100
		7/21/2011				<100	<30
Iron (Fe)	ug/l	6/15/2011	1000	--	--	2,000,000	1,990,000
		7/21/2011				1,780,000	265,000
Lead (Pb)	ug/l	6/15/2011	2.5	--	--	<50	40.7
		7/21/2011				<50	30.4
Magnesium (Mg)	ug/l	6/15/2011	--	--	--	496,000	267,000
		7/21/2011				487,000	196,000
Manganese (Mn)	ug/l	6/15/2011	--	--	100	17,000	18,200
		7/21/2011				15,700	2,940
Nickel (Ni)	ug/l	6/15/2011	52	610	4600	33,000	31,300
		7/21/2011				23,600	9,640
Potassium (K)	ug/l	6/15/2011	--	--	--	<50,000	44,300
		7/21/2011				50,800	89,200
Selenium (Se)	ug/l	6/15/2011	5.0	170	4200	<50	<100
		7/21/2011				<50	<30
Silicon (Si)	ug/l	6/15/2011	--	--	--	5,690	5,150
		7/21/2011				6,100	6,090
Silver (Ag)	ug/l	6/15/2011	--	--	--	<100	<250
		7/21/2011				<130	<15
Sodium (Na)	ug/l	6/15/2011	--	--	--	677,000	662,000
		7/21/2011				814,000	2,170,000
Thallium (Tl)	ug/l	6/15/2011	--	0.24	0.47	<50	<20
		7/21/2011				<50	<30
Zinc (Zn)	ug/l	6/15/2011	120	7400	26000	680	1430
		7/21/2011				447	303

Notes:

[a] Values represent the lesser of the water quality criteria available from CRWQCB (2008b) and USEPA (2009).

[b] Value from CRWQCB – San Francisco Bay water quality criteria for methyl mercury in freshwater (CRWQCB, 2008a). Values were not available from CRWQCB (2008b) and USEPA (2009).

µg/L = microgram per liter.
su = standard units
ng/L = nanogram per liter.
mg/L = milligram per liter.
µmho/cm = micromhos per centimeter.
NTU = nephelometric turbidity unit.

References:

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USEPA. 2009. National Recommended Water Quality Criteria. Office of Water. Office of Science and Technology.

APPENDIX A

LABORATORY ANALYTICAL REPORTS

(PROVIDED IN ELECTRONIC FORMAT)

APPENDIX B

BORING/WELL LOGS

THE SOURCE GROUP, INC.

SGI environmental

BORING/WELL ID: **ADIT-1**

PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA		**Project No.:** 01-SUN-055
BORING LOCATION (AT SITE):			**Logged By:** Kristene Tidwell
CONTRACTOR AND EQUIPMENT:	Boart Longyear		
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE:	5/5/11	**FINISH DATE:**	5/6/11
FIRST WATER (BGS):	65'	**STABILIZED WATER LEVEL:**	65'
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	85'	**BORING DIAMETER/DEPTH:**	8" - 85'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED	Well construction details
			100	0		Weathered muddy sand, grey with red mottling. Mixture of sand, silt, gravel, clay; dry.	
			100	2			
			100	4			
			100	6			
			100	8		Color change to dark grey.	Cement
			100	10			
			100	12			
			100	14			
			100	16		Dark grey, mudstone mixd with large chunks of silica carbonate.	
			100	18			
			100	20		Grey mudstone with pieces of silica carbonate.	
			100	22			
			100	24			
			100	26		No silica carbonate.	
			100	28			
			100	30			
			100	32			
			100	34			
			100	36		Weathered serpeninite, light grey in fine powder matrix.	
			100	38			
				40			

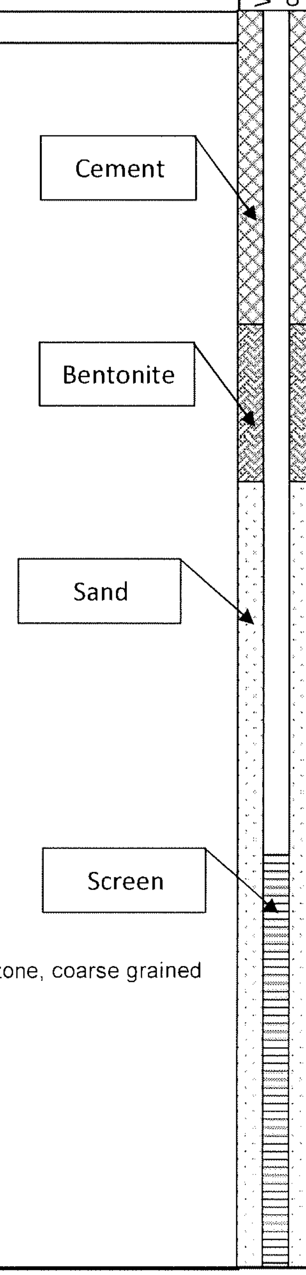
SGI environmental THE SOURCE GROUP, INC.

BORING/WELL ID: **ADIT-1**

PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA		**Project No.:** 01-SUN-055
BORING LOCATION (AT SITE):			**Logged By:** Kristene Tidwell
CONTRACTOR AND EQUIPMENT:	Boart Longyear		
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE:	5/5/11	**FINISH DATE:**	5/6/11
FIRST WATER (BGS):	65'	**STABILIZED WATER LEVEL:**	65'
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	85'	**BORING DIAMETER/DEPTH:**	8" - 85'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED
			100	40		Grey mudstone
			100	42		
			100	44		
			100	46		
			100	48		
			100	50		
			100	52		Some sheared pieces of serpeninite in mudstone matrix.
			100	54		Harder mudstone, possibly sheared.
			100	56		
			100	58		
			100	60		
			100	62		
	▼		100	64		Moist
			100	66		
			100	68		
			100	70		Rubble-muddy matrix with large cables composed of serpeninite, mudstone, coarse grained sand, large pieces of serpeninite with evidence of metacinnabar, wet.
			100	72		
			100	74		
			100	76		
			100	78		Sepeninite rock, somewhat broken up with mud.
				80		

Well construction details



SGI environmental **THE SOURCE GROUP, INC.**

BORING/WELL ID:	**ADIT-1**		
PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA	**Project No.:** 01-SUN-055	
BORING LOCATION (AT SITE):		**Logged By:** Kristene Tidwell	
CONTRACTOR AND EQUIPMENT:	Boart Longyear		
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE:	5/5/11	**FINISH DATE:**	5/6/11
FIRST WATER (BGS):	65'	**STABILIZED WATER LEVEL:**	65'
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	85'	**BORING DIAMETER/DEPTH:**	8" - 85'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED	Well construction details
			100	80		Sepeninite rock, somewhat broken up with mud.	Sand
			100	82			
			100	84			
						Bottom of Boring 85 feet	
				86			
				88			
				90			
				92			
				94			
				96			
				98			
				100			
				102			
				104			
				106			
				108			
				110			
				112			
				114			
				116			
				118			
				120			

THE SOURCE GROUP, INC.			BORING/WELL ID: DMEA-1
PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA		**Project No.:** 01-SUN-055
BORING LOCATION (AT SITE):			**Logged By:** Kristene Tidwell
CONTRACTOR AND EQUIPMENT:	Boart Longyear		
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE/ (TIME):	5/2/11 14:15	**FINISH DATE/ TIME**	5/5/11
FIRST WATER (BGS):		**STABILIZED WATER LEVEL:**	
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	275'	**BORING DIAMETER/DEPTH:**	8" - 275'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED	Well construction details
			100	0		Fill dirt from earthwork.	Cement
			100	2		Sitstone with sand with gravel, (15,65,5,15), reddish brown, dry, low plasticity, low to moderate permeability, angular to subangular gravel, highly weathered mudstone. Lesser clay content, more sand (0,50,35,15).	
			100	4			
			100	6			
			100	8			
			100	10		Slight moisture increase in gravel (0,50,15,55), increase in gravel size to 2" diameter, subangular gravel pieces.	
			100	12			
			100	14		Color change to greenish grey, increase in clay and silt, decrease of gravel and sand (20,60,5,15).	
			100	16		Reddish brown mottling, decrease in gravel and increase in Clay (25,60,5,10), decrease in gravel size, subrounded.	
			100	18		Greenish gray mottling.	
			100	20			
			100	22		Decrease in gravel size.	
			100	24			
			100	26		Color change to grey, mudstone, no gravel (10,80,10,0), dry.	
			100	28			
			100	30			
			100	32			
			100	34			
			100	36			
			100	38			
				40			

SGI environmental THE SOURCE GROUP, INC.			BORING/WELL ID: DMEA-1
PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA		**Project No.:** 01-SUN-055
BORING LOCATION (AT SITE):			**Logged By:** Kristene Tidwell
CONTRACTOR AND EQUIPMENT:	Boart Longyear		
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE/ (TIME):	5/2/11 14:15	**FINISH DATE/ TIME:**	5/5/11
FIRST WATER (BGS):		**STABILIZED WATER LEVEL:**	
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	275'	**BORING DIAMETER/DEPTH:**	8" - 275'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED	Well construction details
			100	40			
			100	42		Looser, less consolidated, dry, color change to greyish brown.	
			100	44			Cement
			100	46			
			100	48			
			100	50		Slight increase in clay, color change to grey.	
			100	52			
			100	54			
			100	56			
			100	58		Increase in sand and gravel in thin layers with moisture.	
			100	60			
			100	62		Dry, no sand/gravel, decrease in clay content.	
			100	64		Dry, no sand, remains grey mudstone.	
			100	66			
			100	68			
			100	70			
			100	72			
			100	74			
			100	76			
			100	78			
				80			

SGI environmental THE SOURCE GROUP, INC.			BORING/WELL ID: DMEA-1
PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA		**Project No.:** 01-SUN-055
BORING LOCATION (AT SITE):			**Logged By:** Kristene Tidwell
CONTRACTOR AND EQUIPMENT:	Boart Longyear		
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE/ (TIME):	5/2/11 14:15	**FINISH DATE/ TIME:**	5/5/11
FIRST WATER (BGS):		**STABILIZED WATER LEVEL:**	
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	275'	**BORING DIAMETER/DEPTH:**	8" - 275'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED	Well construction details
			0	80			
			0	82			
			0	84			Cement
			100	85			
			100	88			
			100	90			
			100	92		Intermittent sandy/gravel zones from 93 - 98'. Interbedded with mudstone, moist.	
	▼		100	94			
			100	96			
			100	98		Mudstone as before, grey.	
			100	100			
			100	102			
			100	104		Thin gravel layer, rounded to subrounded gravel up to 1mm, well sorted, appears dry. Mudstone as before. More competent.	
			100	106			
			100	108			
			100	110			
			100	112			
			100	114			
			100	116			
			100	118			
				120			

SGI environmental **THE SOURCE GROUP, INC.**

BORING/WELL ID:	**DMEA-1**		
PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA	**Project No.:** 01-SUN-055	
BORING LOCATION (AT SITE):		**Logged By:** Kristene Tidwell	
CONTRACTOR AND EQUIPMENT:	Boart Longyear		
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE/ (TIME):	5/2/11 14:15	**FINISH DATE/ TIME**	5/5/11
FIRST WATER (BGS):		**STABILIZED WATER LEVEL:**	
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	275'	**BORING DIAMETER/DEPTH:**	8" - 275'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED	Well construction details
			100	120		Mudstone as before.	Cement
			100	122			
			100	124			
			100	126			
			100	128			
			100	130			
			100	132			
			100	134			
			100	136			
			100	138			
			100	140			
			100	142			
			100	144			
			100	146			
			100	148			
			100	150			
			100	152			
			100	154			
			100	156			
			100	158			
				160			

SGI environmental **THE SOURCE GROUP, INC.**

		BORING/WELL ID: **DMEA-1**
PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA	**Project No.:** 01-SUN-055
BORING LOCATION (AT SITE):		**Logged By:** Kristene Tidwell
CONTRACTOR AND EQUIPMENT:	Boart Longyear	

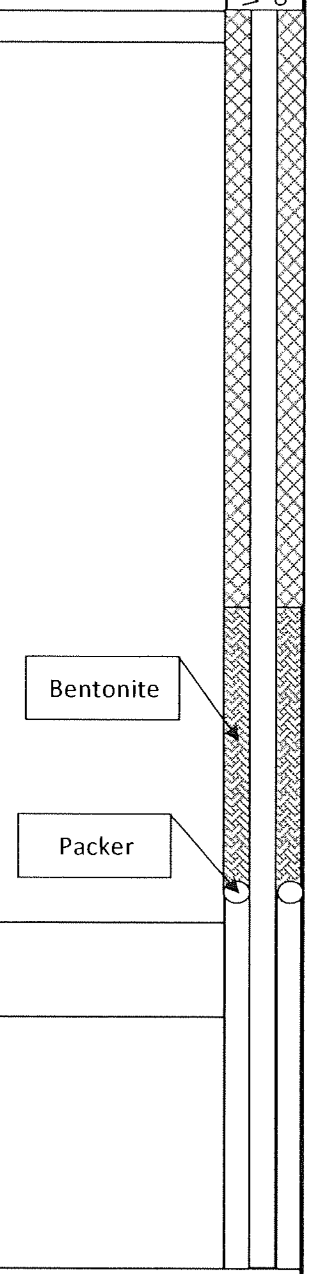
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE/ (TIME):	5/2/11 14:15	**FINISH DATE/ TIME**	5/5/11
FIRST WATER (BGS):		**STABILIZED WATER LEVEL:**	
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	275'	**BORING DIAMETER/DEPTH:**	8" - 275'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED	Well construction details
			100	160		Mudstone as before.	Cement
			100	162			
			100	164			
			100	166			
			100	170			
			100	170			
			100	172			
			100	174		Color change to brownish grey.	
			100	176			
			100	178			
			100	180		Color change to grey.	
			100	182			
			100	184			
			100	186			
			100	188		Transitional fault zone, pieces of silica carbonate, angular with muddy grey mudstone.	
			100	190		Silica carbonate, white/grey with green mineralization.	
			100	192			
			100	194		Same as above.	
			100	196			
			100	198			
				200			

THE SOURCE GROUP, INC.

BORING/WELL ID:	**DMEA-1**		
PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA	**Project No.:** 01-SUN-055	
BORING LOCATION (AT SITE):		**Logged By:** Kristene Tidwell	
CONTRACTOR AND EQUIPMENT:	Boart Longyear		
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE/ (TIME):	5/2/11 14:15	**FINISH DATE/ TIME**	5/5/11
FIRST WATER (BGS):		**STABILIZED WATER LEVEL:**	
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	275'	**BORING DIAMETER/DEPTH:**	8" - 275'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED	Well construction details
			100	200		Grey mudstone.	
			100	202			
			100	204			
			100	206			
			100	208			
			100	210			
			100	212			
			100	214			
			100	216			
			100	218			
			100	220			
			100	222			
			100	224			
			100	226			
			100	228		Medium to coarse sandstone.	
			100	230			
			100	232		Silica carbonate, same as 190', with mud stain at 233-240'.	
			100	234			
			100	236			
			100	238		Soft drilling at 240-244'.	
				240			



SGI environmental **THE SOURCE GROUP, INC.**

BORING/WELL ID:	**DMEA-1**		
PROJECT NAME AND ADDRESS:	Mt. Diablo Mine, 2430 Morgan Territory Road, Clayton, CA	**Project No.:** 01-SUN-055	
BORING LOCATION (AT SITE):		**Logged By:** Kristene Tidwell	
CONTRACTOR AND EQUIPMENT:	Boart Longyear		
SAMPLING METHOD:	Core Barrel	**MONITORING DEVICE:**	N/A
START DATE/ (TIME):	5/2/11 14:15	**FINISH DATE/ TIME**	5/5/11
FIRST WATER (BGS):		**STABILIZED WATER LEVEL:**	
SURFACE ELEVATION:		**CASING TOP ELEVATION:**	
TOTAL BORING DEPTH(S):	275'	**BORING DIAMETER/DEPTH:**	8" - 275'

Time	Water Level	Sample Interval	Recovery (%)	Depth (feet)	Stratigraphy	LITHOLOGIC DESCRIPTION (classification, color, moisture, density, grain size/plasticity, other) ALL PERCENTAGES ARE APPROXIMATE UNLESS OTHERWISE STATED	Well construction details
14:30			100	240		Dark grey, very weak at 240-246'.	
			0	242		Lost all curculation at 243'.	
			0	244			
			0	246		247-266' total 9' recovery.	
			0	248		Grey mud, sand gravel poorly sorted, appears very disturbed, perhaps cave in.	
			0	250		Gravel pieces and cobbles, rounded to angular, consisting of mudstone and some silica carbonate.	
			0	252			
			0	254			
			0	256			
			0	258			
			0	260			
			0	262			
			0	264			
			100	266		Fractured silica carbonate, hard.	
			100	268			
			100	270			
			100	272		Less fractured.	
			100	274			
				276		**Bottom of Boring 275 feet**	
				278			
				280			

APPENDIX C

FIELD DATA SHEETS

Groundwater Monitoring Well
Field Sampling Form

SGI environmental THE SOURCE GROUP, INC.

PROJECT NAME: ____________

PROJECT NO.: ____________

TASK NO.: ________

WELL ID: ADIT - 1

PURGE DATE: ~~<u>4</u>~~ 7/21/11

SAMPLE TIME: 1215

SAMPLE DATE: 7/21/11

PERSONNEL: ~~Deric Kalruz~~ Kristene Tidwell (circle)

INITIAL DTW (ft): 72.65

DEPTH TO BOTTOM (ft): ____________

WELL DIAM. (in): ____________

3 VOLUMES (gals): ____________

h*3*0.064 (1.25"); h*3*0.16 (2"); h*3*0.26 (2.5"); h*3*0.38 (3"); h*3*0.65 (4"); h*3*1.5 (6")

PURGE LOG:

(check units!)

DTW	Time (24 hr)	No. Gallons	pH	EC (us/cm)	Temp. (C)	Disolved Oxygen (mg/L)	REDOX ( )	Color	Turbidity	Other Observations
	1203	0	5.45	11518	24.15	~~0.~~1.29	-12.3	clr	42.1	
	1205	1	5.16	11403	23.40	0.81	-11.8	clr	34.8	
	1209	2	5.14	11695	23.41	0.99	-10.4	clr	39.2	
	1214	3	5.13	11058	23.43	0.98	-11.0	clr	40.8	

Total Gallons Purged: 3

Purging Method: (2" Submersible Pump) — 12 Volt Pump — Peristaltic Pump — Bailer

WELL SAMPLING:

DTW at Time of Sampling: 72.65

Sampling Method: 2" Submersible Pump — 12 Volt Pump — Peristaltic Pump — Bailer

SAMPLE ID: ADIT 1

QA/QC SAMPLING:

WAS QA/QC SAMPLE COLLECTED AFTER THIS WELL? YES / (NO)

IF SO, SAMPLE ID: ____________ TYPE: Rinsate Blank Duplicate Field Blank

PROPER DECON: Yes No

EQUIPMENT CALIBRATED: (Yes) No DRIFT: Yes No (If YES, comment below)

COMMENTS:

Transducer - 5.769
DTW - Meter - 72.68

Groundwater Monitoring Well
Field Sampling Form

SGI environmental THE SOURCE GROUP, INC.

PROJECT NAME: ______

PROJECT NO.: ______

TASK NO.: ______

WELL ID: DMEA-1

PURGE DATE: 7/21/11

SAMPLE TIME: ______

SAMPLE DATE: 7/21/11

PERSONNEL: ~~Derie kair~~uz Kristee Tidwell
(circle)

INITIAL DTW (ft): 99.63

DEPTH TO BOTTOM (ft): ______

WELL DIAM. (in): 4"

3 VOLUMES (gals): ______

h*3*0.064 (1.25"); h*3*0.16 (2"); h*3*0.26 (2.5"); h*3*0.38 (3"); h*3*0.65 (4"); h*3*1.5 (6")

PURGE LOG:

(check units!)

DTW	Time (24 hr)	No. Gallons	pH	EC ( )	Temp. ( )	Disolved Oxygen ( )	REDOX ( )	Color	Turbidity	Other Observations
	1026	0	~~25.87~~ 6.10	13693	25.18	3.09	-71.0	clr	66.0	
	1028	1	6.12	13270	24.39	1.57	-68.3	clr	37.7	
	1033	2	6.08	13205	24.33	1.58	-64.0	clr	37.4	
	1038	3	6.07	13208	24.35	1.37	-63.0	clr	38.6	

Total Gallons Purged: 3

Purging Method: **(2" Submersible Pump)** 12 Volt Pump Peristaltic Pump Bailer

WELL SAMPLING:

DTW at Time of Sampling: 99.63

Sampling Method: **(2" Submersible Pump)** 12 Volt Pump Peristaltic Pump Bailer

SAMPLE ID: DMEA-1

QA/QC SAMPLING:

WAS QA/QC SAMPLE COLLECTED AFTER THIS WELL? YES / NO

IF SO, SAMPLE ID: ______ TYPE: Rinsate Blank Duplicate Field Blank

PROPER DECON: Yes **(No)**

EQUIPMENT CALIBRATED: Yes No DRIFT: Yes No
(If YES, comment below)

COMMENTS:

Transducer depth - 10.11
DTW - 99.63

GROUNDWATER MONITORING WELL
FIELD SAMPLING FORM

JOB NAME: M4 P
TSG JOB NO.: 01-SON-055
TASK NO.: 3
PERSONNEL: K Tidwell

WELL ID: ADIT-1
PURGE DATE: 6/15/11
SAMPLE TIME: 1320
SAMPLE DATE: 6/15/11

INITIAL DTW (ft): 71.12
DEPTH TO BOTTOM (ft): 90.05
WELL DIAM. (in):
3 VOLUMES (gals):
h*3*0.064 (1.25"); h*3*0.16 (2"); h*3*0.26 (2.5"); h*3*0.65 (4")
FINAL DTW (ft):

(check units!)

DTW	Time (24 hr)	No. Gallons	pH	EC ( )	Temp (°)	FL ( )	OX Redox ( )	DO ( )	Turbidity	Color	Other Observations
	1313	0	4.77	9299	27.20		23.1	6.15	128.0	clr	
	1315	0.5	4.75	9351	24.16		8.6	6.03	126.1	clr	
	1318	0.75	4.73	9475	24.17		8.1	6.05	120.0	clr	
	1320	1	4.79	9478	24.10		6.3	6.10	119.3	clr	
71.13	1322	1.25	4.80	9476	24.11		4.9	6.11	117.7	clr	

Totalizer End
Totalizer Start
Total Gallons: 1.25

Purging Method: (2" Submersible Pump) — circled; 12 Volt Pump; Peristaltic Pump; Bailer

Sampling Method: (2" Submersible Pump) — circled; 12 Volt Pump; Peristaltic Pump; Bailer

WAS QA/QC SAMPLE COLLECTED AFTER THIS WELL? YES / NO
IF SO:

Sample ID

Type: Rinsate Blank; Duplicate; Field Blank

COMMENTS

GROUNDWATER MONITORING WELL
FIELD SAMPLING FORM

JOB NAME: Mt. P
TSG JOB NO.: 01-SUN-055
TASK NO.: 3
PERSONNEL: K. Tidwell

WELL ID: DMEA-1
PURGE DATE: 6/15/11
SAMPLE TIME:
SAMPLE DATE:

INITIAL DTW (ft): 98.12
DEPTH TO BOTTOM (ft): 291.71
WELL DIAM. (in): 4"
3 VOLUMES (gals): NA - low flow
h*3*0.064 (1.25"); h*3*0.16 (2"); h*3*0.26 (2.5"); h*3*0.65 (4")
FINAL DTW (ft):

(check units!)

DTW	Time (24 hr)	No. Gallons	pH	EC ( ) us/cm²	Temp (°)	FL ( )	OX Redox ( )	DO ( )	Turbidity	Color	Other Observations
	1215	0	4.30	12516	25.31		163	7.57	34.1	clr	
	1218	0.5	4.31	12021	25.12		167.9	4.32	38.3	clr	
	1220	0.75	4.33	12057	25.70		161.0	4.33	37.13	clr	
	1223	1	4.33	12031	25.71		160.8	4.33	40.1	clr	
98.18	1235	1.5	4.33	12033	25.81		160.5	4.33	40.1	clr	

Totalizer End:
Totalizer Start:
Total Gallons: 1.5

Purging Method: (2" Submersible Pump) 12 Volt Pump Peristaltic Pump Bailer

Sampling Method: (2" Submersible Pump) 12 Volt Pump Peristaltic Pump Bailer

WAS QA/QC SAMPLE COLLECTED AFTER THIS WELL? YES / (NO)

IF SO:

Sample ID: DMEA-1

Type: Rinsate Blank, Duplicate, Field Blank

COMMENTS

APPENDIX D

SURVEYORS REPORTS

Virgil Chavez Land Surveying
721 Tuolumne Street
Vallejo, California 94590
(707) 553-2476 • Fax (707) 553-8698

April 15, 2011
Project No.: 3096-03

Kristene Tidwell
The Source Group, Inc.
3451-C Vincent Road
Pleasant Hill, Ca 94523

Subject: Monitoring Well Survey
Former Morgan Territory Mine
2430 Morgan Territory Road
Clayton, CA

Dear Kristene:

This is to confirm that we have proceeded at your request to locate several points at the above referenced location. The survey was completed on April 7, 2011. The benchmark for this survey is known as PID AA3809, stamped PT 25 LS 5672 1990, located 0.15 Mi. southeast of the intersection of Marsh Creek Road and Morgan Territory Road. The latitude, longitude and coordinates are for top of casings and are based on the Calif. State Coordinate System, Zone III (NAD83). Benchmark Elev. = 781.00 feet (NAVD 88).

Latitude	Longitude	Northing	Easting	Elev.	Desc.
37.9011277	-121.8775226	2153508.40	6164223.50	---	ADIT2
37.9009353	-121.8768552	2153435.49	6164415.00	---	ADIT3
37.9019500	-121.8781100	2153810.28	6164058.44	900.22	DMEA2
37.9017800	-121.8779500	2153747.70	6164103.68	---	DMEA3
37.9017669	-121.8779376	2153742.87	6164107.19	875.72	6' O/S
37.9017153	-121.8790697	2153728.89	6163780.32	---	BLDG COR
37.9017675	-121.8790905	2153748.00	6163774.57	---	BLDG COR
37.9016821	-121.8792007	2153717.38	6163742.33	---	BLDG COR

LICENSED LAND SURVEYOR
VIRGIL D. CHAVEZ
No. 6323
Exp. 12-31-12
STATE OF CALIFORNIA

Sincerely,

Virgil D. Chavez, PLS 6323

Virgil Chavez Land Surveying
721 Tuolumne Street
Vallejo, California 94590
(707) 553-2476 • Fax (707) 553-8698

June 21, 2011
Project No.: 3096-03

RECEIVED
JUN 27 2011
BY:

Kristene Tidwell
The Source Group, Inc.
3451-C Vincent Road
Pleasant Hill, Ca 94523

Subject: Monitoring Well Survey
Former Morgan Territory Mine
2430 Morgan Territory Road
Clayton, CA

Dear Kristene:

This is to confirm that we have proceeded at your request to perform a survey at your request at the above referenced location. The survey was completed on June 14, 2011. The benchmark for this survey is known as PID AA3809, stamped PT 25 LS 5672 1990, located 0.15 Mi. southeast of the intersection of Marsh Creek Road and Morgan Territory Road. The latitude, longitude and coordinates are for top of casings and are based on the Calif. State Coordinate System, Zone III (NAD83). Benchmark Elev. = 781.00 feet (NAVD 88).

Latitude	Longitude	Northing	Easting	Elev.	Desc.
				872.75	GRD ADIT-1
37.9013809	-121.8780037	2153602.60	6164086.06	875.70	TOC ADIT-1
				900.57	GRD DMEA-1
37.9019338	-121.8780972	2153804.33	6164062.04	902.98	TOC DMEA-1

LICENSED LAND SURVEYOR
VIRGIL D. CHAVEZ
No. 6323
Exp. 12-31-12
STATE OF CALIFORNIA

Sincerely,

Virgil D. Chavez

Virgil D. Chavez, PLS 6323

APPENDIX E

WASTE MANIFESTS

DJ3759671 SC PPW 3/3/2011

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number: ~~NONREQUIRED~~ CAC002675268	2. Page 1 of 1	3. Emergency Response Phone (800)483-3718	4. Manifest Tracking Number 003990850 FLE

GENERATOR

5. Generator's Name and Mailing Address: Former Mount Diablo Mercury Mine, 2430 Morgan Territory Road, Clayton, CA 94517
Generator's Site Address (if different than mailing address): SAME
Generator's Phone: (925) 944-2856

6. Transporter 1 Company Name: Clean Harbors Environmental Services Inc — U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: Clean Harbors Buttonwillow LLC, 2500 West Lokern Road, Buttonwillow, CA 93206 — U.S. EPA ID Number: CAD980675276
Facility's Phone: (661) 762-6200

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON-RCRA HAZARDOUS WASTE, SOLID, (METALS)	01	CM	15	Y	611
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
LACH502138E

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Kristene Tidwell — Signature: [signature] — Month 09 Day 08 Year 11

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Richard Blankenship — Signature: Richard Blankenship — Month 9 Day 8 Year 11
Transporter 2 Printed/Typed Name: — Signature: — Month Day Year

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H132			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Ron E Johns — Signature: R E Johns — Month 09 Day 09 Year 11

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping

Site Address : SAME

DJ3680187

SC PPW 3/3/2011 WORK ORDER NO. ~~DJ3680187~~

DOCUMENT NO. 405140 **STRAIGHT BILL OF LADING**

TRANSPORTER 1	Clean Harbors Environmental Services Inc	VEHICLE ID #	4184
EPA ID #	MAD039322250	TRANS. 1 PHONE	(781) 792-5000
TRANSPORTER 2		VEHICLE ID #	
EPA ID #		TRANS. 2 PHONE	

DESIGNATED FACILITY Clean Harbors San Jose LLC	SHIPPER Former Mount Diablo Mercury Mine
FACILITY EPA ID # CAD059494310	SHIPPER EPA ID # NONREQUIRED
ADDRESS 1021 Berryessa Road	ADDRESS 2430 Morgan Territory Road
CITY San Jose STATE CA ZIP 95133	CITY Clayton STATE CA ZIP 94517

CONTAINERS NO. & SIZE	TYPE	HM	DESCRIPTION OF MATERIALS	TOTAL QUANTITY	UNIT WT/VOL
1	TT		A. NON HAZARDOUS, NON D.O.T. REGULATED, (PURGE WATER)	01020	G
			B.		
			C.		
			D.		
			E.		
			F.		
			G.		
			H.		

SPECIAL HANDLING INSTRUCTIONS **EMERGENCY PHONE #: (800) 483-3718** **GENERATOR: Former Mount Diablo Mercury Mine**
A.CH502434B
A. HOTT

SHIPPERS CERTIFICATION: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

	PRINT	SIGN	DATE
SHIPPER	Kristere Tidwell	[signature]	8/10/11
TRANSPORTER 1	Bert Wilson	[signature]	8-10-11
TRANSPORTER 2			
RECEIVED BY	Santa C. Huerez	[signature]	8/10/11

1

CHI 107

Site Address : SAME

SC PPW 3/9/2011 ORDER NO. DJ3610693

DOCUMENT NO. 405567 STRAIGHT BILL OF LADING

TRANSPORTER 1 Clean Harbors Environmental Services Inc VEHICLE ID # T-08

EPA ID # MAD039322250 TRANS. 1 PHONE (781) 792-5000

TRANSPORTER 2 ______ VEHICLE ID # ______

EPA ID # ______ TRANS. 2 PHONE ______

DESIGNATED FACILITY			SHIPPER		
Clean Harbors San Jose LLC			Former Mount Diablo Mercury Mine		
FACILITY EPA ID # CAD059494310			SHIPPER EPA ID # NONREQUIRED		
ADDRESS 1021 Berryessa Road			ADDRESS 2430 Morgan Territory Road		
CITY San Jose	STATE CA	ZIP 95133	CITY Clayton	STATE CA	ZIP 94517

CONTAINERS NO. & SIZE	TYPE	HM	DESCRIPTION OF MATERIALS	TOTAL QUANTITY	UNIT WT/VOL
1	TT		A. NON HAZARDOUS, NON D.O.T. REGULATED, (PURGE WATER)	3733	G
			B.		
			C.		
			D.		
			E.		
			F.		
			G.		
			H.		

SPECIAL HANDLING INSTRUCTIONS EMERGENCY PHONE #: (800) 483-3718 GENERATOR: Former Mount Diablo Mercury Mine
A.CH5024348

SHIPPERS CERTIFICATION: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

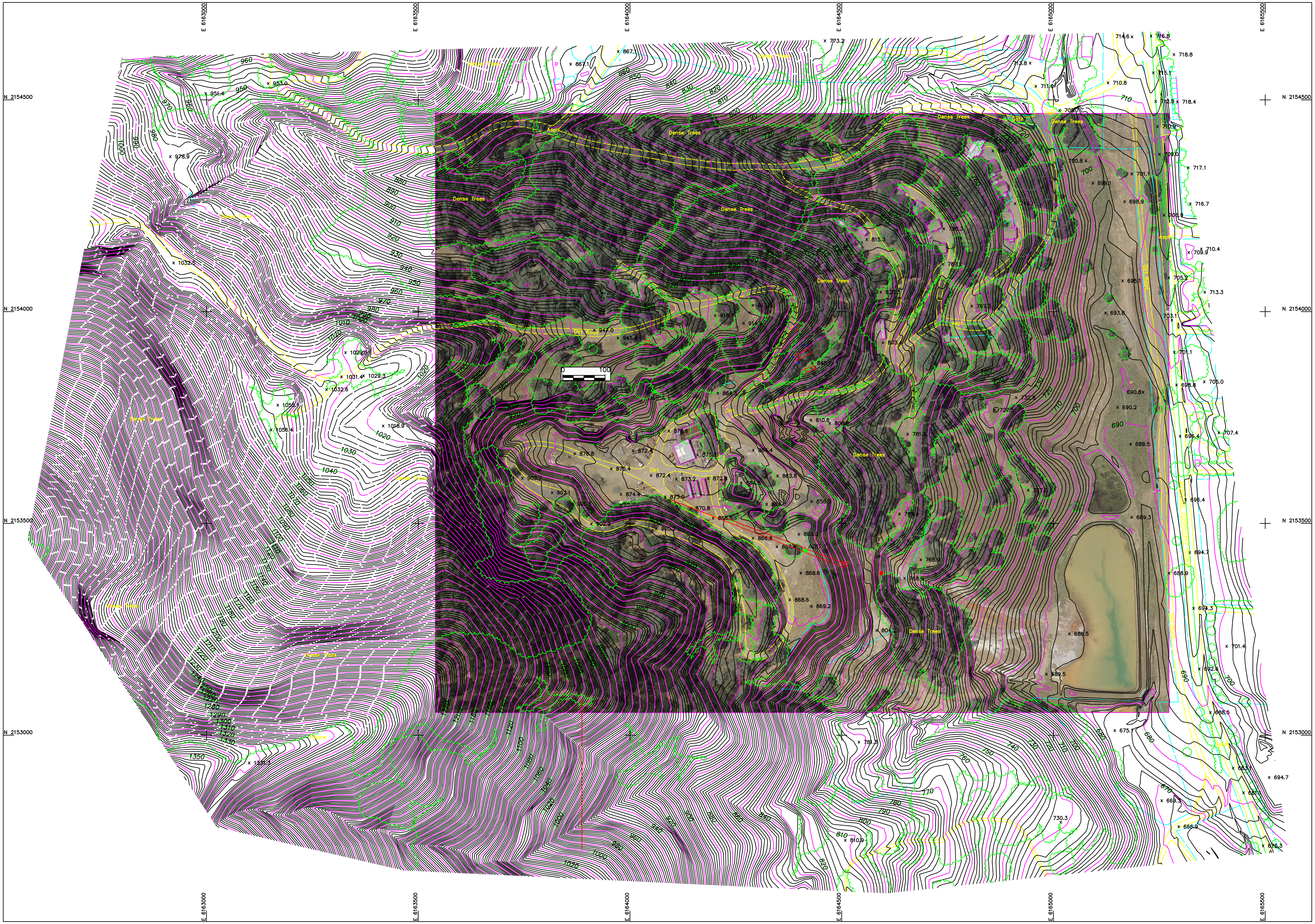
	PRINT	SIGN	DATE
SHIPPER	Kristene Tidwell	[signature]	7-14-11
TRANSPORTER 1	Bert Wilson	[signature]	7-14-11
TRANSPORTER 2			
RECEIVED BY	Santa O. Hutuez	[signature]	7-14-11

1

CHI 107

APPENDIX F

TOPOGRAPHIC MAP



HJW geospatial

NOTE:

This map was prepared using computer assisted, photogrammetric methods by HJW GeoSpatial, Inc., in Oakland California.

In areas of dense vegetation, accuracy of contours may deviate from accepted accuracy standards.

The grid is based on the California Coordinate System, Zone III, NAD 1983.

Control survey performed by The Source Group, Pleasant Hill, CA.

SCALE

100 0 100 200 300 Feet

GRID NORTH

CONTRA COSTA MINE SITE

PREPARED FOR : THE SOURCE GROUP

Map Scale: 1" = 100'	Date of Photography: 07-10-10
Contour Interval: 2 feet	Job Number: 10 - 083

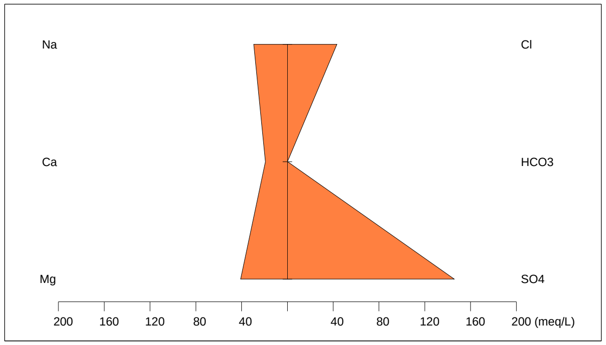
SHEET:
01 of 01

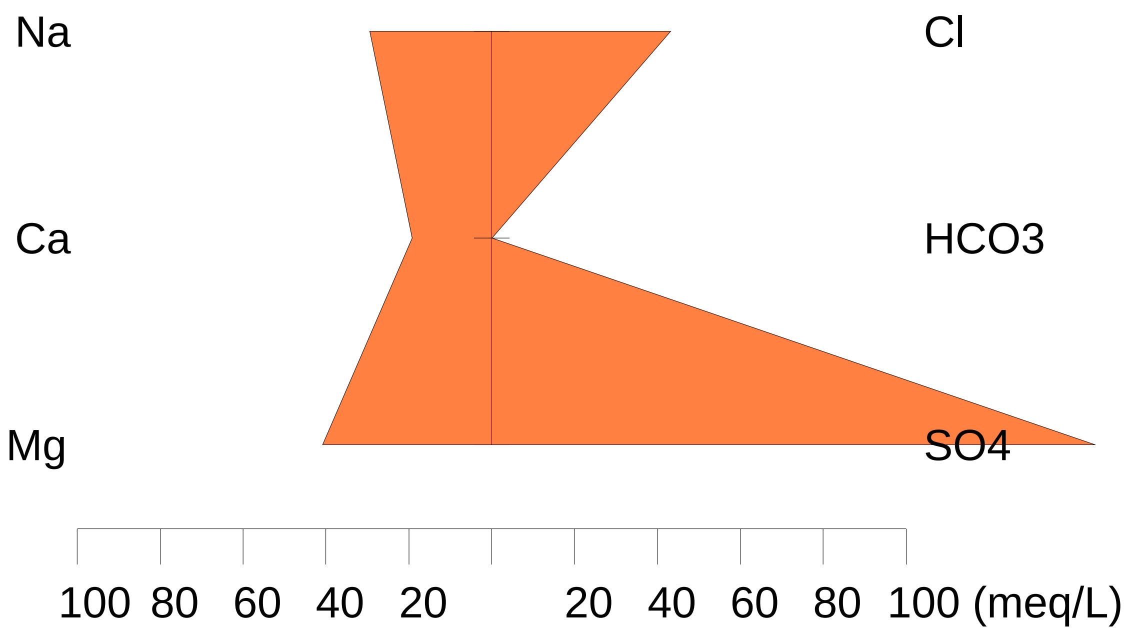
APPENDIX G

WATER QUALITY STIFF DIAGRAMS FOR 2010/2011 SAMPLING

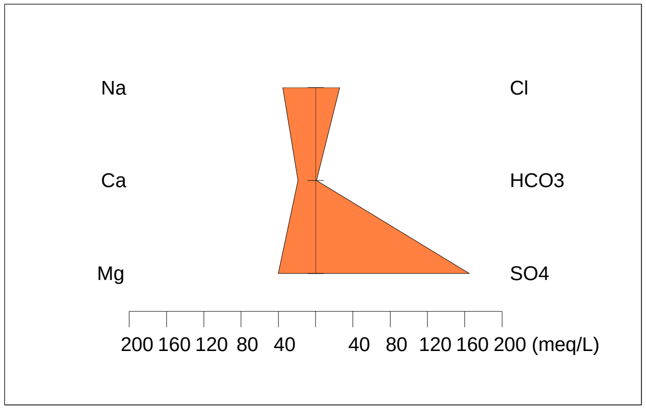
WATER SOURCED FROM UNDERGROUND MINE WORKINGS

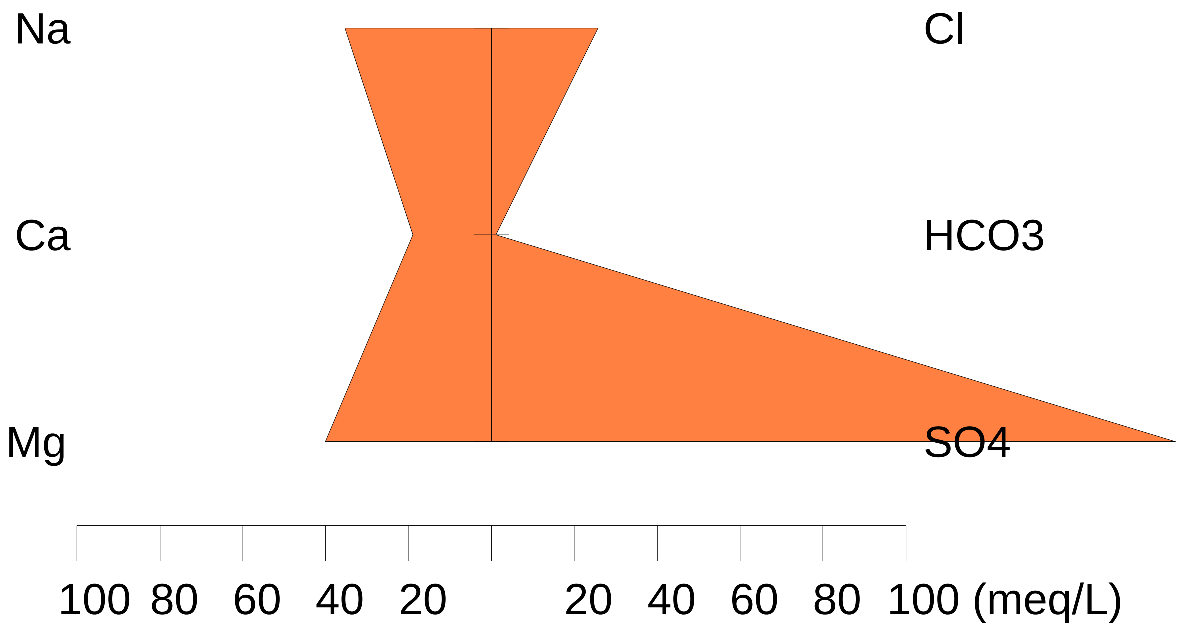
Stiff Diagram – ADIT-1
Collected June 2011



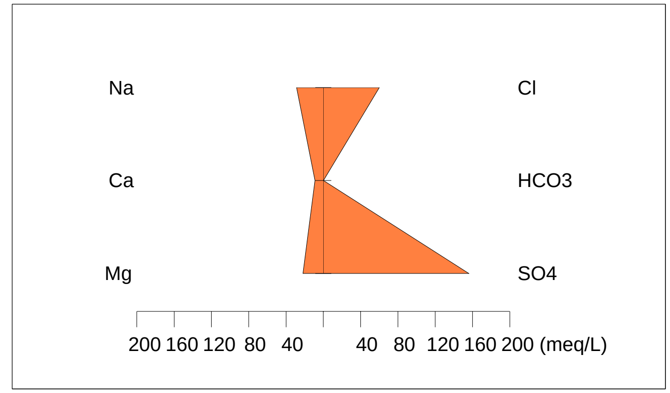


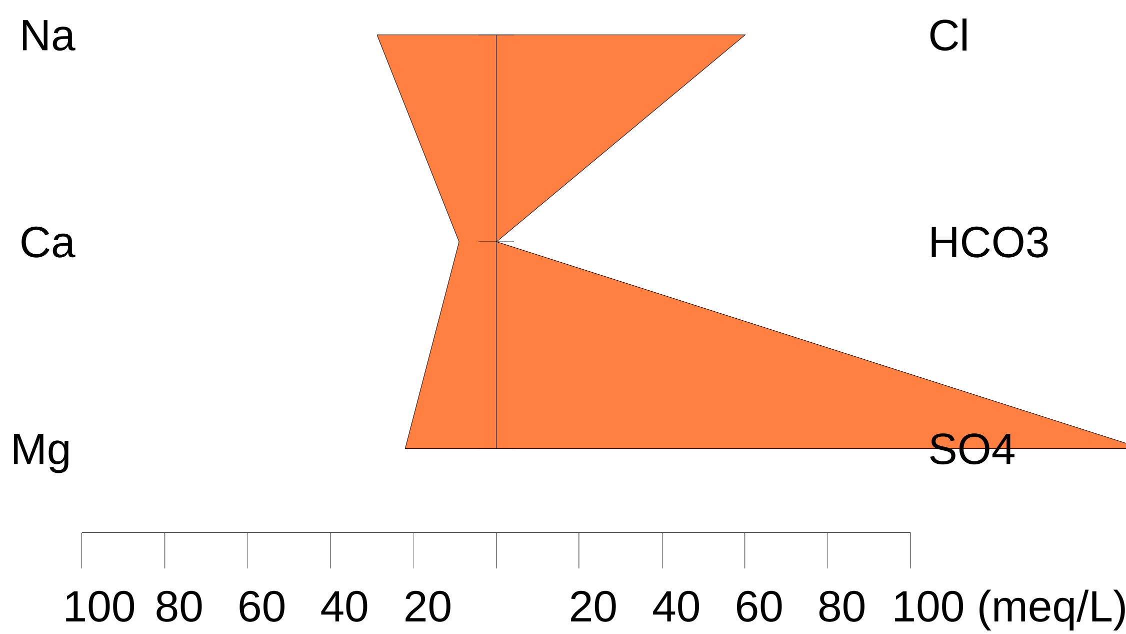
Stiff Diagram – ADIT-1
Collected July 2011



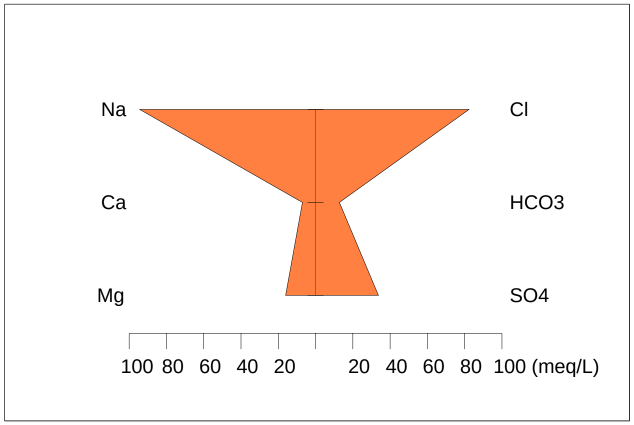


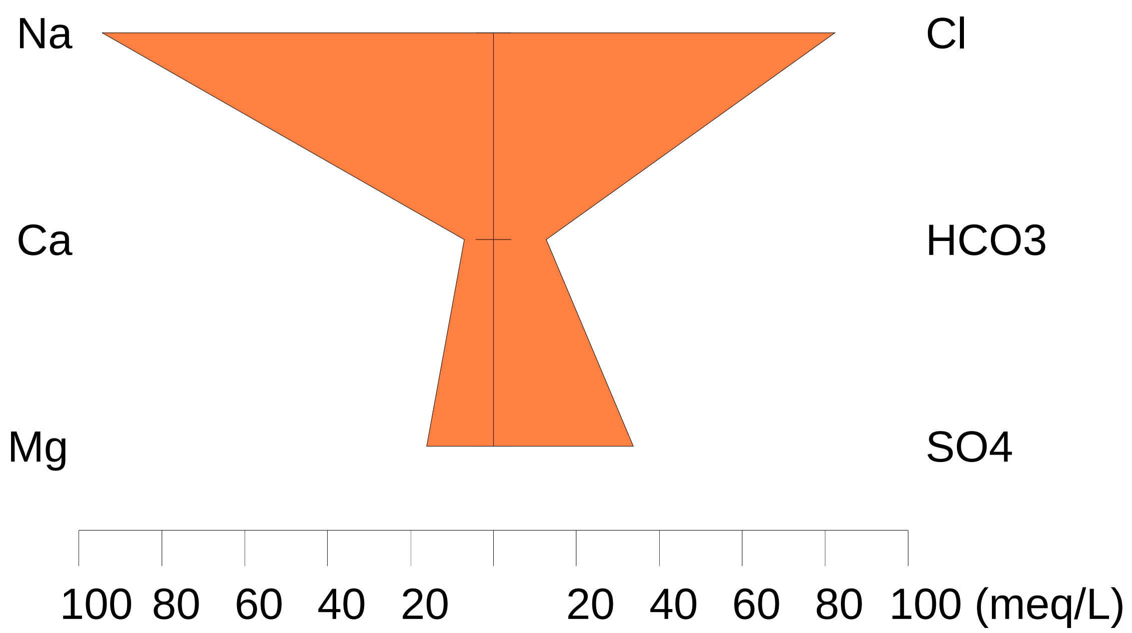
Stiff Diagram – DMEA-1
Collected June 2011



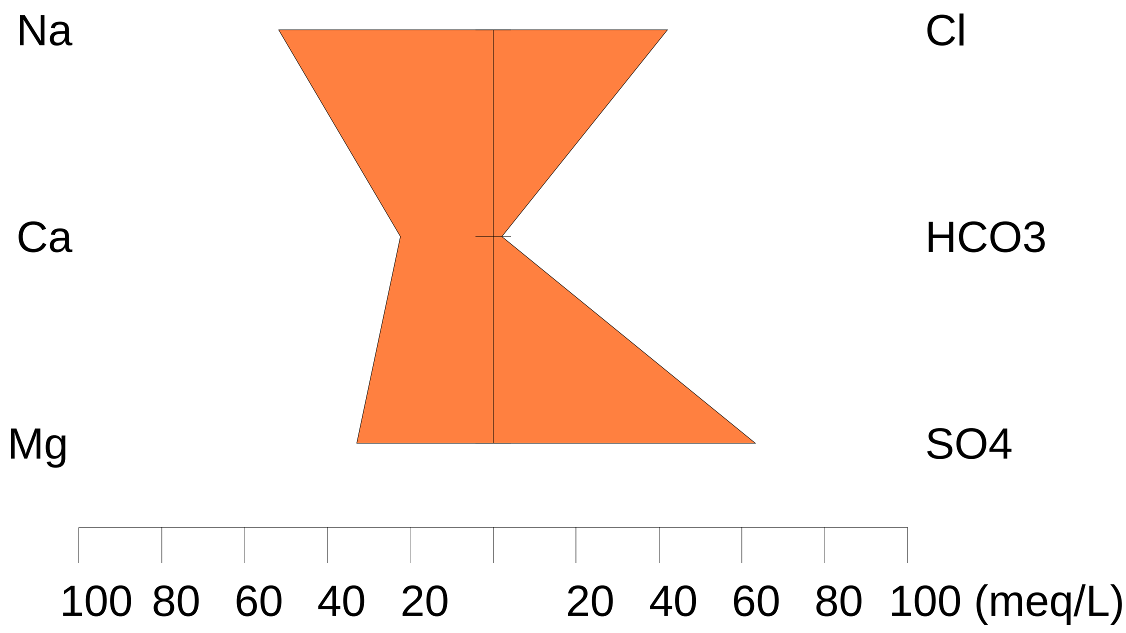


Stiff Diagram – DMEA-1
Collected July 2011

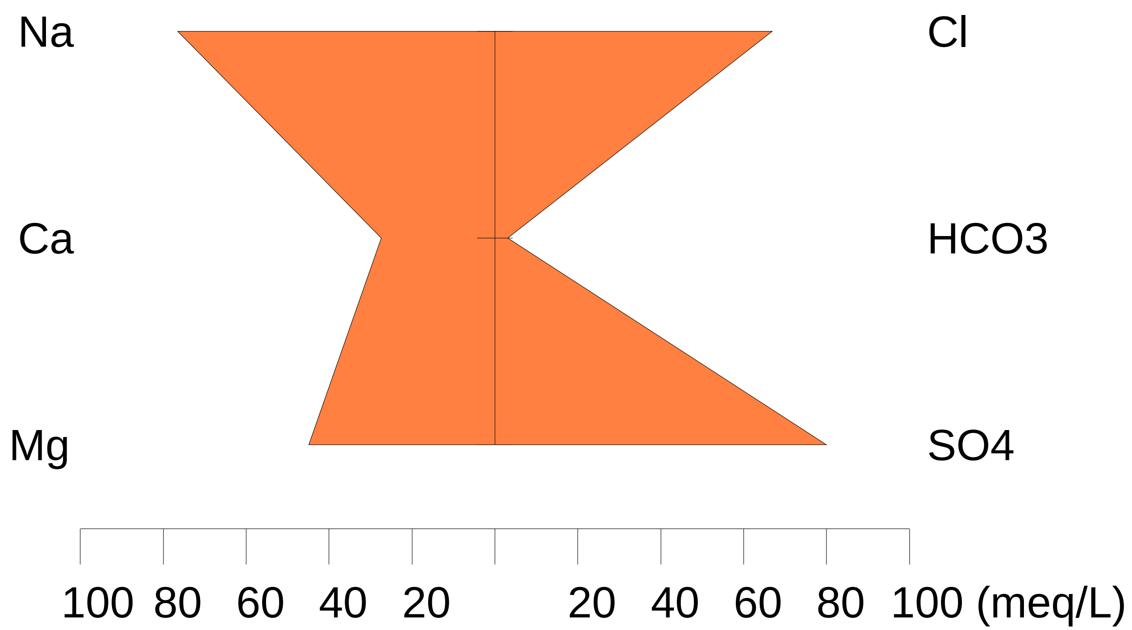




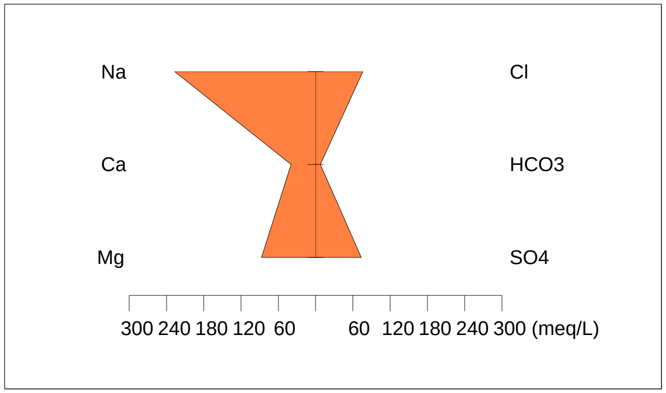
Stiff Diagram – SW-5
Collected April 2010
Altered Mine Waste Water
Mt. Diablo

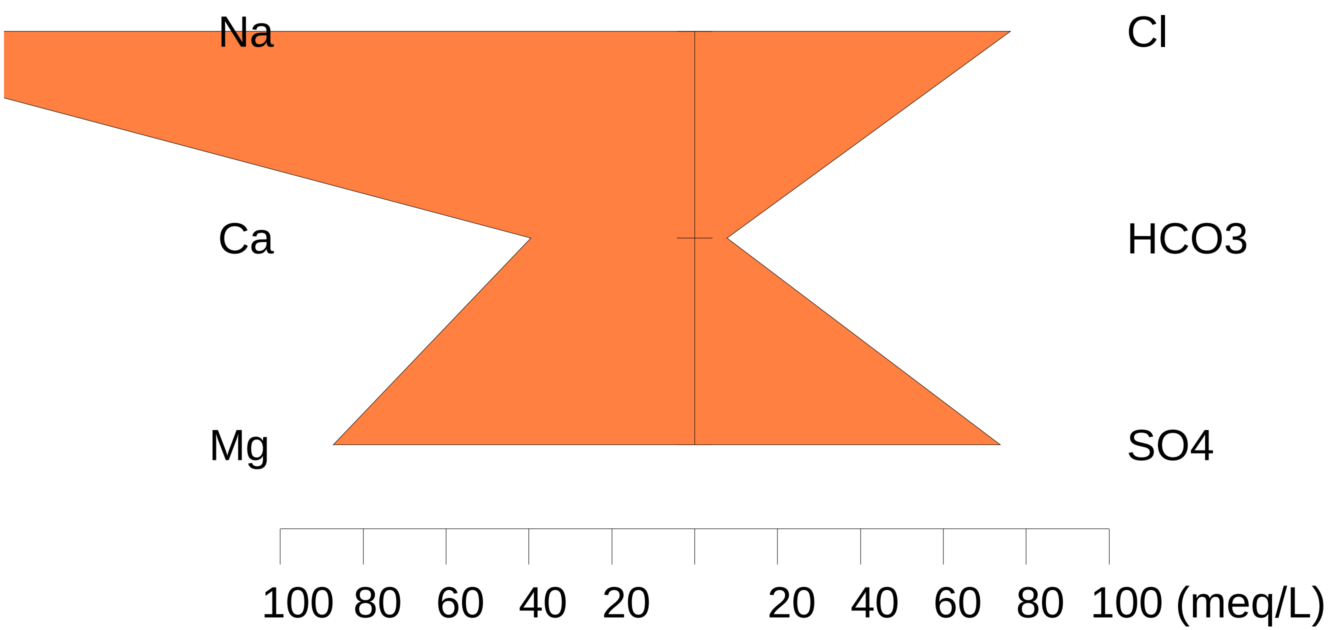


Stiff Diagram – SW-5
Collected May 2010
Altered Mine Waste Water
Mt. Diablo

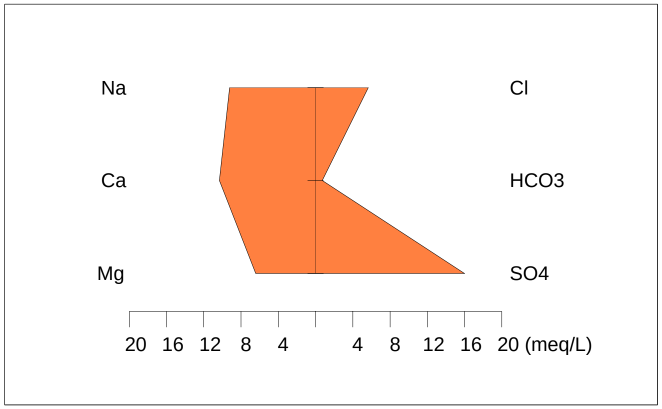


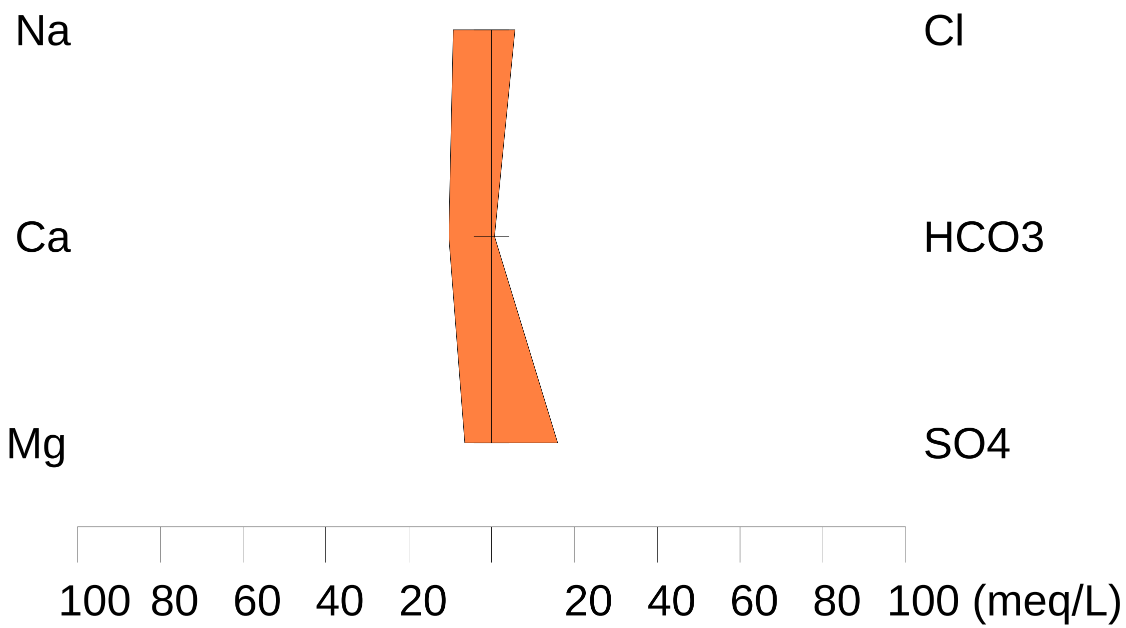
Stiff Diagram – SW-5
Collected October 2010



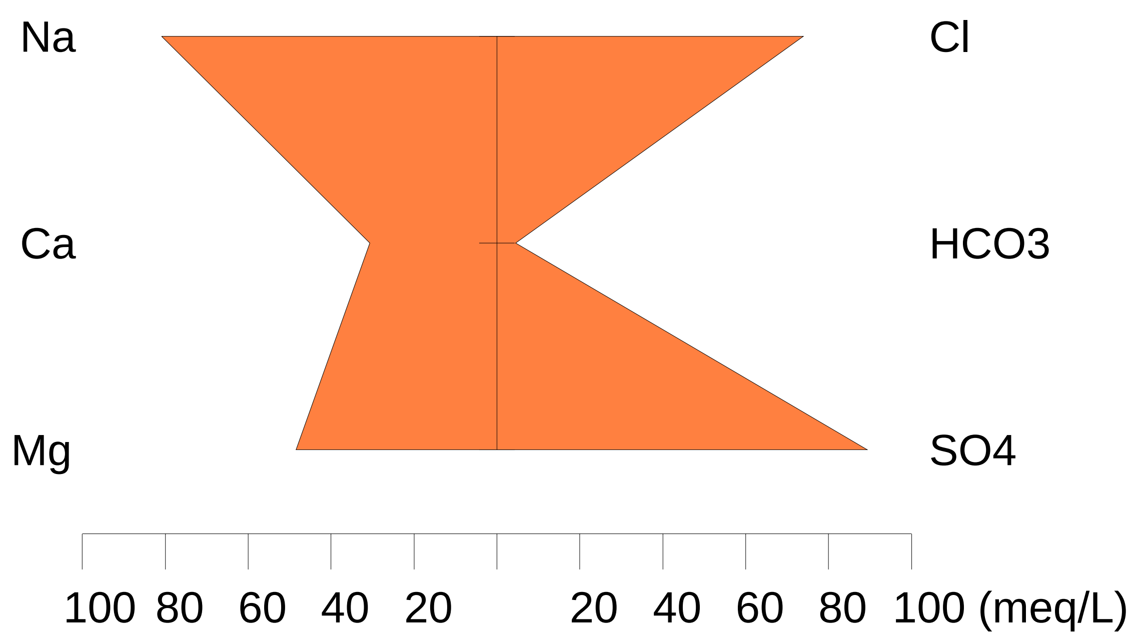


Stiff Diagram – SW-5
Collected February 2011

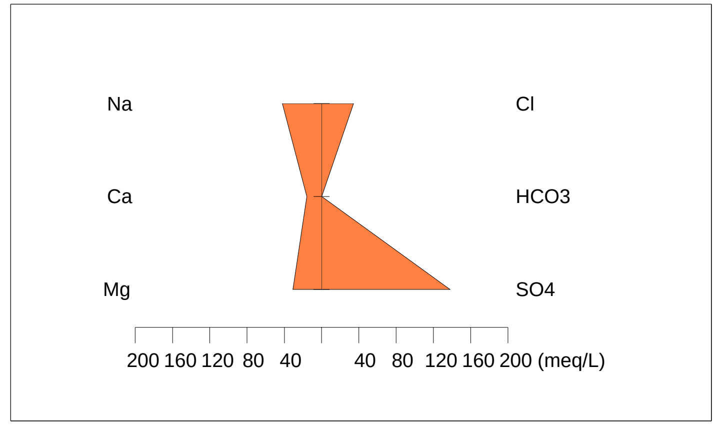


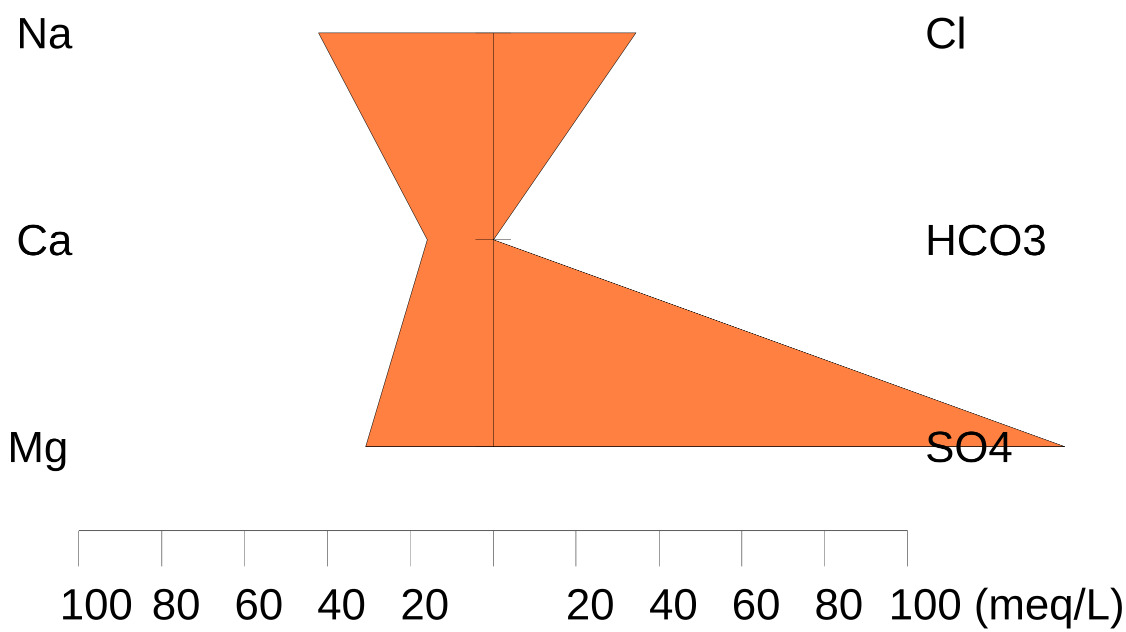


Stiff Diagram – SW-5
Collected June 2011

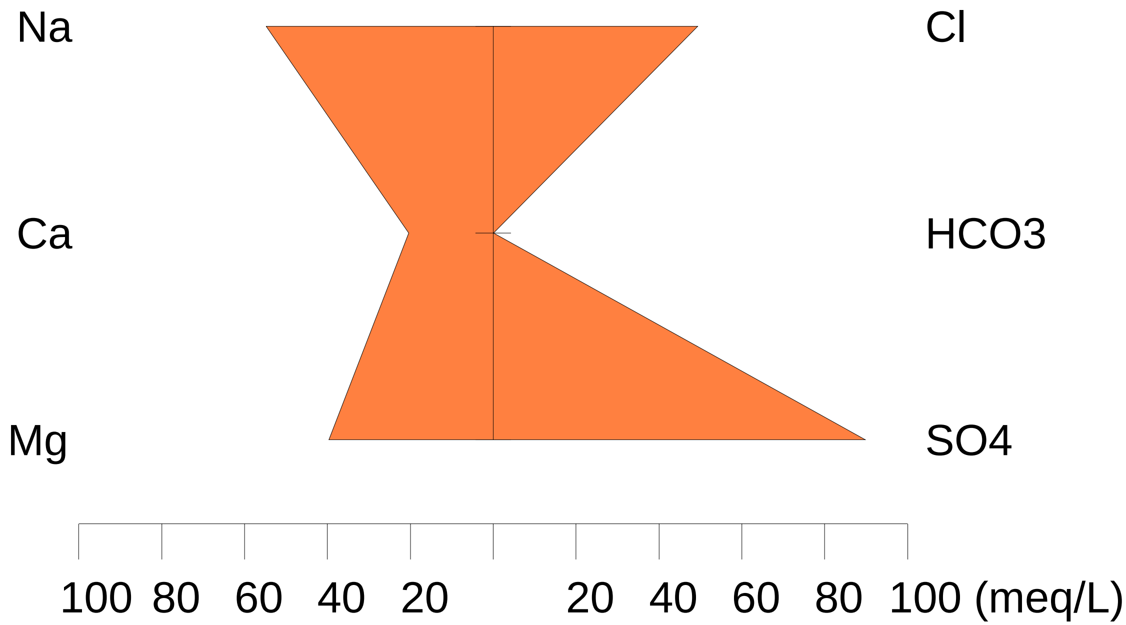


Stiff Diagram – SW-9
Collected April 2010
Altered Mine Waste Water
Mt. Diablo

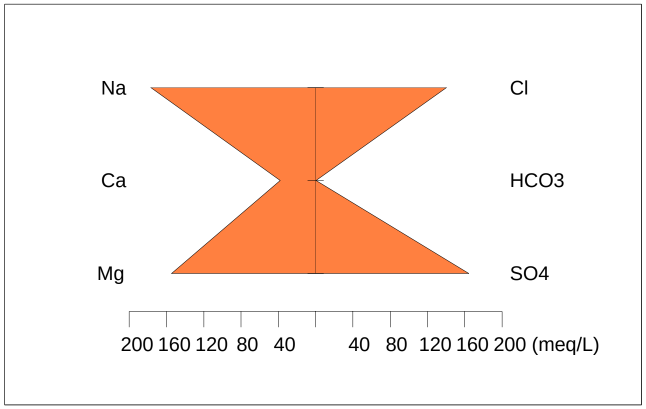


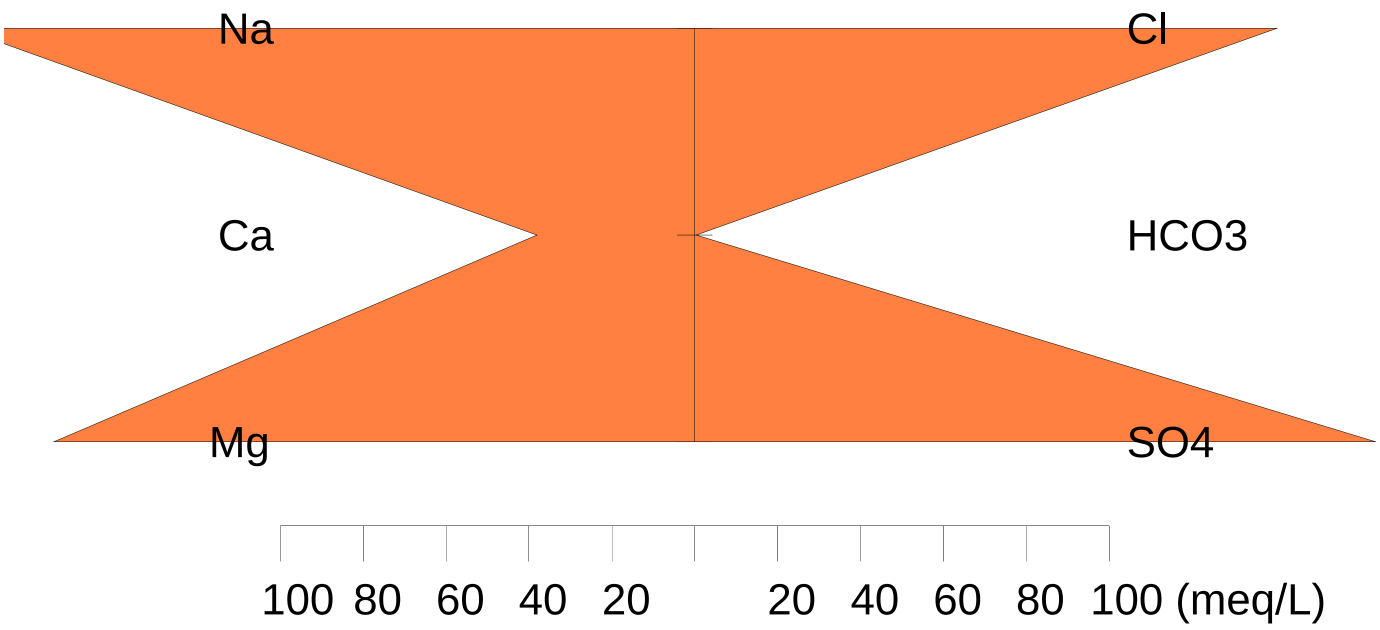


Stiff Diagram – SW-9
Collected May 2010
Altered Mine Waste Water
Mt. Diablo

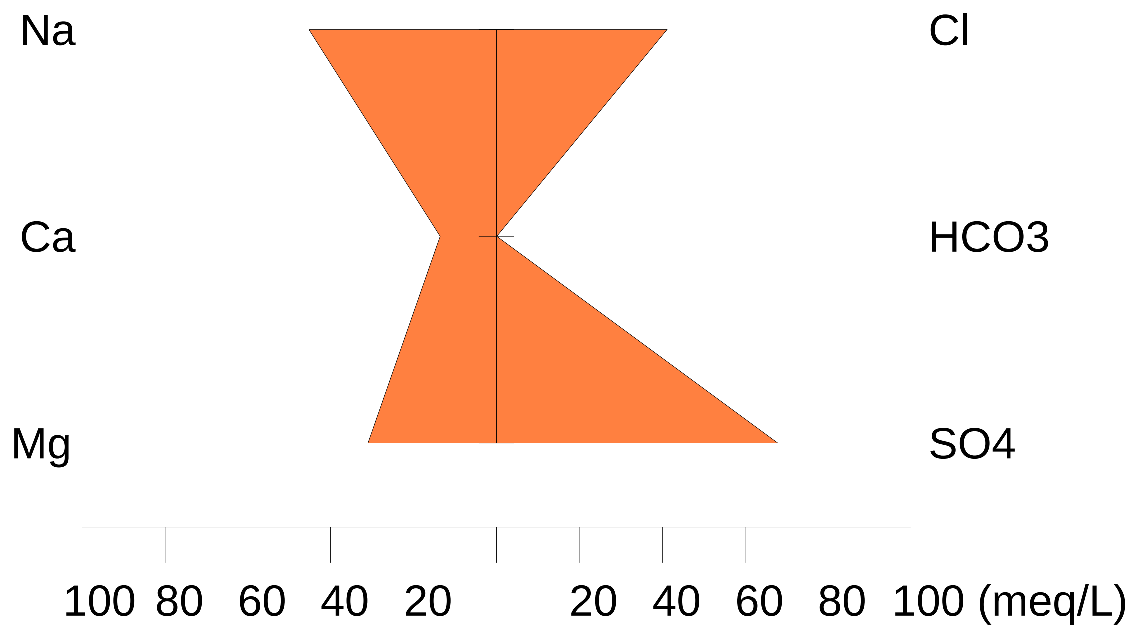


Stiff Diagram – SW-9
Collected October 2010

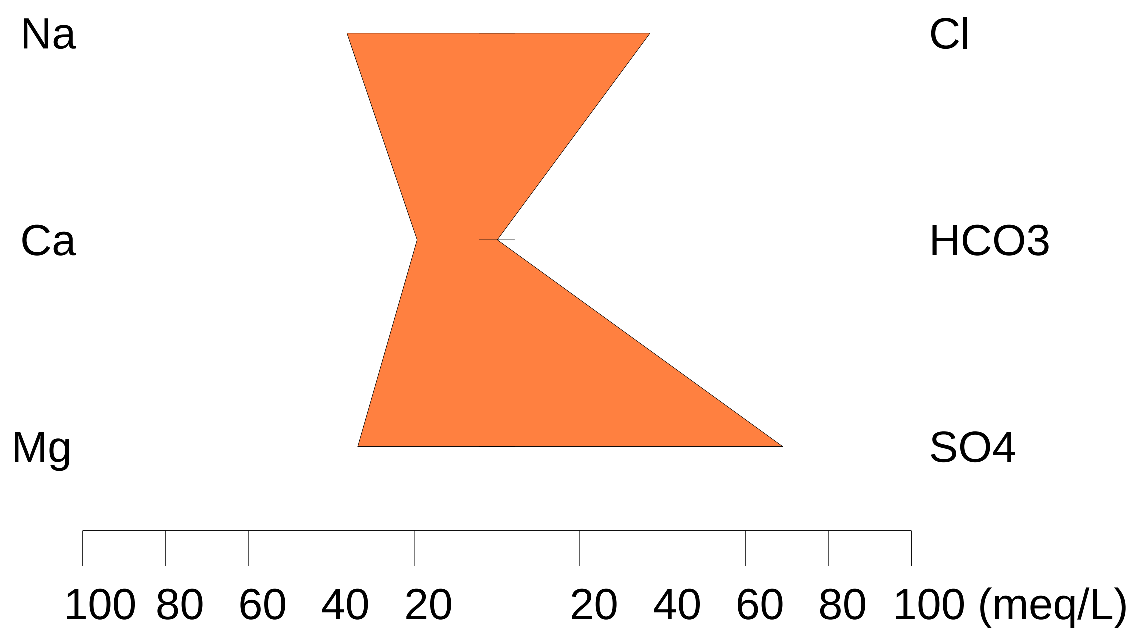




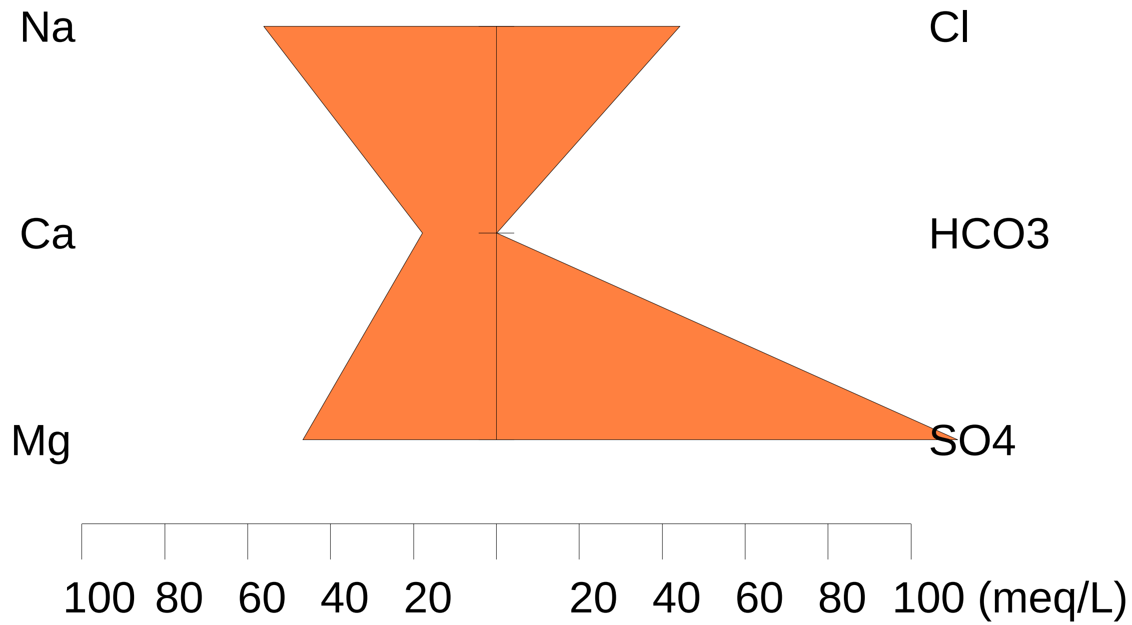
Stiff Diagram – SW-9
Collected February 2011



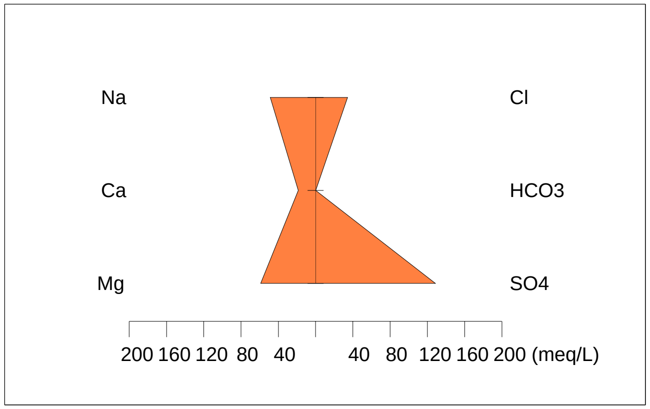
Stiff Diagram – SW-9
Collected June 2011

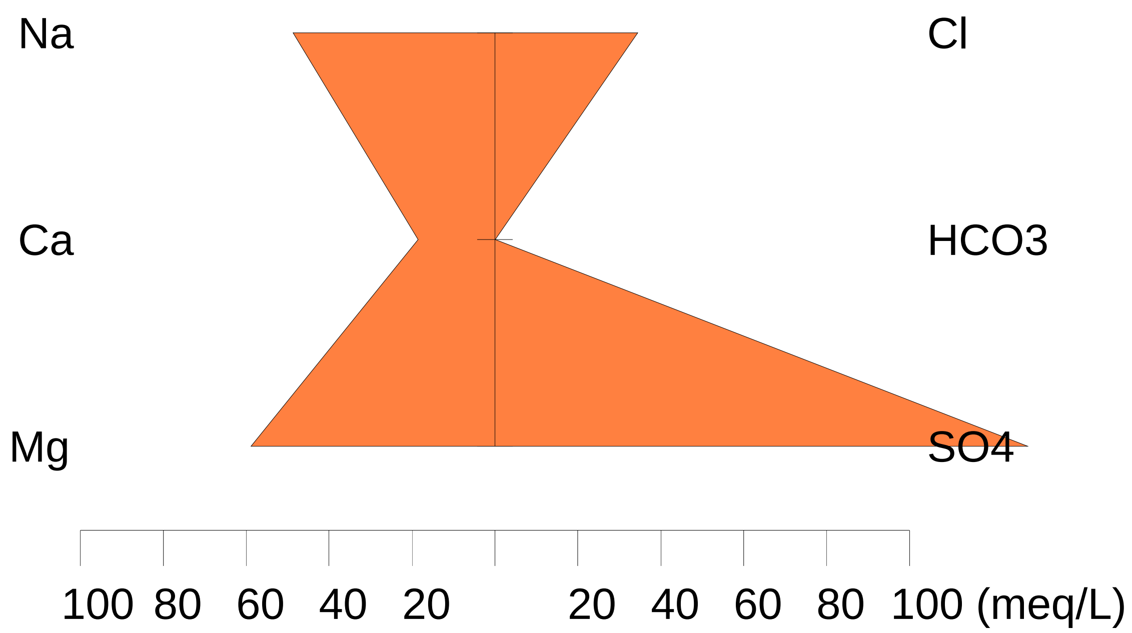


Stiff Diagram – SW-15
Collected May 2010
Altered Mine Waste Water
Mt. Diablo

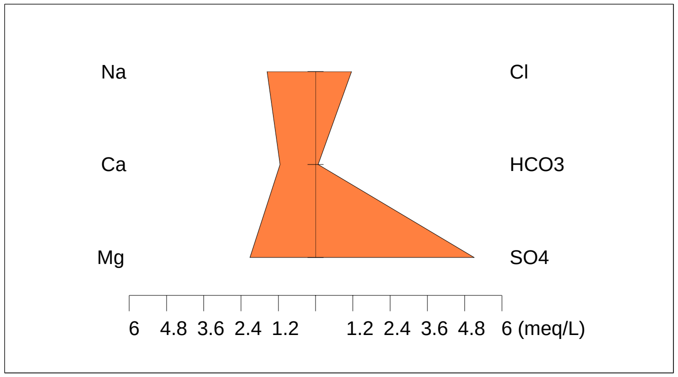


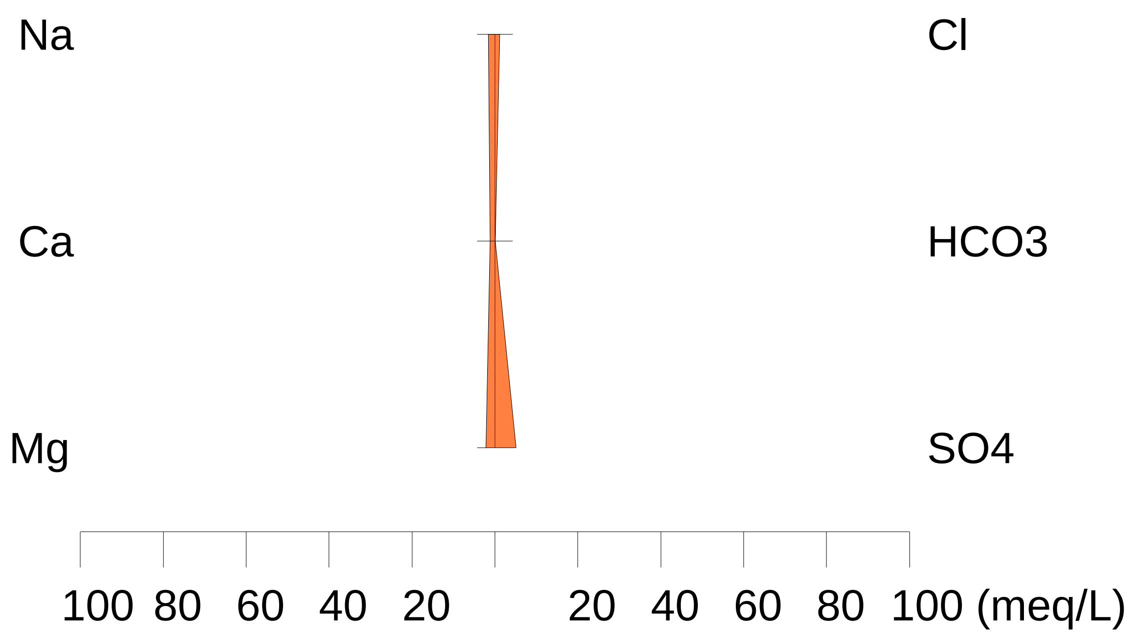
Stiff Diagram – SW-15
Collected October 2010



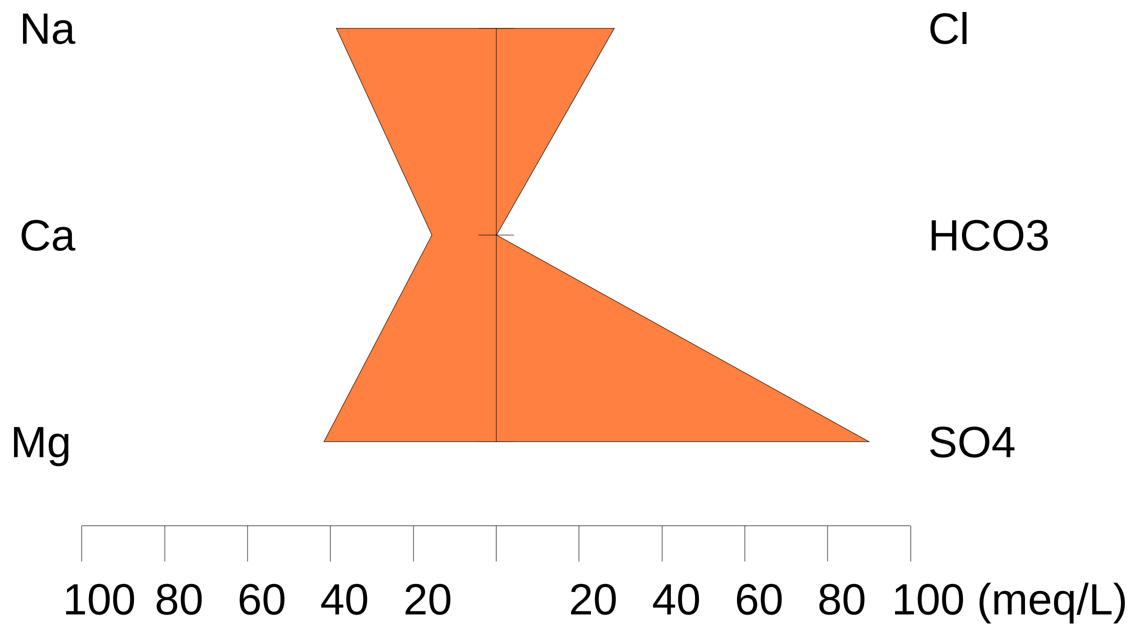


Stiff Diagram – SW-15
Collected February 2011



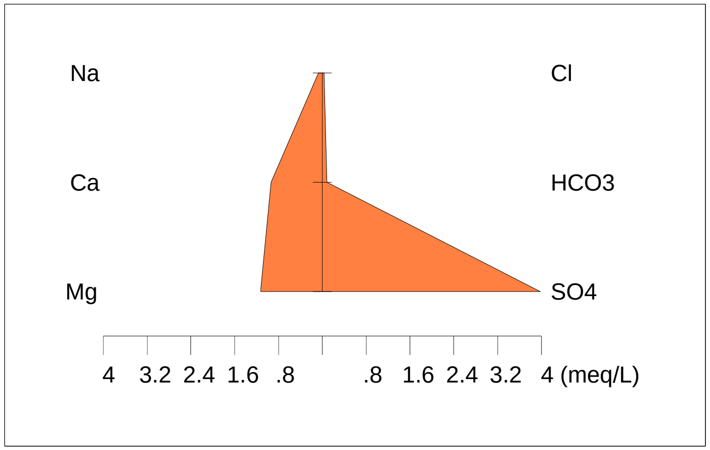


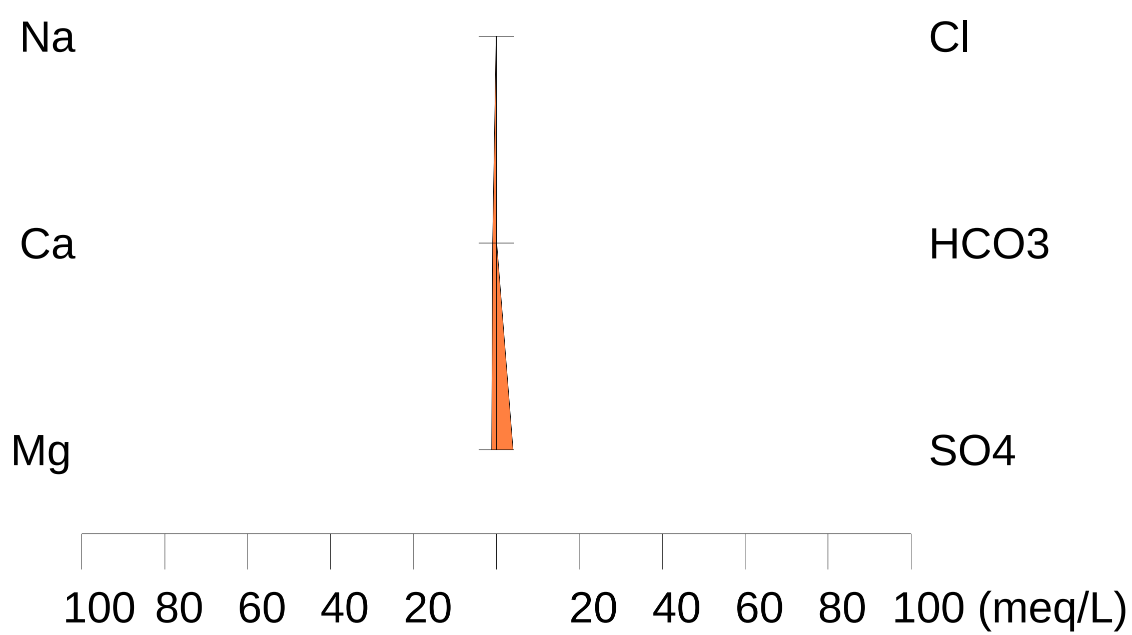
Stiff Diagram – SW-15
Collected June 2011



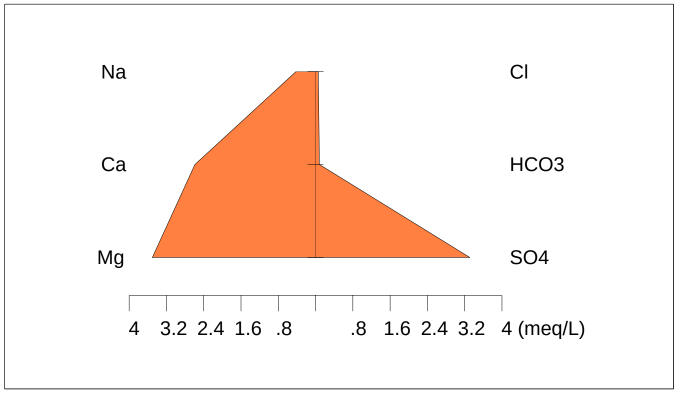
WATER SOURCED FROM PRECIPITATION – RUNOFF OVER AND THROUGH MINE TAILINGS AND WASTE ROCK

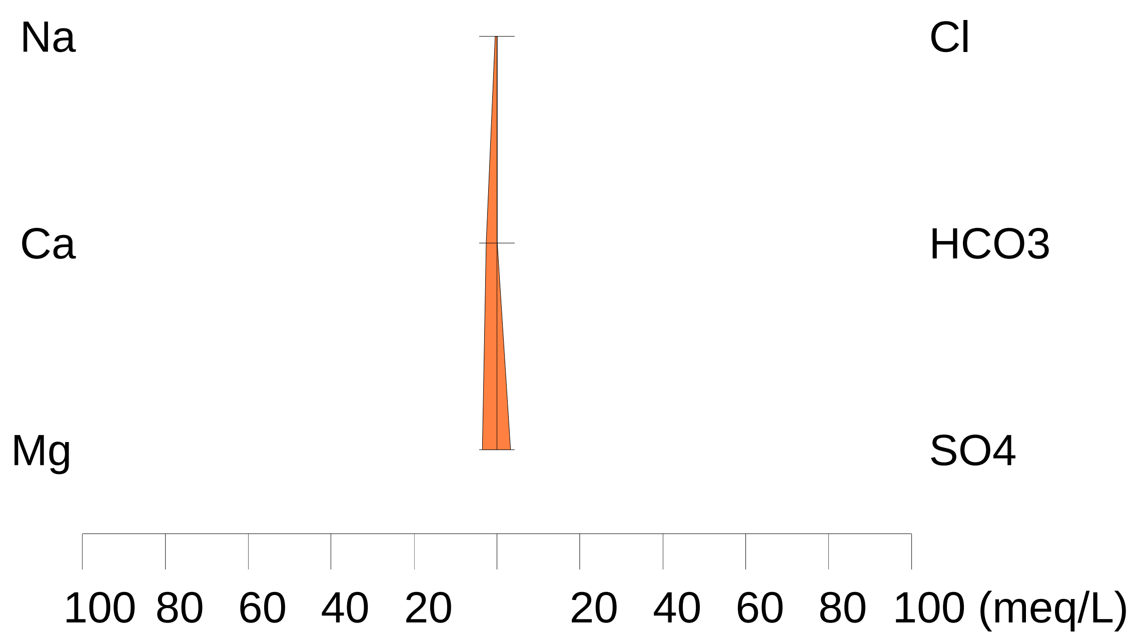
Stiff Diagram – SW-1
Collected April 2010
Mine Waste Source Water
Mt. Diablo



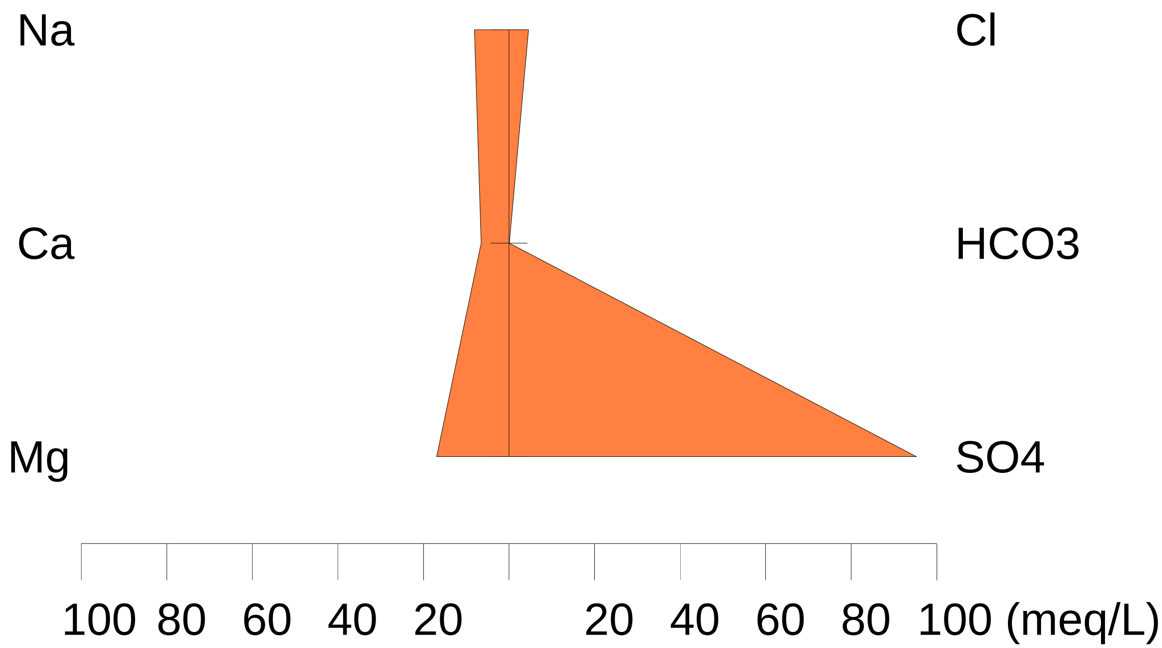


Stiff Diagram – SW-1
Collected February 2011

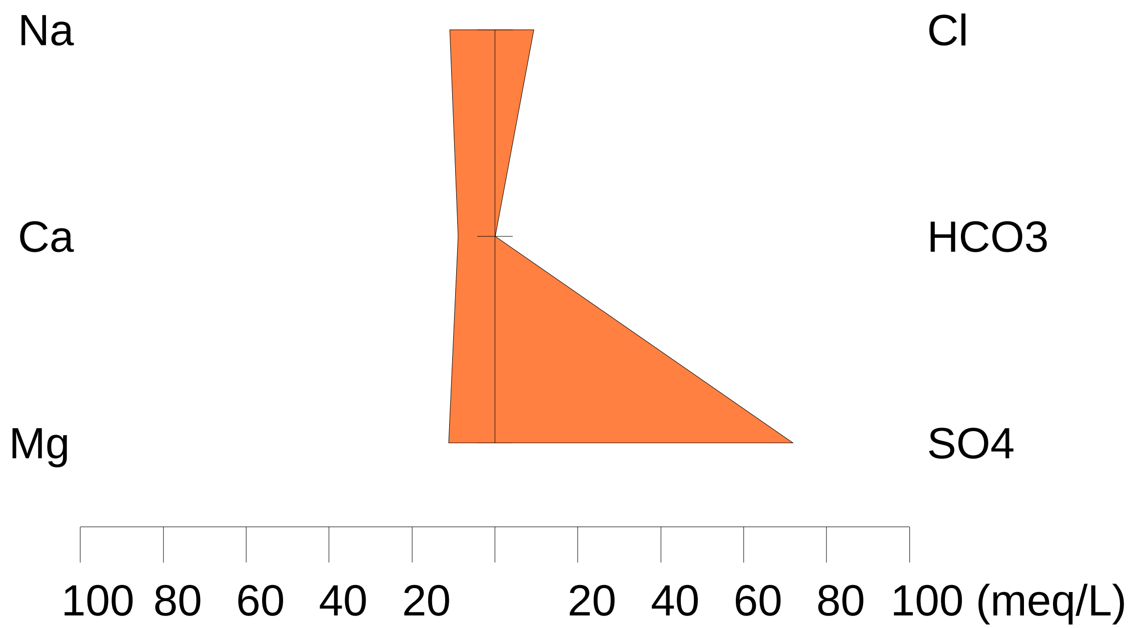




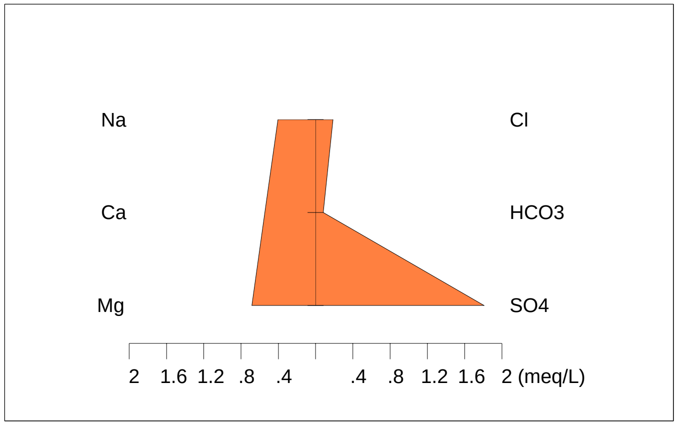
Stiff Diagram – SW-2
Collected April 2010
Mine Waste Source Water
Mt. Diablo

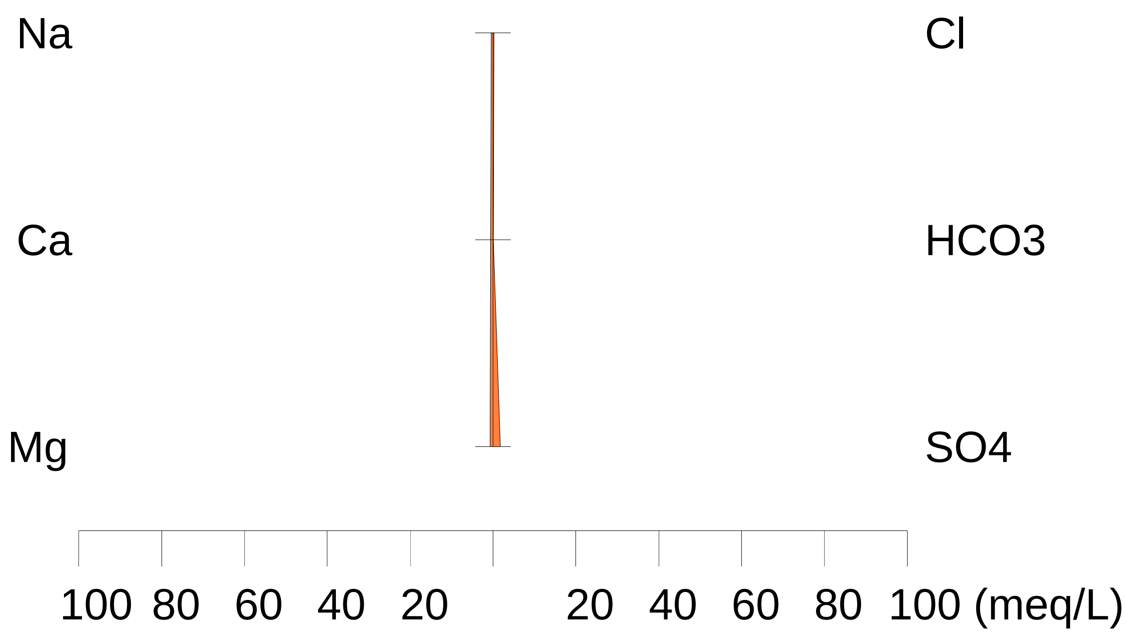


Stiff Diagram – SW-2
Collected May 2010
Mine Waste Source Water
Mt. Diablo

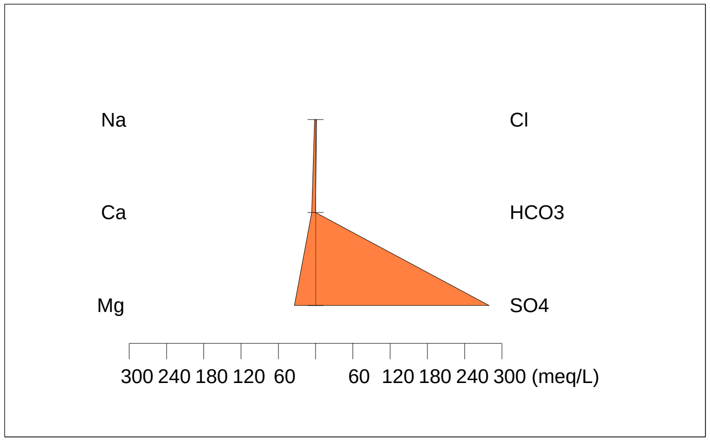


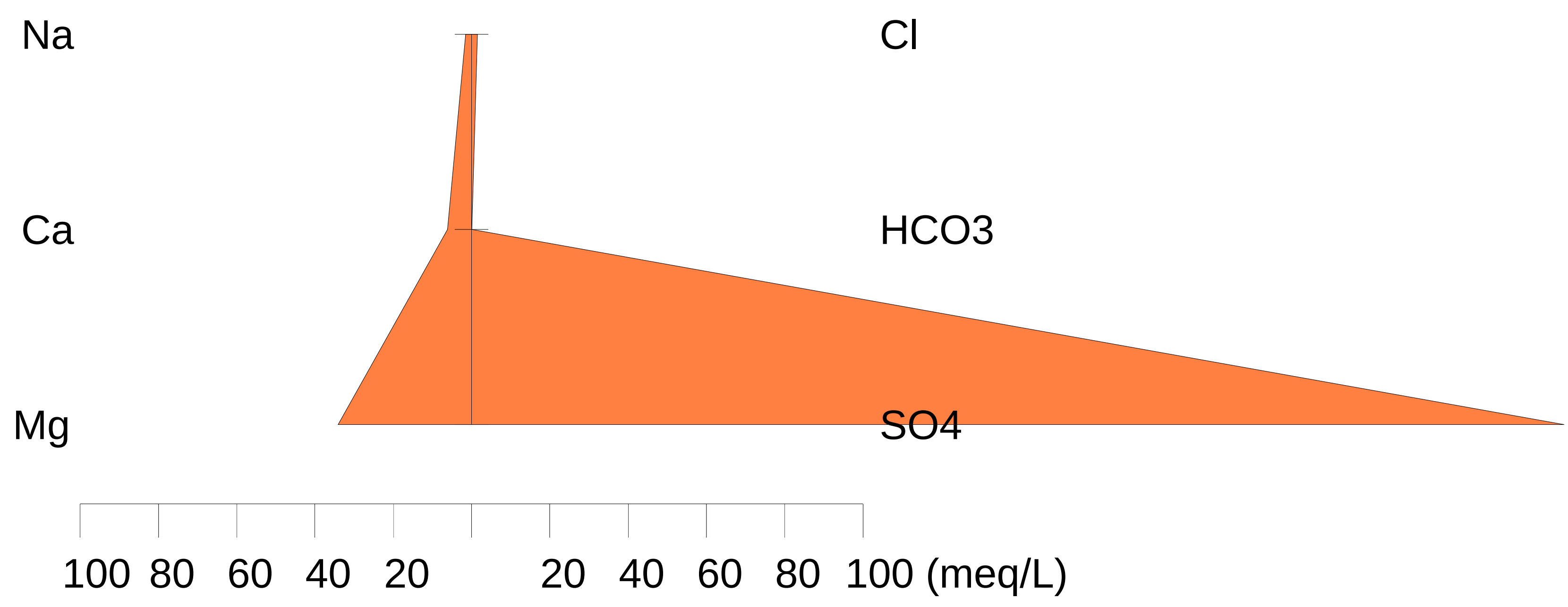
Stiff Diagram – SW-2
Collected February 2011



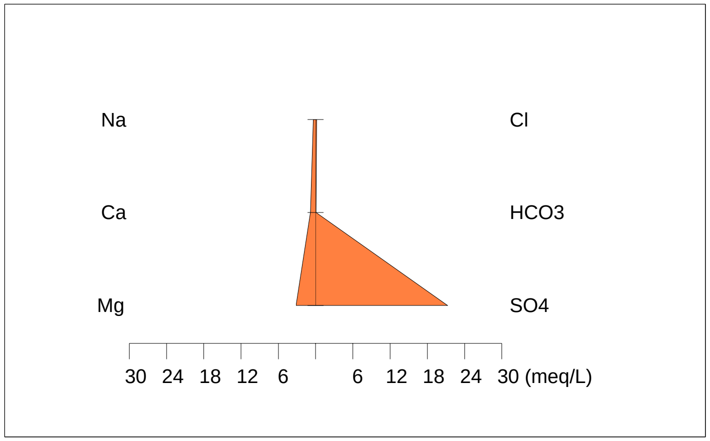


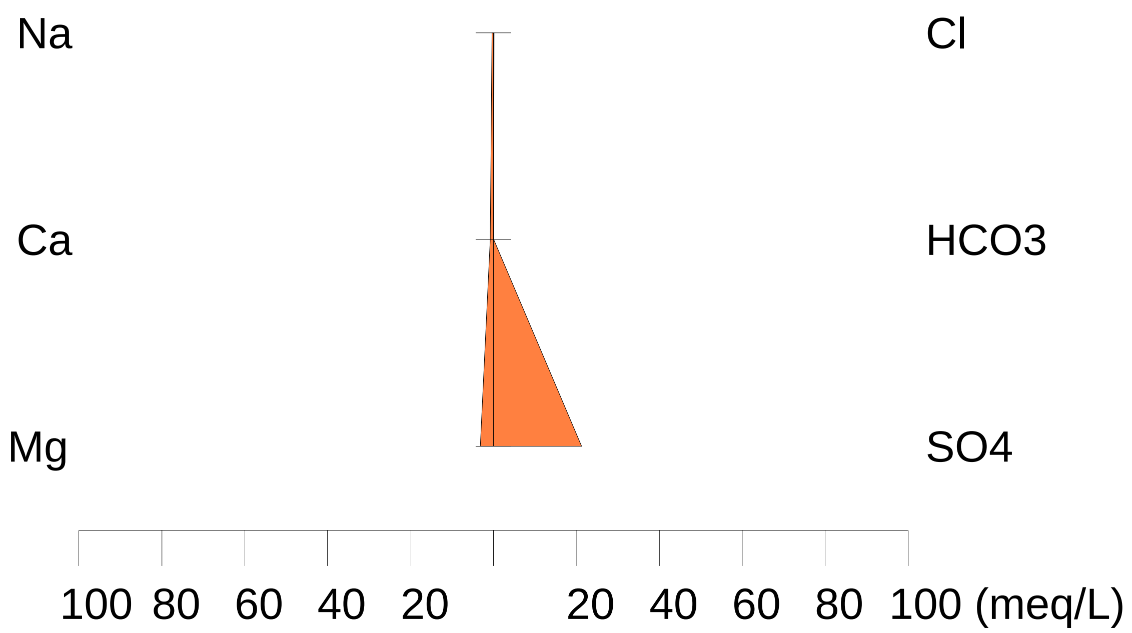
Stiff Diagram – SW-3
Collected April 2010
Mine Waste Source Water
Mt. Diablo



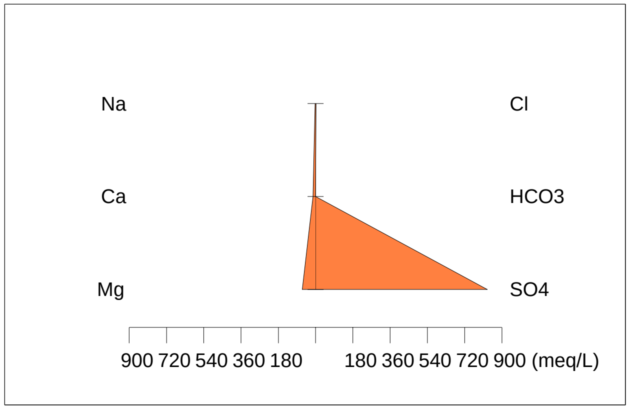


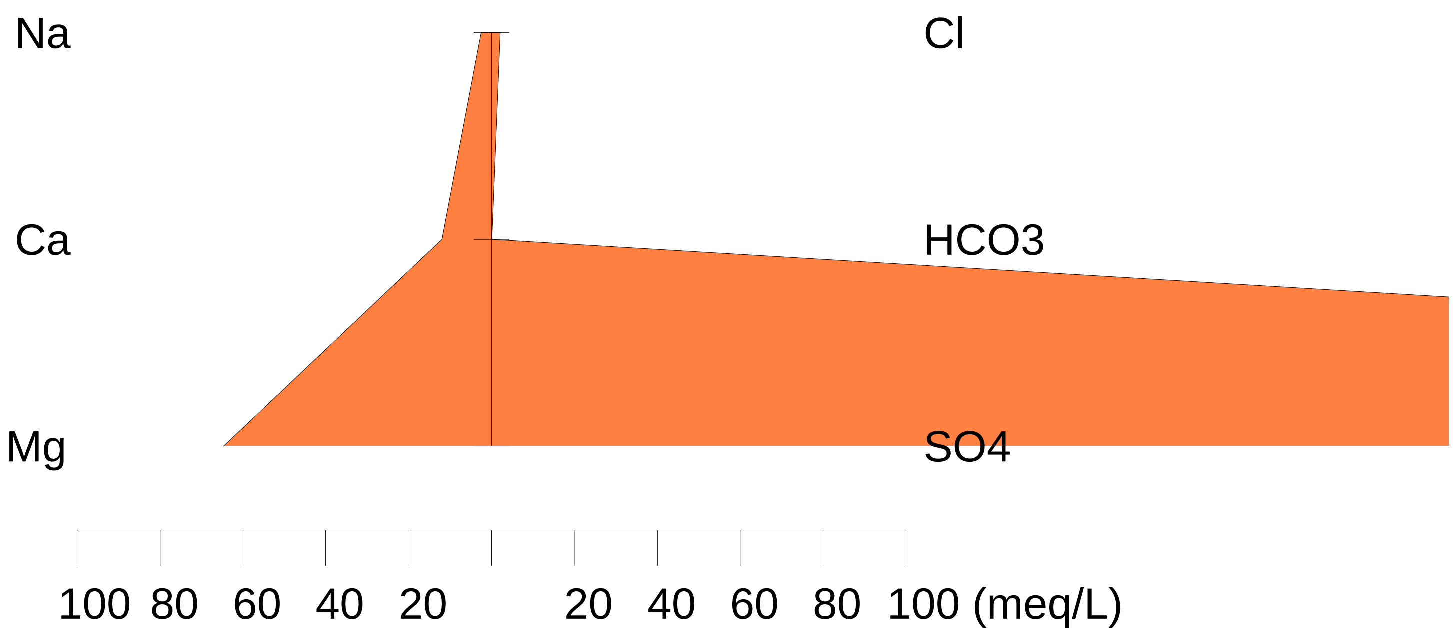
Stiff Diagram – SW-3
Collected February 2011



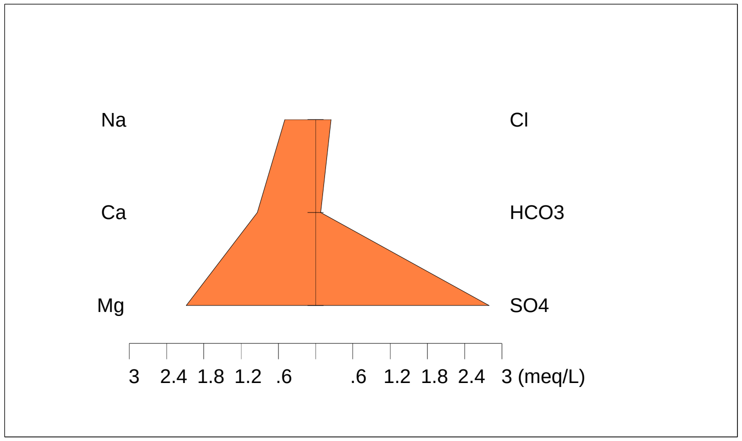


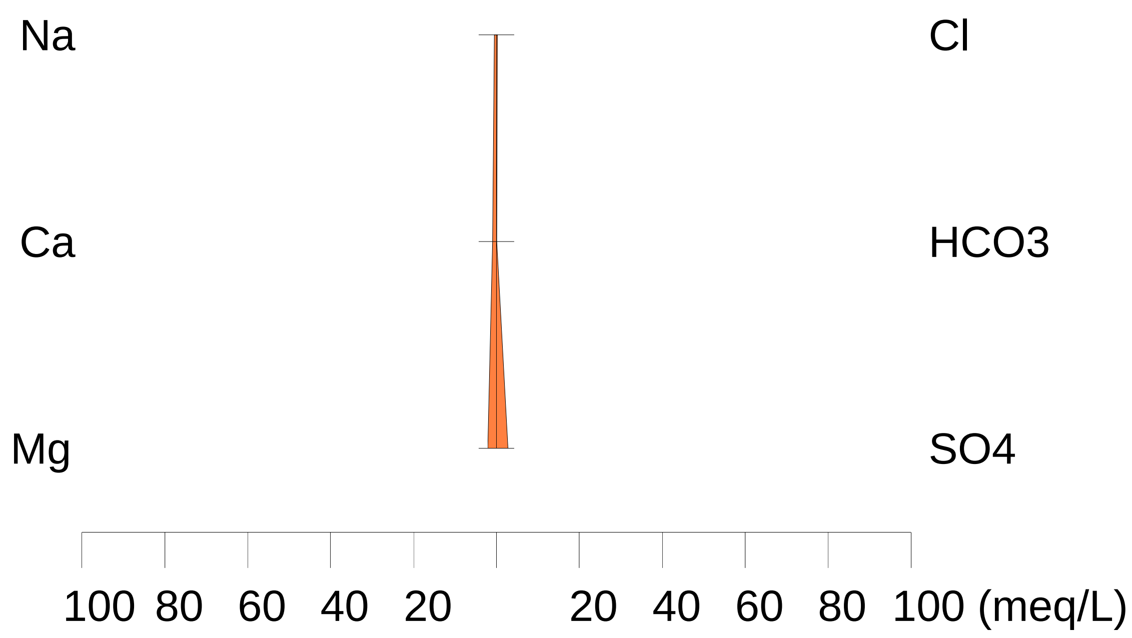
Stiff Diagram – SW-3
Collected June 2011



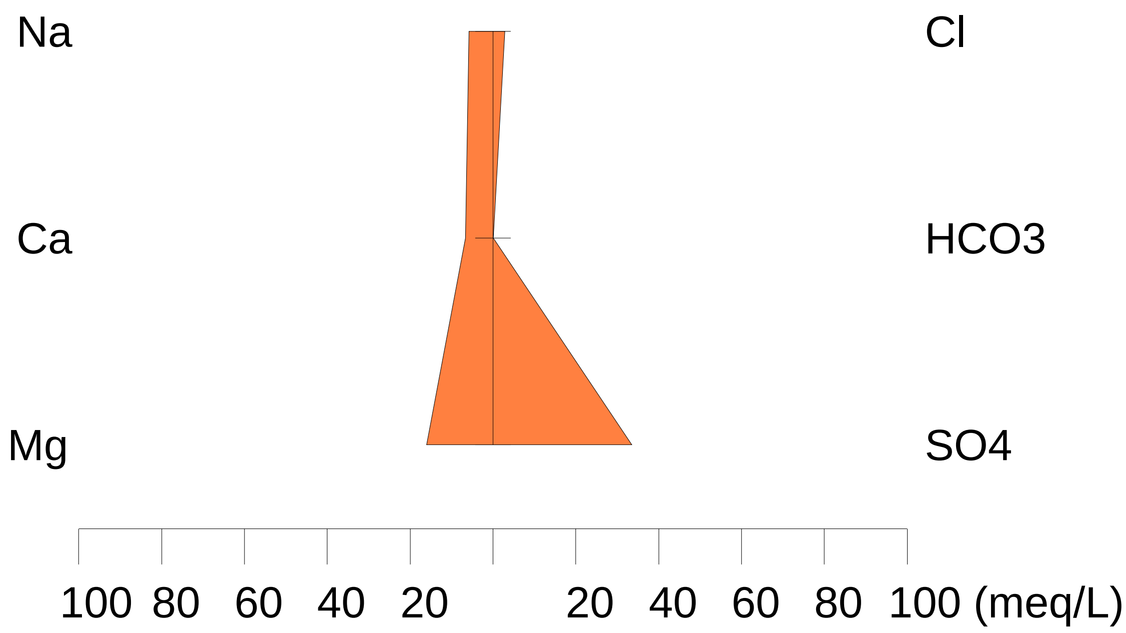


Stiff Diagram – SW-6
Collected April 2010
Mine Waste Source Water
Mt. Diablo

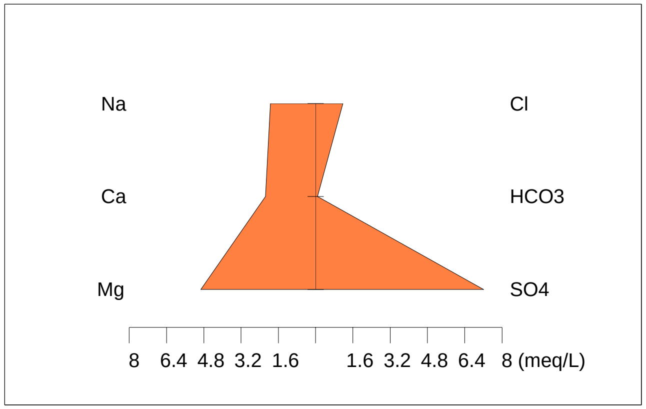


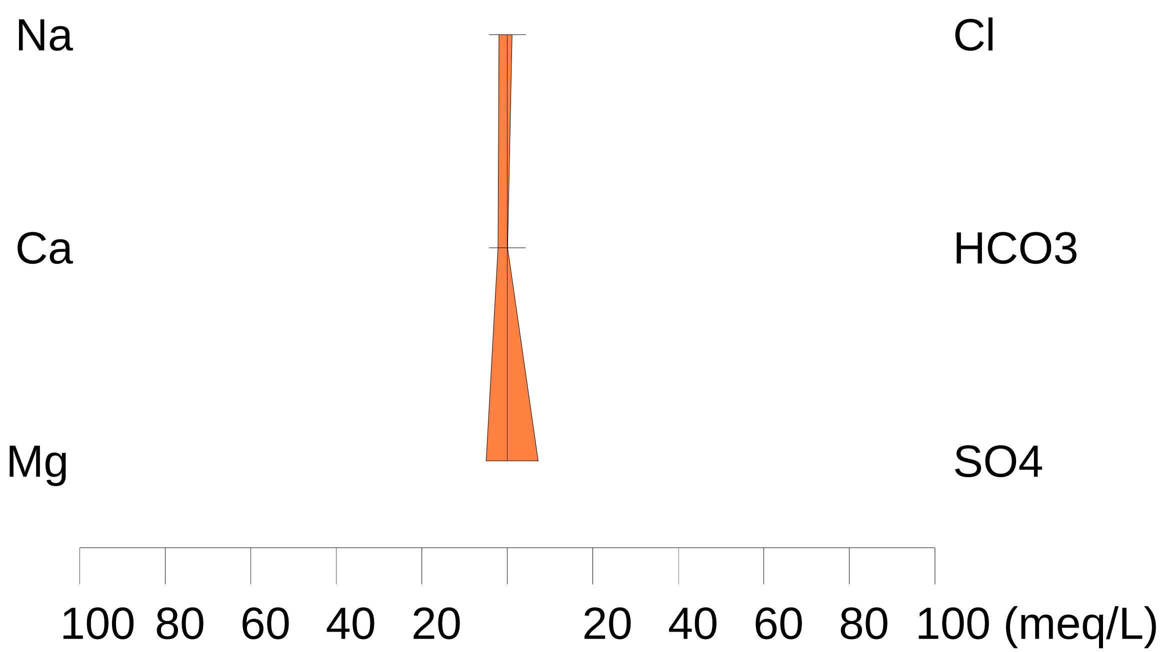


Stiff Diagram – SW-6
Collected May 2010
Mine Waste Source Water
Mt. Diablo

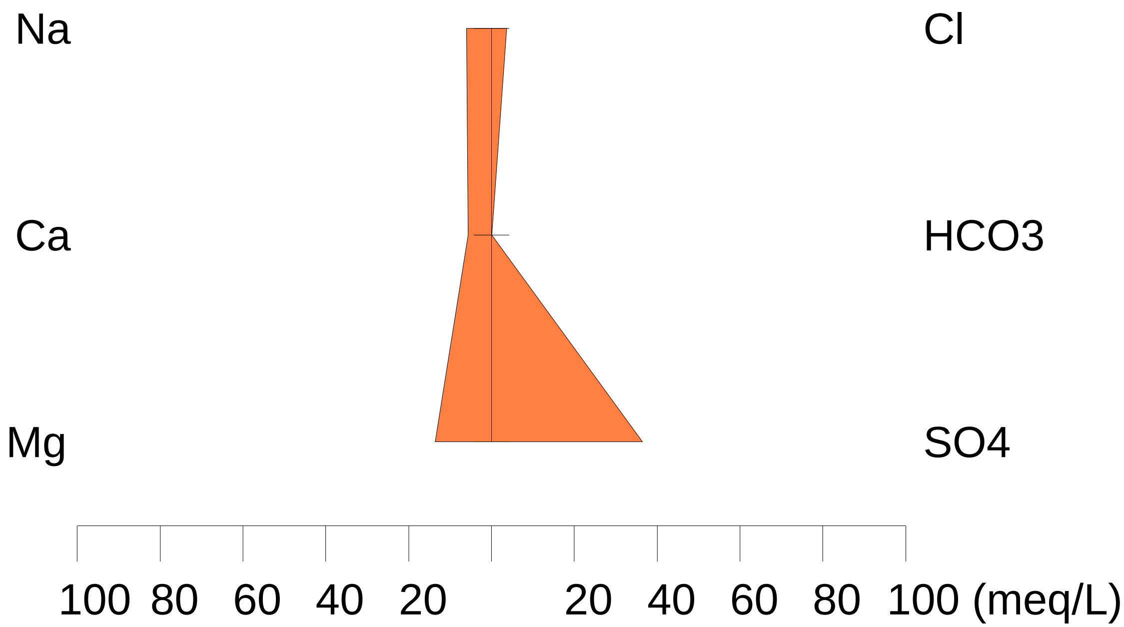


Stiff Diagram – SW-6
Collected February 2011

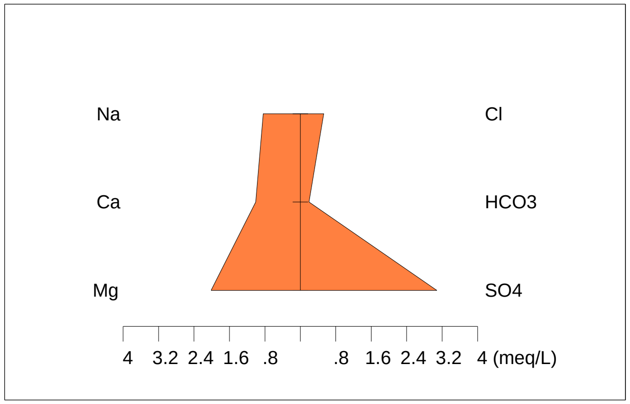


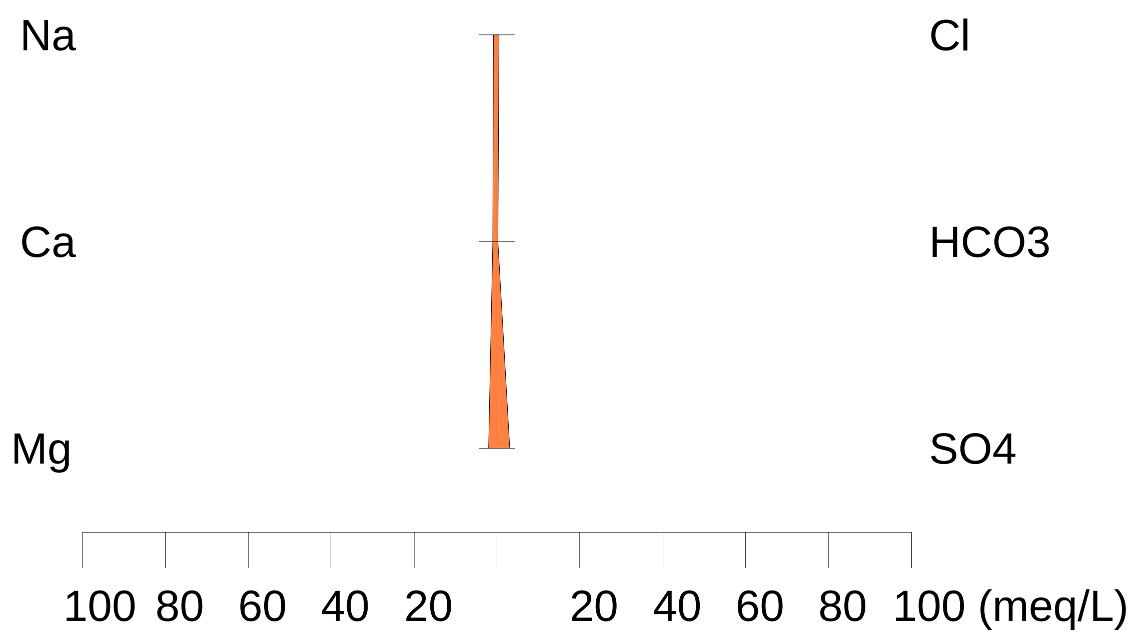


Stiff Diagram – SW-6
Collected June 2011

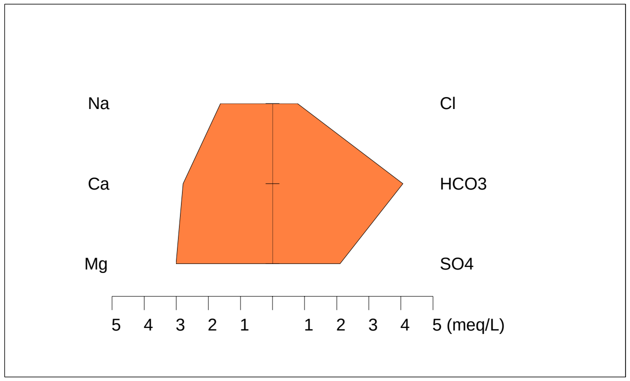


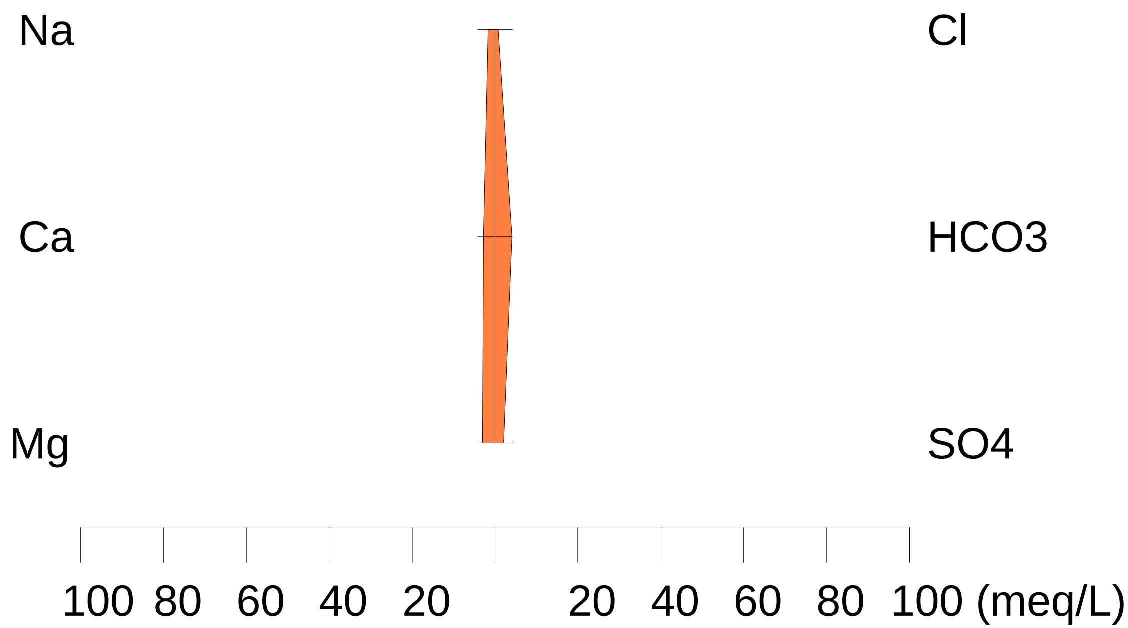
Stiff Diagram – SW-10
Collected April 2010
Mine Waste Source Water
Mt. Diablo



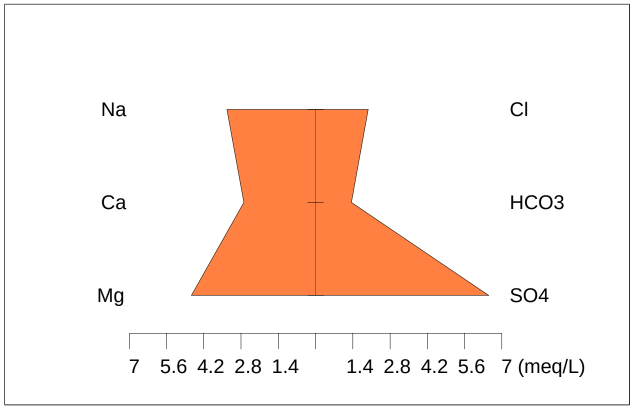


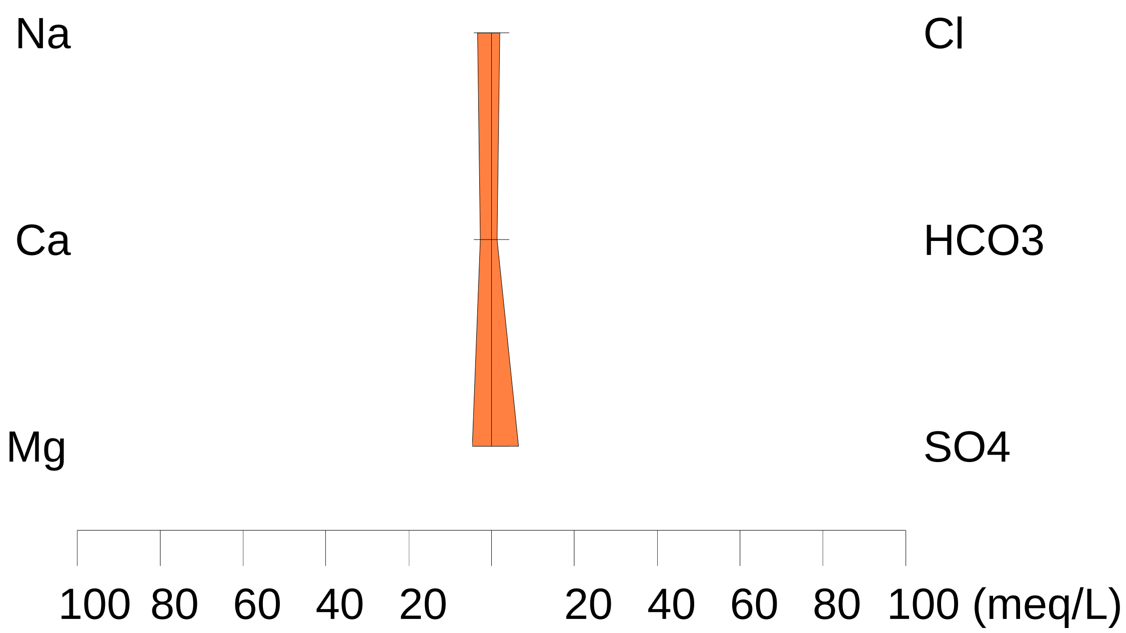
Stiff Diagram – SW-10
Collected May 2010
Background Water
Mt. Diablo



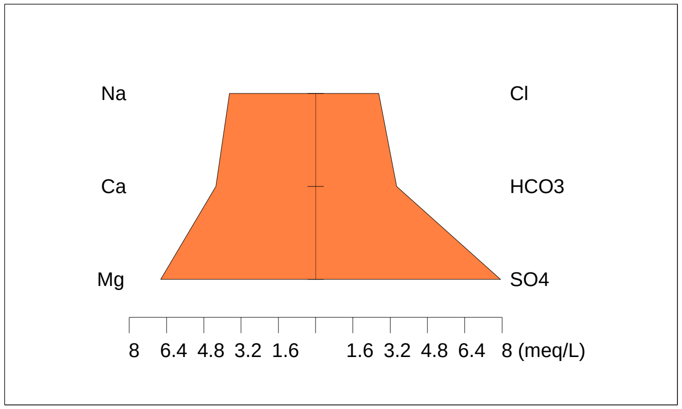


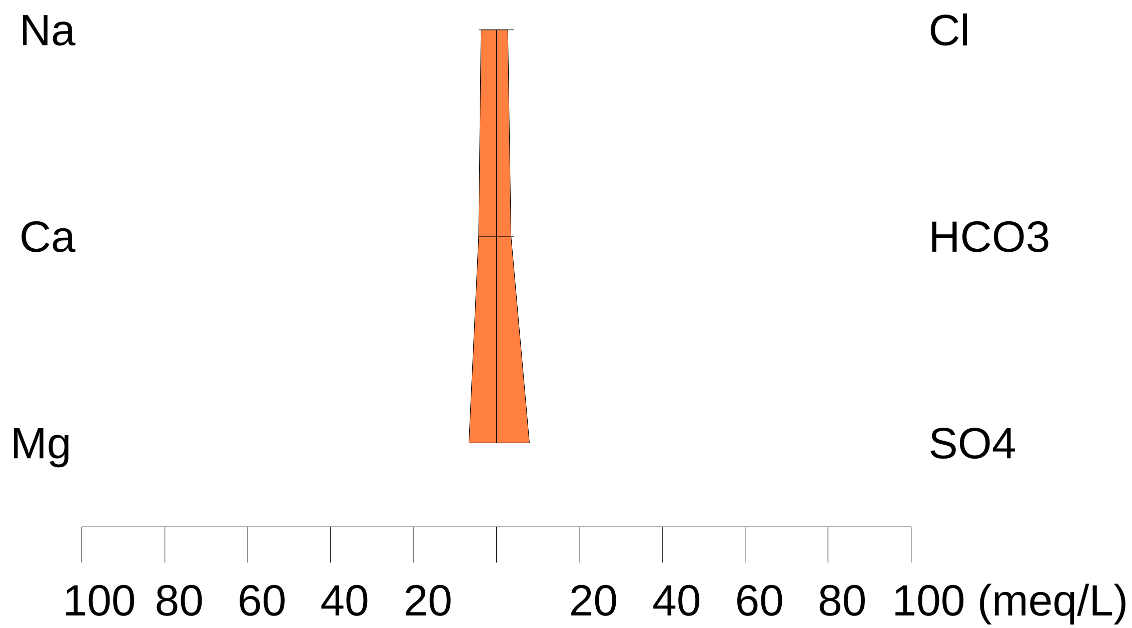
Stiff Diagram – SW-10
Collected February 2011



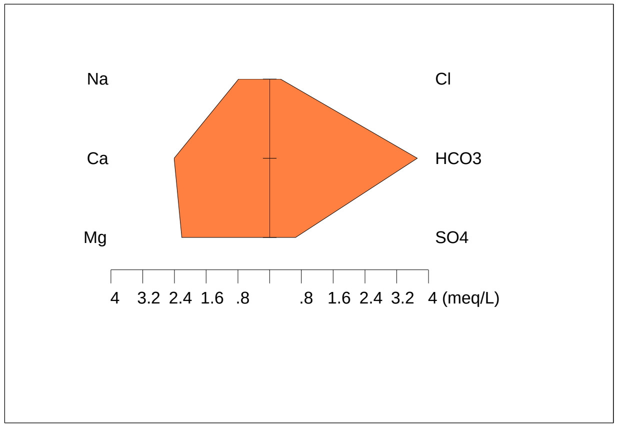


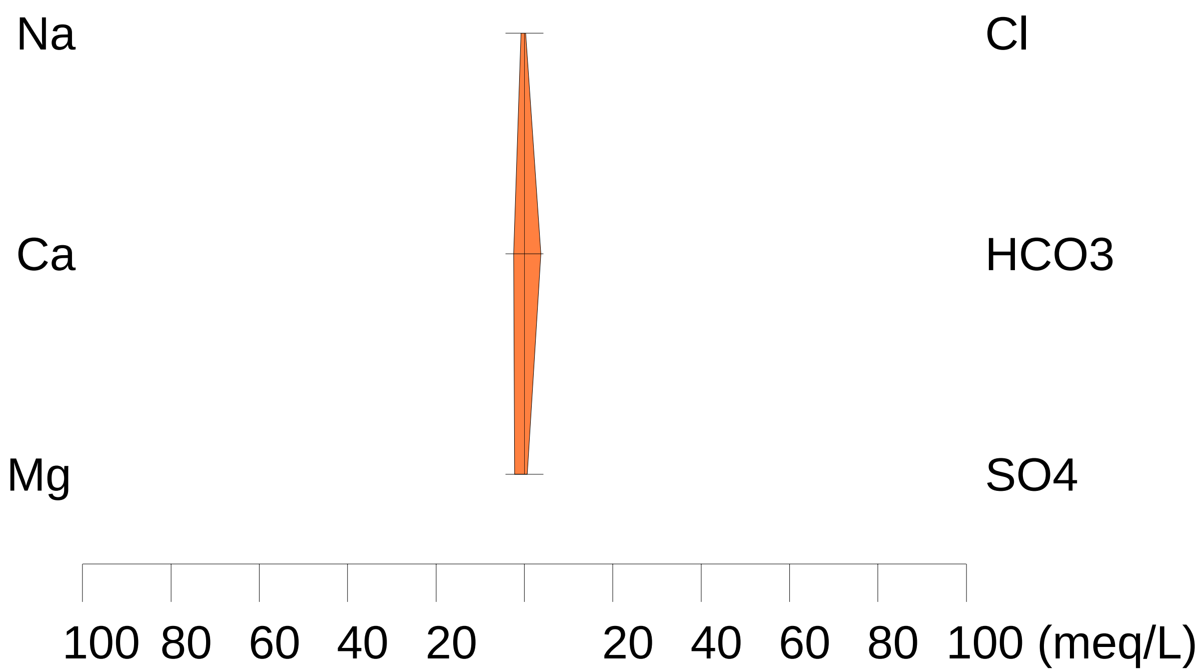
Stiff Diagram – SW-10
Collected June 2011



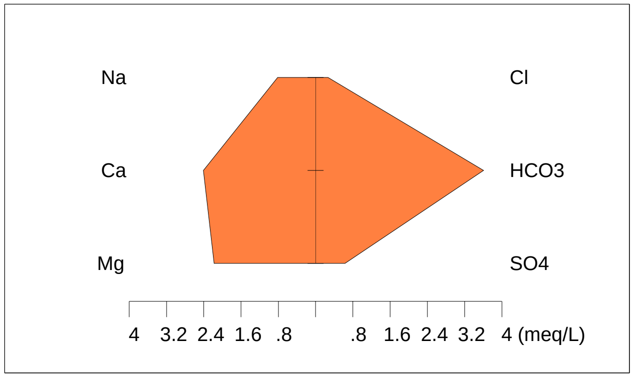


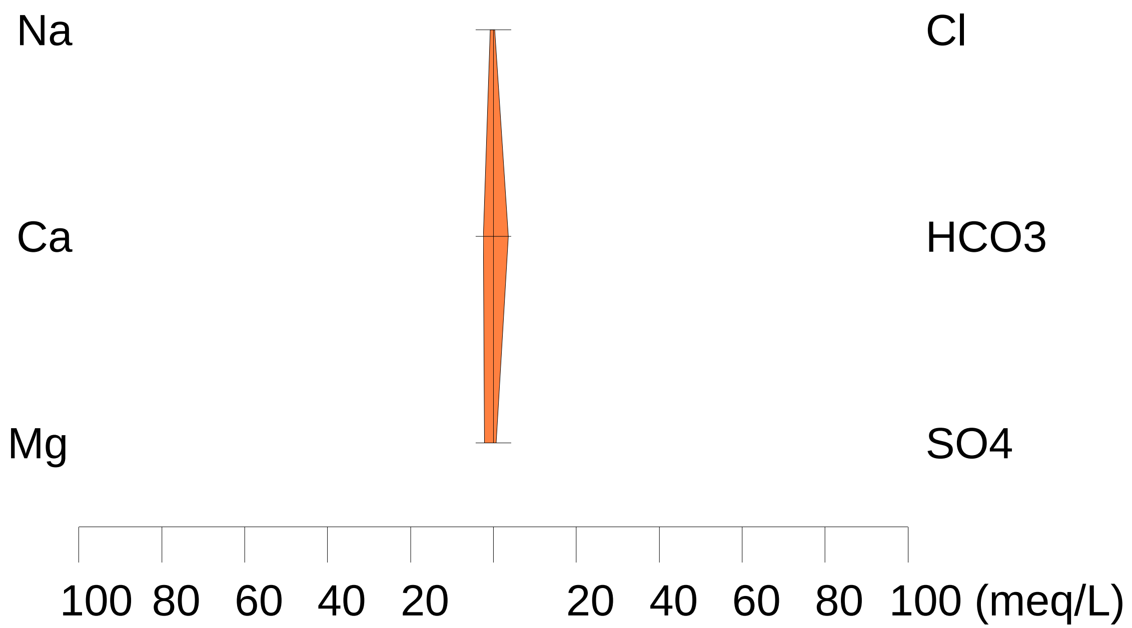
Stiff Diagram – SW-11
Collected May 2010
Background Water
Mt. Diablo



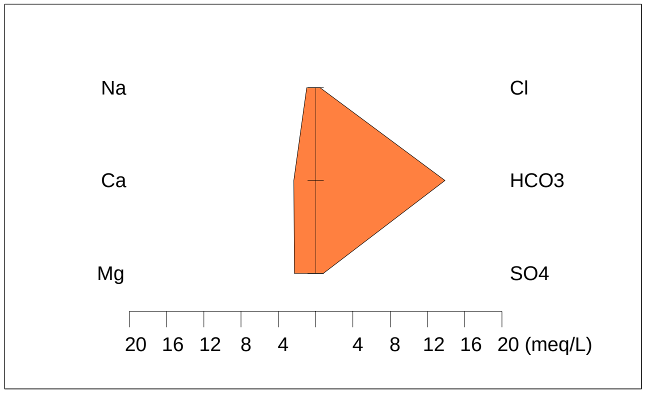


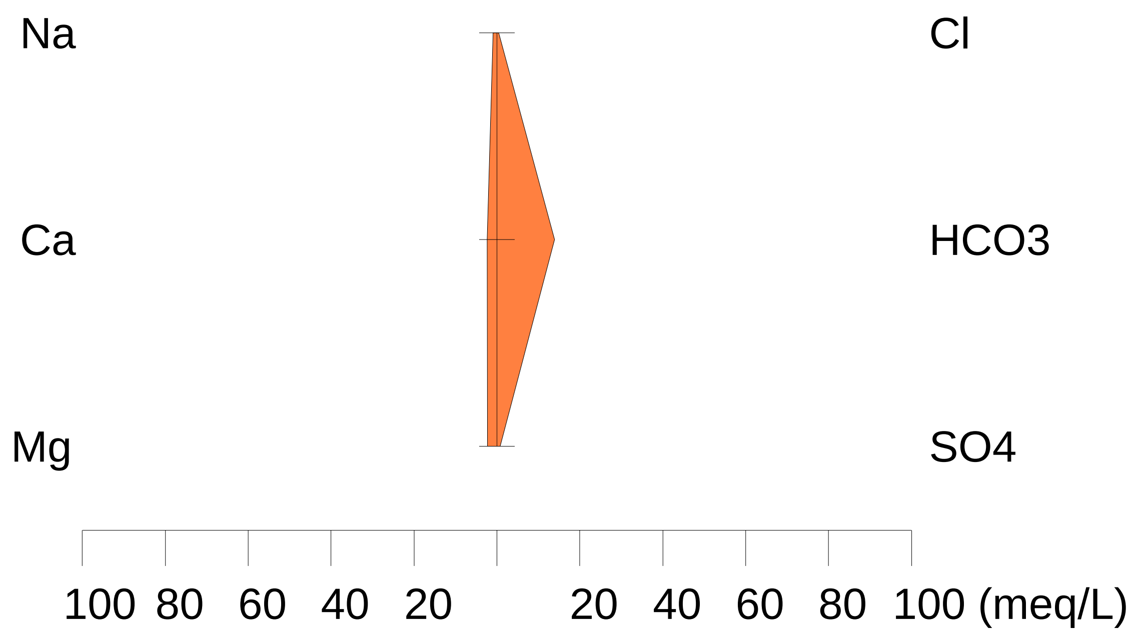
Stiff Diagram – SW-11
Collected February 2011



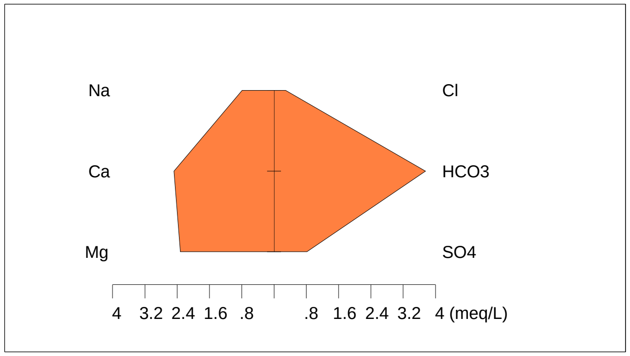


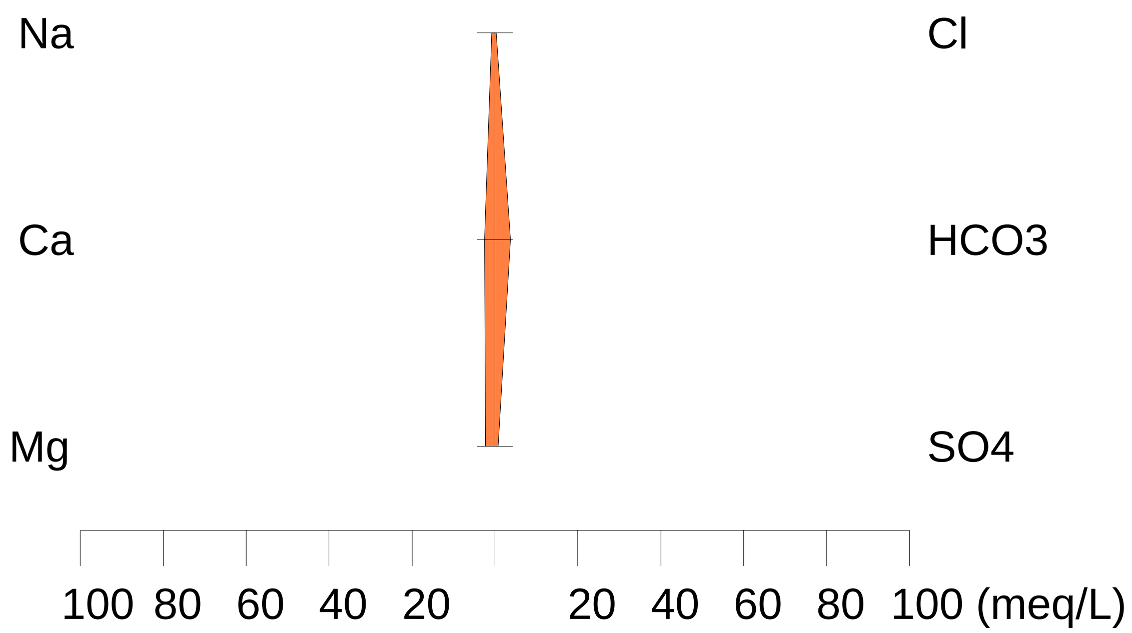
Stiff Diagram – SW-11
Collected June 2011



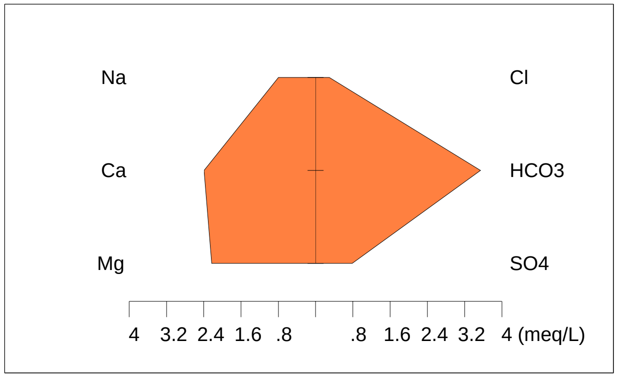


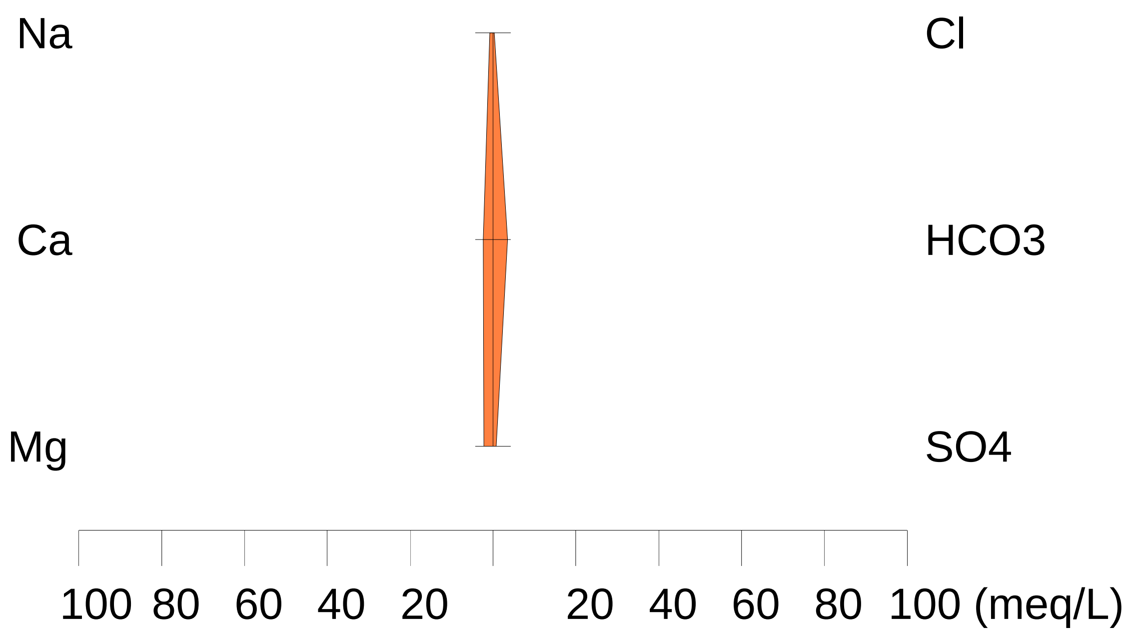
Stiff Diagram – SW-13
Collected May 2010
Background Water
Mt. Diablo



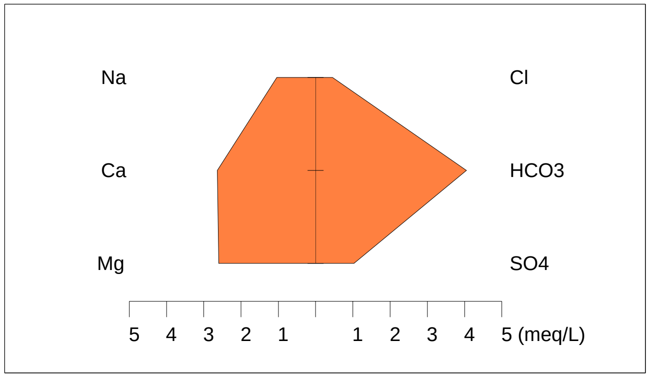


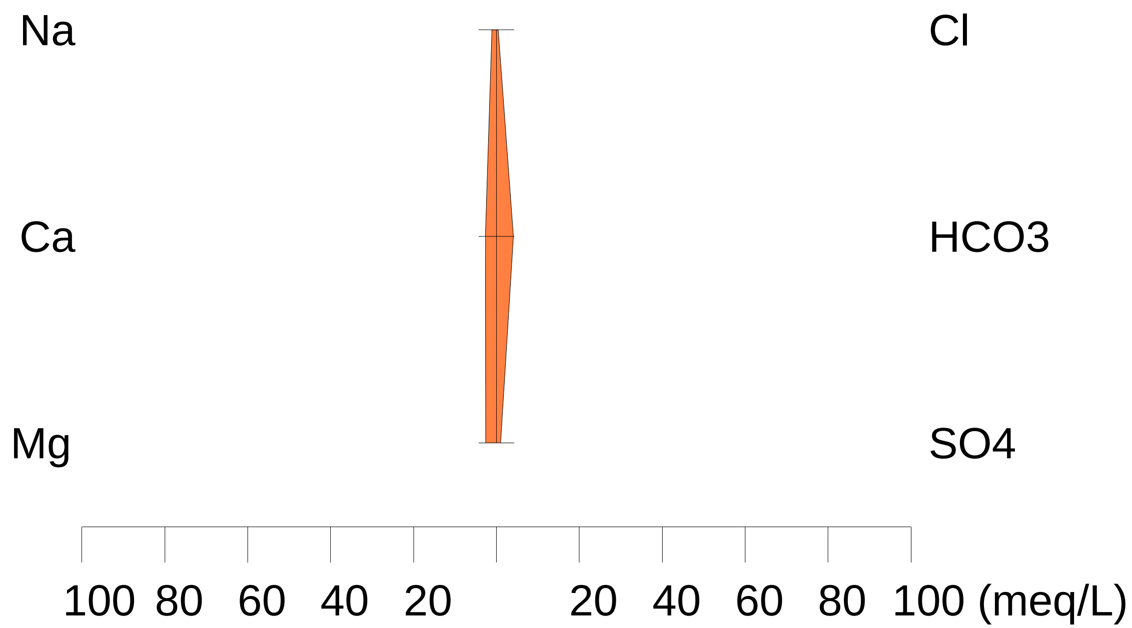
Stiff Diagram – SW-13
Collected February 2011





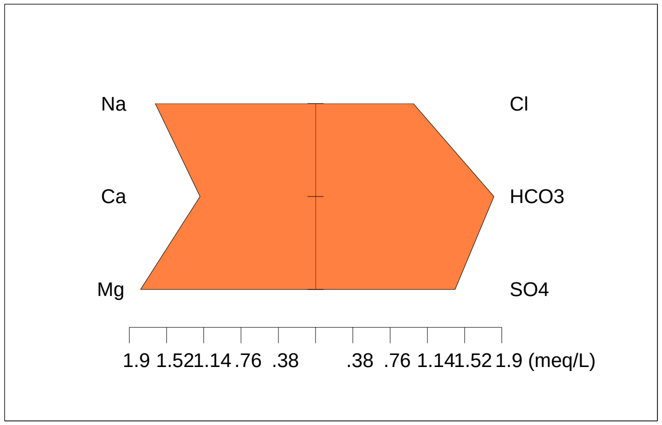
Stiff Diagram – SW-13
Collected June 2011

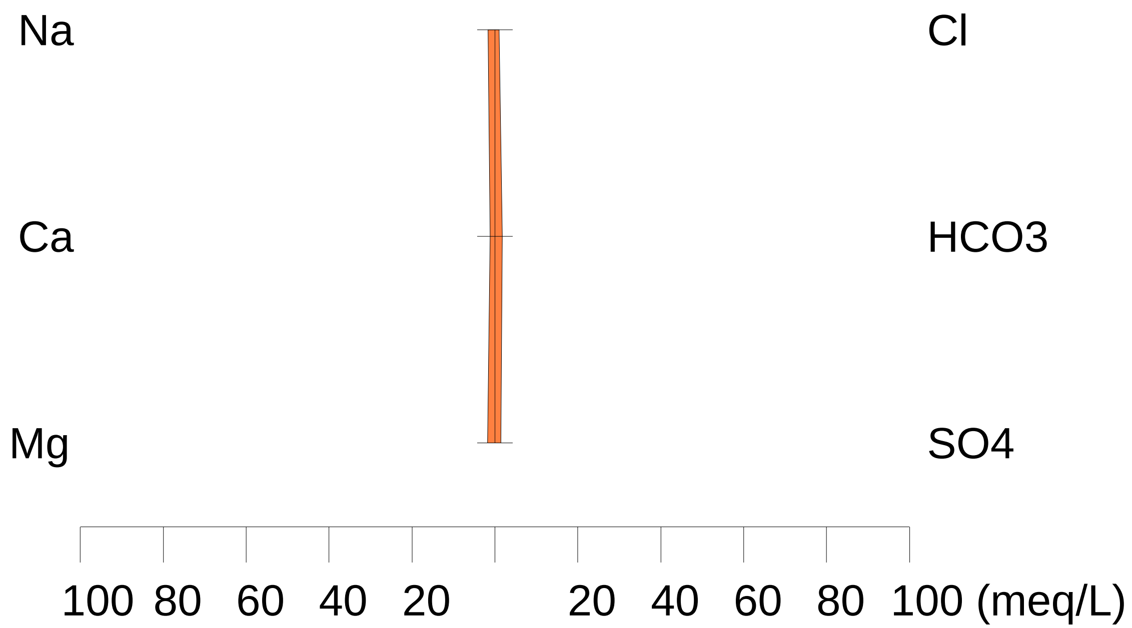




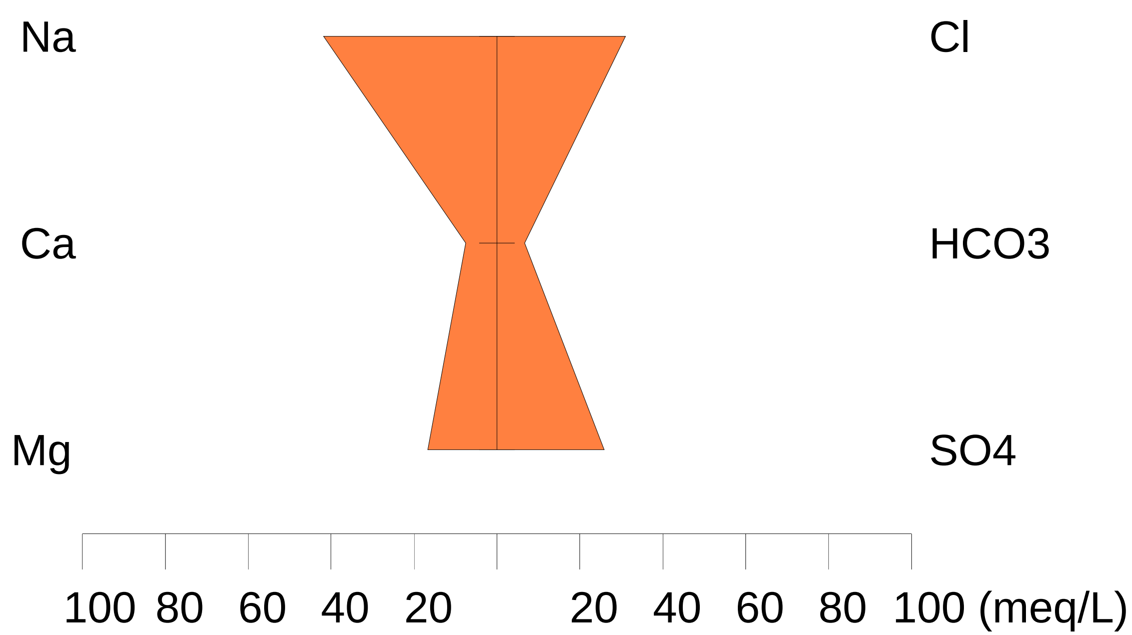
SURFACE WATER ON OR NEAR SITE – NO CONTACT WITH MINE TAILINGS OR WASTE ROCK

Stiff Diagram – SW-4
Collected April 2010
Background Water
Mt. Diablo

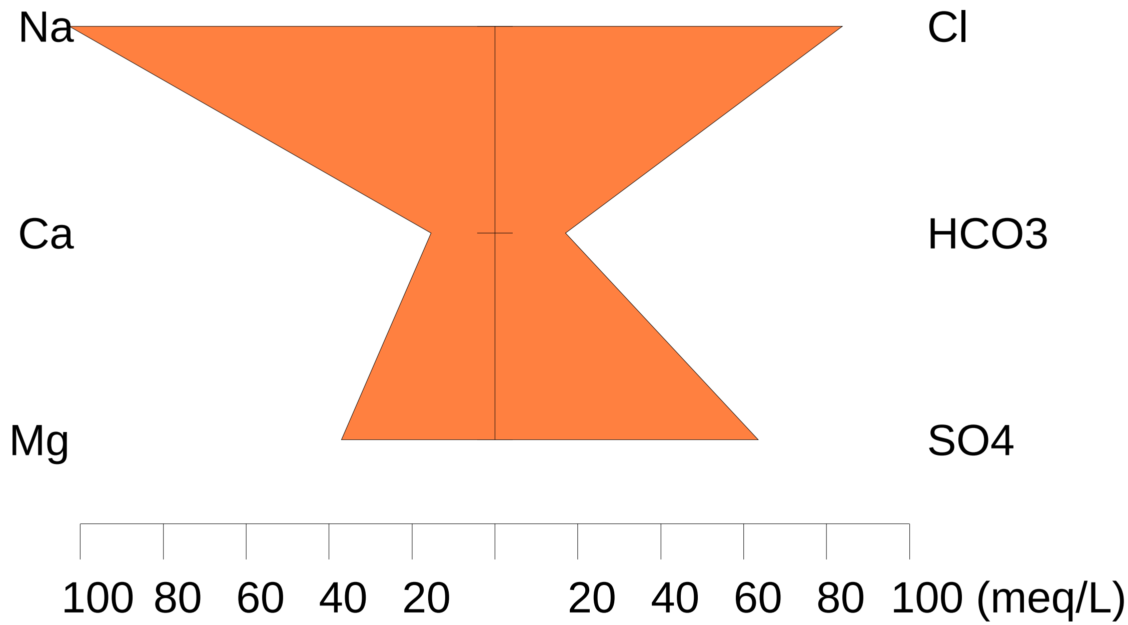




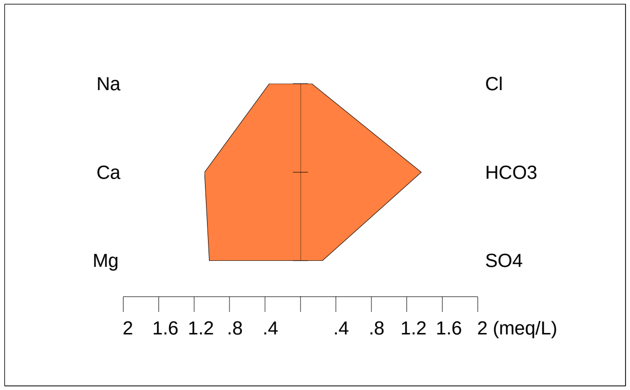
Stiff Diagram – SW-4
Collected February 2011

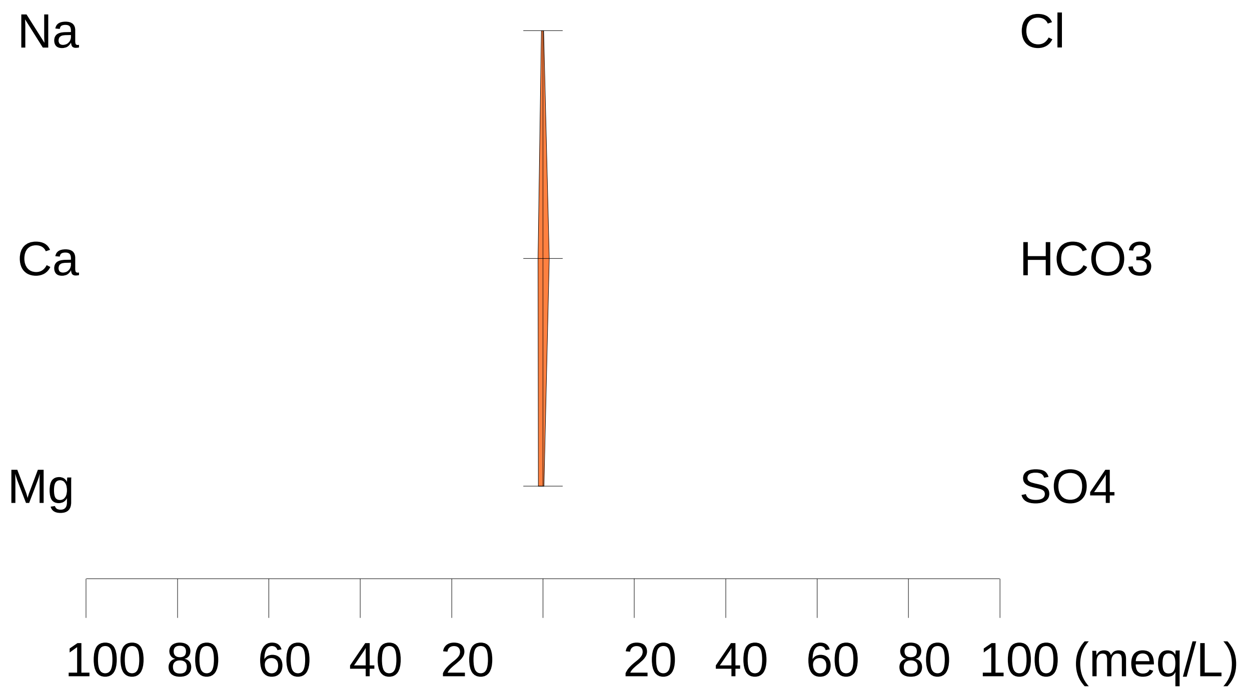


Stiff Diagram – SW-4
Collected June 2011

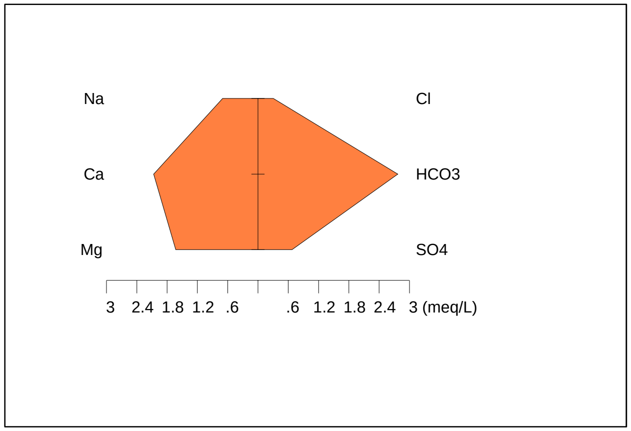


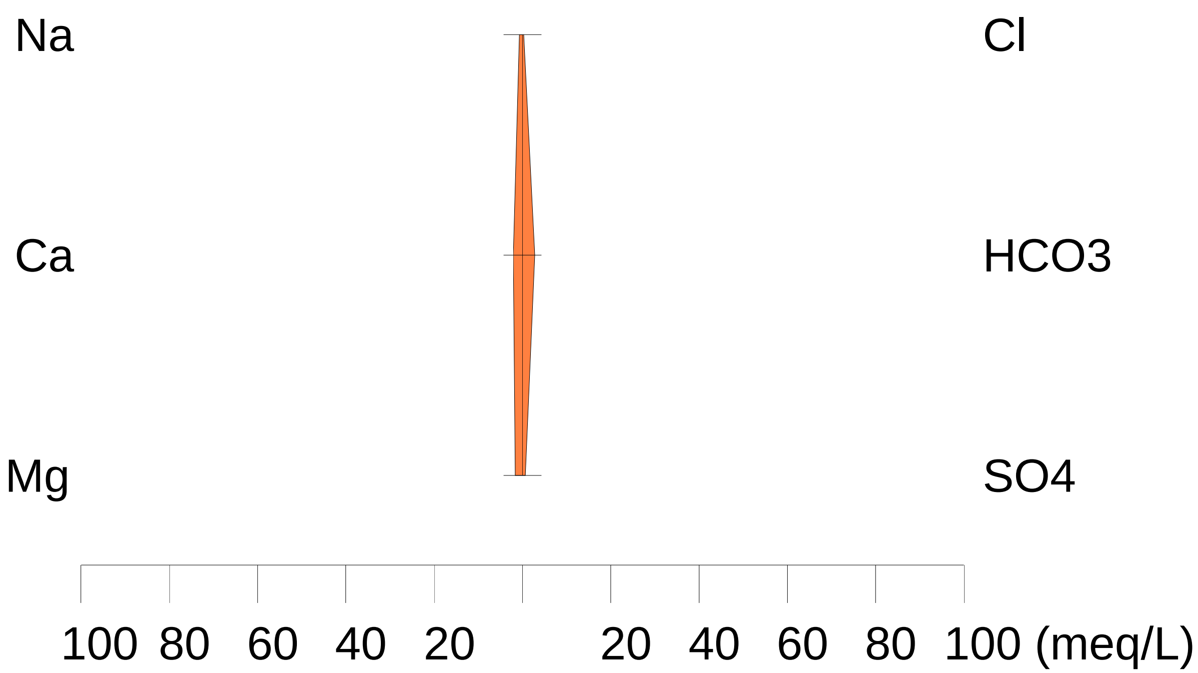
Stiff Diagram – SW-8
Collected April 2010
Background Water
Mt. Diablo



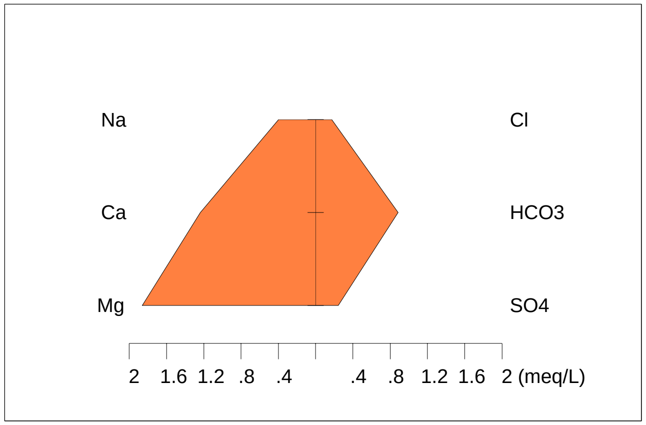


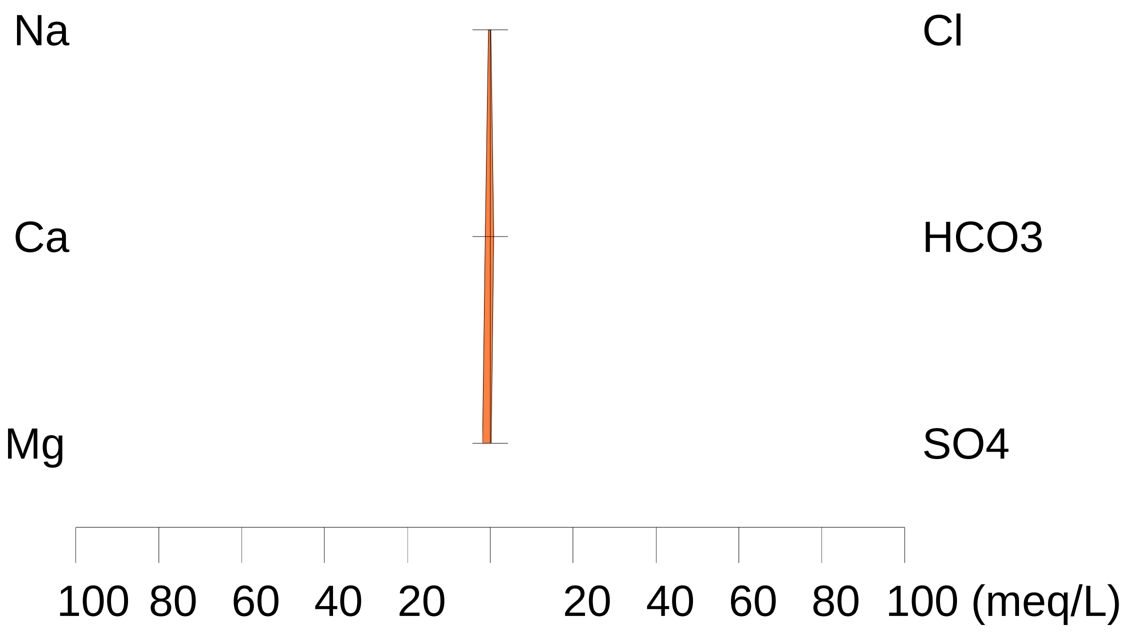
Stiff Diagram – SW-8
Collected May 2010
Background Water
Mt. Diablo



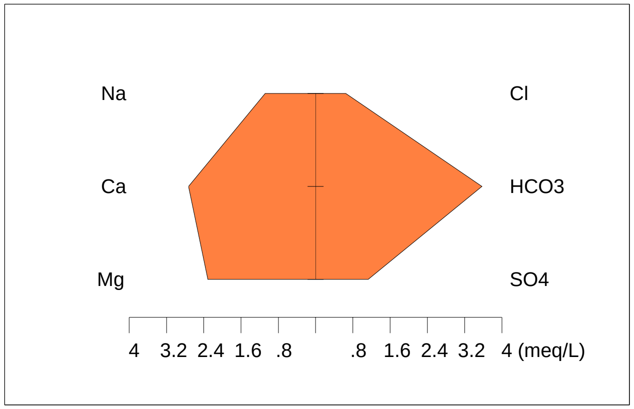


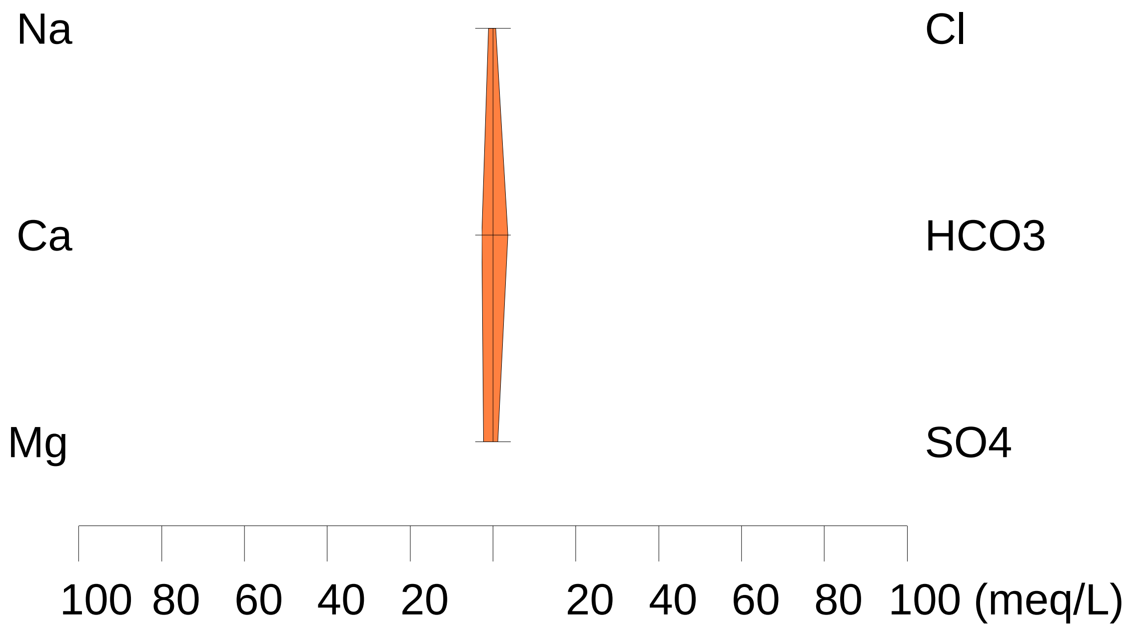
Stiff Diagram – SW-8
Collected February 2011



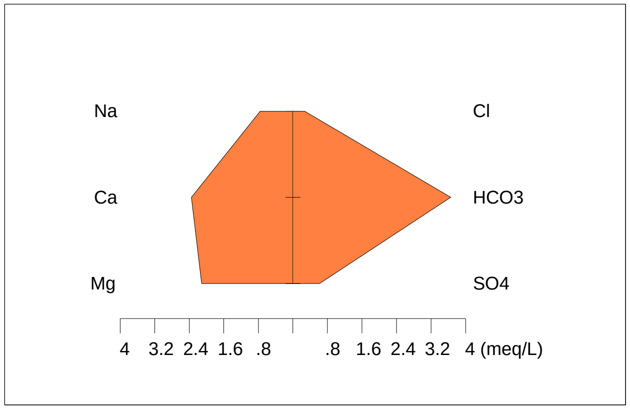


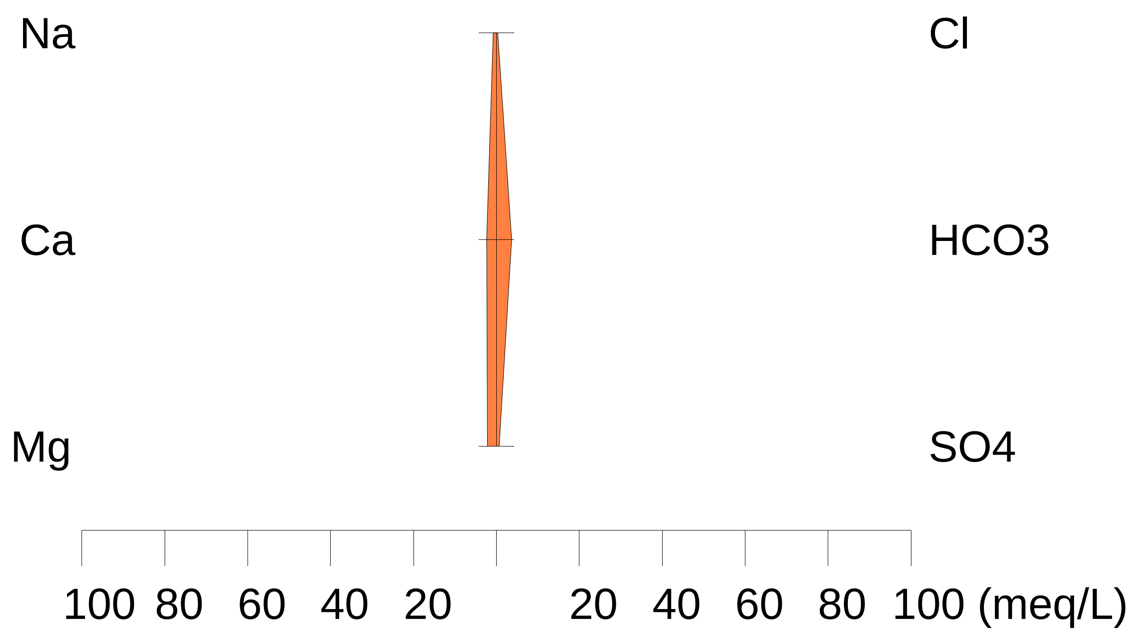
Stiff Diagram – SW-8
Collected June 2011



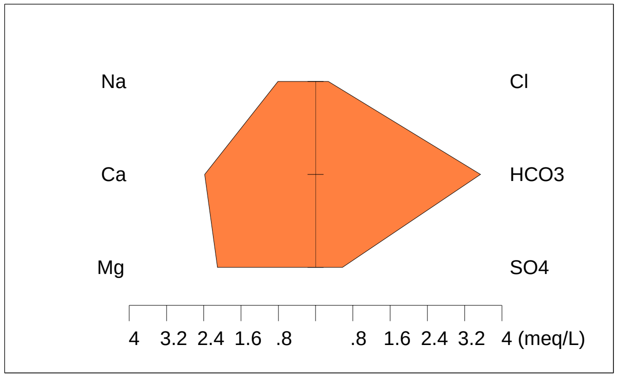


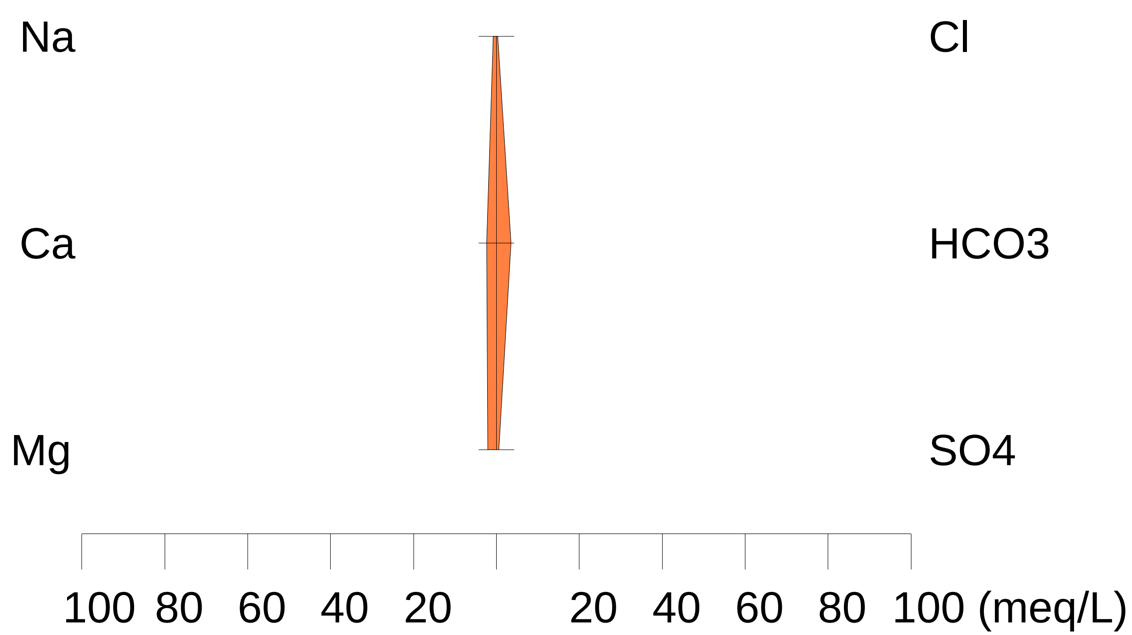
Stiff Diagram – SW-12
Collected May 2010
Background Water
Mt. Diablo



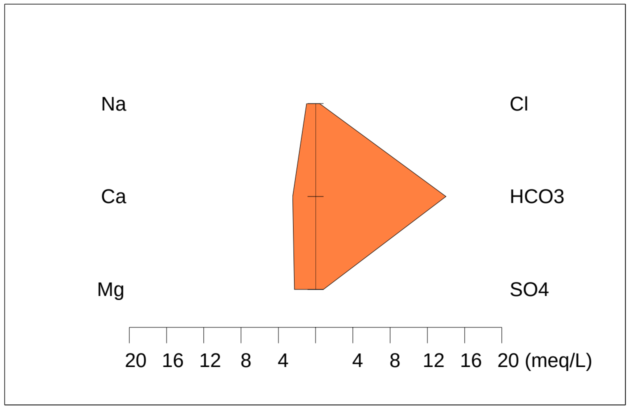


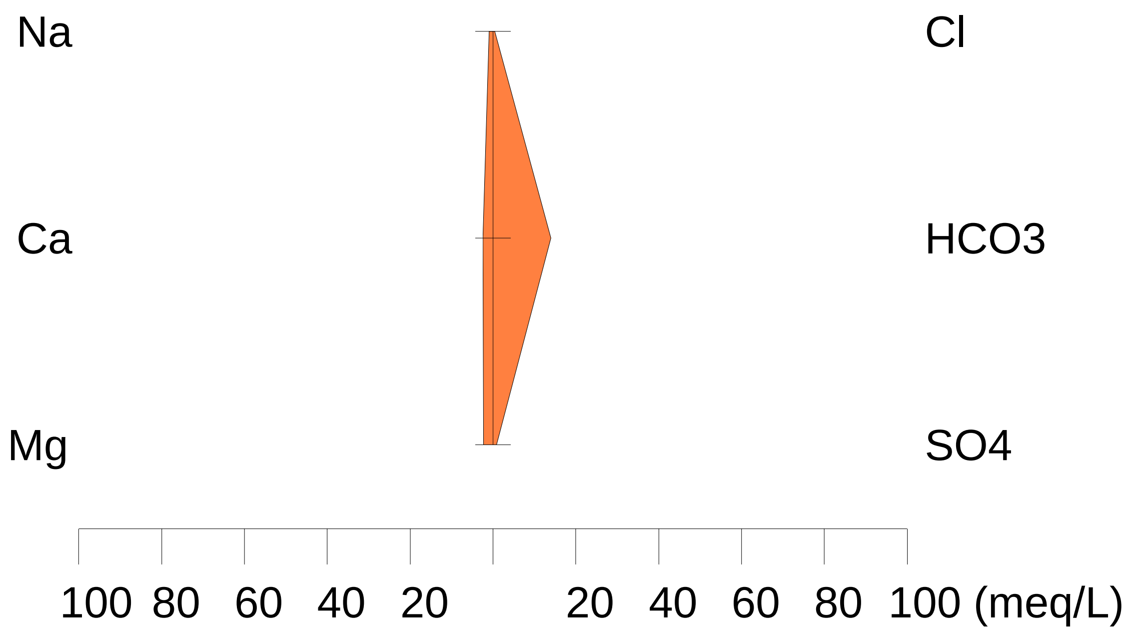
Stiff Diagram – SW-12
Collected February 2011



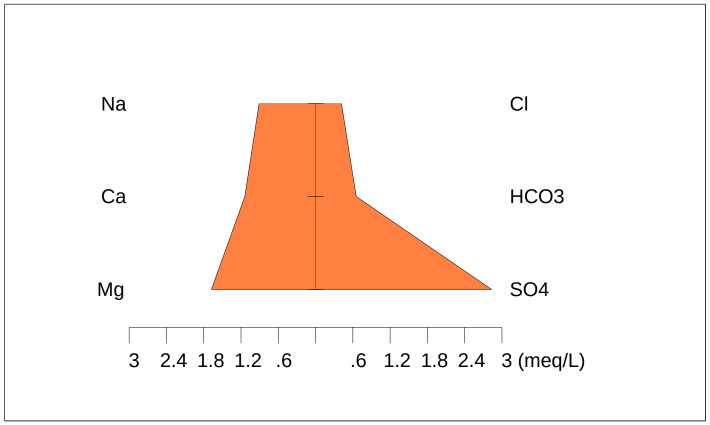


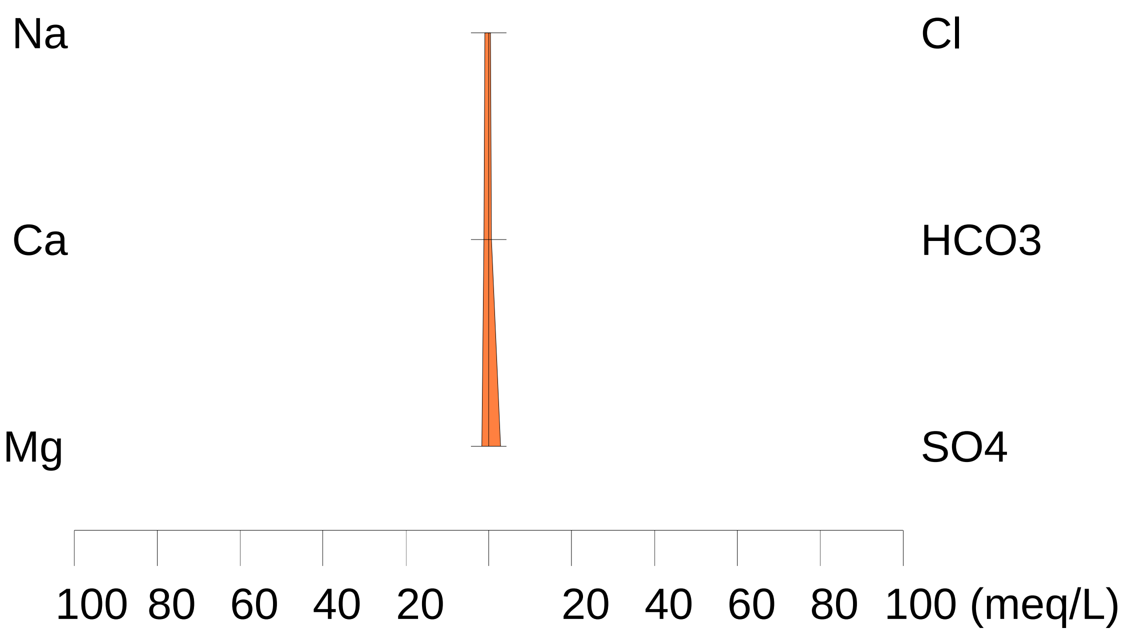
Stiff Diagram – SW-12
Collected June 2011



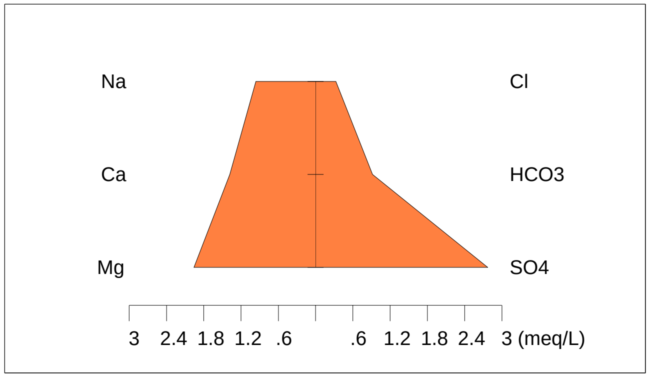


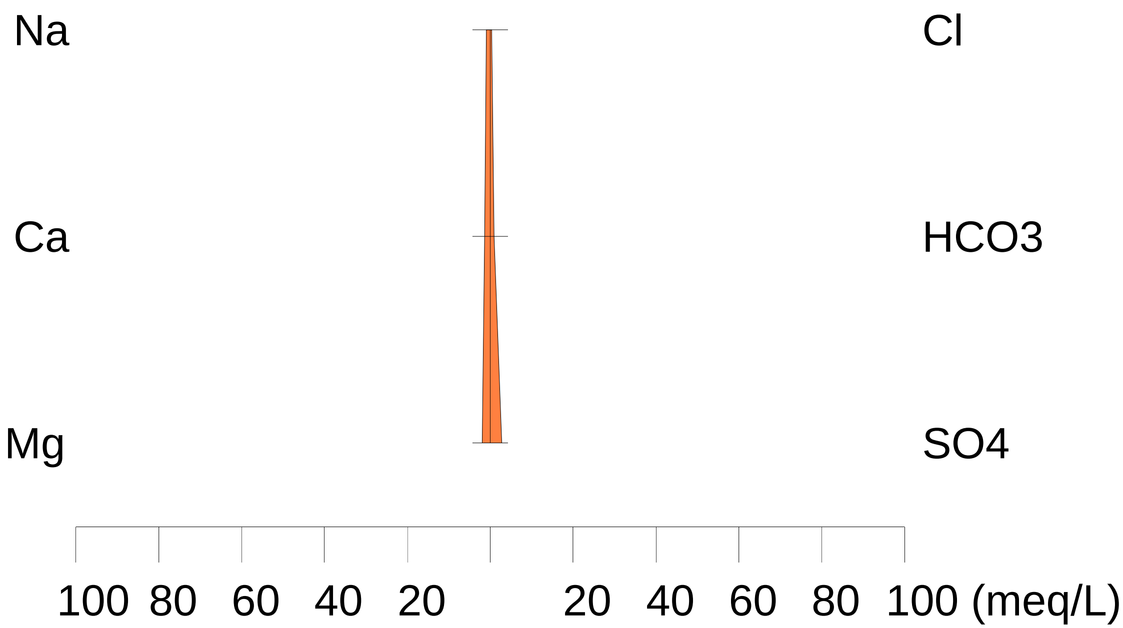
Stiff Diagram – SW-14
Collected May 2010
Mine Waste Source Water
Mt. Diablo



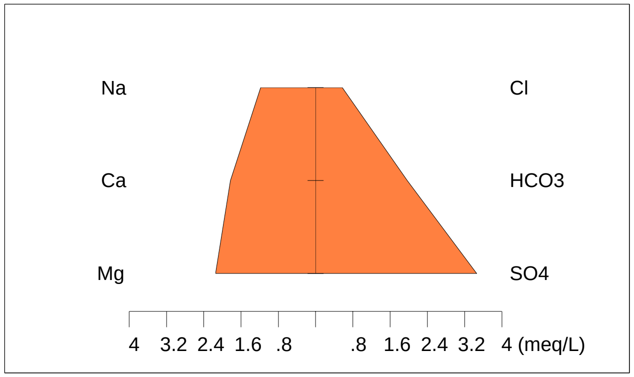


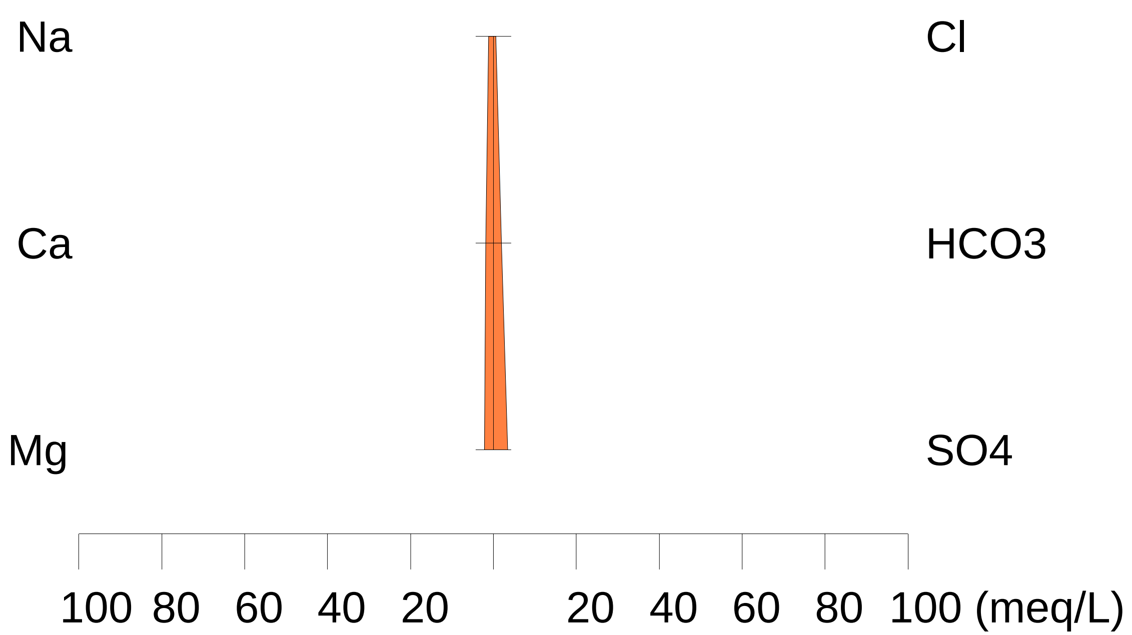
Stiff Diagram – SW-14
Collected February 2011



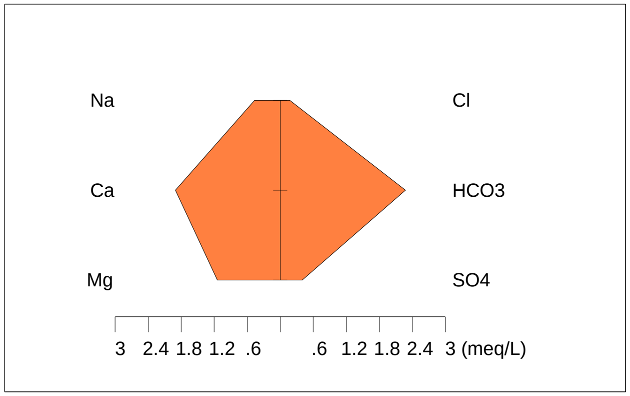


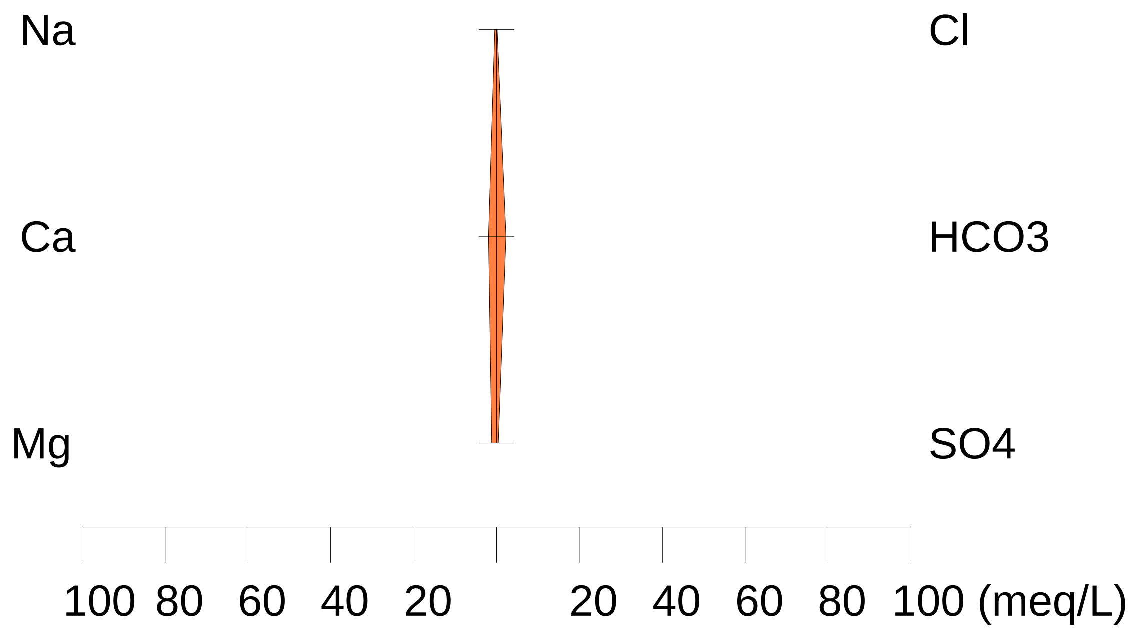
Stiff Diagram – SW-14
Collected June 2011



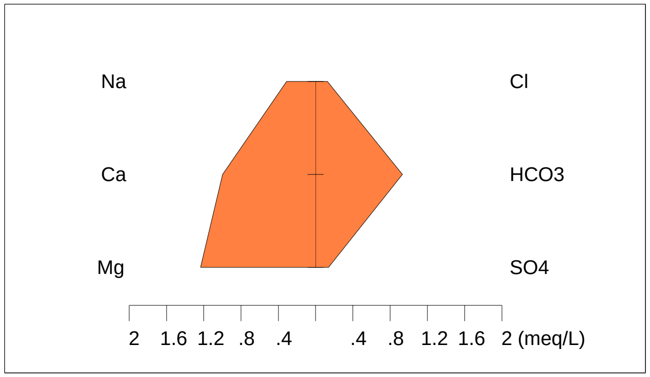


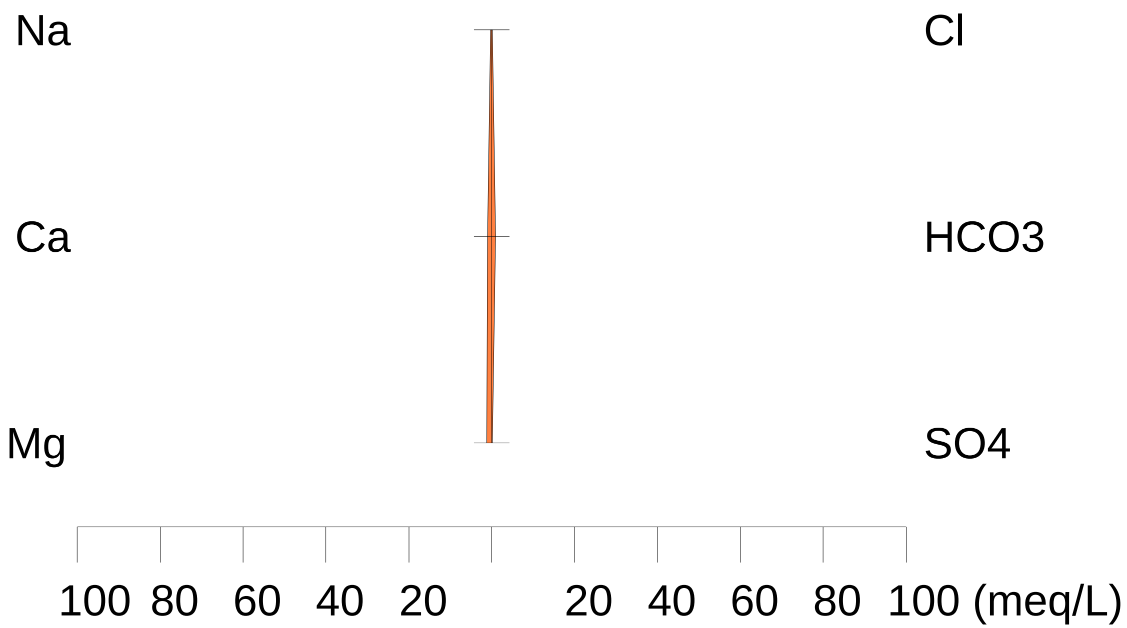
Stiff Diagram – SW-16
Collected May 2010
Background Water
Mt. Diablo



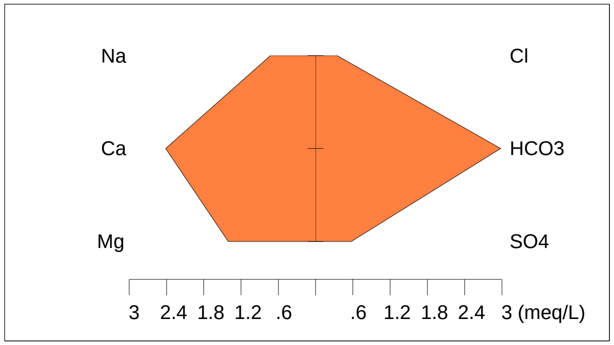


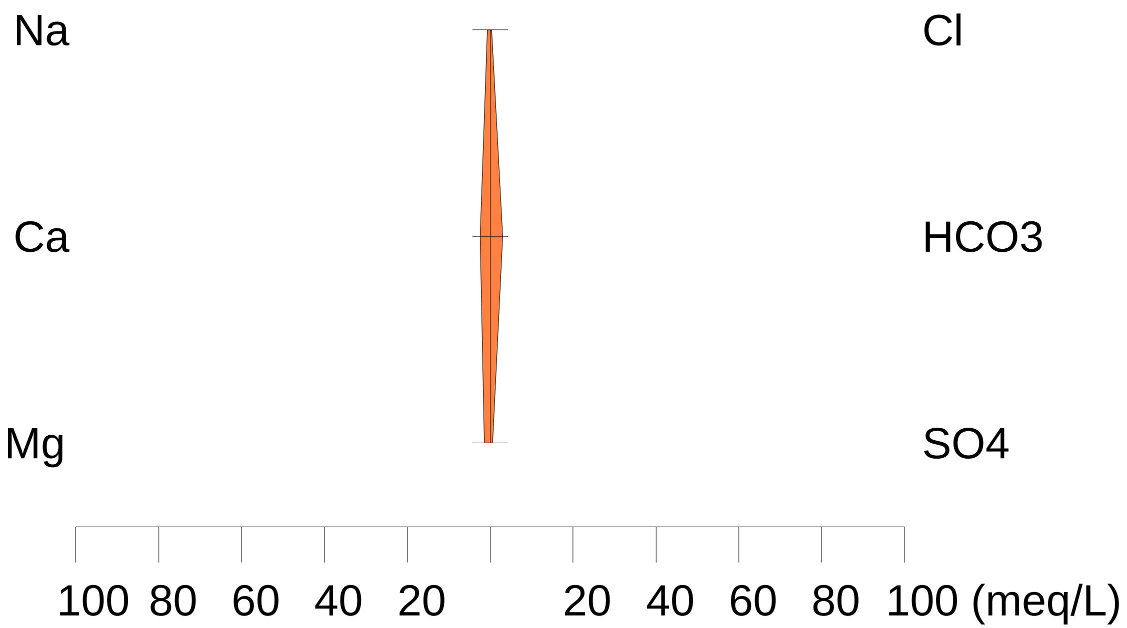
Stiff Diagram – SW-16
Collected February 2011





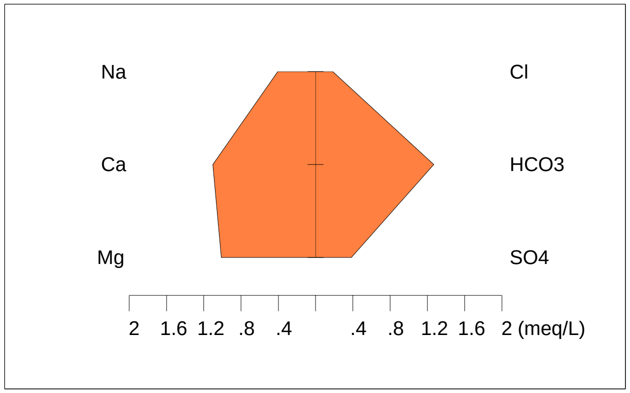
Stiff Diagram – SW-16
Collected June 2011

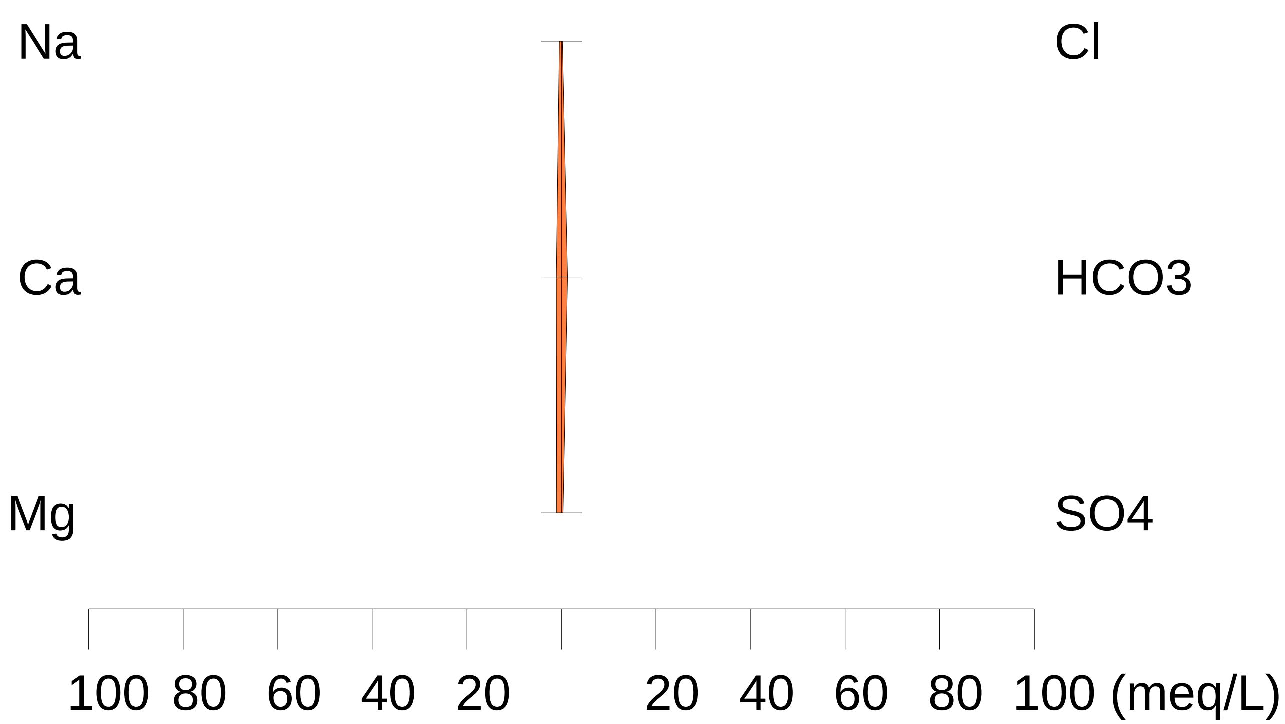




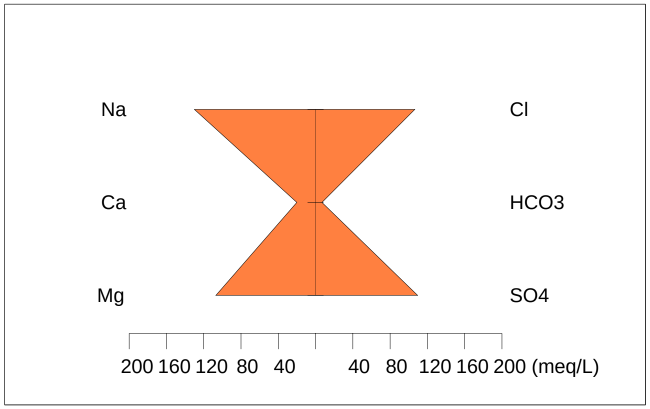
SITE EFFLUENT – POINT OF COMPLIANCE

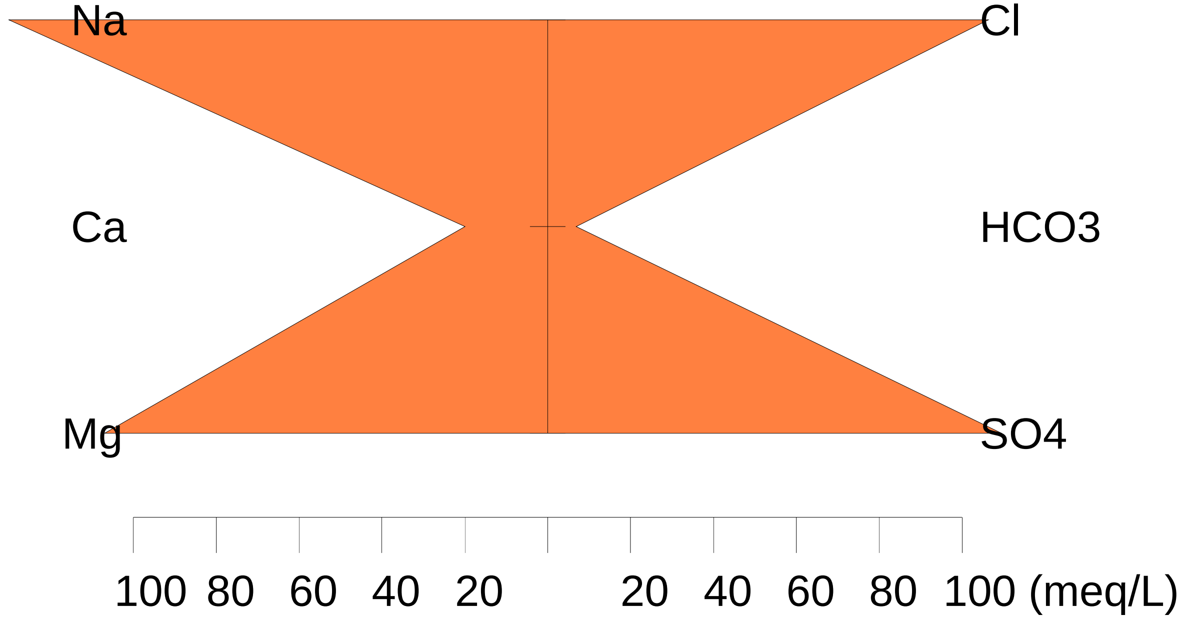
Stiff Diagram – SW-7
Collected April 2010
Background Water
Mt. Diablo



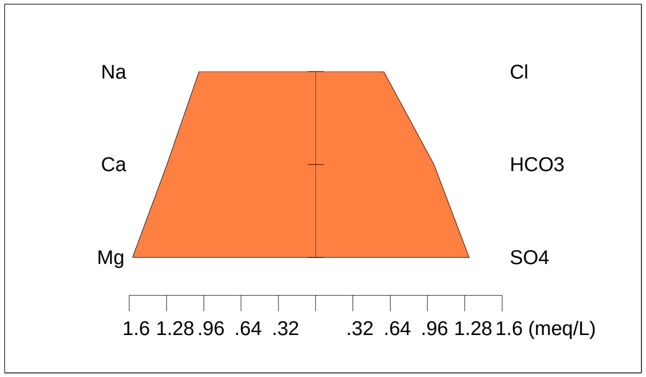


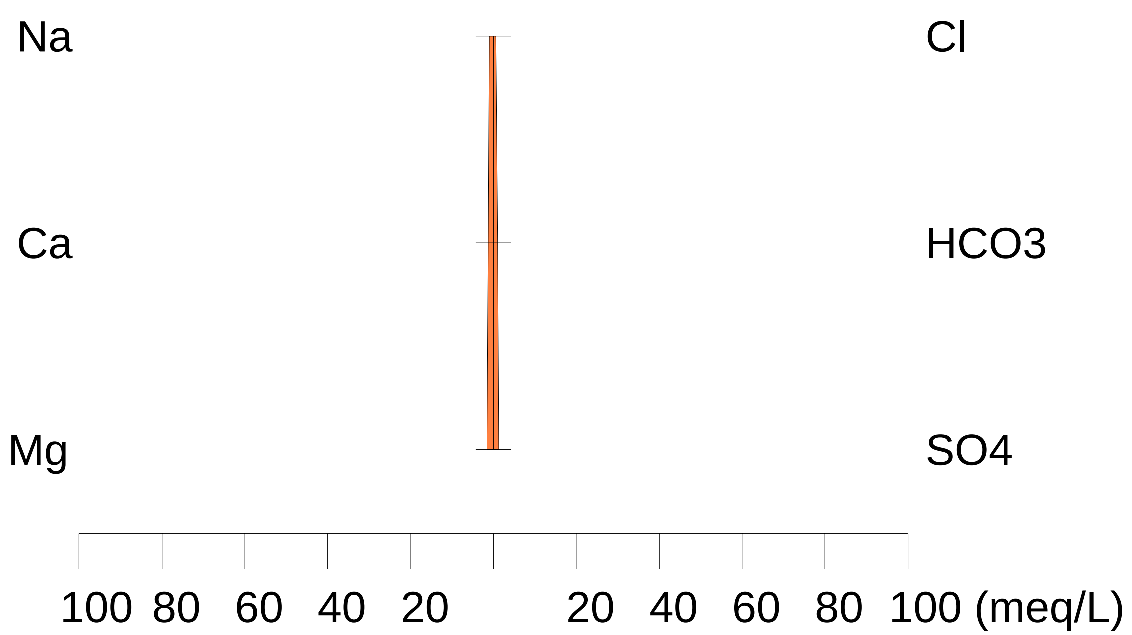
Stiff Diagram – SW-7
Collected October 2010





Stiff Diagram – SW-7
Collected February 2011





Stiff Diagram – SW-7
Collected June 2011