Appendix G
Geotechnical Evaluation Technical Memorandum

Limited Geotechnical Evaluation of Tailings Impoundments AB/BC, and D, ASARCO LLC Hayden Plant Site, Hayden, Arizona

PREPARED FOR: U.S. Environmental Protection Agency

PREPARED BY: CH2M HILL
(Curt Basnett, P.E., G.E./SCO and Karthik Radhakrishnan/SCO)

ISSUE DATE: June 19, 2007

CH2M HILL PROJECT NO: 335404.FI.04

1. Introduction

This technical memorandum presents findings, conclusions, and recommendations from a limited, reconnaissance-level assessment of the general stability of Tailings Impoundments AB/BC and D at the ASARCO LLC Hayden Plant Site (Site) located in Hayden, Arizona. The evaluation was conducted in accordance with Task 3g (Geotechnical Evaluation of Tailings Piles) of the "Final Workplan-Remedial Investigation at the ASARCO LLC Hayden Plant Site" (Workplan, CH2M HILL, September 2005). A project Site location map is presented as Figure 1, which shows the specific impoundment locations considered in this study.

The scope of work for Task 3g included the following:

- Step 1 - Review of available existing information on the construction and operation of Tailings Impoundments AB/BC and D
- Step 2 - Site reconnaissance of the impoundments by a CH2M HILL geotechnical engineer
- Step 3 - Perform general slope stability analyses of the impoundments
- Step 4 - Preparation of this technical memorandum summarizing CH2M HILL' s findings, conclusions, and recommendations

2. Step 1 - Review of Existing Information

CH2M HILL reviewed previous reports documenting results of subsurface investigations, laboratory testing, and engineering analyses (including recommendations for improvements to tailings management) for the two tailings impoundments. Copies of key reports were obtained from ASARCO during a scheduled records review at the Site office conducted on March 16, 2007. Pertinent information presented in each of these reports is summarized in the following sections.

Dames & Moore – December 1990

Dames & Moore assessed the stability of the tailings impoundments and the feasibility of increasing the current (1990) tailings deposition rate from 30,000 Tons per Day (TPD) to 60,000 TPD. Based on historical information provided in this report, the tailings disposal for the Tailings Impoundment AB/BC started in 1910 at a rate of about 4,000 TPD. By 1952 the rate had increased to about 16,000 TPD, followed by an increase to 21,000 TPD in 1960. According to Dames & Moore (1990), the tailings impoundment elevations were raised in 10-feet-thick lifts per year since the early 1950s, suggesting the impoundment was filled to more than a 400 foot height from the early 1950s to 1990. However, Dames & Moore (1990) also reported the maximum height of Tailings Impoundment AB/BC, at the time of their field investigation, was approximately 172 feet, which also included tailings placed prior to the early 1950s. Though not clearly stated in their report, the 10-feet-thick lifts per year most likely occurred over smaller localized areas of the impoundment each year and not continuously across the entire impoundment each year. CH2M HILL estimates the overall rate of filling across the entire impoundment was probably in the range of 2 or 3 feet per year during this period.

The report noted excess seepage at the contact between spigotted materials (coarser grained), and previously deposited materials (finer grained) that were deposited by a single point discharge system. The tailings seepage concern was evident mainly along the western half of the tailings impoundments. The discontinuity eventually caused a slope failure in 1972 that resulted in a slope failure 500 feet across and 30 to 50 feet deep. Another failure occurred in 1973. At the time of failure, water was seeping out of failed portions of the impoundment, and active piping was observed.

In 1982, construction of Tailings Impoundment D was initiated with an 8,700 feet long, 48 feet high starter dike having an upstream slope of 2 horizontal (H):1 vertical (V) and a downstream slope of 2.5H:1V. The top of the starter dike was at elevation 2,020 feet above mean sea level (msl), according to the report. After 29 weeks of tailings disposal behind the dike, settlement cracks and tailing seepage were observed by mine employees. The cracks and seepage were apparently caused by differential settlement between coarse & fine-grained materials.

The Dames & Moore Report indicated that new dikes on the AB/BC and D Tailings Impoundments were built after every third 10-foot-thick lift, or 30 foot height; with embankment crests on each lift set back 30 feet from the previous crest. This approach to embankment construction created successive 30-feet-wide benches. Bulldozers were used to push coarse tailings into an embankment configuration; creating the new dikes. Water ponding on the tailings was removed by decant lines on Tailings Impoundment AB/BC and a riser pipe at Tailings Impoundment D. The water was returned to the concentrator facility at the mill site for reuse.

Subsurface Investigations

Dames & Moore noted that two previous subsurface investigations were completed at the impoundment sites; one conducted in 1960 at Tailings Impoundment AB/BC, and one conducted in 1973-74 for the starter dike at the Tailings Impoundment D area. Limited information is available from these earlier investigations, though Dames & Moore noted

both investigations indicated the impoundment areas are underlain by alluvial granular deposits of gravelly sand, silty sand, clayey sand, and sand.

In 1990, Dames & Moore completed a subsurface investigation by advancing six soil borings along the perimeter crest of Tailings Impoundments AB/BC. No investigation was conducted on Tailings Impoundment D. Piezometers were installed at each boring location to enable measurement of groundwater elevations. Logging of the borings revealed predominately granular tailing materials consisting of mostly silty sand and sandy silt, with coarser-grained materials located near the crest and finer-grained materials encountered at greater depths. The thickness of the tailings ranged from 130 feet to 179 feet, according to the report. Laboratory testing included the following:

- Moisture and Density
- Index Properties
- Consolidated-Undrained Triaxial Compression; and
- Falling-head Permeability

Results of the testing generally indicate that tailing densities generally increase with depth. Triaxial testing indicates that tailing materials have moderately high shear strength.

Engineering Analyses/Recommendations

Engineering analyses completed by Dames & Moore (1990) included projected storage capacity of the impoundments, surface water hydrology, seepage, liquefaction, and stability analyses. Hydrologic analyses were completed to calculate required flood storage volumes. The seepage analysis indicated a seepage rate of 0.08 gallons per minute per foot (gpm/ft) of impoundment length for Tailings Impoundment AB/BC. This rate generally agreed with observations made during the period of analyses. Liquefaction calculations determined no significant effects on the overall stability of the impoundments.

Dames & Moore reported that the stability for the current configuration of Tailings Impoundment AB/BC was inadequate for static and seismic conditions. The stability for the maximum impoundment configuration was found adequate for static conditions, and marginally stable to inadequate for seismic conditions. It was recommended to increase the overall stability by lowering the downstream slope from 2.5H: 1V to 3.0H: 1V or flatter by increasing the bench width from 30 feet to at least 40 feet. Dames & Moore also recommended monitoring of seepage flow rates, in addition to weekly surveillance by operations personnel and a detailed annual inspection conducted by a geotechnical engineer. Installation of inclinometers was also recommended.

Agra Earth and Environmental – 1994, 1996

The scope of these investigations was to evaluate the options for Tailings Impoundment AB/BC and D seepage control, and to limit or prevent impacts on groundwater quality. Field investigations were conducted for this study and included five hollow-stem-auger borings at Tailings Impoundment AB/BC followed by installation of five groundwater monitoring wells. Bulk samples and relatively undisturbed samples were obtained at Tailings Impoundment D. Boring logs were available in one of these reports (1994). However, a site location plan showing boring locations was not included. Information was not complete as to the impacts to groundwater quality from Tailings Impoundment AB/BC.

However, it was concluded that Tailings Impoundment D was impacting groundwater quality. Slime sealing of the back of Tailings Impoundment D was recommended to reduce seepage flow into the underlying alluvial deposits.

Hydrometrics – August 1996

Hydrometrics prepared a preliminary report of a feasibility study to examine alternatives for enhancing the tailings pumping system performance. Recommendations for tailings management were not completed.

Golder Associates – June 1997

Golder Associates, Inc. (Golder) completed an assessment of the post-closure stability of Tailings Impoundments AB/BC and D, including slope stability with seepage and a liquefaction analysis. A field investigation was not completed for this assessment, and Golder's analyses relied on earlier field and laboratory data obtained by Dames & Moore (1990), as described above.

For this study, post-closure embankment crest elevation for Tailings Impoundment AB/BC was projected to be 2,200 feet above mean sea level (msl), resulting in a total tailings height of 250 feet. Tailings Impoundment D crest elevation was projected to be 2,618 feet msl, resulting in a total closure height of approximately 630 feet. Golder noted that successive dike heights were maintained at 30 feet with bench widths of 45 feet. This resulted in interbench side slopes of 1.5H: 1V and an overall global slope of 3.0H: 1V.

Engineering Analyses

A seepage analysis was performed by Golder on the conceptual profile for Tailings Impoundment AB using phreatic surfaces established from measurements of water levels in wells and analyses. A time-dependent or transient seepage analysis was performed. Seepage analysis involved modeling over a time period of 500 years, with increments of 1, 3, 7, 15, 30, 62, 125, 250 and 500 years. Rapid drawdown near the crest was modeled. It was estimated that after closure, the coarser-grained tailings near the crest will be nearly fully-drained in one year. Coarse grained tailings were estimated to be completely drained after 7 years. Golder also estimated that seepage along the sand-slime interface might continue for up to 30 years following closure.

Based on Golder's analysis, it was recommended the phreatic surface used in the stability analyses be set at the final tailings elevation; extending to the sand-slime interface 300 feet from the crest, then down and parallel to the 3H: 1V slope, then following the interface between the materials intersecting the face of the slope at the 200 foot setback elevation, and then following the slope surface down to the natural ground surface.

Slope stability was analyzed using four critical sections. A pseudostatic seismic coefficient of 0.1 was used for the pseudostatic analyses. Tailings profiles were projected from October 1991 survey data to the proposed final crest elevations and bench widths and setbacks described above. Material properties used in the analyses were those recommended in the Dames & Moore (1990) report. The minimum computed factors of safety for the profiles evaluated were greater than the recommended design criteria of 1.3 for static and 1.0 for pseudostatic analyses.

Golder also evaluated the tailings for liquefaction potential during the maximum credible earthquake event. Based on the predicted post-closure pore pressure conditions, Golder concluded that liquefaction was not anticipated.

ASARCO – May 2007

ASARCO, at the request of CH2M HILL, provided their latest digital terrain model depicting the topography of the impoundments. This model was generated based on survey data obtained in 1997 (according to ASARCO personnel). The model was used to generate electronic profiles used in subsequent slope stability analyses conducted by CH2M HILL.

3. Step 2 - Site Reconnaissance

CH2M HILL completed a geotechnical field reconnaissance of Tailing Impoundments AB/BC and D on Tuesday, May 1, 2007. No invasive soil sampling, testing, or field measurements were conducted during this reconnaissance.

CH2M HILL personnel were escorted by ASARCO personnel to the tailings impoundments during the reconnaissance. Tailings Impoundment AB/BC was initially observed, followed by Tailings Impoundment D. Weather was partly cloudy and warm in the morning. However, looming thunderclouds and showers developed south to southwest of Tailings Impoundment D around noon to early afternoon. Partly to mostly cloudy conditions prevailed in the afternoon throughout the Hayden area.

The reconnaissance was conducted by driving around the impoundments along the crest and base of Tailings Impoundment AB/BC and stopping at various locations, including where decant lines intersect berms, to conduct closer observations, and to take photographs. Observations at Tailings Impoundment D were completed along the base (northwest side) and along the backside (southwest) of the impoundment where current tailings merge into the existing topography. Photographs with descriptive captions of both areas are presented in Appendix A.

CH2M HILL's observations indicate the impoundments appear to have been and continue to be constructed and operated in accordance with recommendations by Dames & Moore (1990), by providing approximately 45-foot-wide benches and interbench lifts of maximum 30 feet with approximately 1.5H: 1V interbench side slopes. Based on these observations made during the site visit, it appears that the outer edge of pounded water on top of the impoundments is offset a minimum 300 feet from the embankment crests.

ASARCO personnel reported that pounded water is removed via siphon flow when accumulated to a minimum depth of approximately three feet. Based on a comparison of current elevations from the latest topographical map of the impoundments (1997) provided by ASARCO to current elevations, it appears that the height of Tailings Impoundment AB/BC has increased an additional 30 to 40 feet and Tailings Impoundment D has increased by approximately 30 feet over the past 10 years. This estimate was verified by ASARCO personnel.

In general, CH2M HILL did not observe downstream seepage or significant cracking along the top of and parallel to the crest of the tailings impoundments. Such features are generally indicative of major slope movements. No evidence of slumps on the sides of the

impoundments was observed. ASARCO indicated that French drains installed to control historical seepage along the toe of the southwest side of Tailings Impoundment AB/BC (AB portion) are no longer producing measurable amounts of seepage.

Major erosional features were observed along the slope face at both impoundments. These features seemed especially prevalent along the southwestern sides of Tailings Impoundment AB/BC, though erosion in this area may appear more severe because of ongoing erosion repairs being conducted by ASARCO. At several locations, erosional gullies are sufficiently deep to have created small caves below the tailings surface. Erosional gullies and dropouts were being backfilled with furnace slag in select areas along this side of the impoundments. The slag is underlain by a drainage geotextile, according to ASARCO. Also noted was random backfilling of some gullies with materials such as crushed concrete pipes and what appeared to be woody debris.

Close observations of the outer toe of Tailings Impoundment AB/BC (AB portion) were also conducted, along the Gila River bank near the North Emergency Tailings Pond. No active erosional undercutting of the pond berms or the impoundment berm was noted. Rip rap up to 3 to 4 foot in diameter has been placed along the southeast side of the emergency pond. Rip rap placed north of this area along the riverbank was noticeably smaller, consisting of stone and concrete rubble. Moderate to heavy vegetation covers this area in many places, making the size and placement of rip rap difficult to verify. It appears that all rip rap observed has been randomly placed. ASARCO reported that maintenance of rip rap occurs during the brief period each year (typically in November) when releases to the Gila River from the upstream reservoir cease, which allows equipment access along the riverbank.

The most significant observation made at both impoundments during the reconnaissance is the extensive surface erosion of the tailings, and probable impacts to localized surficial slope stability as a consequence of this erosion. Mitigation of erosion features will need to be a priority for ASARCO, to protect slope stability of the tailings impoundments.

4. Step 3 - Stability Analyses and Results

The following discussion and recommendations are based on review of the available geotechnical references noted above, CH2M HILL's site reconnaissance, and the latest topographic survey information of the impoundments provided by ASARCO.

Development of Stability Profiles

In accordance with Task 3g from the Workplan, eight cross-section-locations were selected to develop profiles for stability analyses; four at Tailings Impoundment AB/BC and four at Tailings Impoundment D. The section locations are designated A-A' through H-H'. CH2M HILL located the sections with respect to conclusions from the site reconnaissance, information from previous studies, and the potential for overall impacts to the Gila River floodplain associated with potential slope failure. As such, the sections are located on the sides of the impoundments that are adjacent and parallel to the Gila River floodplain, as shown in Figure 2.

Cross sections used in the stability analyses were generated electronically from the most recent topographic map of the impoundment areas. Mapping was provided in electronic

format (AutoCAD) by ASARCO. According to ASARCO personnel, the most recent topographic mapping was completed in 1997. The electronic files used to generate sections for stability analyses were imported directly into the slope stability program, resulting in a more representative surface-boundary model compared with earlier evaluations (where sections were developed manually based on construction procedures for the impoundments). Section modifications were completed based on estimated elevation changes from 1997 to the present. According to ASARCO, the present elevation of Tailings Impoundment AB/BC is about 40 feet higher, and the D Tailings Impoundment is about 30 feet higher compared to the 1997 elevations. The embankment slopes from these sections were projected from the 1997 topography to the present estimated elevations at 3H:1V overall slopes, with 30 feet bench heights, 45 feet setbacks, and 1.5H:1V bench face slopes. These estimates are based on the overall construction procedures documented in previous studies, site observations, and feedback from ASARCO personnel.

The material types within the embankments were stratified and their boundaries were demarcated based upon information collected from ASARCO regarding impoundment construction. From previous studies, the impoundments are estimated to consist of three material layers described as follows:

- Coarse-grained tailings materials
- Fine grained tailing materials
- Alluvial soils forming the native ground surface

These materials are described more fully below. Internal boundaries for these materials within the tailings impoundments are consistent with those recommended by Golder; based on the historical operations of the impoundments and findings from previous studies.

Design Soil Parameters

The primary materials forming coarse grained tailings were reported to consist of poorly graded sands (SP) to silty sands (SM). These materials were assumed to be deposited during slurry surface flows from spigotted pipes and have been assumed to exist within 300 feet of the impoundment crest. The fine grained tailing materials were reported as generally silty sands (SM) to low-plasticity silts (ML). They were assumed to be deposited within the supernatant pool maintained 300 feet from the embankment crest. The native alluvial soils underlying the impoundments were described as dense, poorly graded sand and gravels.

The strength parameters used in the stability analyses are those recommended by Dames and Moore (1990) based on site-specific consolidated–undrained triaxial testing. These data are shown in Table 1, and represent effective strength parameters for drained conditions. Golder (1997) also used these strength parameters in their analyses.

Table 1

Generalized Design Soil Parameters for Slope Stability Analyses[1]

Material Type	Total Unit Weight (puff)[2]	Cohesion (puff)[3]	Friction Angle ϕ (degrees)
Coarse-grained tailing materials	112	0	37
Fine-grained tailing materials	122	100	38
Foundation alluvial soil	135	0	38

[1]Effective Strength Soil Parameters from Dames & Moore (1990)
[2]pcf = pounds per cubic foot
[3]psf = pounds per square foot

Dames & Moore (1990) also presented total (undrained) strength parameters for the coarse and fine-grained tailing materials. However, these parameters were not considered in their analyses. A total strength friction angle of 20 degrees and cohesion of 200 pounds per square foot were reported for the fine tailings. This total strength is considerably lower than the effective parameters tabulated above. Total strengths are normally recommended during transient loadings caused by earthquake events. Dames & Moore considered the transient earthquake loading to be too low at the ASARCO site to generate excessive pore water pressures.

Analyses Methodology

The slope stability analyses performed considered the overall (global) stability of slopes using circular and wedge shaped failure planes. Localized circular failure planes were also considered and analyzed separately. The slope stability analyses were performed using the Modified Bishop method for circular-shaped slip surfaces, and Jamb Corrected method for wedge failures. The calculations were performed using the limit equilibrium computer program SLIDE v.5.0 (Rocscience Inc., 2006). The critical slip surface for each major slope is shown on the results of analyses. Results of slope stability analyses are presented in Appendices B, C and D.

The Arizona Mining Guidance Manual (BADCT) was reviewed to determine the minimum slope stability factor of safety for the tailings impoundment slopes. Based on review of Tables E-1 and E-2, Appendix E of this document, a minimum factor of safety of 1.3 under static conditions and 1.0 for pseudostatic conditions is required; only if site-specific shear strength properties are known. Where site-specific test results are not available, factors of safety of 1.5 and 1.1, respectively, are required. BADCT also requires a slope deformation analysis if environmental impacts are potentially imminent under failure conditions, which was considered in our evaluations.

Static and pseudostatic analyses were conducted on the eight profiles. A seismic coefficient of 0.1 was used in the pseudostatic analyses. Selection of 0.1 is consistent with previous studies, and was verified as conservatively appropriate by CH2M HILL.

The phreatic surface assumed in the analyses corresponds to that previously used by other consultants. The analysis assumes that the phreatic surface begins at the sand-slime interface 300 feet offset from the crest, extending down along the interface of fine and coarse tailings at a 3H: 1V slope, intersecting the face of the slope at the 200 foot setback elevation, and following the slope surface to native ground. This assumption may be conservative because no downstream seepage was observed during our site reconnaissance, and the French drain is not producing measurable amounts of seepage as noted by ASARCO personnel. However, in the absence of current site-specific data to establish a phreatic surface elevation, this assumption has been made.

The following sections discuss the results and limitations of our analyses.

Stability Analyses Results

A total of eight cross sections were analyzed for slope stability. Global circular and block failure surfaces were considered. Local failure planes were also analyzed. Details of the results are presented below.

Gross Slope Stability

The existing crest elevation of Tailings Impoundment AB/BC is estimated at 2,200 feet msl, while the crest elevation of Tailings Impoundment D is estimated at 2,150 feet msl. Based on the topographic contours, the slopes appear to have been graded to an overall slope ratio of approximately 3H: 1V. The slopes shown on cross sections A-A' through H-H' were analyzed for gross stability under static and pseudostatic conditions. Table 2 below summarizes the results from the stability analyses performed with circular failure surfaces. Static and pseudo static analyses results are shown in Appendix B.

Table 2

Global Stability Analyses Results (Circular)

Impoundment	Section	Static Factor of Safety (FOS)	Pseudo static Factor of Safety (FOS)
AB	A-A'	1.84	1.28
	B-B'	1.65	1.17
BC	C-C'	2.08	1.45
	D-D'	2.34	1.56
D	E-E'	2.13	1.60
	F-F'	2.20	1.63
	G-G'	2.38	1.69
	H-H'	2.45	1.77

The summary of results for the global stability analyses using block failure planes are shown in Table 3 below, and corresponding analyses are presented in Appendix C.

Table 3

Global Stability Analyses Results (Block)

Impoundment	Section	Static Factor of Safety (FOS)	Pseudo static Factor of Safety (FOS)
AB	A-A'	2.09	1.49
	B-B'	2.14	1.51
BC	C-C'	2.51	1.73
	D-D'	2.81	1.84
D	E-E'	2.24	1.69
	F-F'	2.40	1.78
	G-G'	2.42	1.78
	H-H'	2.65	1.90

Localized Surficial Stability

The surficial stability of a localized slope shown in section A-A' was also evaluated. The results are shown in Appendix D. Results of the analysis indicate that tailing soils on the face of the steeper interbench slopes could approach incipient failure when the surface soil becomes saturated. This is consistent with the significant erosion observed on localized slopes at both impoundment locations and, if left unchecked, could lead to larger stability issues and the need for repairs.

Deformation Analyses

In accordance with BADCT, CH2M HILL also completed a deformation analysis of the large impoundment slopes due to a seismic event. This was completed in accordance with procedures presented by Makdisi and Seed (1977). Undrained shear strengths were assumed for the fine tailings material. Further, a peak ground acceleration of 0.13g, representative of the maximum credible earthquake event, was assumed to occur at the base of the slopes in the analysis. Sections B-B', E-E', and H-H' were evaluated. Results indicate that 2 to 3 feet of slope deformation could be expected at Tailings Impoundment AB/BC. Deformations at Tailings Impoundment D are expected to be negligible.

The above analyses assume that undrained shear strengths develop in the fine tailings material during the seismic event, and the phreatic surface is present near the slope surface shown in the profiles. Because seepage was not observed along the downstream slope of the impoundments during the site reconnaissance (indicating a lower phreatic surface than assumed), CH2M HILL's opinion is that these are conservative assumptions and undrained

conditions are unlikely. This, along with the relatively low seismic acceleration expected at the site, justifies the use of drained shear strengths in the analyses.

5. Step 4 - Discussion, Conclusions, and Recommendations

Stability

The cross sections developed and analyses performed were based on the available topographic maps and information from previous reports and investigations. From the results of the global stability analyses performed for the impoundment slopes, the overall stability of the slopes of Tailings Impoundments AB/BC and D appears to be adequate under static and pseudostatic conditions. Based on conservative assumptions, the anticipated displacement of Tailing Impoundment AB/BC slopes during a seismic event is in the order of 2 to 3 feet. Such a displacement is not expected to impact the Gila River floodplain, however, because these major slopes are located at least 100 to 200 feet from this flood plain area. Deformation analyses are normally conducted to assess impacts to geosynthetic membranes.

The mine tailings are highly erodible, consisting of cohesionless fine sands and silts. This is evident by observations of the impoundments, and should require a constant maintenance effort for ASARCO to address. ASARCO has implemented controls such as placement of coarse furnace slag and geotextiles in repaired areas, which appears to help within the areas of application. However, until sloped areas are regraded as needed and completely covered with some form of erosion protection, significant erosion is expected to continue.

CH2M HILL's stability analyses are limited in their conclusiveness, because they are based on recommendations and findings from previous studies, and included no additional field sampling to support more detailed evaluations. Six borings were previously completed to investigate the tailing index properties and stratigraphy, and data collected from these borings as well as information from ASARCO on the operational history of the impoundments were used to develop simplified profiles. If actual profiles differ from those used in the analyses, then the results of the stability analyses may vary from those reported herein. For example, it was assumed in previous studies that relatively thin, weak, and continuous bedding planes do not exist within the tailings; especially near the crest. A continuous, relatively flat bedding plane could have easily been missed during the site investigation conducted by Dames & Moore (1990), because continuous sampling was not conducted and assumptions were made based on relatively small, discreet samples obtained at 20 foot depth intervals. Only continuous sampling or sounding methods could possibly detect such layers, if they exist.

Nevertheless, ASARCO has not reported major slope failures, with exception for surficial erosion, since modifications were made to the impoundments as a result of the global slope failures in late 1972 and early 1973.

River Bank Erosion

CH2M HILL's opinion is that river bank erosion near Tailings Impoundment AB/BC is the greatest threat potentially impacting the stability of the mine tailings and ecosystem along the Gila River floodplain. Based on CH2M HILL's site reconnaissance, ASARCO has taken

steps to control river bank erosion. This includes placement of rip rap combined with annual inspection of the river bank to assess and plan needed repairs. As noted in the site reconnaissance, the rip rip appears to be randomly placed. The size of the rip rap located near cross section A-A′ is estimated to be nominally 3 to 4 feet in diameter. Stones of this size placed on a 2H: 1V slope can resist flow velocities of approximately 18 to 20 feet per second (fps), according to hydraulic design criteria charts published by the United States Army Corps of Engineers (1970). Smaller rocks and rubble noted further downstream along the river bank would resist river flow in the range of 8 to 10 fps.

According to the topography map provided by ASARCO, the top-of-berms along the riverbank vary in elevation and are noted below relative to each cross section evaluated.

- A-A′ -- Top-of-Berm at elevation 1,975 feet msl, berm height from river bottom is 32 feet
- B-B′ -- Top-of-Berm at elevation 1,961 feet msl, berm height from river bottom is 28 feet
- C-C′ -- Top-of-Berm at elevation 1,940 feet msl, berm height from river bottom is 12.5 feet
- D-D′ -- Top-of-Berm at elevation 1,946 feet msl, berm height from river bottom is 18 feet

These top-of-berm elevations should be compared to the maximum water surface elevation of the most recent projected 100-year flood event within the Gila River floodplain. Based on information provided by ASARCO personnel, historic flood events have resulted in maximum water levels at an elevation corresponding to the elevation of the base of the railroad trestle located just east of cross section A-A′. Though it appears that cross section A-A′ may receive the most impact from a flood event, it also appears that the berm near cross section C-C′ could have the greatest vulnerability to a flood event.

Conclusions and Recommendations

Based on our site reconnaissance, review of pertinent engineering reports, and our analyses, CH2M HILL concludes the following:

- Global stability analyses of the impoundment slopes indicate that the minimum slope stability factors of safety are achieved.
- Localized slope instability related to erosion and surface saturation of the tailings is possible. If left unchecked, larger stability issues could develop from localized slope failures.
- Deformation analyses indicate that global slope deformations along Tailings Impoundment AB/BC could be in the range of 2 to 3 feet during a maximum credible earthquake event. Though unlikely to occur, these deformations are not expected to directly impact the Gila River floodplain.
- River bank erosion poses the greatest threat to the overall stability of Tailings Impoundment AB/BC, and corresponding impacts to the Gila River floodplain.
- Additional field investigation is recommended for a more detailed evaluation. This should include continuous borings or cone penetration soundings to determine the presence, depth, and thickness of any relatively thin weak bedding layers. Additional

groundwater level measurements should be collected to determine the current level of the phreatic surface within the impoundments.

- Current berm elevations along the Gila River near Tailings Impoundment AB/BC should be compared to the maximum water surface elevation for the 100-year flood event within the Gila River floodplain. The berms should be sized to provide at least 3 feet of freeboard to protect against overtopping as a result of the 100-year flood event.
- Rip rap placed along the river channel should be engineered and constructed to resist the expected flood flow velocities. If current rip rap is adequate, ASARCO should provide evidence such as engineering calculations prepared by an Arizona-registered Professional Engineer.

Limitations

This geotechnical memorandum has been prepared for the exclusive use of the CH2M HILL project team and EPA. This memorandum has been prepared in accordance with generally accepted geotechnical engineering practices at the time of its preparation. No other warranty, express or implied, is made.

The analyses and recommendations contained in this memorandum are based on the data obtained from the review of available references, our site reconnaissance, and previous studies and subsurface investigation reports. If variations in surface or subsurface conditions from those described in this memorandum are noted, the recommendations presented in this memorandum must be re-evaluated.

In the event that any changes in the nature, design, or location of the proposed facilities occur, the conclusions and recommendations of this memorandum should not be considered valid unless the changes are reviewed, and conclusions of this memorandum are verified in writing by CH2M HILL. CH2M HILL is not responsible for any claims, damages, or liability associated with the reinterpretation or reuse of the subsurface data in this memorandum.

References

Agra Earth and Environmental, 1996, *Discharge Reduction Evaluation D-Tailings Impoundment*, ASARCO Inc. – Ray Complex, Gila & Pinal counties, Arizona.

Arizona Department of Environmental Quality Web Site, 2007, *Arizona Mining Guidance Manual, Best Available Demonstrated Control Technology (BADCT),* Appendix E, Tables E-1 and E-2.

ASARCO Personnel, May 1, 2007, Communication during site reconnaissance.

Dames & Moore, 1990, *Final Report, Geotechnical Engineering Services, Tailings Ponds AB, BC and D*, Ray Unit, Hayden, Arizona, December 14.

Golder Associates Inc., 1997, *Post – Closure Stability Analysis for the AB/BC and D Tailings Disposal Facilities*, Hayden, Arizona, June.

Hydrometrics Inc., 1996, *Third Stage Tailings Feasibility Study*, ASARCO, Ray Unit, Hayden Concentrator, August.

Makdisi and Seed, *A Simplified Procedure for Estimating Earthquake Induced Deformation in Dams and Embankments*, UCB/EERC 77/19, August 1977.

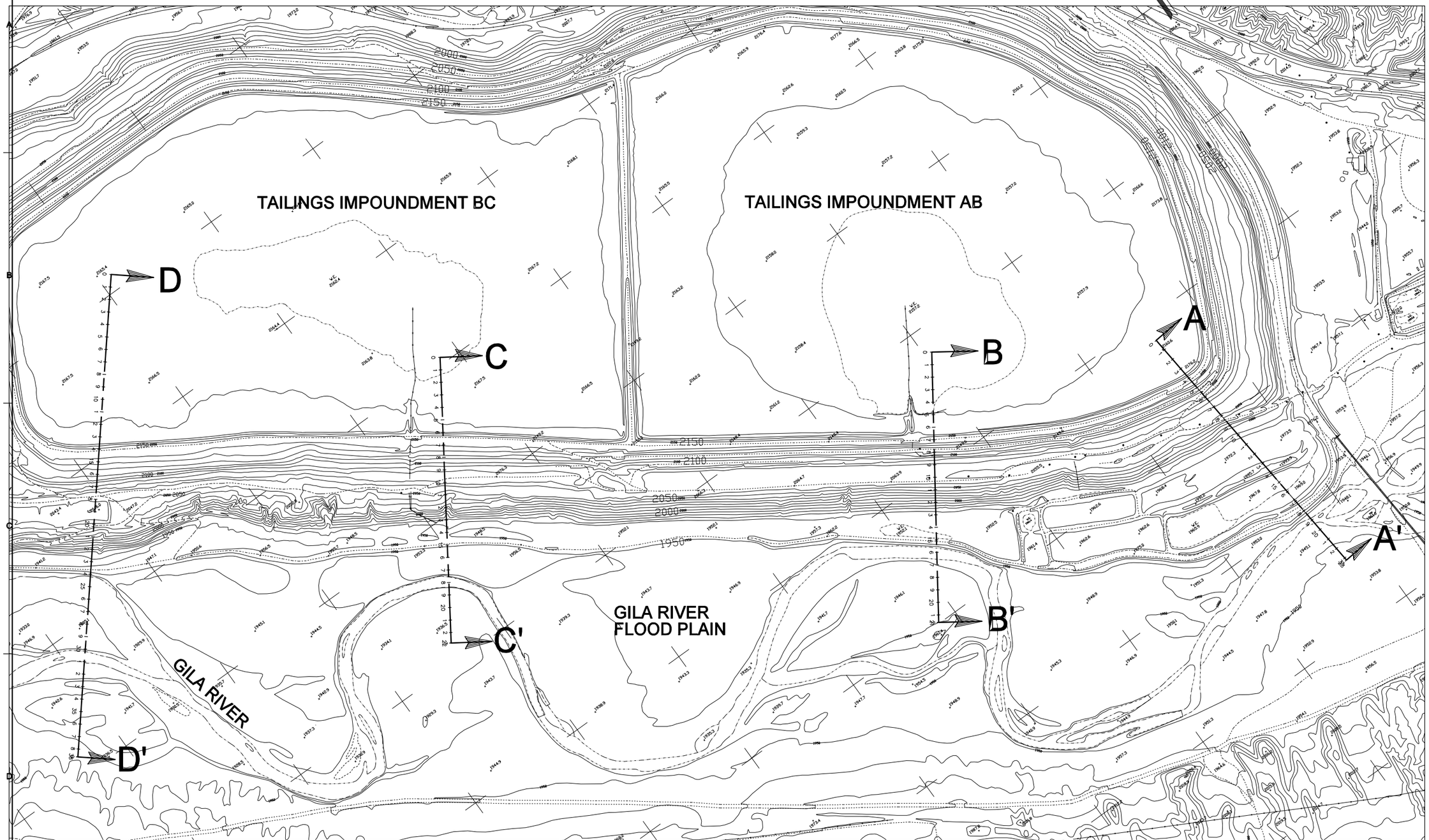
Slide, Rocscience Inc. *User's Guide 1989-2003.*

United States Army Corps of Engineers, 1970, Hydraulic Design Criteria, Sheet 712-1.

United States Geological Survey (USGS) Seismic Hazard Map, 2% Probability of Exceedance in 50 Years, October 2002rev.

Figures

FIGURE 1
SITE LOCATION PLAN



REF: BASE PLAN BY ASARCO, LLC (1997)

FIGURE 2A
CROSS-SECTION LOCATIONS
TAILINGS IMPOUNDMENT AB/BC

CH2MHILL

ASARCO LLC
HAYDEN PLANT SITE
HAYDEN, ARIZONA

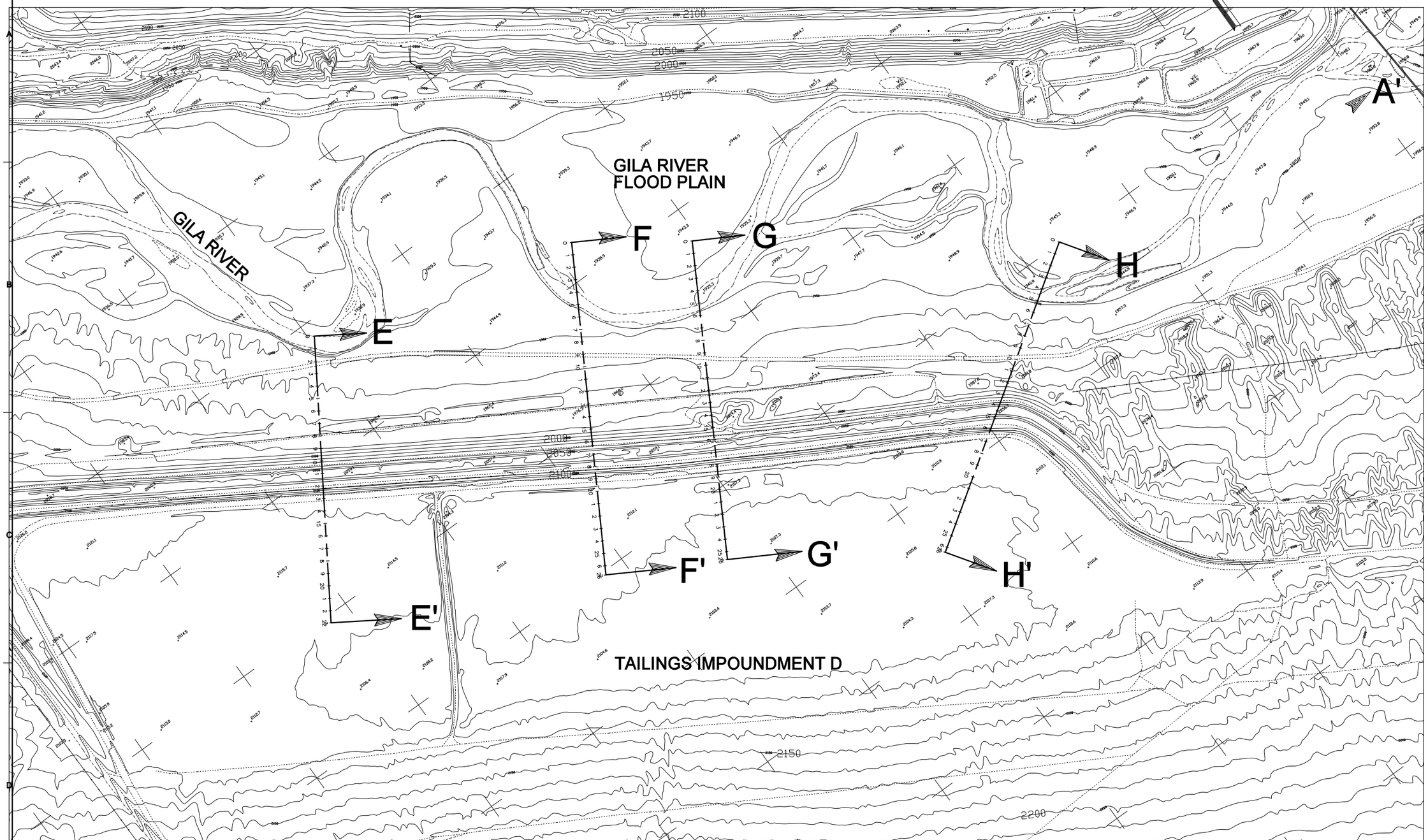
ISSUED FOR 100% REVIEW

SCALE 1"=800'

SHEET 1

FILENAME: Hayden Site Upper.dgn PLOT DATE: 6/15/2007

PLOT TIME: 8:01:28 AM



REF: BASE PLAN BY ASARCO, LLC (1997)

FIGURE 2B
CROSS-SECTION LOCATIONS
TAILINGS IMPOUNDMENT D

CH2MHILL

ASARCO LLC
HAYDEN PLANT SITE
HAYDEN, ARIZONA

SCALE 1"=800'

SHEET 2

FILENAME: Hayden Site Lower.dgn PLOT DATE: 6/15/2007

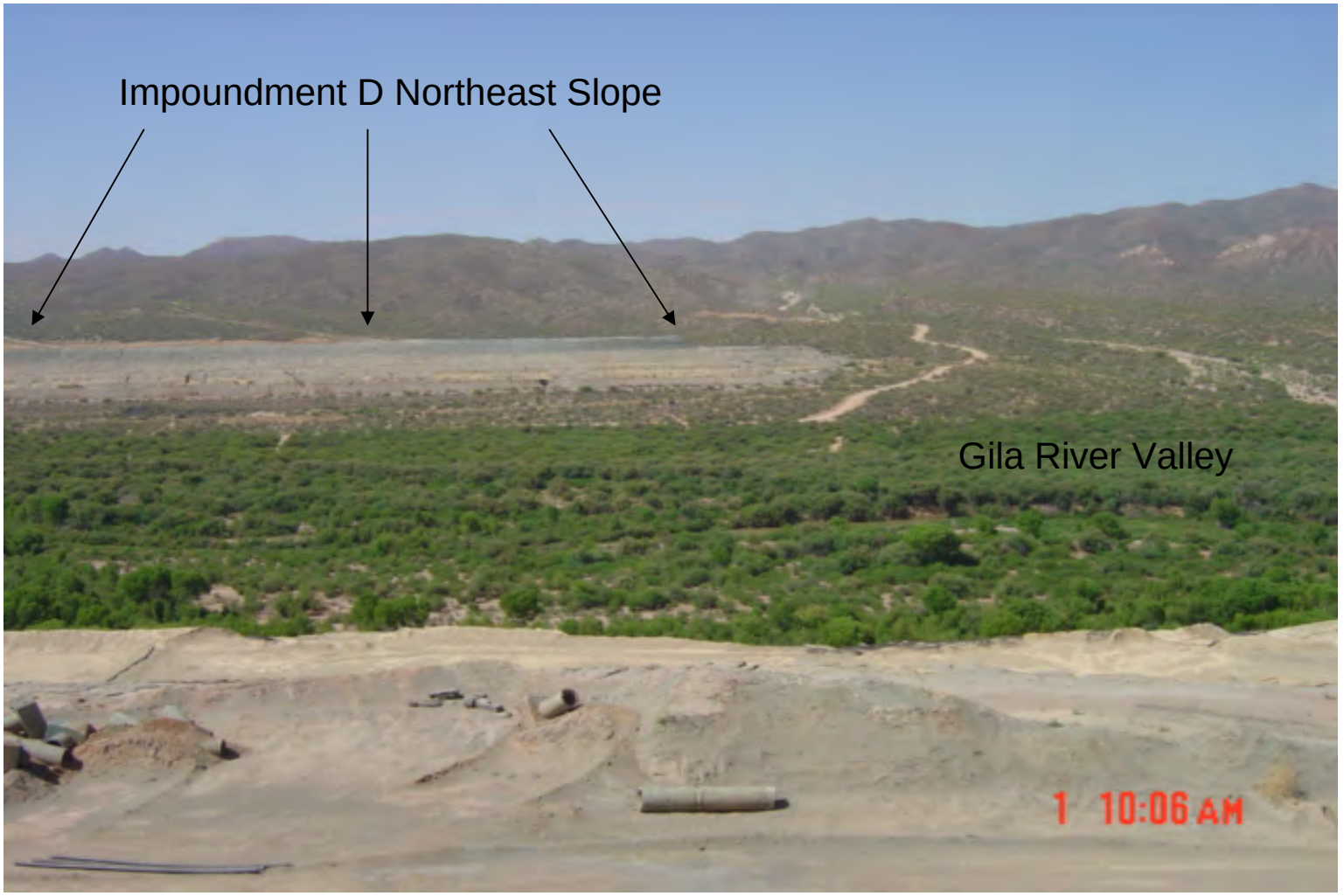
PLOT TIME: 7:59:40 AM

ISSUED FOR 100% REVIEW

REUSE OF DOCUMENTS: THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CH2M HILL AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2MHILL

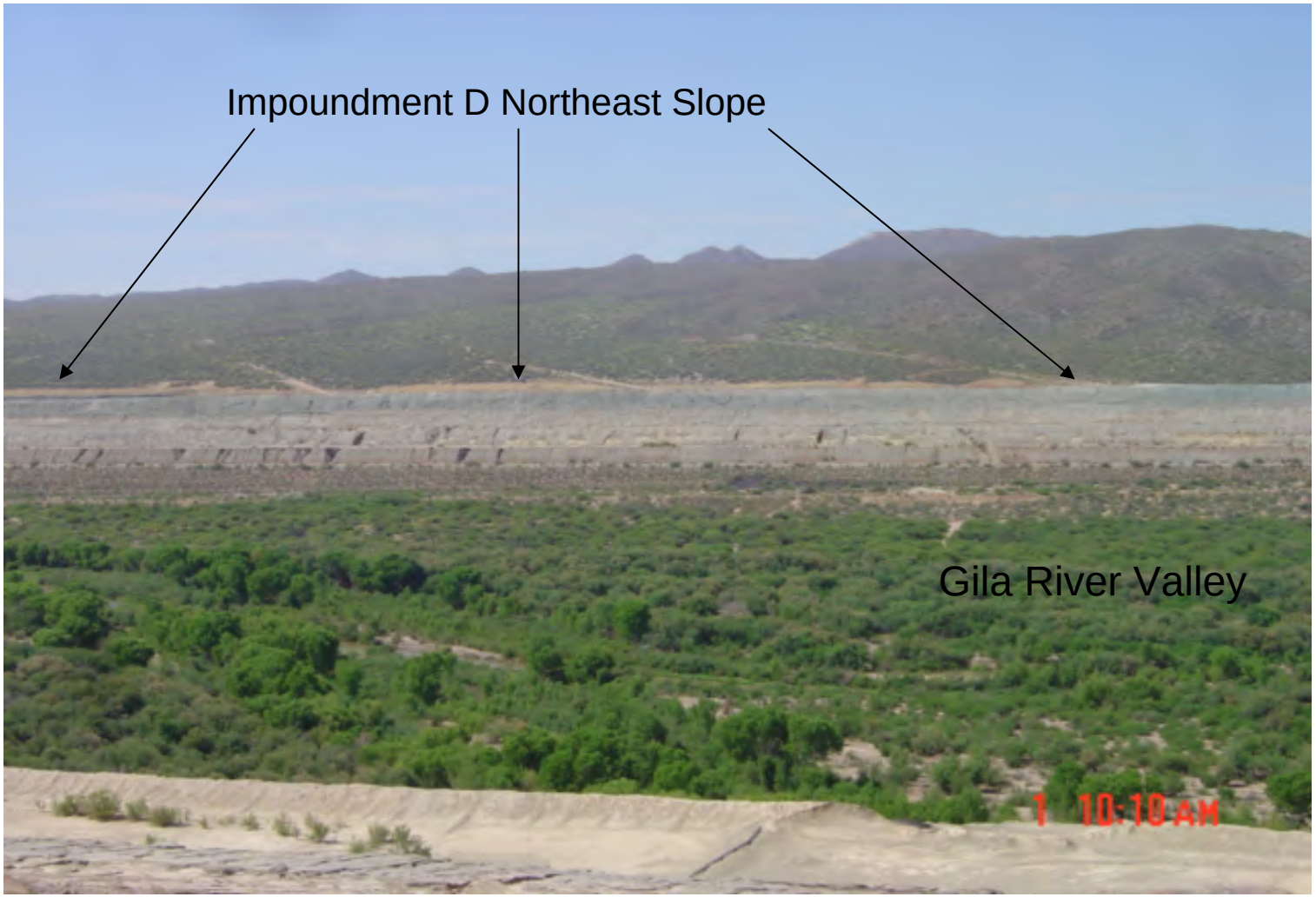
Appendix A
Site Reconnaissance Photographs

Photograph 1



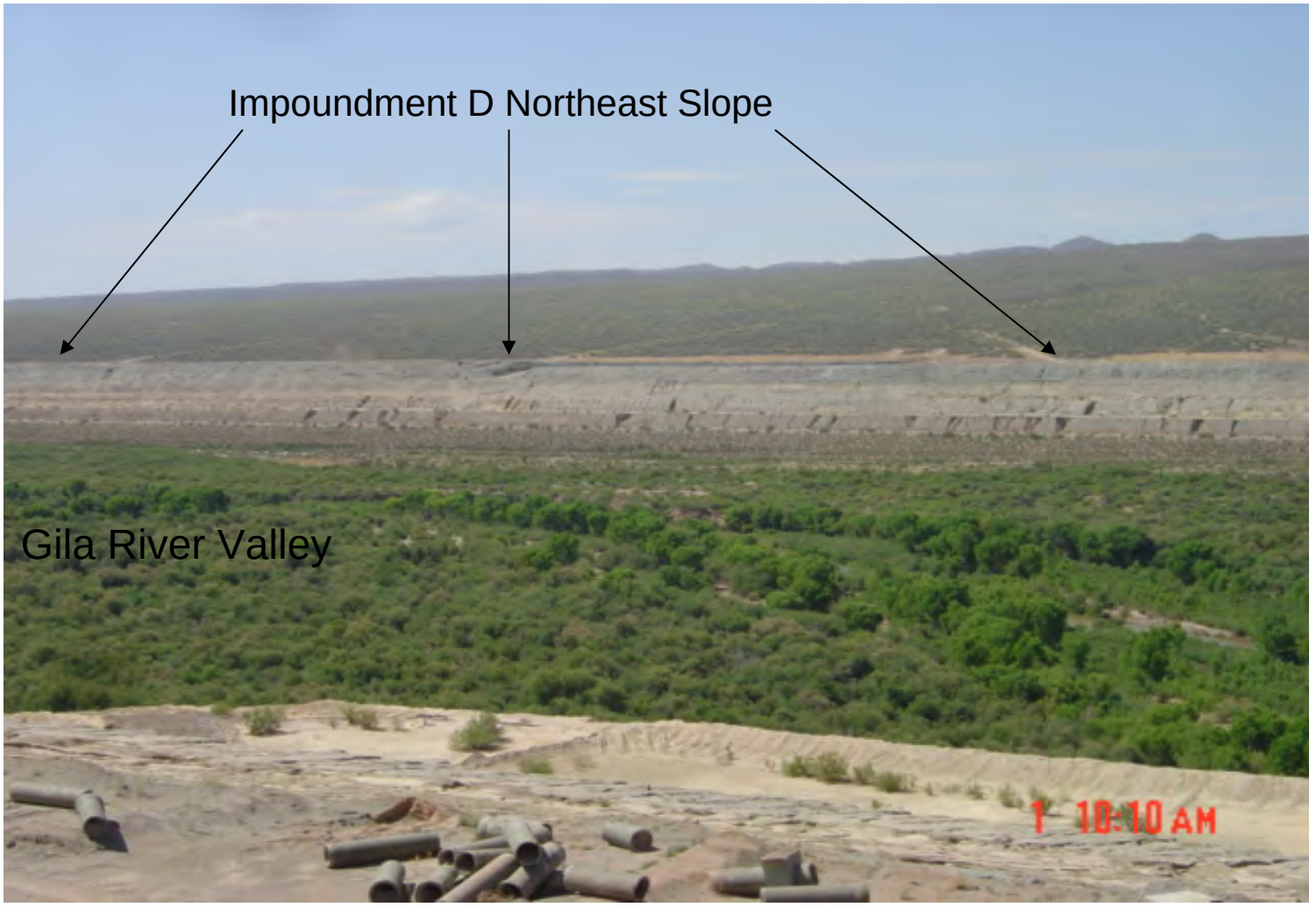
View looking west to southwest at northeast corner of Impoundment D. Photograph taken from the northwest crest of Impoundment BC.

Photograph 2



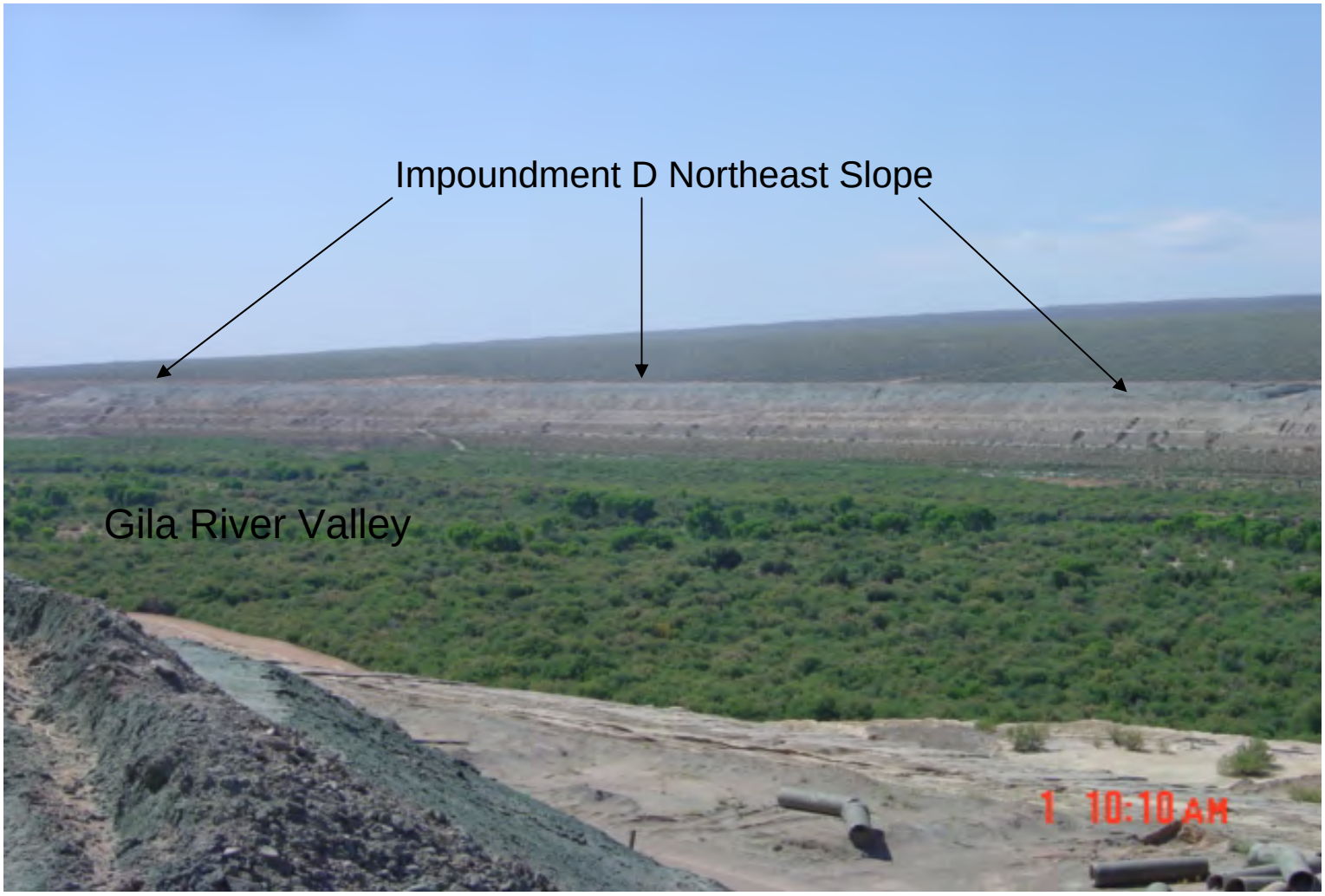
Photographs 2 through 5 present panoramic view of Impoundment D's northeast slope, viewed from northwest to southeast.

Photograph 3



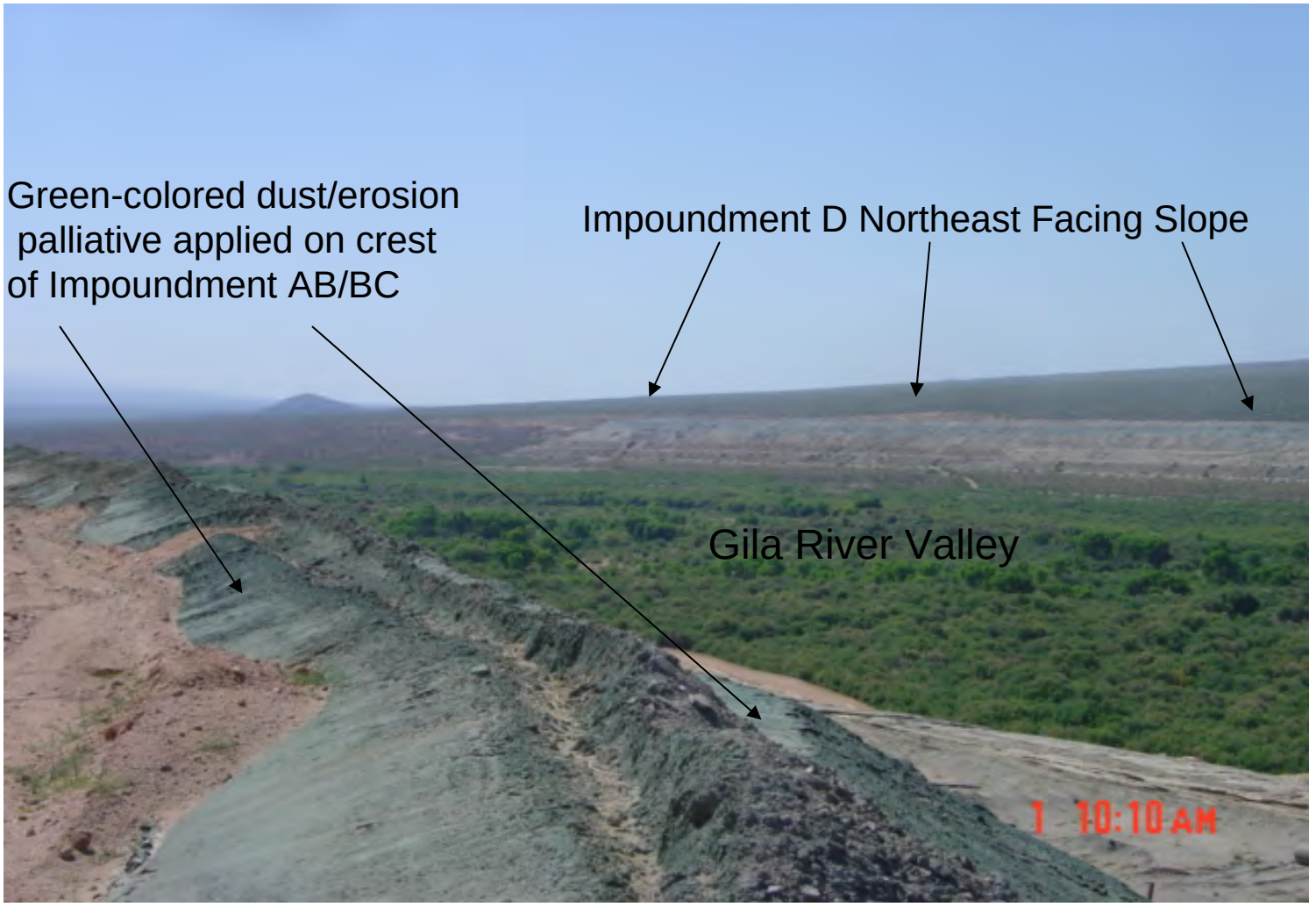
Photographs 2 through 5 present panoramic view of Impoundment D's northeast slope, viewed from northwest to southeast.

Photograph 4



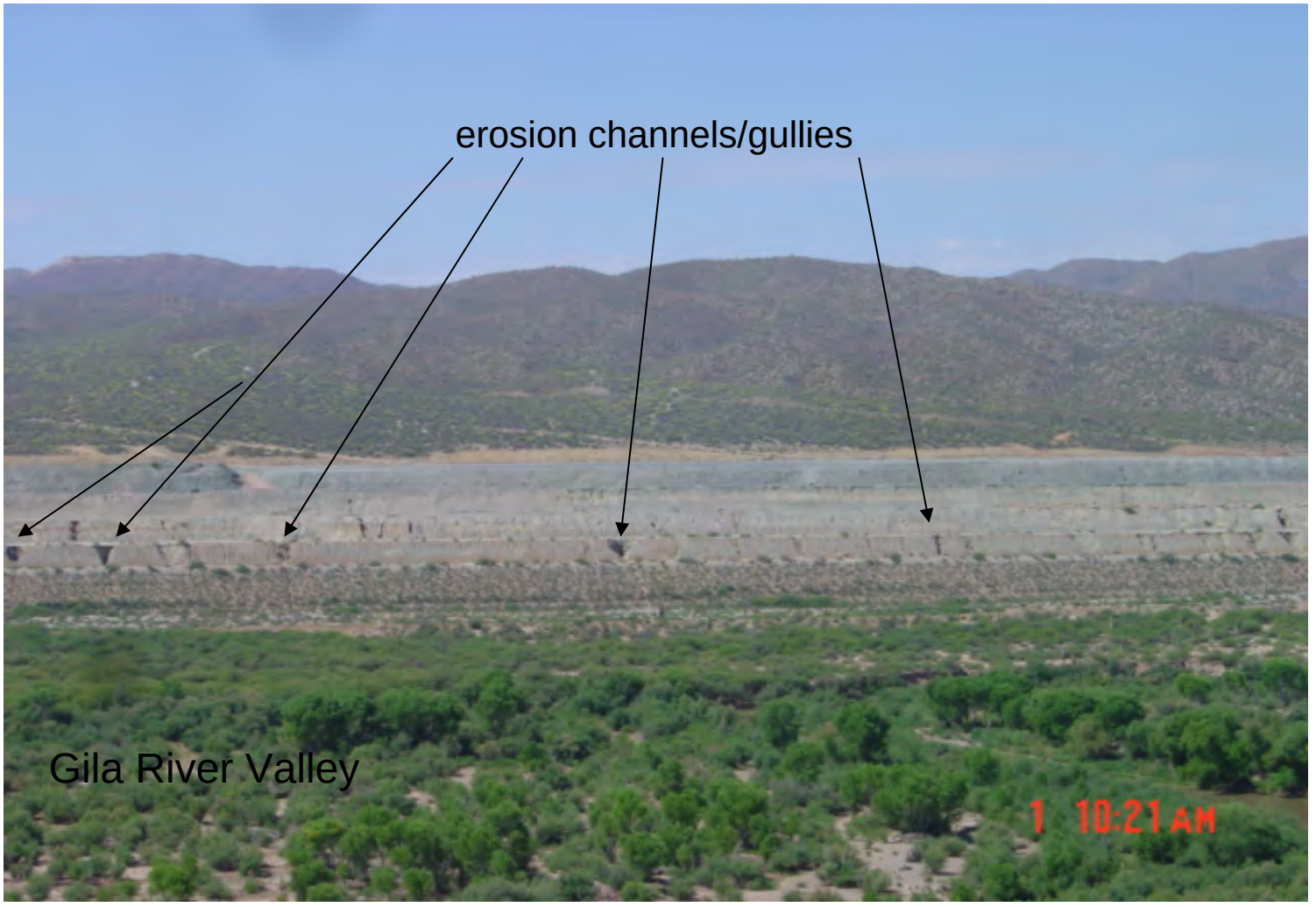
Photographs 2 through 5 present panoramic view of Impoundment D's northeast slope, viewed from northwest to southeast.

Photograph 5



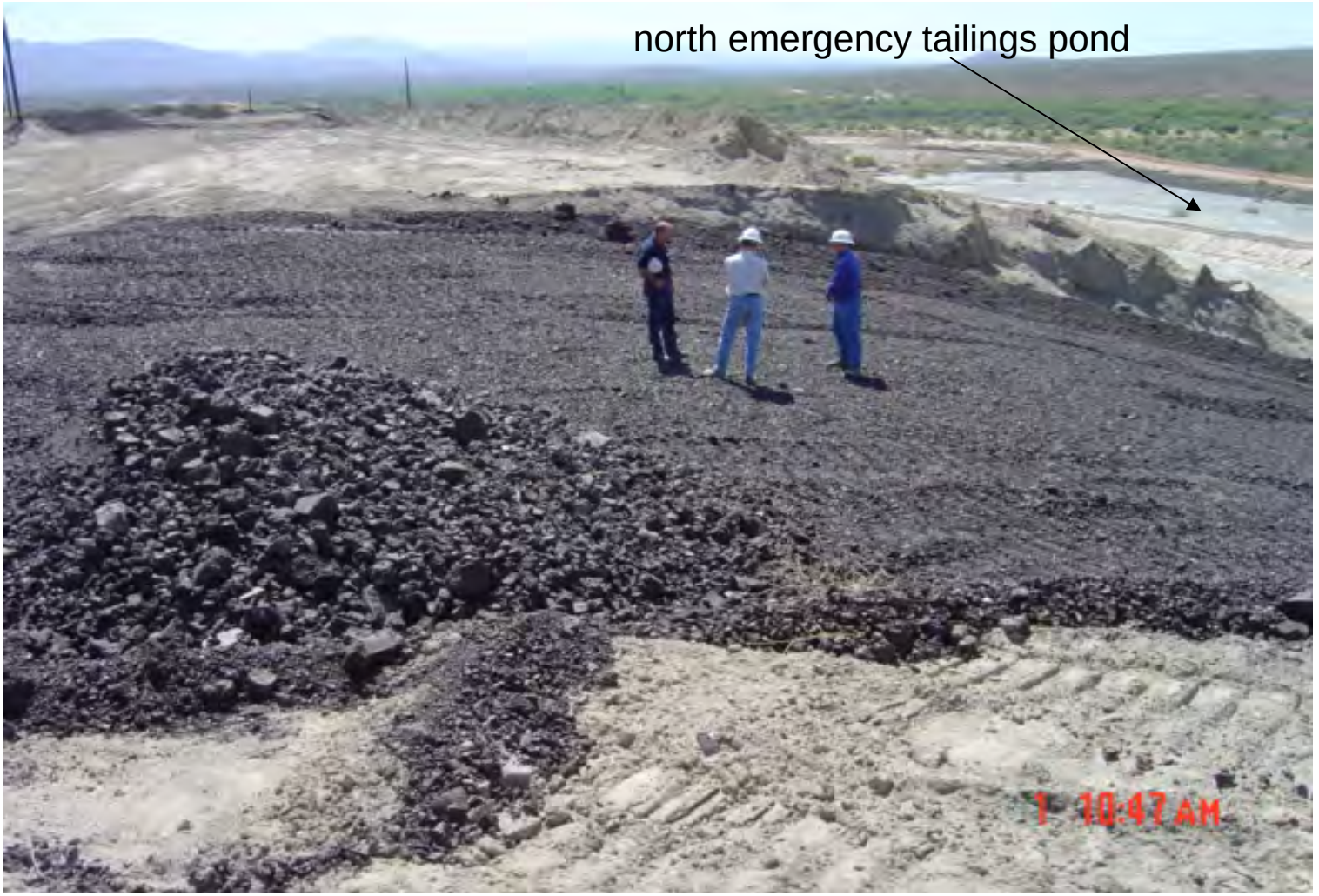
Photographs 2 through 5 present panoramic view of Impoundment D's northeast slope, viewed from northwest to southeast.

Photograph 6



Closer view of Impoundment D northeast slope showing erosion features along lower bench face.

Photograph 7



Erosion repairs to lower slope near southwest corner of Impoundment AB/BC using crushed furnace slag.

Photograph 8

Erosion repairs to lower slope near southwest corner of Impoundment AB/BC using crushed furnace slag.

Photograph 9

Closer image of crushed furnace slag used for erosion repairs to lower bench near southwest corner of Impoundment AB.

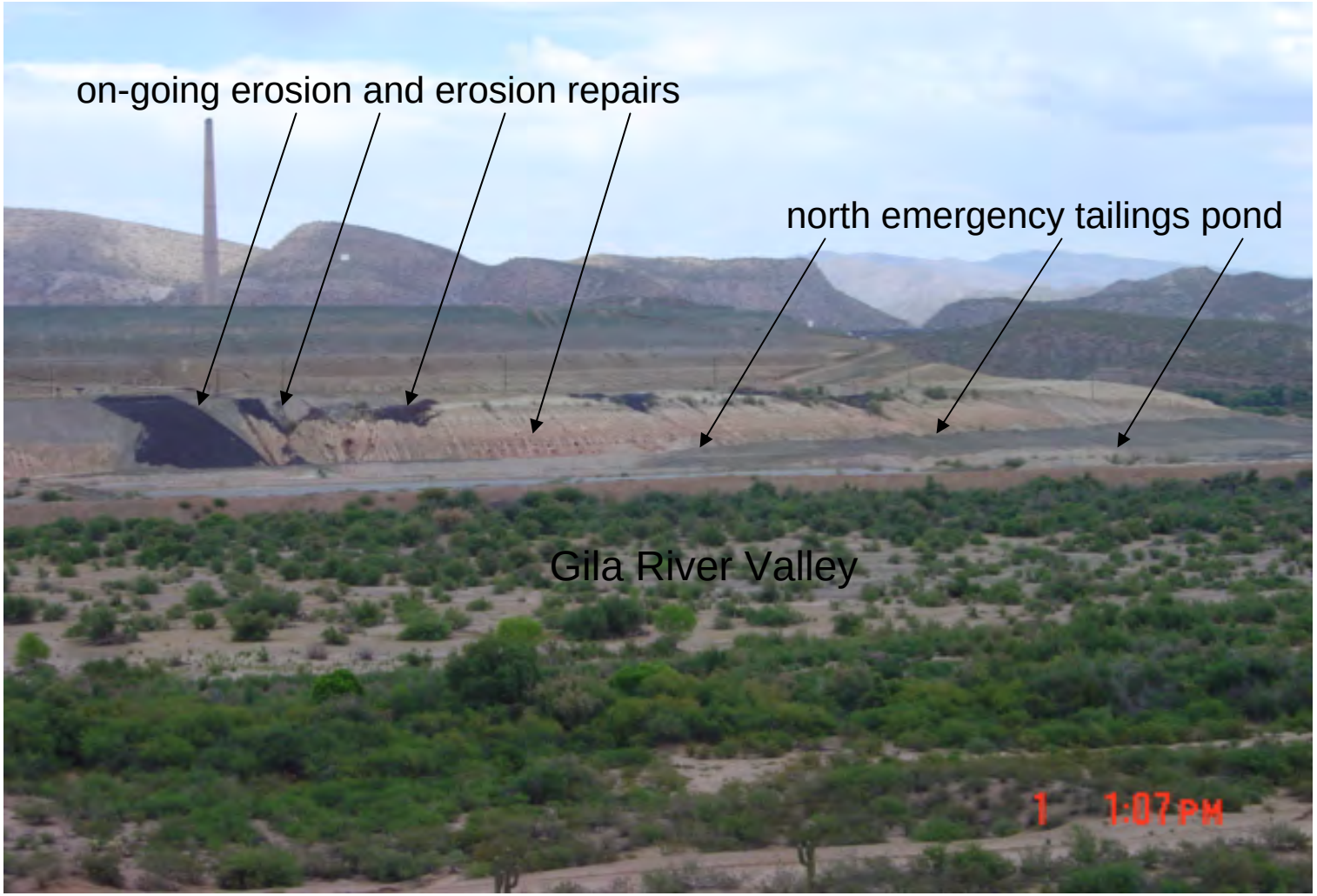
Photograph 10

On-going erosion repairs to lower southwest facing slope of Impoundment AB using furnace slag. Area is near dividing berm between AB and BC impoundments.

Photograph 11

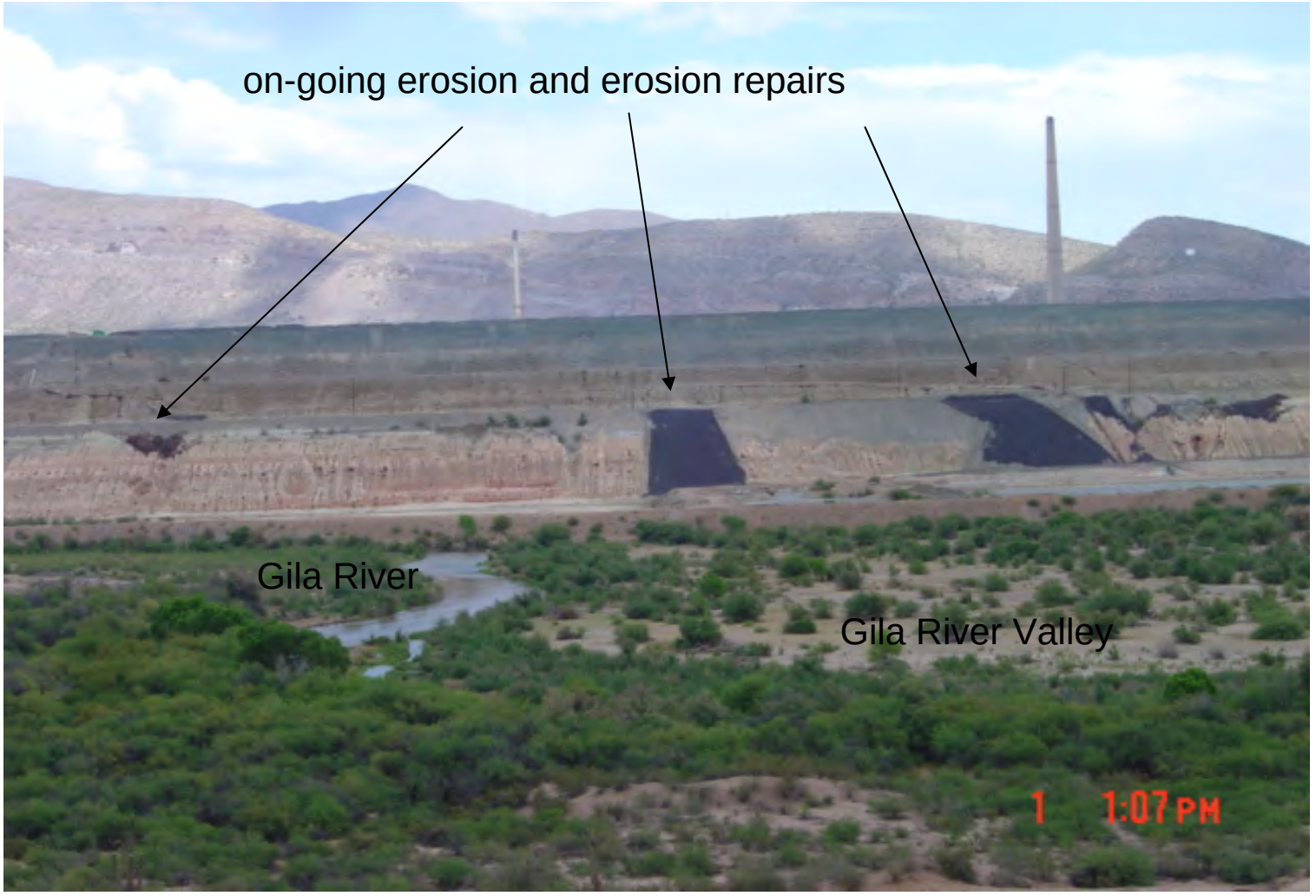
Severe erosion along crest of lower southwest facing slope of Impoundment AB. Furnace slag appears to be randomly placed for erosion protection.

Photograph 12



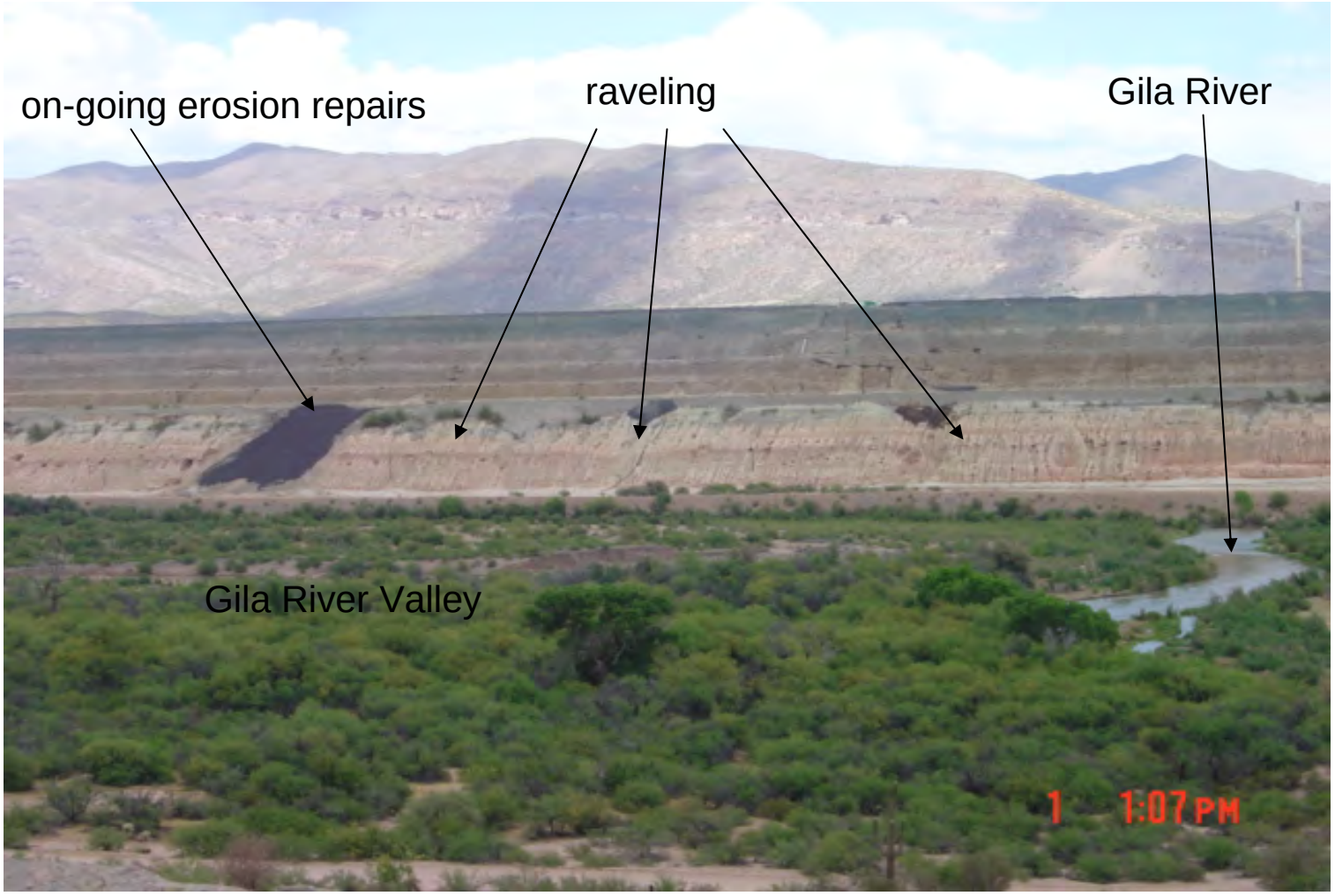
Photographs 12 through 17 illustrate panoramic view of southwest (this photo) side and corner of Impoundment AB looking from south to north.

Photograph 13



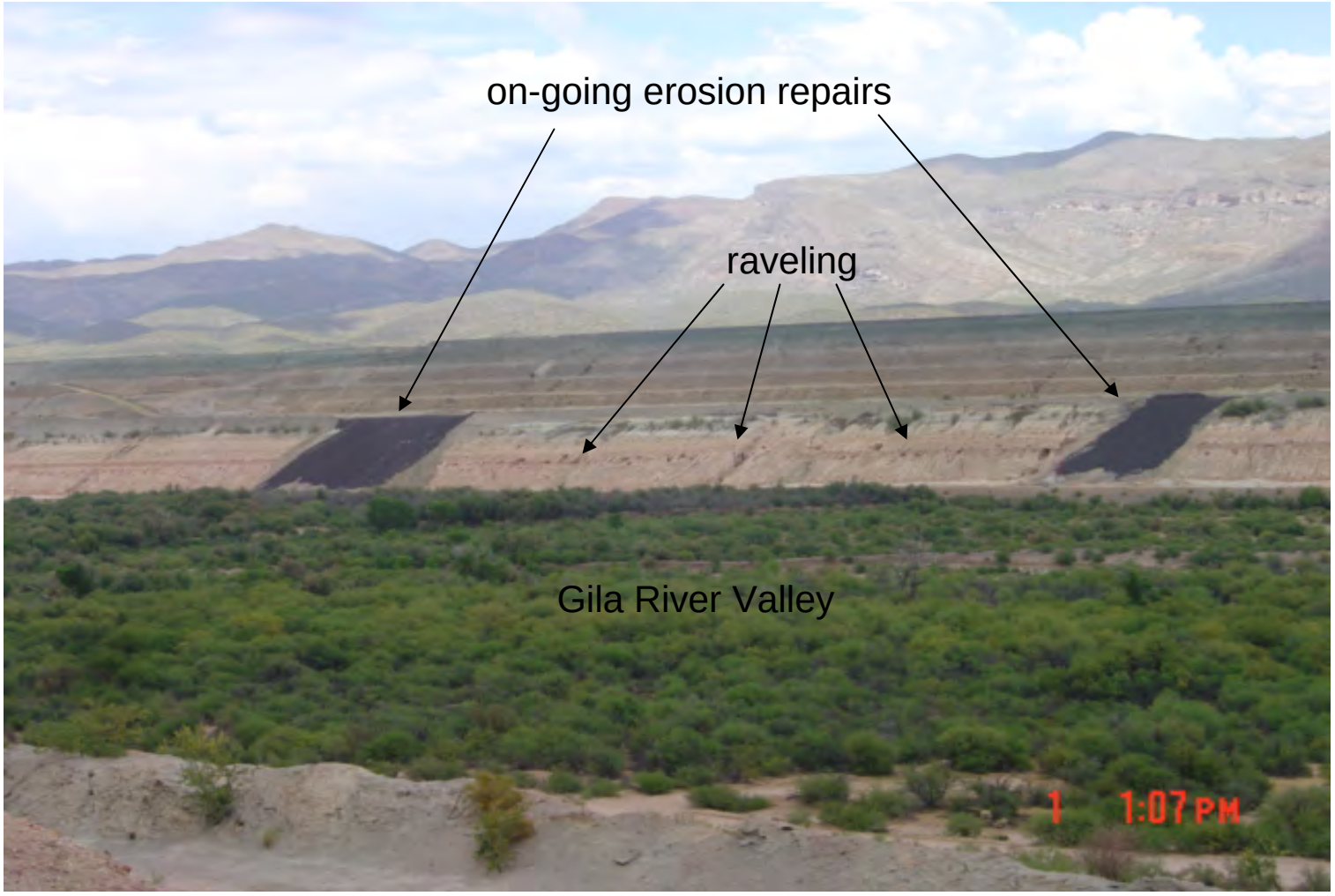
Photographs 12 through 17 illustrate panoramic view of southwest (this photo) side of Impoundments AB/BC looking from south to north.

Photograph 14



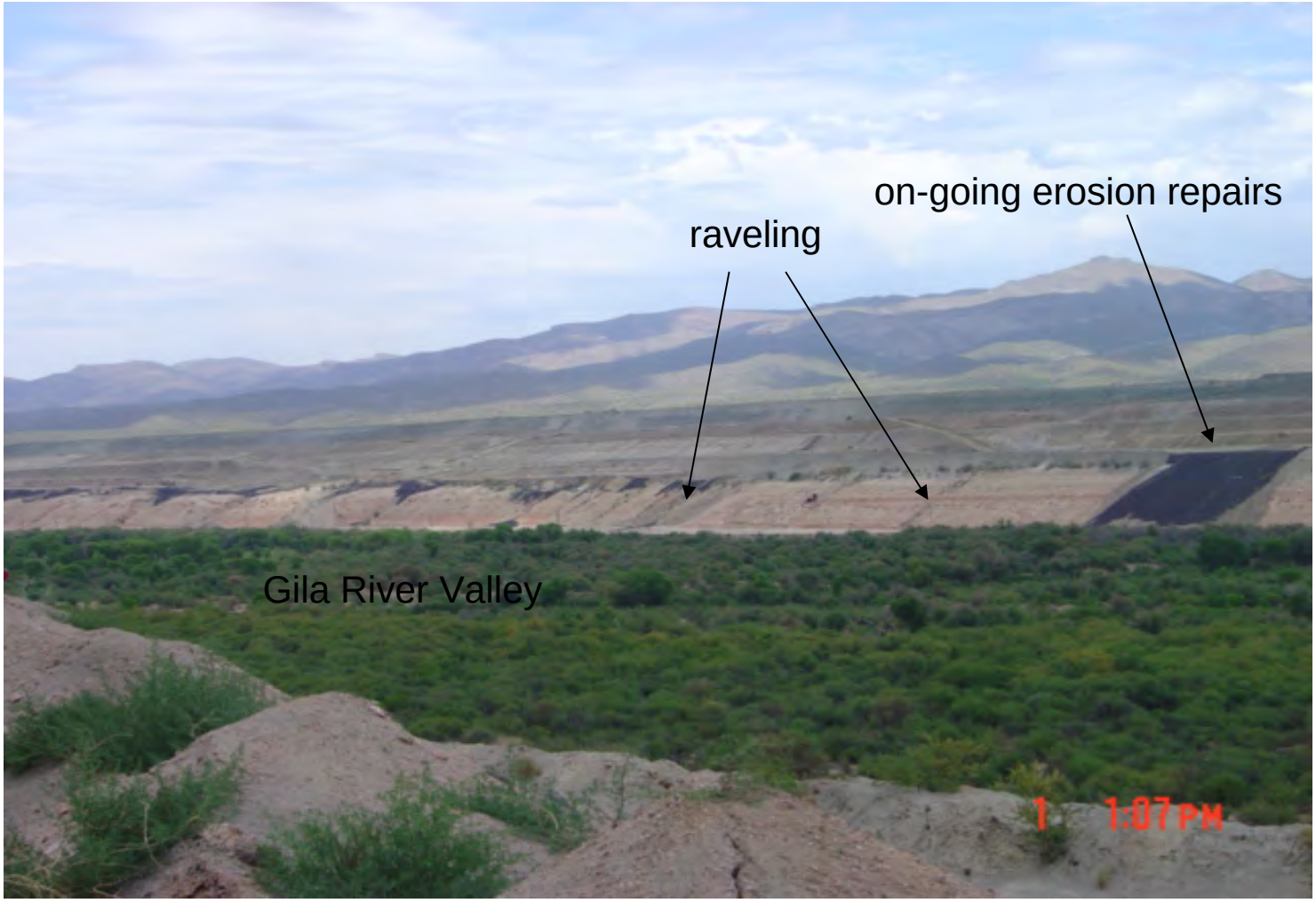
Photographs 12 through 17 illustrate panoramic view of southwest (this photo) side of Impoundment BC looking from south to north.

Photograph 15



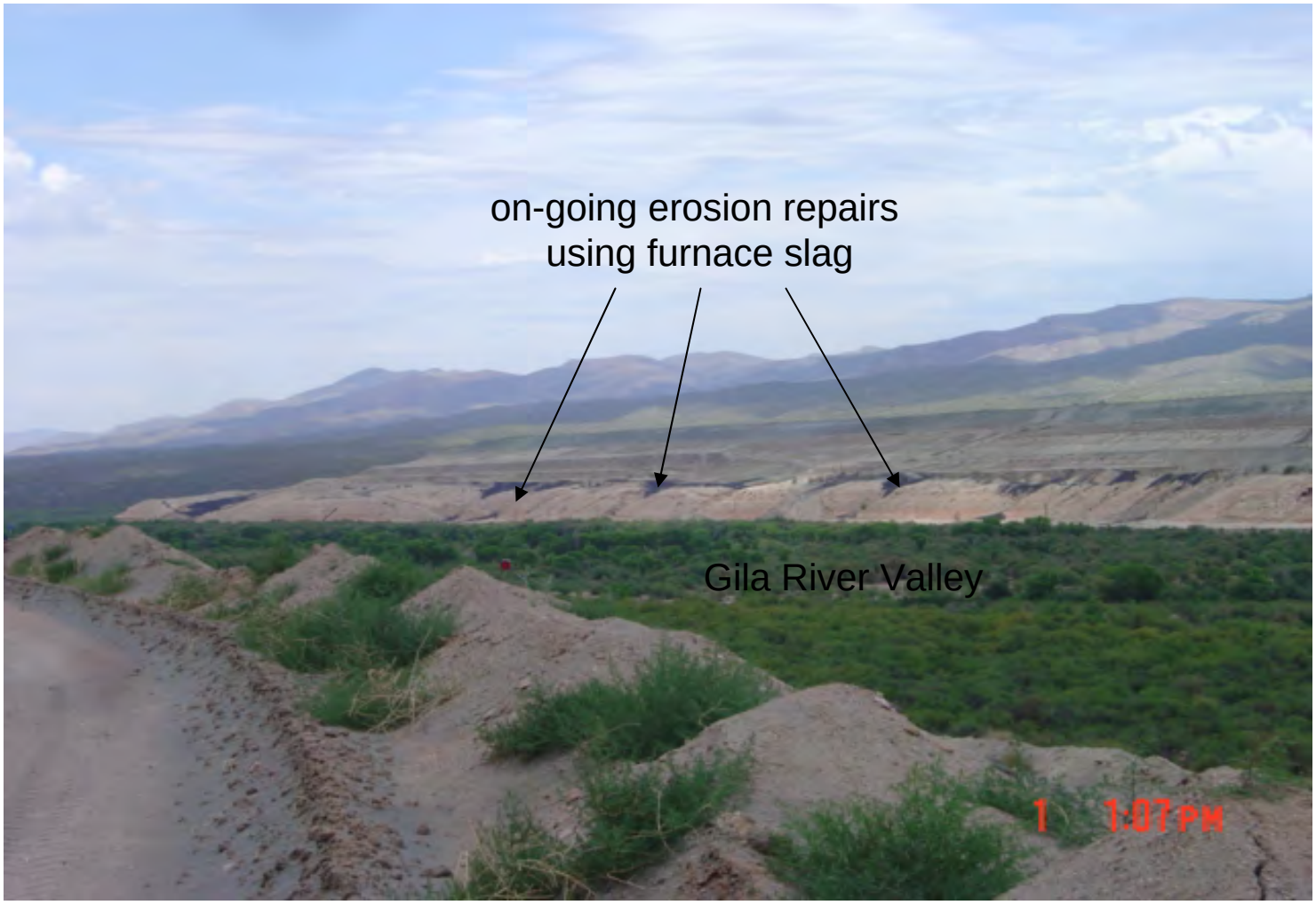
Photographs 12 through 17 illustrate panoramic view of southwest (this photo) side of Impoundment BC looking from south to north.

Photograph 16



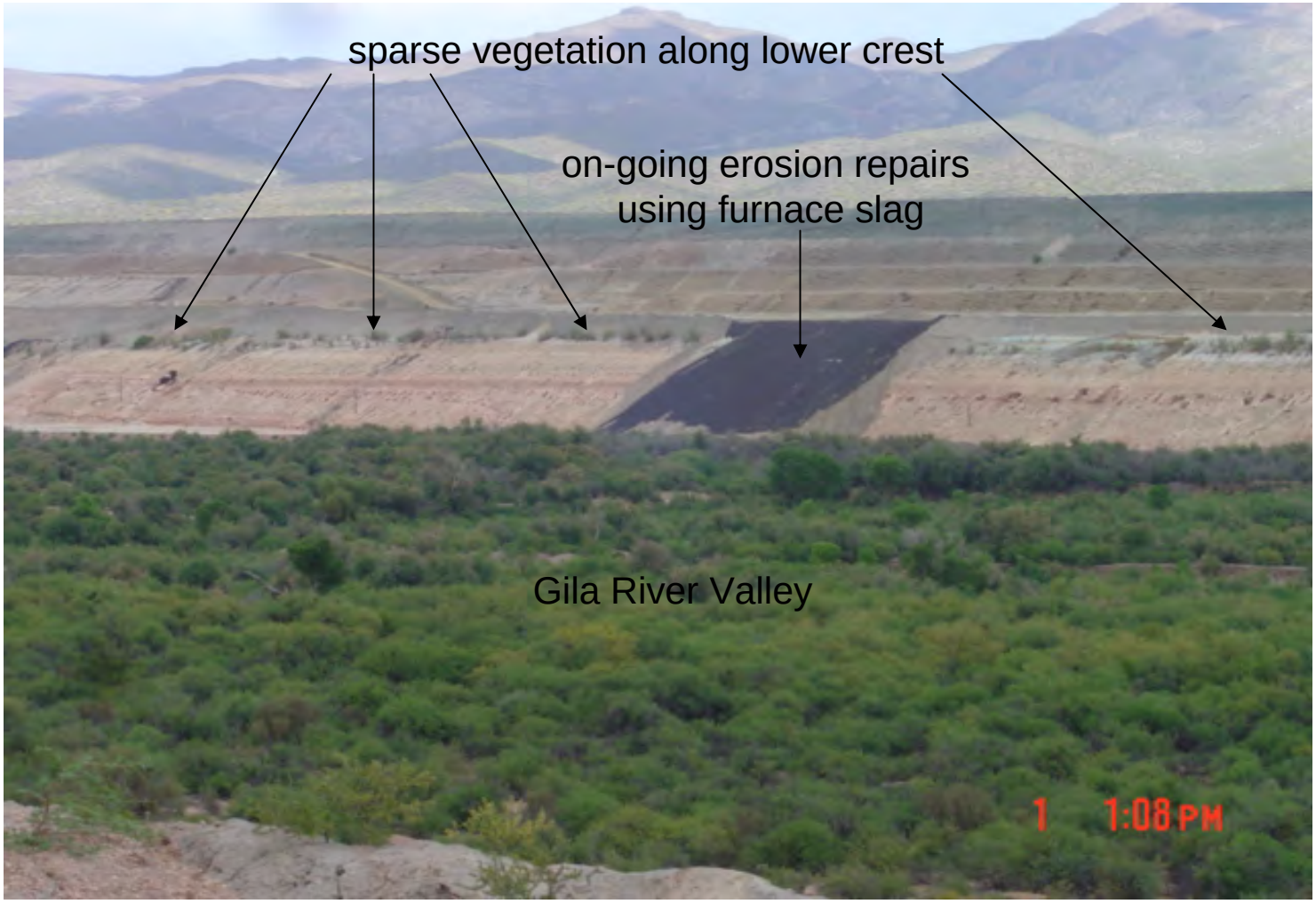
Photographs 12 through 17 illustrate panoramic view of southwest (this photo) side of Impoundment BC looking from south to north.

Photograph 17



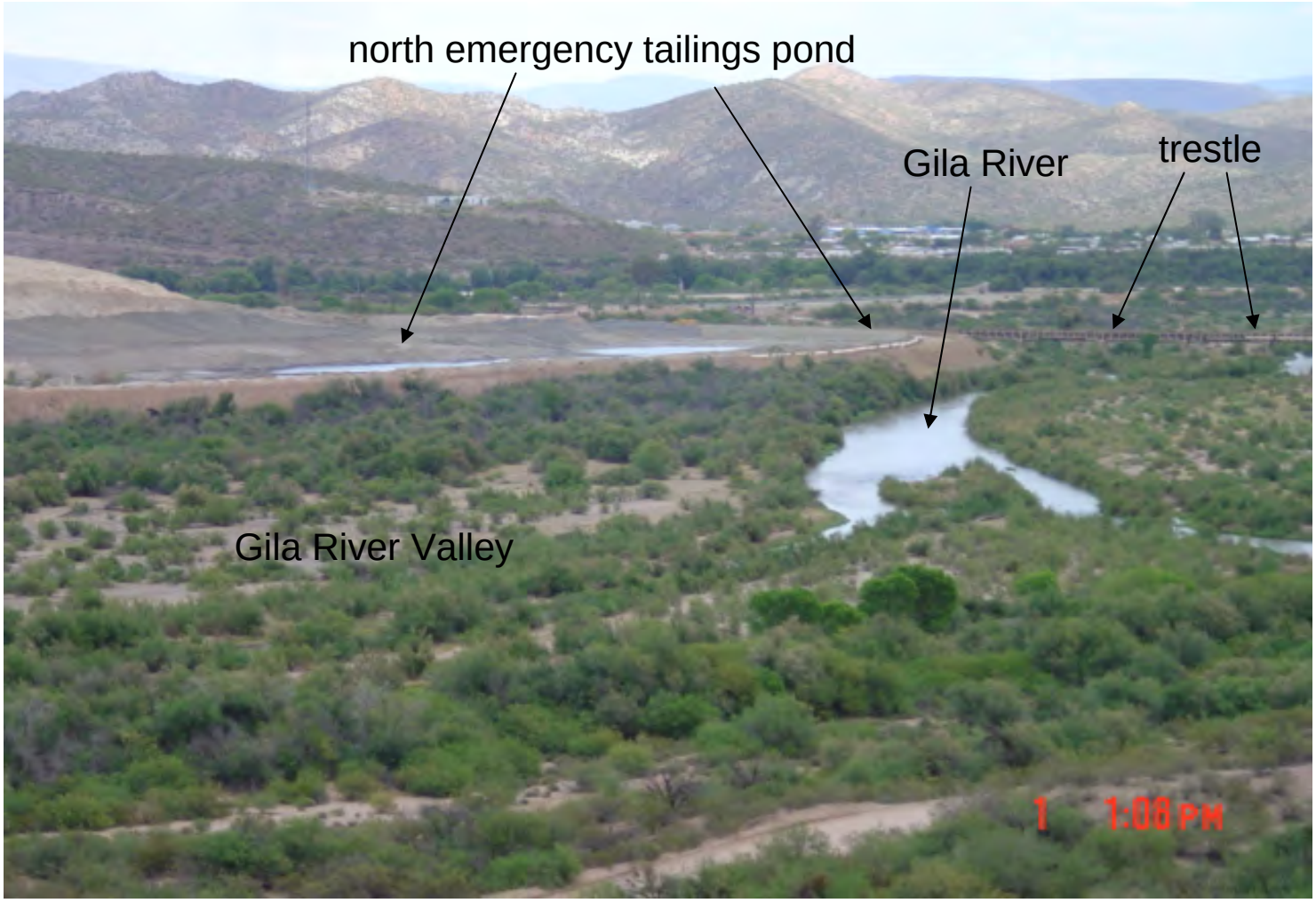
Photographs 12 through 17 illustrate panoramic view of southwest (this photo) side of Impoundment BC looking from south to north.

Photograph 18



Erosion repair along southwest of Impoundment AB/BC.

Photograph 19

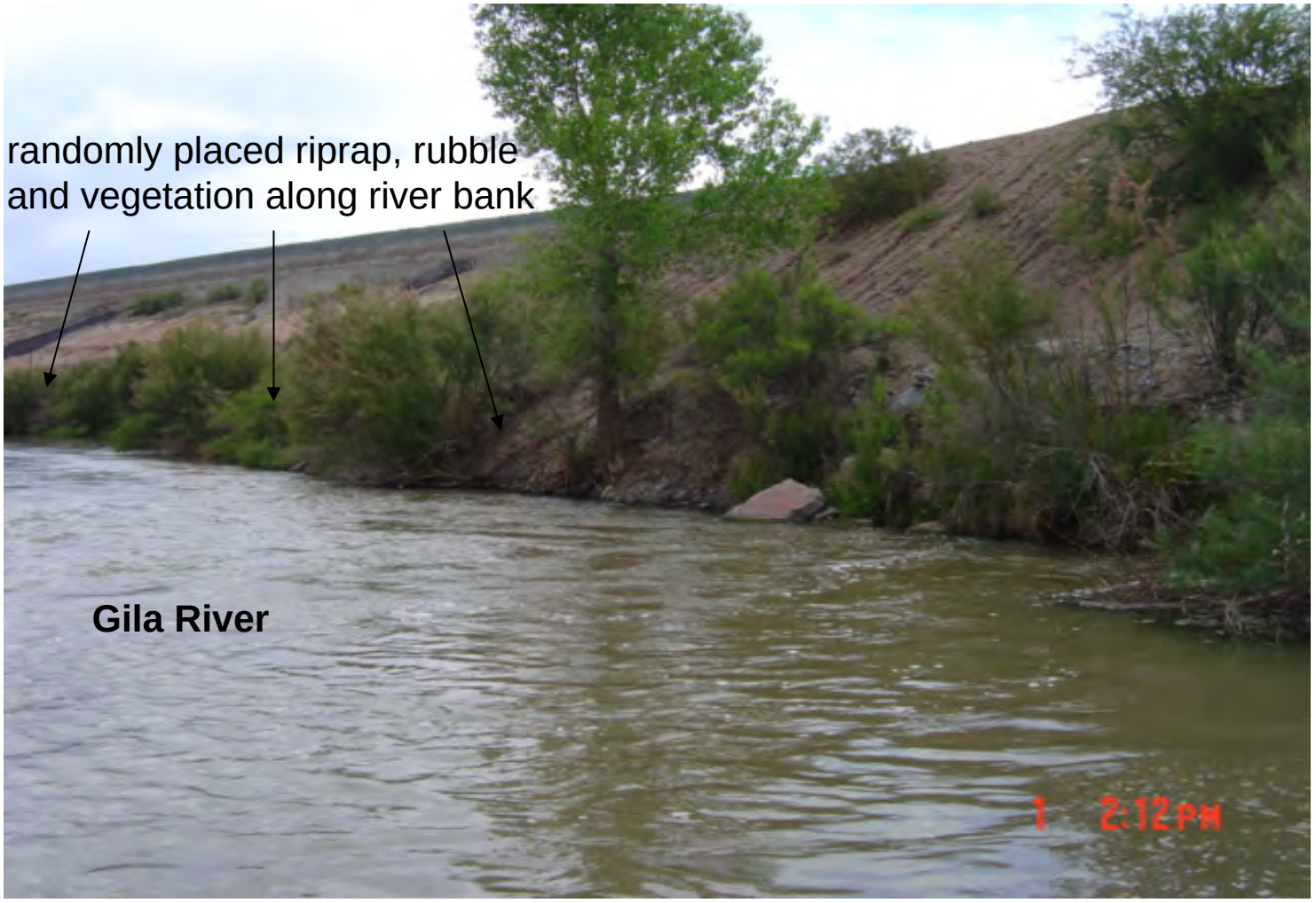


Southwest corner of Impoundment AB/BC near the North Emergency Tailings Pond.

Photograph 20

Photographs 20 through 23 show panoramic southeast to northwest view of Gila River at toe of lower berm near Impoundment AB/BC.

Photograph 21

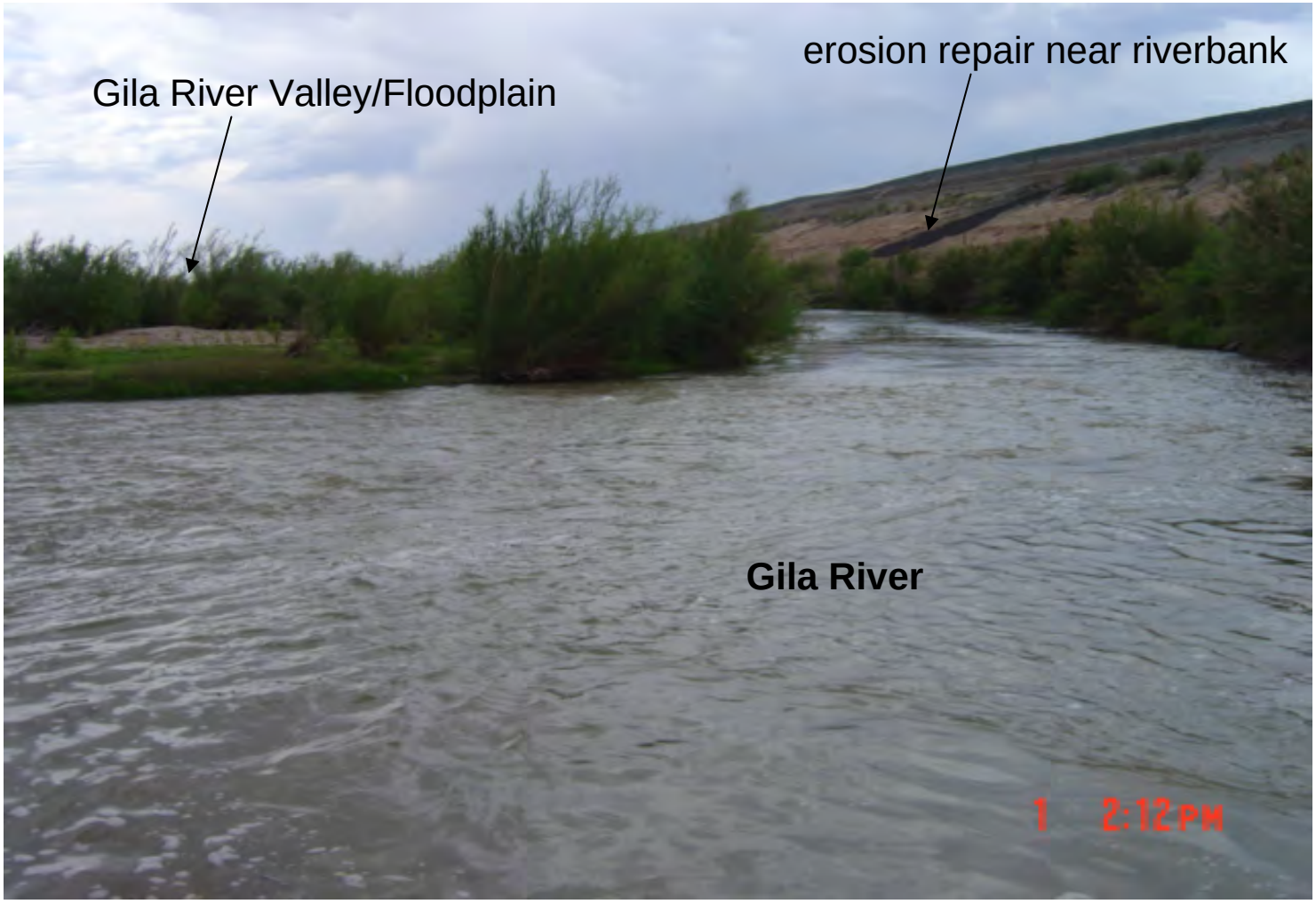


Photographs 20 through 23 show panoramic southeast to northwest view of Gila River at toe of lower berm near Impoundment AB/BC.

Photograph 22

Photographs 20 through 23 show panoramic southeast to northwest view of Gila River at toe of lower berm near Impoundment AB/BC.

Photograph 23

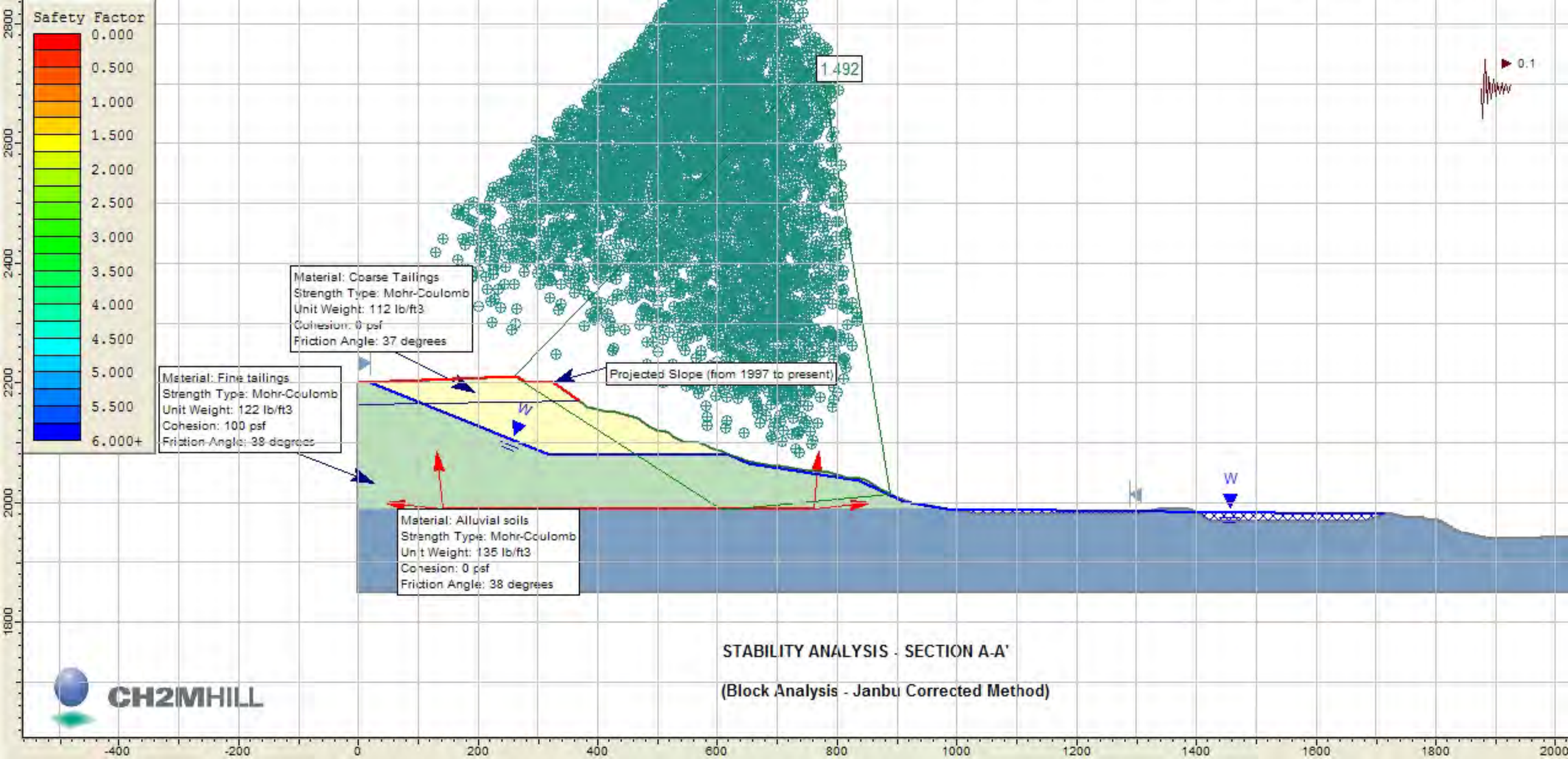


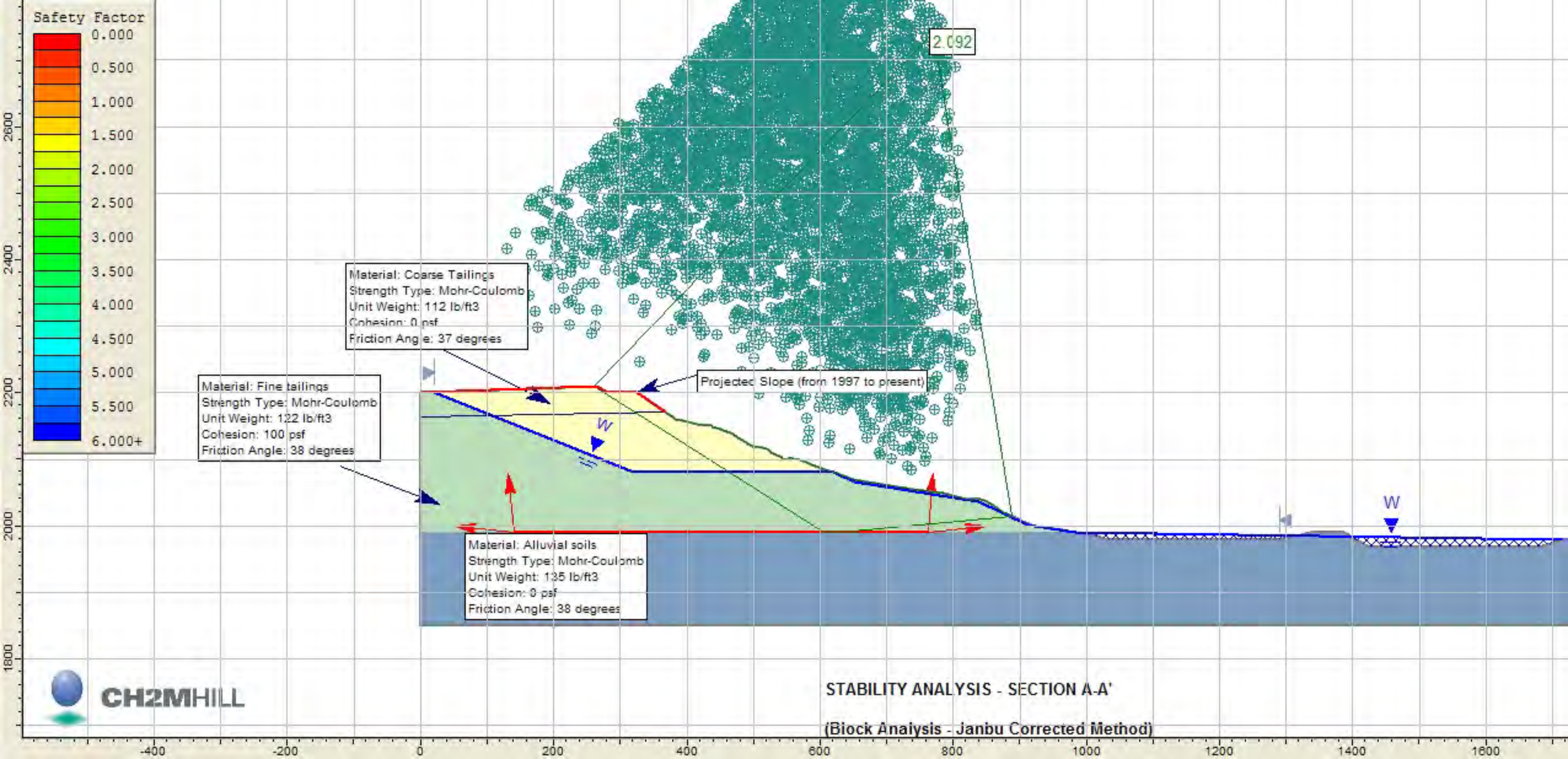
Photographs 20 through 23 show panoramic southeast to northwest view of Gila River at toe of lower berm near Impoundment AB/BC.

Photograph 24

View near southwest corner of North Emergency Tailings Pond and Gila River. Railway trestle in background. Randomly placed riprap boulders in foreground along pond berm.

Appendix C
Global Stability Analyses
Block Failure Surfaces

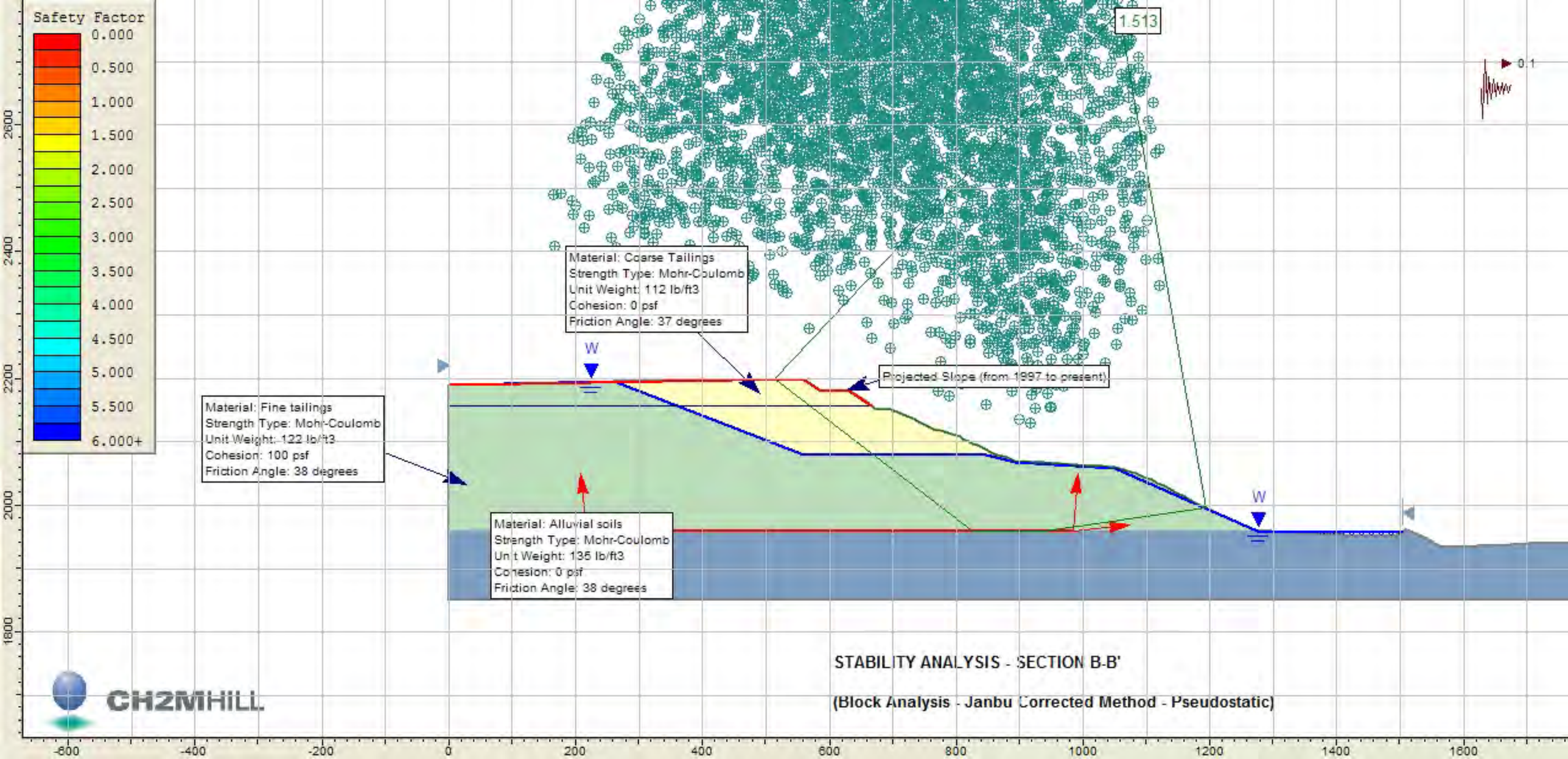

Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
1.492
0.1
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Projected Slope (from 1997 to present)
W
W
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
2800
2600
2400
2200
2000
1800
-400
-200
0
200
400
600
800
1000
1200
1400
1600
1800
2000
STABILITY ANALYSIS - SECTION A-A'
(Block Analysis - Janbu Corrected Method)
CH2MHILL

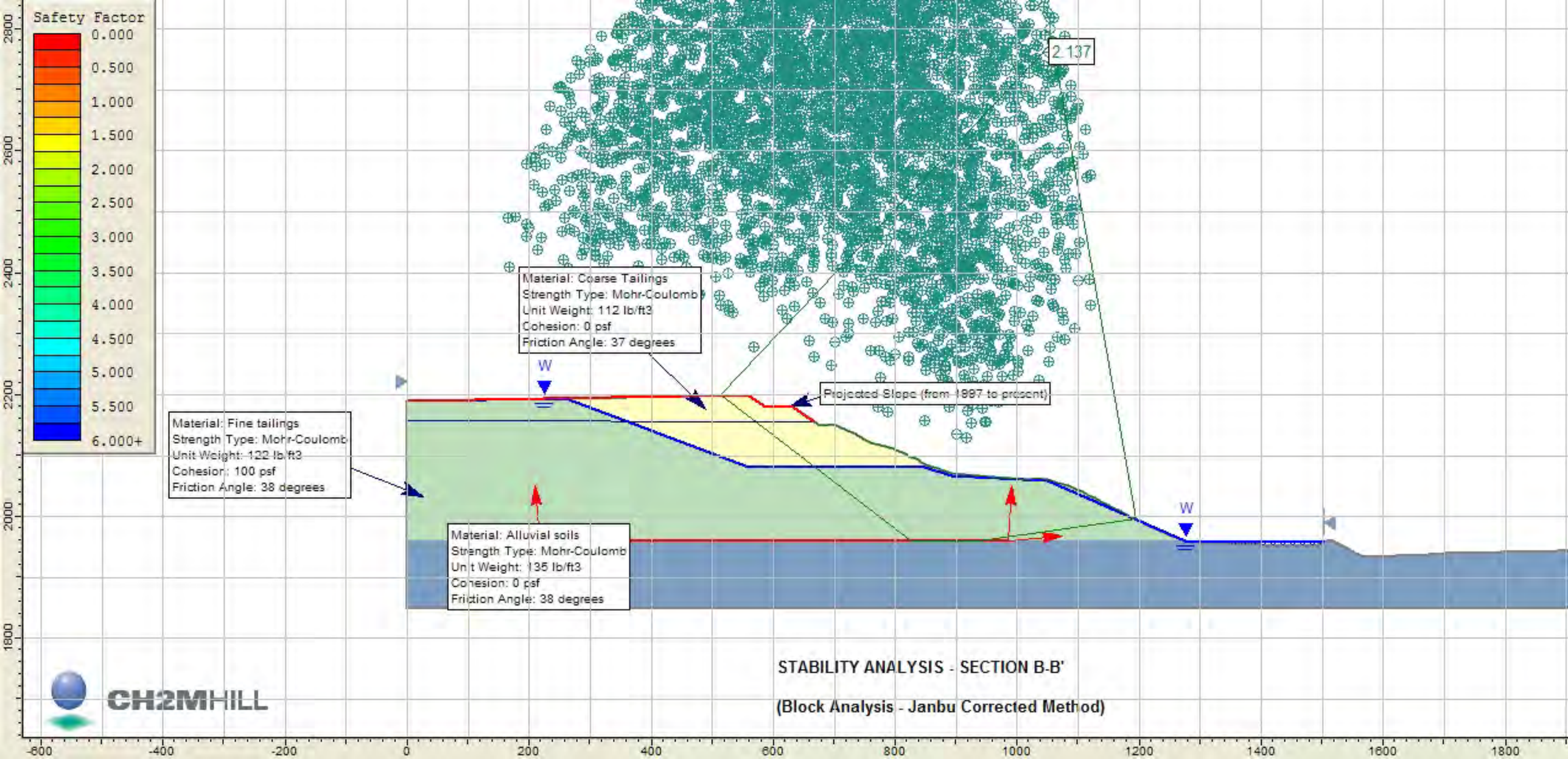


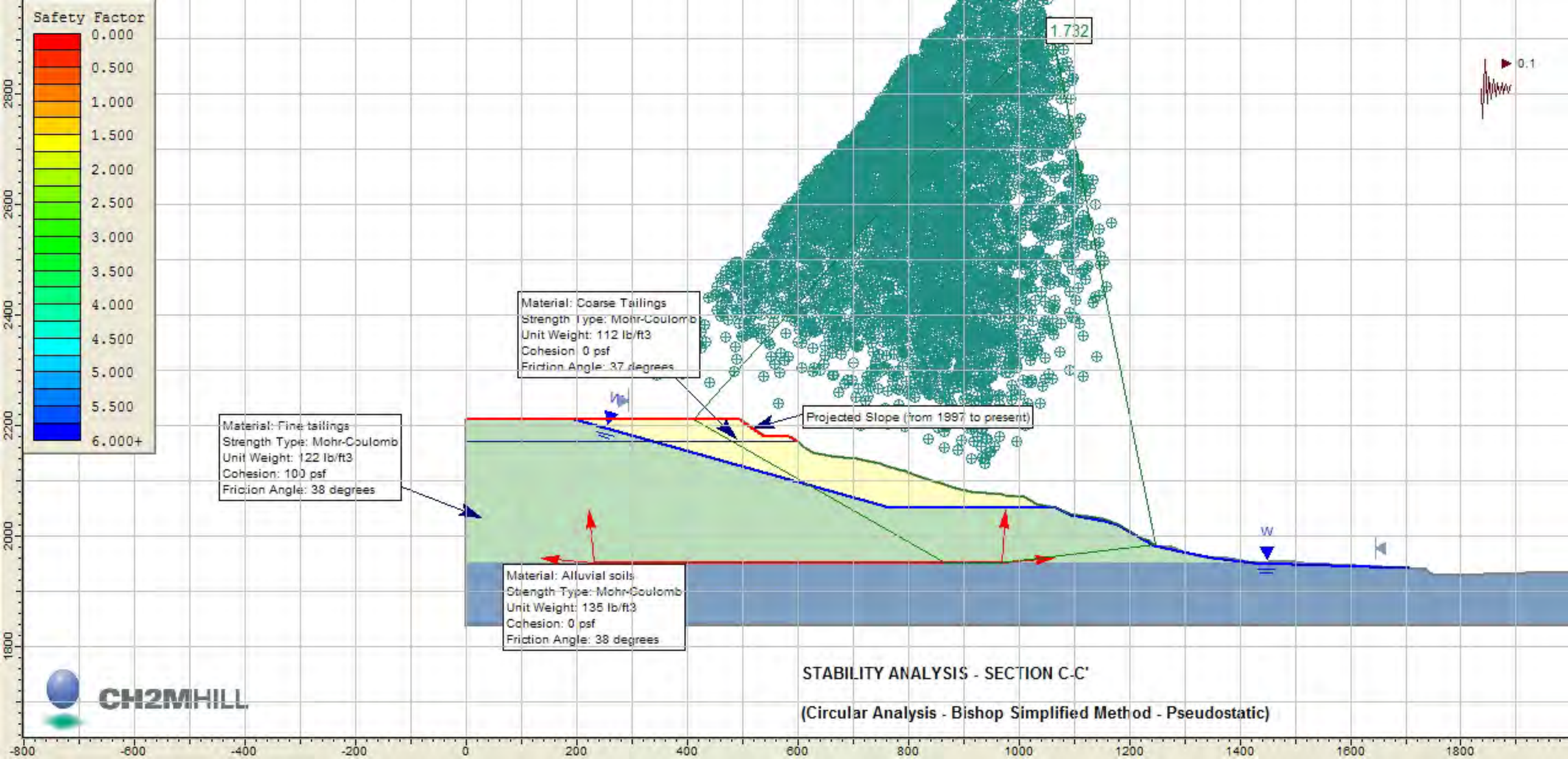
CH2MHILL

STABILITY ANALYSIS - SECTION A-A'

(Block Analysis - Janbu Corrected Method)


Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
1.513
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Projected Slope (from 1997 to present)
W
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
2600
2400
2200
2000
1800
-600
-400
-200
0
200
400
600
800
1000
1200
1400
1600
CH2MHILL
STABILITY ANALYSIS - SECTION B-B'
(Block Analysis - Janbu Corrected Method - Pseudostatic)

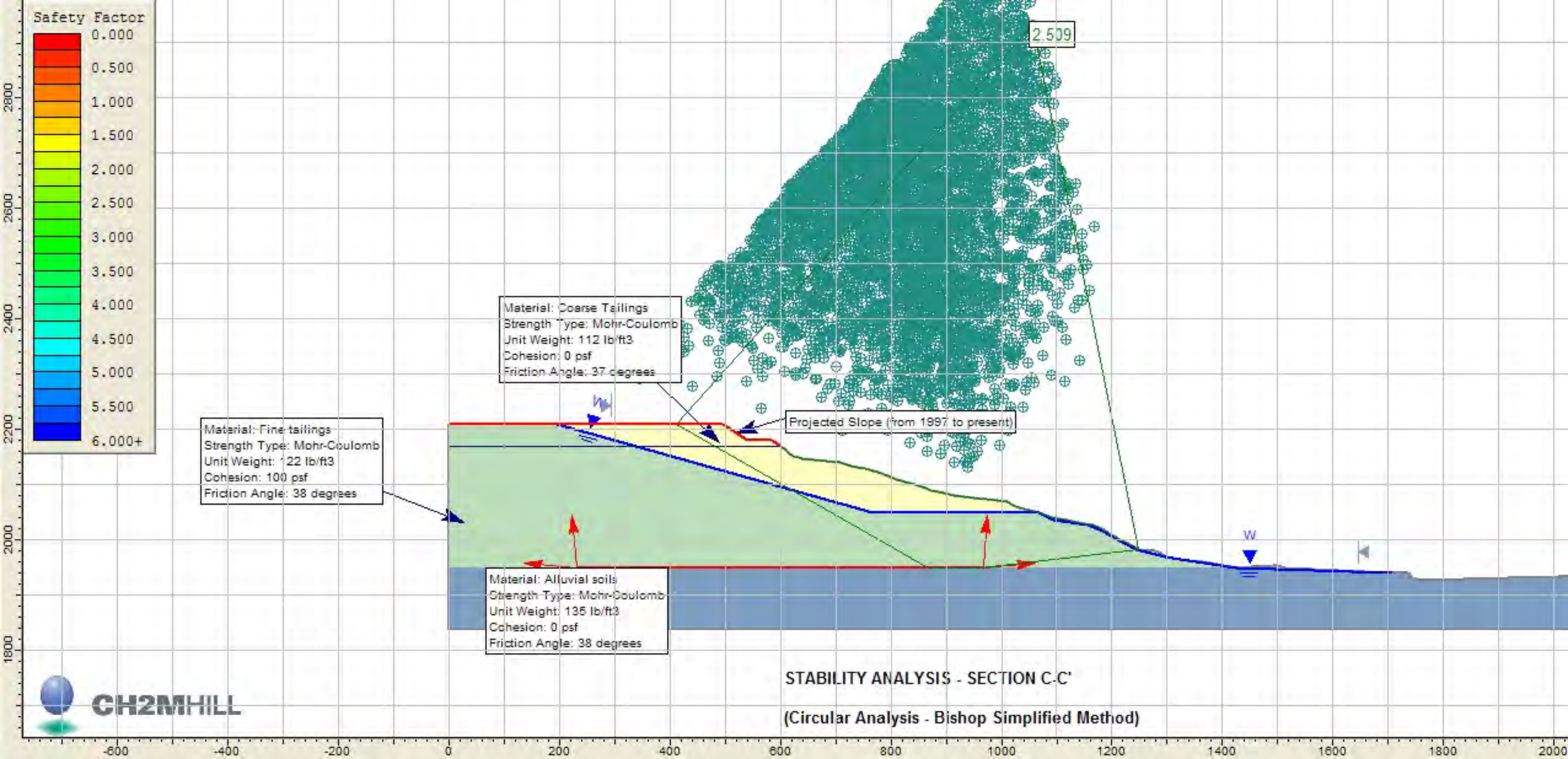

Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
2.137
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
W
Projected Slope (from 1997 to present)
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
2800
2600
2400
2200
2000
1800
-600
-400
-200
0
200
400
600
800
1000
1200
1400
1600
1800
CH2MHILL
STABILITY ANALYSIS - SECTION B-B'
(Block Analysis - Janbu Corrected Method)

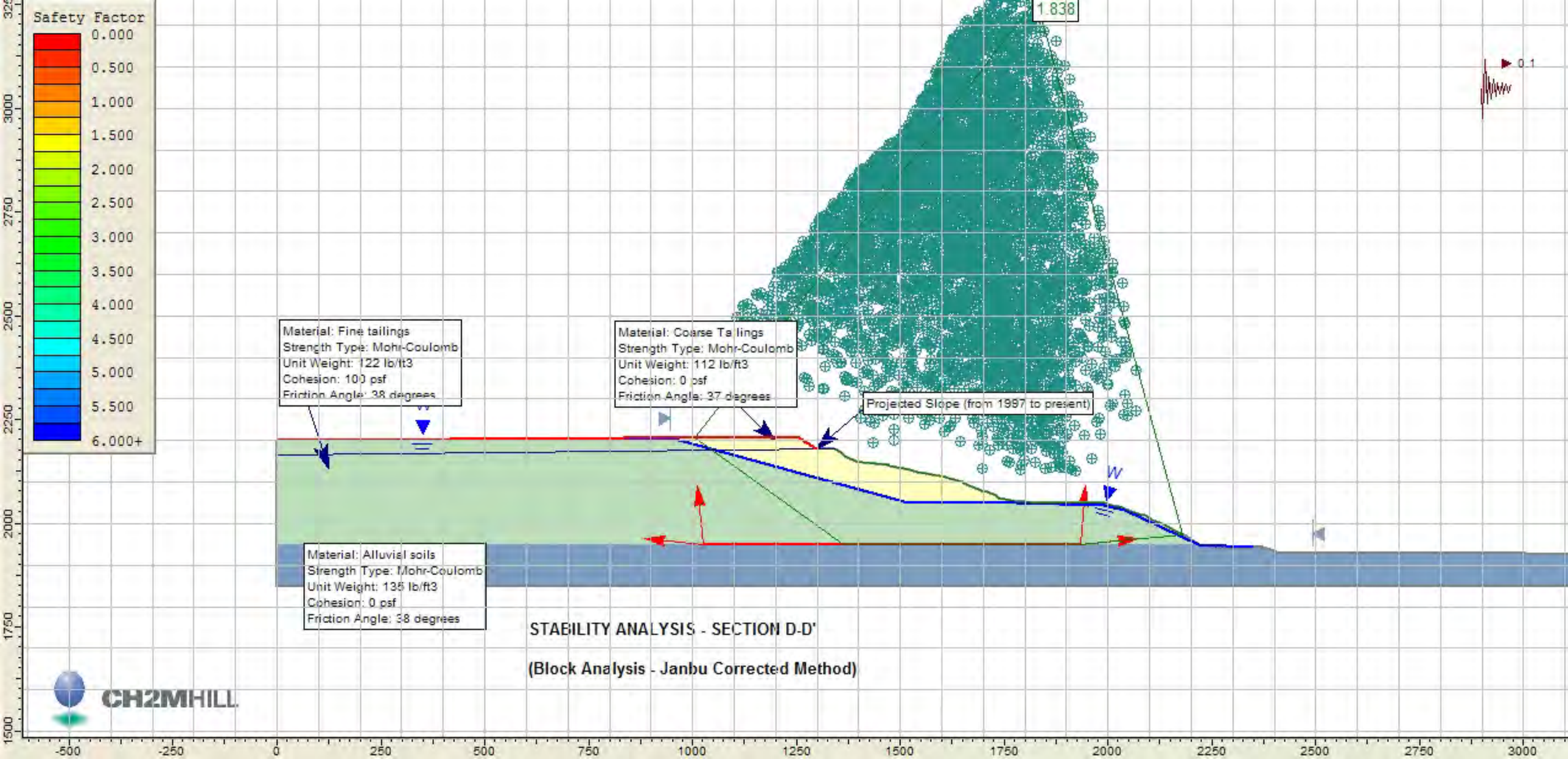


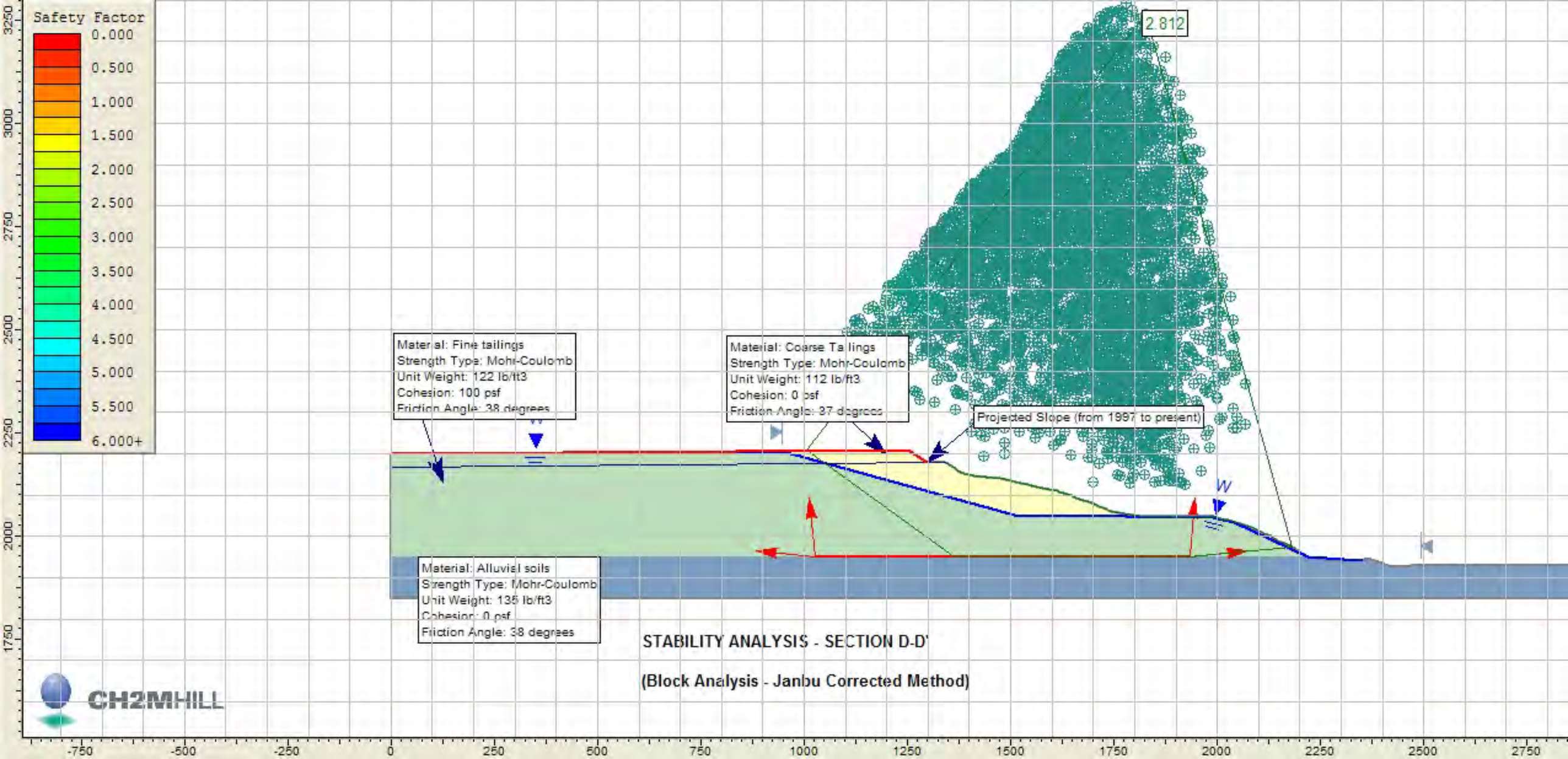
CH2MHILL

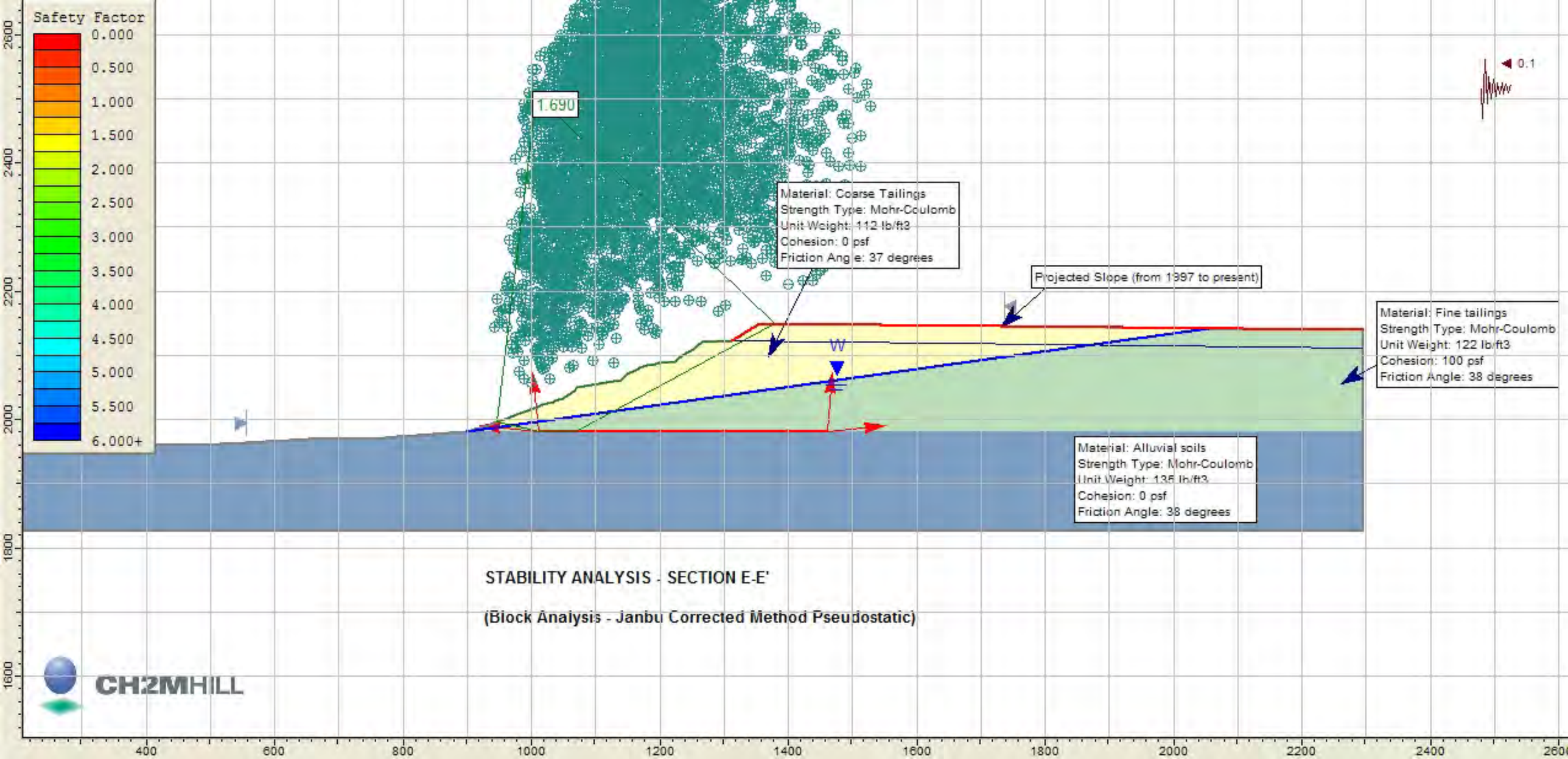
STABILITY ANALYSIS - SECTION C-C'

(Circular Analysis - Bishop Simplified Method - Pseudostatic)


Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
2.509
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Projected Slope (from 1997 to present)
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
W
W
2800
2600
2400
2200
2000
1800
-600
-400
-200
0
200
400
600
800
1000
1200
1400
1600
1800
2000
CH2MHILL
STABILITY ANALYSIS - SECTION C-C'
(Circular Analysis - Bishop Simplified Method)


Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
1.838
0.1
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Projected Slope (from 1997 to present)
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
STABILITY ANALYSIS - SECTION D-D'
(Block Analysis - Janbu Corrected Method)
CH2MHILL
3250
3000
2750
2500
2250
2000
1750
1500
-500
-250
0
250
500
750
1000
1250
1500
1750
2000
2250
2500
2750
3000

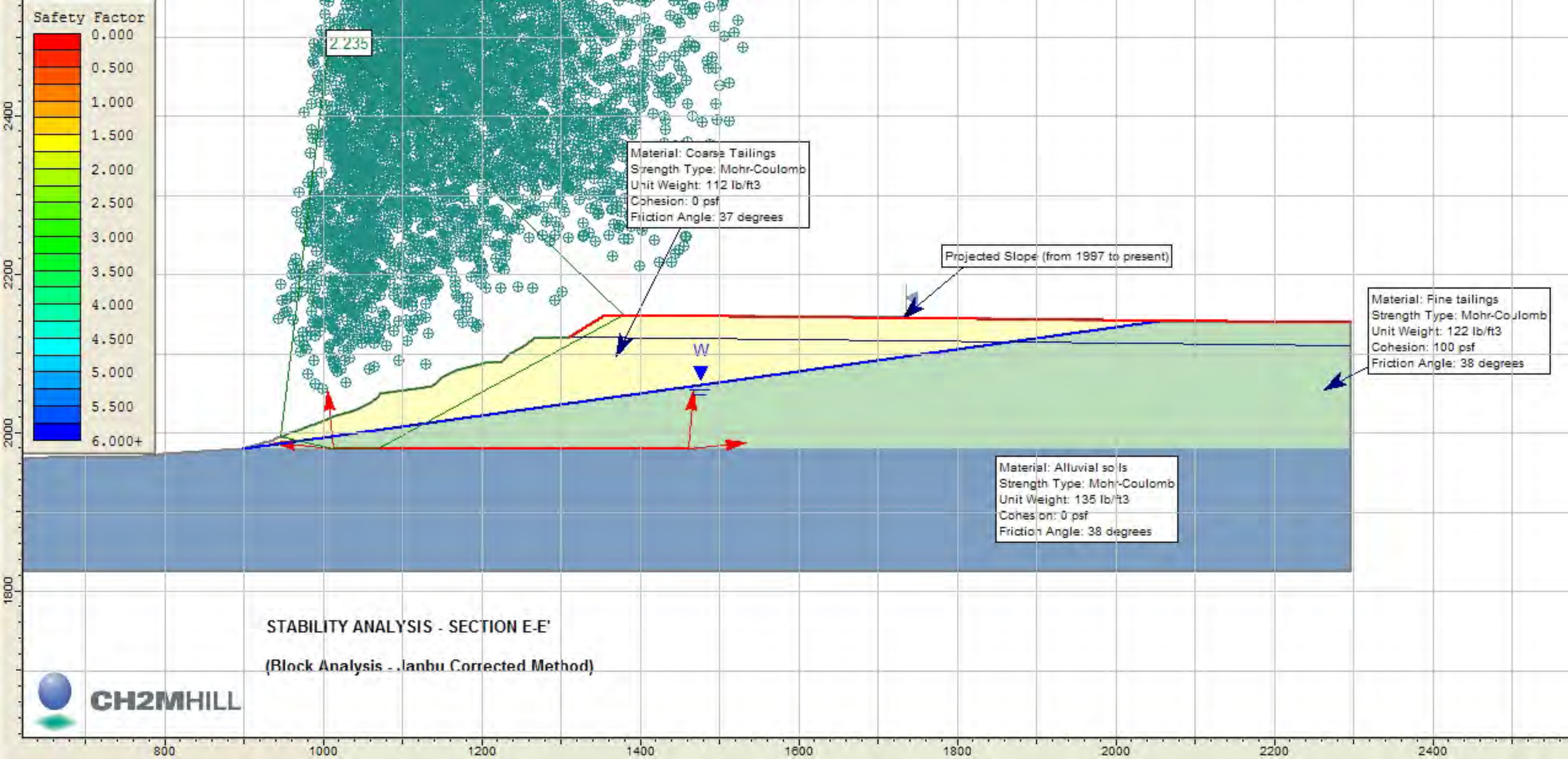

Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
2.812
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Projected Slope (from 1997 to present)
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
STABILITY ANALYSIS - SECTION D-D'
(Block Analysis - Janbu Corrected Method)
CH2MHILL
3250
3000
2750
2500
2250
2000
1750
-750
-500
-250
0
250
500
750
1000
1250
1500
1750
2000
2250
2500
2750

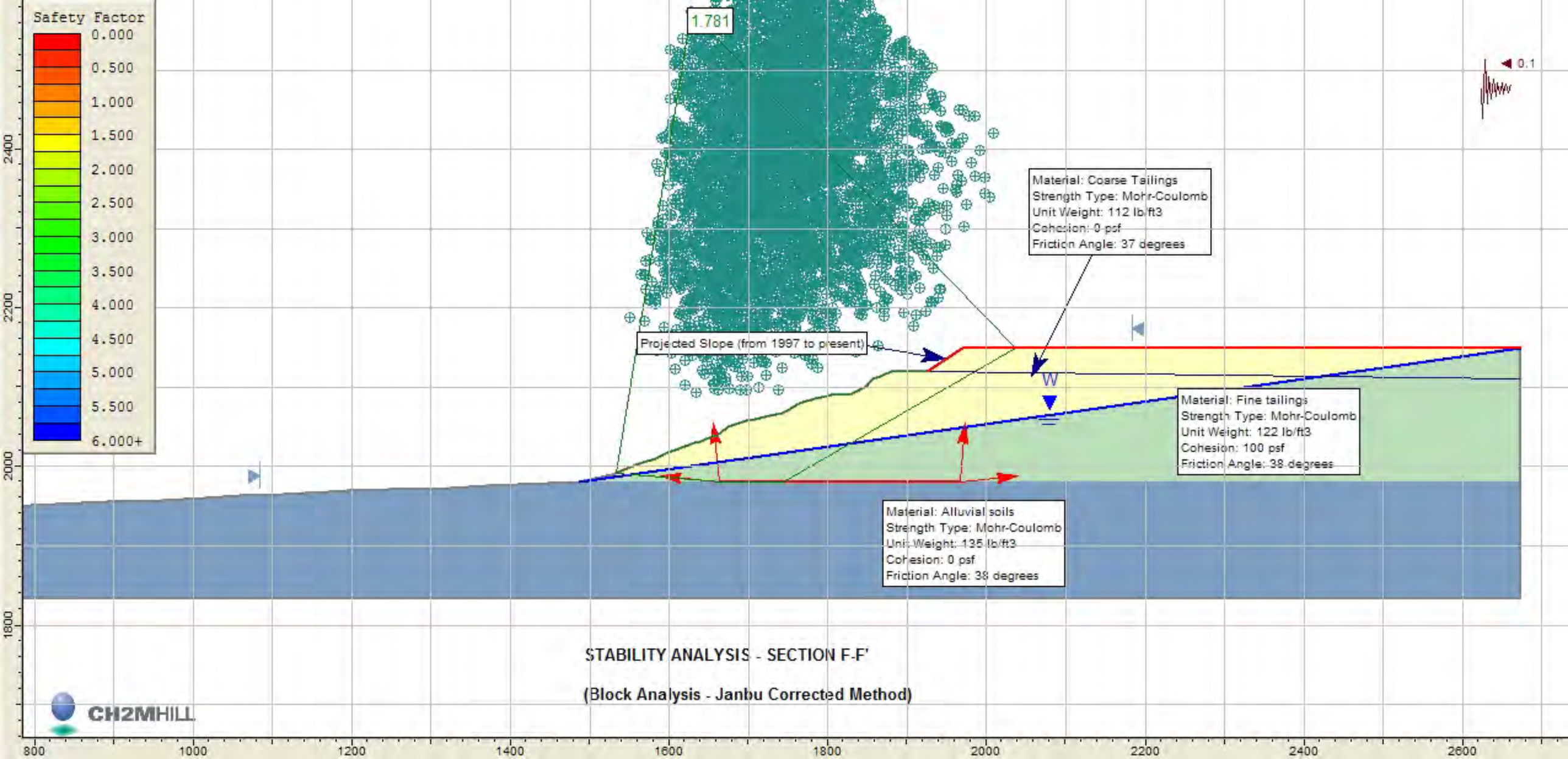


STABILITY ANALYSIS - SECTION E-E'

(Block Analysis - Janbu Corrected Method Pseudostatic)

CH2MHILL

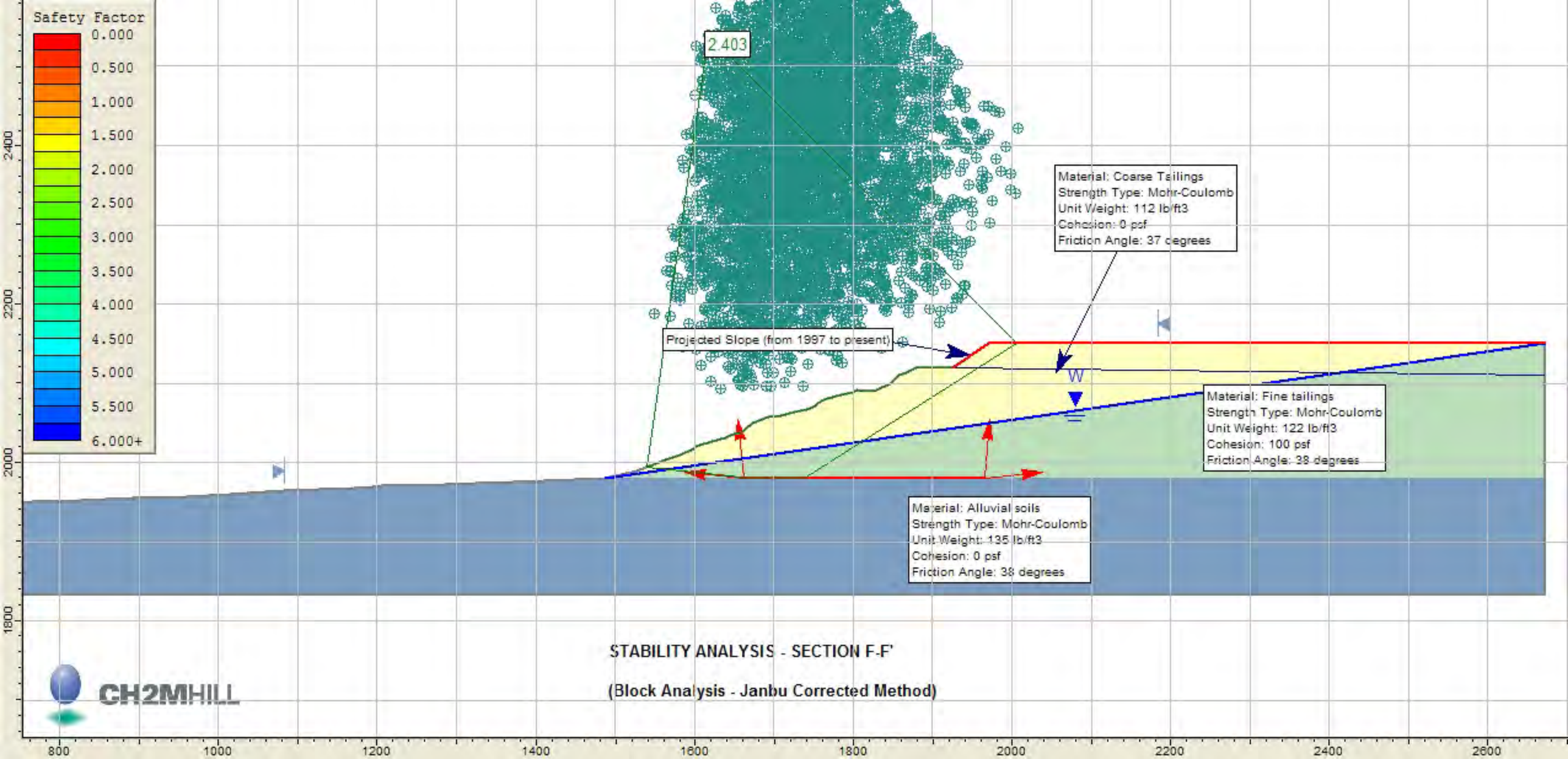

Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
2.235
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Projected Slope (from 1997 to present)
W
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
2400
2200
2000
1800
800
1000
1200
1400
1600
1800
2000
2200
2400
STABILITY ANALYSIS - SECTION E-E'
(Block Analysis - Janbu Corrected Method)
CH2MHILL



STABILITY ANALYSIS - SECTION F-F'

(Block Analysis - Janbu Corrected Method)

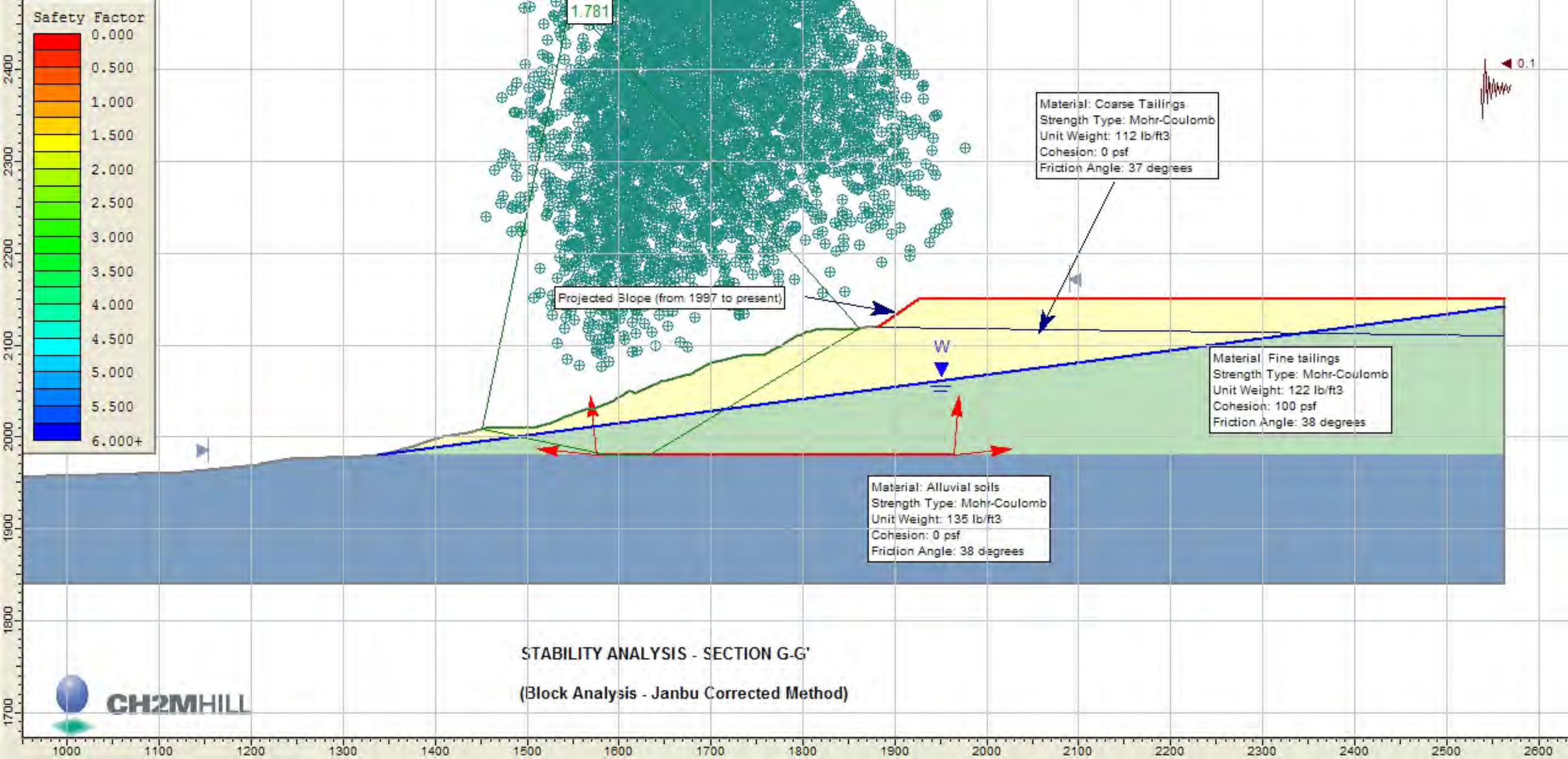
CH2MHILL

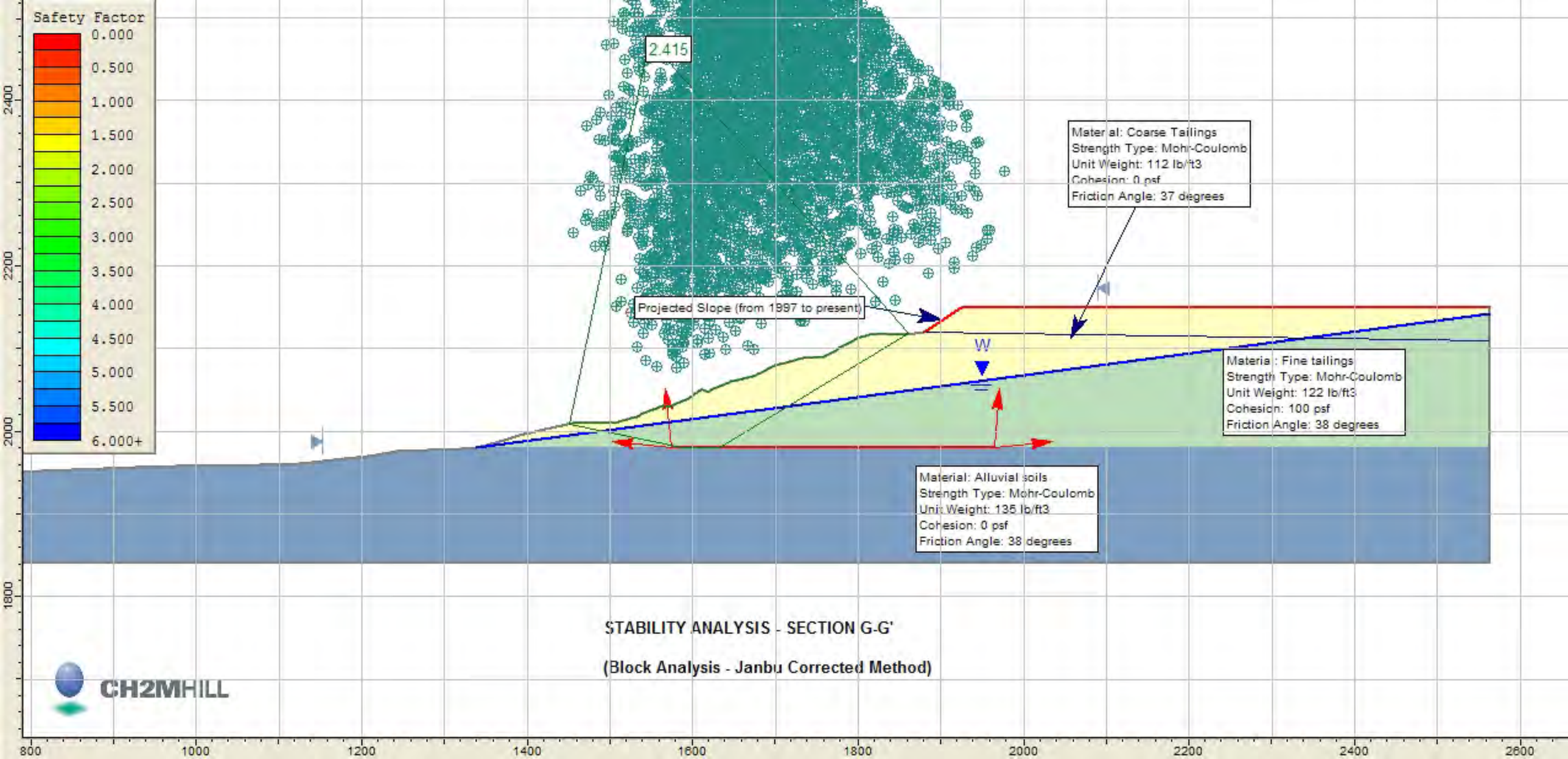


STABILITY ANALYSIS - SECTION F-F'

(Block Analysis - Janbu Corrected Method)

CH2MHILL

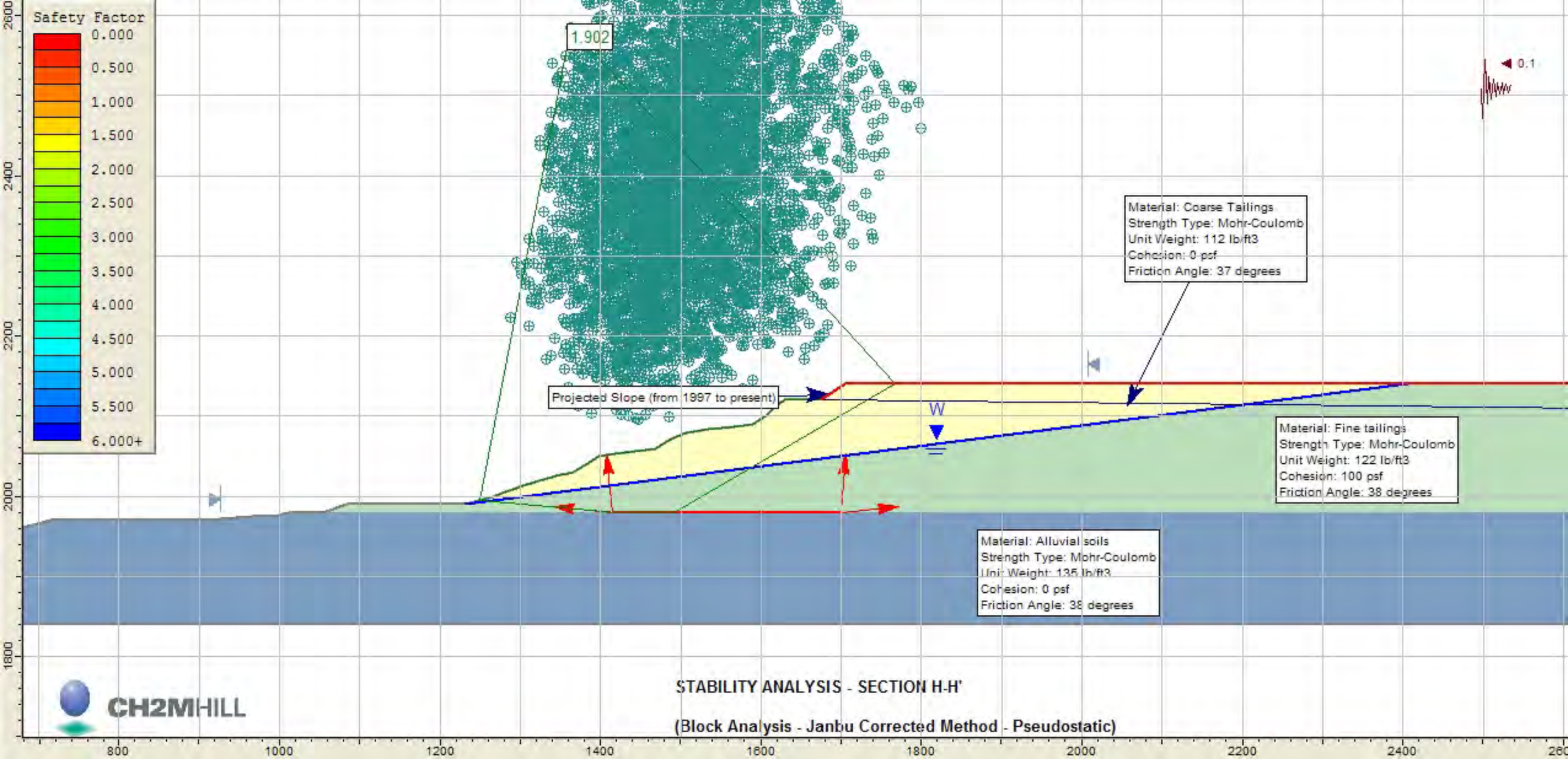

Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
1.781
Projected Slope (from 1997 to present)
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Material Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
W
0.1
2400
2300
2200
2100
2000
1900
1800
1700
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
STABILITY ANALYSIS - SECTION G-G'
(Block Analysis - Janbu Corrected Method)
CH2MHILL

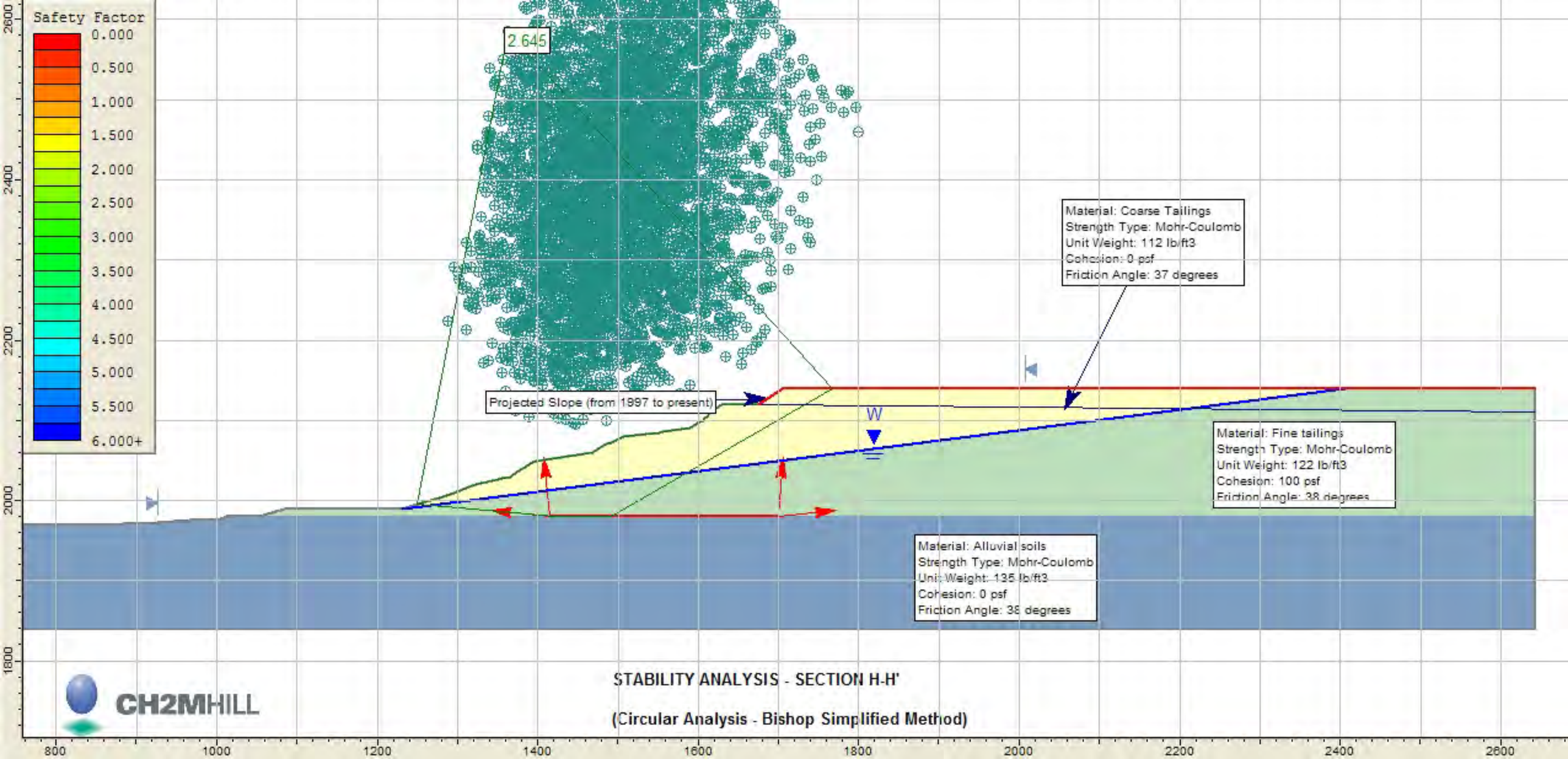


STABILITY ANALYSIS - SECTION G-G'

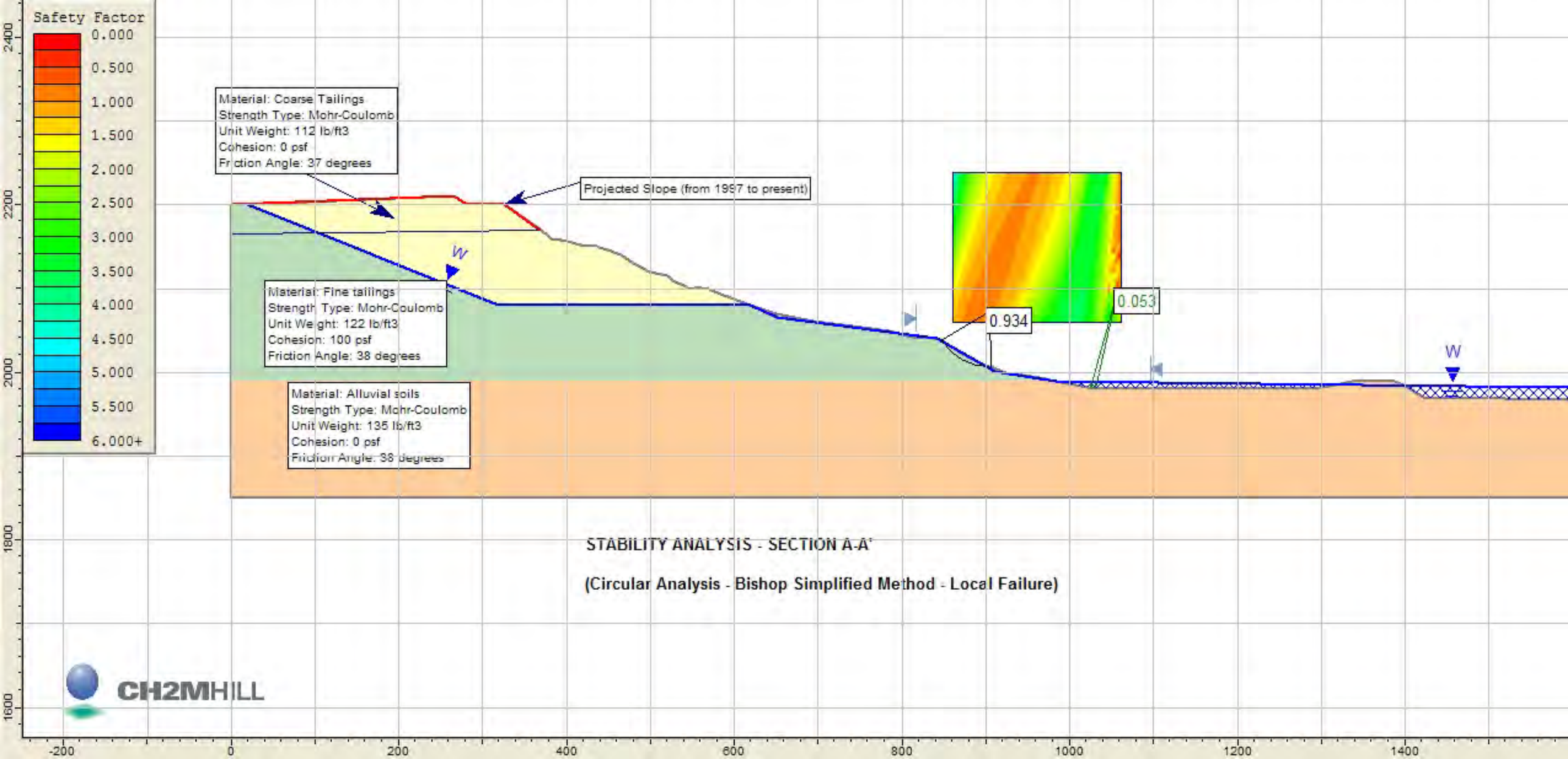
(Block Analysis - Janbu Corrected Method)

CH2MHILL


Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
1.902
0.1
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Projected Slope (from 1997 to present)
W
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
2600
2400
2200
2000
1800
800
1000
1200
1400
1600
1800
2000
2200
2400
CH2MHILL
STABILITY ANALYSIS - SECTION H-H'
(Block Analysis - Janbu Corrected Method - Pseudostatic)


Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
2.645
Projected Slope (from 1997 to present)
W
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
2600
2400
2200
2000
1800
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
CH2MHILL
STABILITY ANALYSIS - SECTION H-H'
(Circular Analysis - Bishop Simplified Method)

Appendix D
Local Stability Analysis
Circular Failure Surfaces


Safety Factor
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
5.000
5.500
6.000+
Material: Coarse Tailings
Strength Type: Mohr-Coulomb
Unit Weight: 112 lb/ft3
Cohesion: 0 psf
Friction Angle: 37 degrees
Projected Slope (from 1997 to present)
W
Material: Fine tailings
Strength Type: Mohr-Coulomb
Unit Weight: 122 lb/ft3
Cohesion: 100 psf
Friction Angle: 38 degrees
Material: Alluvial soils
Strength Type: Mohr-Coulomb
Unit Weight: 135 lb/ft3
Cohesion: 0 psf
Friction Angle: 38 degrees
0.934
0.053
W
STABILITY ANALYSIS - SECTION A-A'
(Circular Analysis - Bishop Simplified Method - Local Failure)
CH2MHILL
2400
2200
2000
1800
1600
-200
0
200
400
600
800
1000
1200
1400

Appendix H
Investigated Derived Waste (IDW Analysis)

Investigated Derived Waste (IDW) Analysis – Procedures and Results

Remedial Investigation at ASARCO LLC Hayden Plant Site

PREPARED FOR: John Hillenbrand (USEPA)

PREPARED BY: CH2M HILL

DATE: June 14, 2006

PROJECT NUMBER: 335404.FI.04

Introduction

This memorandum briefly describes the procedures and results for investigation-derived waste (IDW) generated in early 2006 during drilling activities, monitoring well installation, and well development portion of the ongoing remedial investigation at the ASARCO LLC Hayden Plant site (Site). The IDW included soil cuttings mixed with groundwater produced during drilling which are contained in two roll-off bins, and the purge water from well development which is contained in two polyethylene tanks. Based on approval from ASARCO prior to the start of work, the roll-off bins are located in the Laydown Yard west of the main gate within the Site. The two polyethylene tanks are located near GW-3 within the Hayden Well Field. Minor additional IDW generated at the site (e.g., debris such as empty bentonite bags and excess well pipe, excess grout, used personal protective equipment) was disposed of by the drilling subcontractor as non-hazardous general refuse.

Purpose

The IDW generated during field activities was containerized primarily for housekeeping purposes since some wells were located adjacent to public areas, and secondarily to avoid possible migration of any contaminants which may be present in IDW to surface soils and surface water. To determine final disposal of the IDW, soil/cuttings from the roll-off bins were sampled and analyzed for Toxicity Characteristic Leaching Program (TCLP) volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), TCLP RCRA eight metals (arsenic, barium, cadmium, chromium, lead, selenium, silver, mercury) and corrosivity, reactivity, ignitability and toxicity (CRIT). Water from the polyethylene tanks was sampled and analyzed for target compound list (TCL) VOCs, TCL SVOCs, and the Target Analyte List (TAL) inorganics. The requested analytes suites are detailed in the Field Sampling Plan (FSP). The results were compared to applicable standards to evaluate whether the IDW can be disposed of within the Site or needs to be taken off-site for disposal at a waste facility.

Procedures

Separate samples were collected from each of the roll-off bins and polyethylene tanks on February 7, 2006, following the completion of drilling and most well development activities. Collecting IDW samples from the roll-off bins was conducted by using a stainless steel spoon to grab soil from different locations in the bin to create a composite sample. The composite was spooned into the appropriate sample jars. The sample equipment was decontaminated between samples according to the FSP. Additionally, one duplicate sample was taken from one of the roll-off bins.

Collecting IDW samples from the polyethylene tanks was conducted by lowering a disposable bailer mid-depth into the tank from the top and collecting the water. The bailer was retrieved and the water was transferred into the appropriate sample containers. A new disposable bailer was used for each tank. Additionally, one duplicate sample was taken from one of the polyethylene tanks.

Sample labeling, the chain-of-custody (COC), and shipping procedures followed the guidelines set forth in the FSP.

Furthermore, prior to the start of the groundwater sampling events, the preliminary results of the IDW water sample analysis for the polyethylene tanks were received. These results were forwarded to Jack Garrity (ASARCO) on March 2, 2006. Per discussions with Mr. Garrity, based on the data and standard practices followed by ASARCO's consultant which entail discharging monitor well purge water directly to the ground surface, he approved allowing the purge water from the newly installed wells to be discharged to the ground surface during monitor well sampling.

Results and Conclusions

The results of the soil and water IDW samples were received by early March 2006. The results were non-detect (ND) for the majority of the analytes tested for. Analytes found above detection limit are listed in Tables 1 and 2 and the results are compared with the applicable standards. No analytes exceeded the applicable standards. The CRIT analysis was negative, thereby confirming that IDW soil is non-hazardous. The complete laboratory results are in Attachment A.

Based on these results, the IDW is considered non-hazardous. Pending ASARCO review and approval of the results, the contents of the roll-off bins may be disposed of at the on-site landfill or other appropriate location, and the contents of the polyethylene tanks may be discharged into a surface water containment basin. Written approval for this approach was obtained from EPA on May 26, 2006. Written approval from ASARCO will be obtained prior to proceeding with this effort.

TABLE 1
Analytic Results for Purge Water Investigation Derived Waste
Asarco LLC Hayden Plant Site Remedial Investigation

Analyte	Result (µg/L)	MCL (µg/L)	AWQS (µg/L)
Metals			
Aluminum[1]	23	--	--
Aluminum[2]	870	--	--
Arsenic[1]	5.1	10	50
Arsenic[2]	7	10	50
Barium[1]	43	2000	2000
Barium[2]	35	2000	2000
Boron[1]	100	--	--
Boron[2]	180	--	--
Calcium[1]	130000	--	--
Calcium[2]	68000	--	--
Chromium[1]	16	100	100
Chromium[2]	3.4	100	100
Cobalt[1]	2.2	--	--
Cobalt[2]	0.59	--	--
Copper[1]	3.4	1300	--
Copper[2]	11	1300	--
Iron[2]	660	--	--
Magnesium[1]	100000	--	--
Magnesium[2]	15000	--	--
Manganese[1]	17	--	--
Manganese[2]	13	--	--
Mercury[1]	0.023	2	2
Mercury[2]	0.015	2	2
Molybdenum[1]	9.6	--	--
Molybdenum[2]	13	--	--
Potassium[1]	7100	--	--
Potassium[2]	5200	--	--
Selenium[1]	7.2	50	50

TABLE 1
Analytic Results for Purge Water Investigation Derived Waste
Asarco LLC Hayden Plant Site Remedial Investigation

Analyte	Result (µg/L)	MCL (µg/L)	AWQS (µg/L)
Selenium[2]	0.96	50	50
Silver[1]	0.48	--	--
Sodium[1]	110000	--	--
Sodium[2]	150000	--	--
Vanadium[1]	17	--	--
Vanadium[2]	7.8	--	--
Zinc[2]	40	--	--
Volatile Organic Compounds			
1,1,1-Trichloroethane[1]	8.9	200	200
1,2,3-Trichlorobenzene[1]	0.8	--	--
1,2,4-Trichlorobenzene[1]	0.9	70	70
Acetone[1]	16	--	--
Acetone[2]	14	--	--
Chloroform[1]	0.5	100	--
Semi Volatile Organic Compounds			
1,2,4-Trichlorobenzene[1]	0.8	70	70
1,4-Dioxane[1]	0.5	--	--
13-Docosenamide, (Z)-[2]	2.4	--	--
4-Pyrazolin-3-one, 1-phenyl-[1]	4.9	--	--
bis(2-Ethylhexyl) phthalate[1]	1.3	6	6
bis(2-Ethylhexyl) phthalate[2]	1.1	6	6
Butyl benzyl phthalate[1]	0.5	--	--
Ethanol, 2-[2-[2-[2-[2-[p-(1,1...[2]	7.1	--	--
Ethanol, 2-[2-[4-(1,1,3,3-t...[2]	30	--	--
Ethanol, 2-butoxy-, phospha...[2]	2.4	--	--
Indazole, nitro[1]	13	--	--
Stigmasterol[1]	11	--	--
unknown 10[2]	3.6	--	--

TABLE 1
Analytic Results for Purge Water Investigation Derived Waste
Asarco LLC Hayden Plant Site Remedial Investigation

Analyte	Result (µg/L)	MCL (µg/L)	AWQS (µg/L)
unknown 4[2]	7.9	--	--
unknown 6[2]	18	--	--
unknown 7[2]	2.2	--	--
unknown C20H34O4[2]	13	--	--
unknown oxygenated[1]	2	--	--

Notes:

1) Sample taken from roll-off bin # 1

2) Sample taken from roll-off bin # 2

MCL – Maximum Contaminant Level

AWQS – Aquifer Water Quality Standard (Arizona)

TABLE 2
Analytic Results for Drill Cuttings Investigation Derived Waste
Asarco LLC Hayden Plant Site Remedial Investigation

Analyte	Result (mg/L)	Maximum for TCLP Extraction (mg/l)
Toxicity Characteristic Leaching Procedure (TCLP) Metals		
Barium[1]	0.26	100.0
Barium[2]	0.15	100.0
Cadmium[1]	0.09	1.0
Cadmium[2]	0.006	1.0
Chromium[1]	0.01	5.0
Chromium[2]	0.02	5.0
Mercury[2]	0.00002	0.2
pH Measurement		
pH[1]	8.6 (unitless)	--
pH[2]	8.5 (unitless)	
Volatile Organic Compounds		
All VOCs were non-detect	--	--
Semi Volatile Organic Compounds		
bis(2-Ethylhexyl) phthalate[1]	0.006	--
bis(2-Ethylhexyl) phthalate[2]	0.008	--
unknown 1[2]	0.02	--
unknown 3[2]	0.02	--
unknown ester[2]	0.02	--
Corrosivity/Reactivity/Ignitability/Toxicity (CRIT)		
All CRIT values were negative		

Notes:

1) Sample taken from poly tank # 1
2) Sample taken from poly tank # 2

Attachments

Attachment A: Laboratory Results

ATTACHMENT A TO IDW TECH MEMO
(CH2M HILL, JUNE 14, 2006)

0602012 FINAL 02 21 06 1352

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street Building 201
Richmond, CA 94804

Subject: **Analytical Testing Results - Project R06S25**
SDG: 06041A

From: **Brenda Bettencourt, Director**
EPA Region 9 Laboratory
PMD-2

To: **John Hillenbrand**
Private Site and DOE Section
SFD-8-2

Attached are the results from the analysis of samples from the **ASARCO Feb 2006 IDW Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Analyses included in this

Metals, TCLP, ICP	Metals, TCLP, Mercury
pH	TCLP extraction

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:**	02/21/06 13:52
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
IDW-S-01-020706	0602012-01	Soil	02/07/06 18:00	02/09/06 14:50
IDW-S-02-020706	0602012-02	Soil	02/07/06 17:30	02/09/06 14:50
IDW-S-0X-020706	0602012-03	Soil	02/07/06 17:00	02/09/06 14:50

TCLP, ICP Metals, Batch B6B0061: The blank spike recovery for selenium (116%) was outside the QC limits of 85 - 115% (biased high). All selenium sample results were non-detected and are reported without qualification.

Samples were received at 10 deg. C which is outside the recommended temperature range of 0 to 6 deg. C. No adverse impact is anticipated on the data quality.

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/21/06 13:52
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602012-01**								Soil - Sampled: 02/07/06 18:00
Sample ID: **IDW-S-01-020706**								TCLP Extraction by EPA 1311
TCLP Extraction	**Not applicable.**		**1.0**	N/A	B6B0052	02/13/06	02/16/06	1311/SOP250
Arsenic	**ND**	**U**	**0.20**	mg/L	B6B0061	02/14/06	02/15/06	200.7/SOP505
Barium	**0.26**		**0.01**	"	"	"	02/15/06	200.7/SOP505
Cadmium	**0.09**		**0.005**	"	"	"	02/15/06	200.7/SOP505
Chromium	**0.01**		**0.01**	"	"	"	"	200.7/SOP505
Lead	**ND**	**U**	**0.10**	"	"	"	02/15/06	200.7/SOP505
Selenium	**ND**	**U**	**0.20**	"	"	"	"	200.7/SOP505
Silver	**ND**	**U**	**0.01**	"	"	"	"	200.7/SOP505
Mercury	**ND**	**U**	**0.00003**	"	B6B0072	02/15/06	02/15/06	245.1/SOP515
pH	**8.6**	**A3, J**	**0.10**	pH Units	B6B0038	02/17/06	02/17/06	9045C/SOP 582
Lab ID: **0602012-02**								Soil - Sampled: 02/07/06 17:30
Sample ID: **IDW-S-02-020706**								TCLP Extraction by EPA 1311
TCLP Extraction	**Not applicable.**		**1.0**	N/A	B6B0052	02/13/06	02/16/06	1311/SOP250
Arsenic	**ND**	**U**	**0.20**	mg/L	B6B0061	02/14/06	02/15/06	200.7/SOP505
Barium	**0.15**		**0.01**	"	"	"	02/15/06	200.7/SOP505
Cadmium	**0.006**		**0.005**	"	"	"	"	200.7/SOP505
Chromium	**0.02**		**0.01**	"	"	"	"	200.7/SOP505
Lead	**ND**	**U**	**0.10**	"	"	"	02/15/06	200.7/SOP505
Selenium	**ND**	**U**	**0.20**	"	"	"	"	200.7/SOP505
Silver	**ND**	**U**	**0.01**	"	"	"	"	200.7/SOP505
Mercury	**0.00002**	**J, C1**	**0.00003**	"	B6B0072	02/15/06	02/15/06	245.1/SOP515
pH	**8.5**	**A3, J**	**0.10**	pH Units	B6B0038	02/17/06	02/17/06	9045C/SOP 582
Lab ID: **0602012-03**								Soil - Sampled: 02/07/06 17:00
Sample ID: **IDW-S-0X-020706**								TCLP Extraction by EPA 1311
TCLP Extraction	**Not applicable.**		**1.0**	N/A	B6B0052	02/13/06	02/16/06	1311/SOP250
Arsenic	**ND**	**U**	**0.20**	mg/L	B6B0061	02/14/06	02/15/06	200.7/SOP505
Barium	**0.20**		**0.01**	"	"	"	02/15/06	200.7/SOP505
Cadmium	**0.005**		**0.005**	"	"	"	"	200.7/SOP505
Chromium	**0.02**		**0.01**	"	"	"	"	200.7/SOP505
Lead	**ND**	**U**	**0.10**	"	"	"	02/15/06	200.7/SOP505
Selenium	**ND**	**U**	**0.20**	"	"	"	"	200.7/SOP505
Silver	**ND**	**U**	**0.01**	"	"	"	"	200.7/SOP505
Mercury	**ND**	**U**	**0.00003**	"	B6B0072	02/15/06	02/15/06	245.1/SOP515
pH	**8.3**	**A3, J**	**0.10**	pH Units	B6B0038	02/17/06	02/17/06	9045C/SOP 582

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/21/06 13:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

R9Q

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
										Prepared & Analyzed: 02/17/06
Batch B6B0038 - - General Inorganic - pH										Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control
Duplicate (B6B0038-DUP1)	**Source: 0602012-01**									
pH	8.68		0.10	pH Units		8.65			0.3	20
Reference (B6B0038-SRM1)										
pH	7.03			pH Units	7.00		100	98.6-101.4		
										Prepared: 02/13/06 Analyzed: 02/16/06
Batch B6B0052 - 1311 TCLP - TCLP extraction										TCLP Extraction by EPA 1311 - Quality Control
Blank (B6B0052-BLK1)										
TCLP Extraction	Not applicable.		1.0	N/A						
Duplicate (B6B0052-DUP1)	**Source: 0602012-01**									
TCLP Extraction	Not applicable.		1.0	N/A		ıt applicab				200
										Prepared: 02/14/06 Analyzed: 02/15/06
Batch B6B0061 - Leachate Digest - Metals, TCLP, ICP										Metals by EPA 200 Series Methods - Quality Control
Blank (B6B0061-BLK1)										
Arsenic	ND	U	0.20	mg/L						
Barium	ND	U	0.01	"						
Cadmium	ND	U	0.005	"						
Chromium	ND	U	0.01	"						
Lead	ND	U	0.10	"						
Selenium	ND	U	0.20	"						
Silver	ND	U	0.01	"						
LCS (B6B0061-BS1)										
Arsenic	0.882		0.20	mg/L	0.800		110	85-115		
Barium	0.207		0.01	"	0.200		104	85-115		
Cadmium	0.211		0.005	"	0.200		106	85-115		
Chromium	0.422		0.01	"	0.400		106	85-115		
Lead	1.00		0.10	"	1.00		100	85-115		
Selenium	2.32		0.20	"	2.00		116	85-115		
Silver	0.077		0.01	"	0.0750		103	85-115		
Duplicate (B6B0061-DUP1)	**Source: 0602012-01**									
Arsenic	ND	U	0.20	mg/L		ND				20
Barium	0.257		0.01	"		0.256			0.4	20
Cadmium	0.102		0.005	"		0.090			12	20
Chromium	0.011		0.01	"		0.011			0	20
Lead	ND	U	0.10	"		ND				20
Selenium	ND	U	0.20	"		ND				20
Silver	ND	U	0.01	"		ND				20
Matrix Spike (B6B0061-MS1)	**Source: 0602012-01**									
Arsenic	0.796		0.20	mg/L	0.800	ND	100	70-130		
Barium	0.430		0.01	"	0.200	0.256	87	70-130		
Cadmium	0.262		0.005	"	0.200	0.090	86	70-130		
Chromium	0.361		0.01	"	0.400	0.011	88	70-130		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/21/06 13:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/14/06 Analyzed: 02/15/06		
Batch B6B0061 - Leachate Digest - Metals, TCLP, ICP								Metals by EPA 200 Series Methods - Quality Control		
Matrix Spike (B6B0061-MS1)	**Source: 0602012-01**									
Lead	0.791		0.10	"	1.00	ND	79	70-130		
Selenium	2.03		0.20	"	2.00	ND	102	70-130		
Silver	0.070		0.01	"	0.0750	ND	93	70-130		
Matrix Spike Dup (B6B0061-MSD1)	**Source: 0602012-01**									
Arsenic	0.793		0.20	mg/L	0.800	ND	99	70-130	0.4	20
Barium	0.426		0.01	"	0.200	0.256	85	70-130	0.9	20
Cadmium	0.257		0.005	"	0.200	0.090	84	70-130	2	20
Chromium	0.356		0.01	"	0.400	0.011	86	70-130	1	20
Lead	0.783		0.10	"	1.00	ND	78	70-130	1	20
Selenium	2.04		0.20	"	2.00	ND	102	70-130	0.5	20
Silver	0.069		0.01	"	0.0750	ND	92	70-130	1	20
								Prepared & Analyzed: 02/15/06		
Batch B6B0072 - Leachate Digest - Metals, TCLP, Mercury								Metals by EPA 200 Series Methods - Quality Control		
Blank (B6B0072-BLK1)										
Mercury	ND	U	0.00003	mg/L						
Blank (B6B0072-BLK2)										
Mercury	ND	U	0.00003	mg/L						
LCS (B6B0072-BS1)										
Mercury	0.0002		0.00003	mg/L	0.000200		100	85-115		
Duplicate (B6B0072-DUP1)	**Source: 0602012-01**									
Mercury	ND	U	0.00003	mg/L		ND				20
Matrix Spike (B6B0072-MS1)	**Source: 0602012-01**									
Mercury	0.0002		0.00003	mg/L	0.000200	ND	100	70-130		
Matrix Spike Dup (B6B0072-MSD1)	**Source: 0602012-01**									
Mercury	0.0002		0.00003	mg/L	0.000200	ND	100	70-130	0	20

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:**	02/21/06 13:52
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Qualifiers and Comments

NA	Not applicable.
J	The reported result for this analyte should be considered an estimated value.
C1	The reported concentration for this analyte is below the quantitation limit.
A3	The sample was extracted/analyzed past the recommended holding time.
U	Not Detected
NR	Not Reported

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street Building 201
Richmond, CA 94804

Subject: **Analytical Testing Results - Project R06S25**
SDG: 06041A

From: **Brenda Bettencourt, Director**
EPA Region 9 Laboratory
PMD-2

To: **John Hillenbrand**
Private Site and DOE Section
SFD-8-2

Attached are the results from the analysis of samples from the **ASARCO Feb 2006 IDW Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Analyses included in this
VOCs

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:**	03/07/06 09:30
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
IDW-S-01-020706	0602012-01	Soil	02/07/06 18:00	02/09/06 14:50
IDW-S-02-020706	0602012-02	Soil	02/07/06 17:30	02/09/06 14:50
IDW-S-0X-020706	0602012-03	Soil	02/07/06 17:00	02/09/06 14:50

VOC Analysis:

Samples were received at 10 deg. C which is outside the recommended temperature range of 0 to 6 deg. C. This may have an adverse affect on data quality.

Samples were received in jars. EPA method 5035A list a variety of container options for shipping samplesfor volatile orgaincs analysis, but jars are not recommended. Loss of volatile compounds may have occured.

Samples were collected on 2/7/06 and received on 2/9/06. Consequently, the samples were not analyzed or preserved within the 48 hour hold time recommended in EPA method 5035A. Loss of volatiles may have occurred.

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 03/07/06 09:30
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602012-01**								Soil - Sampled: 02/07/06 18:00
Sample ID: **IDW-S-01-020706**								Volatile Organic Compounds by EPA Method 8260B
Dichlorodifluoromethane	**ND**	**A-01, U, J**	**2.9**	ug/kg dry	B6B0081	02/10/06	02/16/06	8260B/SOP305
Chloromethane	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
Vinyl chloride	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
Bromomethane	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
Chloroethane	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
Trichlorofluoromethane	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
1,1-Dichloroethene	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	**ND**	**U, J, A-01**	**2.9**	"	"	"	"	8260B/SOP305
Acetone	**ND**	**C3, J, U, A-01**	**46**	"	"	"	"	8260B/SOP305
Carbon disulfide	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
Dichloromethane	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
trans-1,2-Dichloroethene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
tert-Butyl methyl ether (MTBE)	**ND**	**A-01, U, J**	**11**	"	"	"	"	8260B/SOP305
1,1-Dichloroethane	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
Ethyl tert-butyl ether	**ND**	**C3, J, A-01, U**	**11**	"	"	"	"	8260B/SOP305
cis-1,2-Dichloroethene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
2-Butanone (MEK)	**ND**	**C3, J, U, A-01**	**46**	"	"	"	"	8260B/SOP305
Chloroform	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
1,1,1-Trichloroethane	**ND**	**U, J, A-01**	**2.9**	"	"	"	"	8260B/SOP305
tert-Amyl methyl ether	**ND**	**A-01, U, J**	**11**	"	"	"	"	8260B/SOP305
1,1-Dichloropropene	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
Benzene	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
1,2-Dichloroethane	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
Carbon tetrachloride	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
Trichloroethene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
1,2-Dichloropropane	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
Bromodichloromethane	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
cis-1,3-Dichloropropene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
trans-1,3-Dichloropropene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
1,1,2-Trichloroethane	**ND**	**U, J, A-01**	**2.9**	"	"	"	"	8260B/SOP305
4-Methyl-2-pentanone (MIBK)	**ND**	**Q4, J, U, A-01**	**23**	"	"	"	"	8260B/SOP305
Toluene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
Tetrachloroethene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
1,3-Dichloropropane	**ND**	**U, J, A-01**	**2.9**	"	"	"	"	8260B/SOP305
2-Hexanone	**ND**	**Q4, J, U, A-01**	**46**	"	"	"	"	8260B/SOP305
Chlorodibromomethane	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
1,2-Dibromoethane (EDB)	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
Chlorobenzene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
Ethylbenzene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
m&p-Xylene	**ND**	**A-01, U, J**	**5.7**	"	"	"	"	8260B/SOP305
o-Xylene	**ND**	**A-01, U, J**	**2.9**	"	"	"	"	8260B/SOP305
Styrene	**ND**	**J, Q6, A-01, U**	**2.9**	"	"	"	"	8260B/SOP305
Bromoform	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
1,1,2,2-Tetrachloroethane	**ND**	**U, J, A-01**	**2.9**	"	"	"	"	8260B/SOP305

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 03/07/06 09:30
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0602012-01								Soil - Sampled: 02/07/06 18:00
Sample ID: IDW-S-01-020706								Volatile Organic Compounds by EPA Method 8260B
1,2,3-Trichloropropane	**ND**	**U, A-01, J**	**2.9**	ug/kg dry	B6B0081	02/10/06	02/16/06	8260B/SOP305
1,3-Dichlorobenzene	**ND**	**U, J, A-01**	**2.9**	"	"	"	"	8260B/SOP305
1,4-Dichlorobenzene	**ND**	**U, J, A-01**	**2.9**	"	"	"	"	8260B/SOP305
1,2-Dichlorobenzene	**ND**	**U, A-01, J**	**2.9**	"	"	"	"	8260B/SOP305
1,2-Dibromo-3-chloropropane	**ND**	**Q4, J, U, A-01**	**11**	"	"	"	"	8260B/SOP305
Surrogate: 1,2-Dichloroethane-d4	*31.2*		*108 %*		*58-140%*	"	"	"
Surrogate: Toluene-d8	*27.0*		*93 %*		*50-160%*	"	"	"
Surrogate: 4-Bromofluorobenzene	*26.5*		*91 %*		*52-150%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*27.9*		*96 %*		*61-150%*	"	"	"
Lab ID: 0602012-02								Soil - Sampled: 02/07/06 17:30
Sample ID: IDW-S-02-020706								Volatile Organic Compounds by EPA Method 8260B
Dichlorodifluoromethane	**ND**	**U, A-01, J**	**2.6**	ug/kg dry	B6B0081	02/10/06	02/16/06	8260B/SOP305
Chloromethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Vinyl chloride	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
Bromomethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Chloroethane	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
Trichlorofluoromethane	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
1,1-Dichloroethene	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Acetone	**ND**	**U, C3, J, A-01**	**42**	"	"	"	"	8260B/SOP305
Carbon disulfide	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
Dichloromethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
trans-1,2-Dichloroethene	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
tert-Butyl methyl ether (MTBE)	**ND**	**U, A-01, J**	**11**	"	"	"	"	8260B/SOP305
1,1-Dichloroethane	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
Ethyl tert-butyl ether	**ND**	**A-01, U, C3, J**	**11**	"	"	"	"	8260B/SOP305
cis-1,2-Dichloroethene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
2-Butanone (MEK)	**ND**	**U, C3, J, A-01**	**42**	"	"	"	"	8260B/SOP305
Chloroform	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,1,1-Trichloroethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
tert-Amyl methyl ether	**ND**	**A-01, U, J**	**11**	"	"	"	"	8260B/SOP305
1,1-Dichloropropene	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
Benzene	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dichloroethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Carbon tetrachloride	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
Trichloroethene	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dichloropropane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Bromodichloromethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
cis-1,3-Dichloropropene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
trans-1,3-Dichloropropene	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
1,1,2-Trichloroethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
4-Methyl-2-pentanone (MIBK)	**ND**	**U, J, A-01**	**21**	"	"	"	"	8260B/SOP305
Toluene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 03/07/06 09:30
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602012-02**								Soil - Sampled: 02/07/06 17:30
Sample ID: **IDW-S-02-020706**								Volatile Organic Compounds by EPA Method 8260B
Tetrachloroethene	**ND**	**U, A-01, J**	**2.6**	ug/kg dry	B6B0081	02/10/06	02/16/06	8260B/SOP305
1,3-Dichloropropane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
2-Hexanone	**ND**	**U, A-01, J**	**42**	"	"	"	"	8260B/SOP305
Chlorodibromomethane	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dibromoethane (EDB)	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Chlorobenzene	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
Ethylbenzene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
m&p-Xylene	**ND**	**U, A-01, J**	**5.3**	"	"	"	"	8260B/SOP305
o-Xylene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Styrene	**ND**	**A-01, U, J**	**2.6**	"	"	"	"	8260B/SOP305
Bromoform	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,1,2,2-Tetrachloroethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2,3-Trichloropropane	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
1,3-Dichlorobenzene	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
1,4-Dichlorobenzene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dichlorobenzene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dibromo-3-chloropropane	**ND**	**U, A-01, J**	**11**	"	"	"	"	8260B/SOP305
Surrogate: 1,2-Dichloroethane-d4	*26.3*		*104 %*		*58-140%*	"	"	"
Surrogate: Toluene-d8	*22.9*		*91 %*		*50-160%*	"	"	"
Surrogate: 4-Bromofluorobenzene	*23.0*		*91 %*		*52-150%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*23.9*		*95 %*		*61-150%*	"	"	"
Lab ID: **0602012-03**								Soil - Sampled: 02/07/06 17:00
Sample ID: **IDW-S-0X-020706**								Volatile Organic Compounds by EPA Method 8260B
Dichlorodifluoromethane	**ND**	**U, J, A-01**	**2.6**	ug/kg dry	B6B0081	02/10/06	02/16/06	8260B/SOP305
Chloromethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Vinyl chloride	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
Bromomethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Chloroethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Trichlorofluoromethane	**2.8**	**J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
1,1-Dichloroethene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Acetone	**ND**	**U, C3, J, A-01**	**42**	"	"	"	"	8260B/SOP305
Carbon disulfide	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Dichloromethane	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
trans-1,2-Dichloroethene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
tert-Butyl methyl ether (MTBE)	**ND**	**U, A-01, J**	**11**	"	"	"	"	8260B/SOP305
1,1-Dichloroethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Ethyl tert-butyl ether	**ND**	**U, C3, J, A-01**	**11**	"	"	"	"	8260B/SOP305
cis-1,2-Dichloroethene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
2-Butanone (MEK)	**ND**	**U, C3, J, A-01**	**42**	"	"	"	"	8260B/SOP305
Chloroform	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,1,1-Trichloroethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
tert-Amyl methyl ether	**ND**	**U, A-01, J**	**11**	"	"	"	"	8260B/SOP305

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 03/07/06 09:30
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602012-03**								Soil - Sampled: 02/07/06 17:00
Sample ID: **IDW-S-0X-020706**								Volatile Organic Compounds by EPA Method 8260B
1,1-Dichloropropene	**ND**	**U, A-01, J**	**2.6**	ug/kg dry	B6B0081	02/10/06	02/16/06	8260B/SOP305
Benzene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dichloroethane	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
Carbon tetrachloride	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Trichloroethene	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dichloropropane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Bromodichloromethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
cis-1,3-Dichloropropene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
trans-1,3-Dichloropropene	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
1,1,2-Trichloroethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
4-Methyl-2-pentanone (MIBK)	**ND**	**U, A-01, J**	**21**	"	"	"	"	8260B/SOP305
Toluene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Tetrachloroethene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,3-Dichloropropane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
2-Hexanone	**ND**	**U, A-01, J**	**42**	"	"	"	"	8260B/SOP305
Chlorodibromomethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dibromoethane (EDB)	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Chlorobenzene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Ethylbenzene	**ND**	**U, J, A-01**	**2.6**	"	"	"	"	8260B/SOP305
m&p-Xylene	**ND**	**U, A-01, J**	**5.3**	"	"	"	"	8260B/SOP305
o-Xylene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Styrene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
Bromoform	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,1,2,2-Tetrachloroethane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2,3-Trichloropropane	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,3-Dichlorobenzene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,4-Dichlorobenzene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dichlorobenzene	**ND**	**U, A-01, J**	**2.6**	"	"	"	"	8260B/SOP305
1,2-Dibromo-3-chloropropane	**ND**	**U, A-01, J**	**11**	"	"	"	"	8260B/SOP305
Surrogate: 1,2-Dichloroethane-d4	*26.6*			*104 %*	*58-140%*	"	"	"
Surrogate: Toluene-d8	*23.4*			*92 %*	*50-160%*	"	"	"
Surrogate: 4-Bromofluorobenzene	*23.0*			*90 %*	*52-150%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*24.1*			*95 %*	*61-150%*	"	"	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 03/07/06 09:30
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

R9Q

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

Prepared & Analyzed: 02/16/06

Batch B6B0081 - - General VOA - VOCs

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Blank (B6B0081-BLK1)

Dichlorodifluoromethane	ND	U	2.5	ug/kg wet
Chloromethane	ND	U	2.5	"
Vinyl chloride	ND	U	2.5	"
Bromomethane	ND	U	2.5	"
Chloroethane	ND	U	2.5	"
Trichlorofluoromethane	ND	U	2.5	"
1,1-Dichloroethene	ND	U	2.5	"
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon 113)	ND	U	2.5	"
Acetone	ND	U, C3, J	40	"
Carbon disulfide	ND	U	2.5	"
Dichloromethane	ND	U	2.5	"
trans-1,2-Dichloroethene	ND	U	2.5	"
tert-Butyl methyl ether (MTBE)	ND	U	10	"
1,1-Dichloroethane	ND	U	2.5	"
Ethyl tert-butyl ether	ND	U, C3, J	10	"
cis-1,2-Dichloroethene	ND	U	2.5	"
2-Butanone (MEK)	ND	U, J, C3	40	"
Chloroform	ND	U	2.5	"
1,1,1-Trichloroethane	ND	U	2.5	"
tert-Amyl methyl ether	ND	U	10	"
1,1-Dichloropropene	ND	U	2.5	"
Benzene	ND	U	2.5	"
1,2-Dichloroethane	ND	U	2.5	"
Carbon tetrachloride	ND	U	2.5	"
Trichloroethene	ND	U	2.5	"
1,2-Dichloropropane	ND	U	2.5	"
Bromodichloromethane	ND	U	2.5	"
cis-1,3-Dichloropropene	ND	U	2.5	"
trans-1,3-Dichloropropene	ND	U	2.5	"
1,1,2-Trichloroethane	ND	U	2.5	"
4-Methyl-2-pentanone (MIBK)	ND	U	20	"
Toluene	ND	U	2.5	"
Tetrachloroethene	ND	U	2.5	"
1,3-Dichloropropane	ND	U	2.5	"
2-Hexanone	ND	U	40	"
Chlorodibromomethane	ND	U	2.5	"
1,2-Dibromoethane (EDB)	ND	U	2.5	"
Chlorobenzene	ND	U	2.5	"
Ethylbenzene	ND	U	2.5	"
m&p-Xylene	ND	U	5.0	"
o-Xylene	ND	U	2.5	"
Styrene	ND	U	2.5	"
Bromoform	ND	U	2.5	"
1,1,2,2-Tetrachloroethane	ND	U	2.5	"
1,2,3-Trichloropropane	ND	U	2.5	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 03/07/06 09:30
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
										Prepared & Analyzed: 02/16/06
Batch B6B0081 - - General VOA - VOCs										Volatile Organic Compounds by EPA Method 8260B - Quality Control
Blank (B6B0081-BLK1)										
1,3-Dichlorobenzene	ND	U	2.5	"						
1,4-Dichlorobenzene	ND	U	2.5	"						
1,2-Dichlorobenzene	ND	U	2.5	"						
1,2-Dibromo-3-chloropropane	ND	U	10	"						
Surrogate: 1,2-Dichloroethane-d4	*23.8*			"	*25.0*		*95*	*58-140*		
Surrogate: Toluene-d8	*23.0*			"	*25.0*		*92*	*50-160*		
Surrogate: 4-Bromofluorobenzene	*22.2*			"	*25.0*		*89*	*52-150*		
Surrogate: 1,2-Dichlorobenzene-d4	*22.0*			"	*25.0*		*88*	*61-150*		
LCS (B6B0081-BS1)										
Dichlorodifluoromethane	22.4		2.5	ug/kg wet	25.0		90	0.01-190		
Chloromethane	23.8		2.5	"	25.0		95	48-160		
Vinyl chloride	24.2		2.5	"	25.0		97	59-150		
Bromomethane	27.5		2.5	"	25.0		110	49-160		
Chloroethane	23.7		2.5	"	25.0		95	63-140		
Trichlorofluoromethane	23.6		2.5	"	25.0		94	34-180		
1,1-Dichloroethene	24.2		2.5	"	25.0		97	70-120		
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon 113)	23.8		2.5	"	25.0		95	61-140		
Acetone	182		40	"	200		91	30-180		
Dichloromethane	23.1		2.5	"	25.0		92	65-120		
trans-1,2-Dichloroethene	22.1		2.5	"	25.0		88	69-130		
tert-Butyl methyl ether (MTBE)	91.7		10	"	100		92	54-150		
1,1-Dichloroethane	21.3		2.5	"	25.0		85	72-130		
cis-1,2-Dichloroethene	26.5		2.5	"	25.0		106	73-140		
2-Butanone (MEK)	221		40	"	200		110	58-154		
Chloroform	25.1		2.5	"	25.0		100	72-130		
1,1,1-Trichloroethane	24.8		2.5	"	25.0		99	73-130		
1,1-Dichloropropene	28.9		2.5	"	25.0		116	76-120		
Benzene	25.4		2.5	"	25.0		102	79-120		
1,2-Dichloroethane	24.2		2.5	"	25.0		97	77-130		
Carbon tetrachloride	24.8		2.5	"	25.0		99	61-140		
Trichloroethene	25.6		2.5	"	25.0		102	73-140		
1,2-Dichloropropane	25.4		2.5	"	25.0		102	84-120		
Bromodichloromethane	24.9		2.5	"	25.0		100	82-130		
cis-1,3-Dichloropropene	28.3		2.5	"	25.0		113	88-130		
trans-1,3-Dichloropropene	29.4		2.5	"	25.0		118	84-140		
1,1,2-Trichloroethane	24.9		2.5	"	25.0		100	82-130		
4-Methyl-2-pentanone (MIBK)	283	Q2	20	"	200		142	81-140		
Toluene	26.3		2.5	"	25.0		105	76-120		
Tetrachloroethene	26.0		2.5	"	25.0		104	79-130		
1,3-Dichloropropane	26.3		2.5	"	25.0		105	85-120		
2-Hexanone	352	Q2	40	"	200		176	67-150		
Chlorodibromomethane	25.8		2.5	"	25.0		103	80-140		
1,2-Dibromoethane (EDB)	25.4		2.5	"	25.0		102	84-130		
Chlorobenzene	25.8		2.5	"	25.0		103	78-123		
Ethylbenzene	28.0		2.5	"	25.0		112	78-120		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:**	03/07/06 09:30
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
										Prepared & Analyzed: 02/16/06
Batch B6B0081 - - General VOA - VOCs										Volatile Organic Compounds by EPA Method 8260B - Quality Control
LCS (B6B0081-BS1)										
m&p-Xylene	51.3		5.0	"	50.0		103	74-130		
o-Xylene	28.5		2.5	"	25.0		114	78-130		
Styrene	27.6		2.5	"	25.0		110	73-140		
Bromoform	25.1		2.5	"	25.0		100	70-140		
1,1,2,2-Tetrachloroethane	23.5		2.5	"	25.0		94	75-130		
1,2,3-Trichloropropane	24.0		2.5	"	25.0		96	78-130		
1,3-Dichlorobenzene	26.2		2.5	"	25.0		105	76-130		
1,4-Dichlorobenzene	25.7		2.5	"	25.0		103	76-120		
1,2-Dichlorobenzene	25.0		2.5	"	25.0		100	76-130		
1,2-Dibromo-3-chloropropane	110		10	"	100		110	39-180		
Surrogate: 1,2-Dichloroethane-d4	*22.6*			*"*	*25.0*		*90*	*58-140*		
Surrogate: Toluene-d8	*24.3*			*"*	*25.0*		*97*	*50-160*		
Surrogate: 4-Bromofluorobenzene	*24.5*			*"*	*25.0*		*98*	*52-150*		
Surrogate: 1,2-Dichlorobenzene-d4	*22.6*			*"*	*25.0*		*90*	*61-150*		
Matrix Spike (B6B0081-MS1)	**Source: 0602012-01**									
Dichlorodifluoromethane	20.2		2.7	ug/kg dry	26.7	ND	76	70-130		
Chloromethane	23.8		2.7	"	26.7	ND	89	70-130		
Vinyl chloride	23.2		2.7	"	26.7	ND	87	70-130		
Bromomethane	24.9		2.7	"	26.7	ND	93	70-130		
Chloroethane	22.7		2.7	"	26.7	ND	85	70-130		
Trichlorofluoromethane	23.7		2.7	"	26.7	ND	89	70-130		
1,1-Dichloroethene	22.2		2.7	"	26.7	ND	83	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon 113)	22.7		2.7	"	26.7	ND	85	70-130		
Acetone	203		43	"	214	ND	95	70-130		
Dichloromethane	22.0		2.7	"	26.7	ND	82	70-130		
trans-1,2-Dichloroethene	20.4		2.7	"	26.7	ND	76	70-130		
tert-Butyl methyl ether (MTBE)	88.5		11	"	107	ND	83	70-130		
1,1-Dichloroethane	20.3		2.7	"	26.7	ND	76	70-130		
cis-1,2-Dichloroethene	24.5		2.7	"	26.7	ND	92	70-130		
2-Butanone (MEK)	229		43	"	214	ND	107	70-130		
Chloroform	23.9		2.7	"	26.7	ND	90	70-130		
1,1,1-Trichloroethane	25.3		2.7	"	26.7	ND	95	70-130		
1,1-Dichloropropene	27.2		2.7	"	26.7	ND	102	70-130		
Benzene	25.1		2.7	"	26.7	ND	94	70-130		
1,2-Dichloroethane	25.8		2.7	"	26.7	ND	97	70-130		
Carbon tetrachloride	25.1		2.7	"	26.7	ND	94	70-130		
Trichloroethene	26.0		2.7	"	26.7	ND	97	70-130		
1,2-Dichloropropane	25.7		2.7	"	26.7	ND	96	70-130		
Bromodichloromethane	25.2		2.7	"	26.7	ND	94	70-130		
cis-1,3-Dichloropropene	27.3		2.7	"	26.7	ND	102	70-130		
trans-1,3-Dichloropropene	28.3		2.7	"	26.7	ND	106	70-130		
1,1,2-Trichloroethane	25.4		2.7	"	26.7	ND	95	70-130		
4-Methyl-2-pentanone (MIBK)	286	Q4	21	"	214	ND	134	70-130		
Toluene	25.7		2.7	"	26.7	ND	96	70-130		
Tetrachloroethene	24.7		2.7	"	26.7	ND	93	70-130		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 03/07/06 09:30
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/14/06 Analyzed: 02/16/06		
Batch B6B0081 - - General VOA - VOCs								Volatile Organic Compounds by EPA Method 8260B - Quality Control		
Matrix Spike (B6B0081-MS1)	**Source: 0602012-01**									
1,3-Dichloropropane	26.8		2.7	"	26.7	ND	100	70-130		
2-Hexanone	309	Q4	43	"	214	ND	144	70-130		
Chlorodibromomethane	26.2		2.7	"	26.7	ND	98	70-130		
1,2-Dibromoethane (EDB)	26.0		2.7	"	26.7	ND	97	70-130		
Chlorobenzene	24.7		2.7	"	26.7	ND	93	70-130		
Ethylbenzene	27.0		2.7	"	26.7	ND	101	70-130		
m&p-Xylene	48.8		5.3	"	53.4	ND	91	70-130		
o-Xylene	27.5		2.7	"	26.7	ND	103	70-130		
Styrene	25.1		2.7	"	26.7	ND	94	70-130		
Bromoform	27.3		2.7	"	26.7	ND	102	70-130		
1,1,2,2-Tetrachloroethane	24.7		2.7	"	26.7	ND	93	70-130		
1,2,3-Trichloropropane	26.2		2.7	"	26.7	ND	98	70-130		
1,3-Dichlorobenzene	Not reported.	U, Q4	2.7	"	26.7	ND		70-130		
1,4-Dichlorobenzene	Not reported.	U, Q4	2.7	"	26.7	ND		70-130		
1,2-Dichlorobenzene	Not reported.	U, Q4	2.7	"	26.7	ND		70-130		
1,2-Dibromo-3-chloropropane	Not reported.	U, Q4	11	"	107	ND		70-130		
Surrogate: 1,2-Dichloroethane-d4	*26.7*			"	*26.7*		*100*	*58-140*		
Surrogate: Toluene-d8	*25.9*			"	*26.7*		*97*	*50-160*		
Surrogate: 4-Bromofluorobenzene	*26.1*			"	*26.7*		*98*	*52-150*		
Surrogate: 1,2-Dichlorobenzene-d4	*0.00*	*U, Q7*		"	*26.7*			*61-150*		
Matrix Spike Dup (B6B0081-MSD1)	**Source: 0602012-01**									
Dichlorodifluoromethane	23.2		2.7	ug/kg dry	27.1	ND	86	70-130	12	20
Chloromethane	26.3		2.7	"	27.1	ND	97	70-130	9	20
Vinyl chloride	25.0		2.7	"	27.1	ND	92	70-130	6	20
Bromomethane	29.6		2.7	"	27.1	ND	109	70-130	16	20
Chloroethane	25.6		2.7	"	27.1	ND	94	70-130	10	20
Trichlorofluoromethane	26.1		2.7	"	27.1	ND	96	70-130	8	20
1,1-Dichloroethene	24.6		2.7	"	27.1	ND	91	70-130	9	20
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon 113)	25.8		2.7	"	27.1	ND	95	70-130	11	20
Acetone	194		43	"	217	ND	89	70-130	7	20
Dichloromethane	23.5		2.7	"	27.1	ND	87	70-130	6	20
trans-1,2-Dichloroethene	22.5		2.7	"	27.1	ND	83	70-130	9	20
tert-Butyl methyl ether (MTBE)	87.1		11	"	108	ND	81	70-130	2	20
1,1-Dichloroethane	22.5		2.7	"	27.1	ND	83	70-130	9	20
cis-1,2-Dichloroethene	27.0		2.7	"	27.1	ND	100	70-130	8	20
2-Butanone (MEK)	216		43	"	217	ND	100	70-130	7	20
Chloroform	27.1		2.7	"	27.1	ND	100	70-130	11	20
1,1,1-Trichloroethane	28.6		2.7	"	27.1	ND	106	70-130	11	20
1,1-Dichloropropene	30.7		2.7	"	27.1	ND	113	70-130	10	20
Benzene	27.9		2.7	"	27.1	ND	103	70-130	9	20
1,2-Dichloroethane	26.5		2.7	"	27.1	ND	98	70-130	1	20
Carbon tetrachloride	29.4		2.7	"	27.1	ND	108	70-130	14	20
Trichloroethene	29.4		2.7	"	27.1	ND	108	70-130	11	20
1,2-Dichloropropane	27.7		2.7	"	27.1	ND	102	70-130	6	20
Bromodichloromethane	27.7		2.7	"	27.1	ND	102	70-130	8	20

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 03/07/06 09:30
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/14/06 Analyzed: 02/16/06		
Batch B6B0081 - - General VOA - VOCs								Volatile Organic Compounds by EPA Method 8260B - Quality Control		
Matrix Spike Dup (B6B0081-MSD1)	**Source: 0602012-01**									
cis-1,3-Dichloropropene	29.4		2.7	"	27.1	ND	108	70-130	6	20
trans-1,3-Dichloropropene	31.0		2.7	"	27.1	ND	114	70-130	7	20
1,1,2-Trichloroethane	26.4		2.7	"	27.1	ND	97	70-130	2	20
4-Methyl-2-pentanone (MIBK)	294	Q4	22	"	217	ND	135	70-130	0.7	20
Toluene	29.8		2.7	"	27.1	ND	110	70-130	14	20
Tetrachloroethene	29.6		2.7	"	27.1	ND	109	70-130	16	20
1,3-Dichloropropane	27.9		2.7	"	27.1	ND	103	70-130	3	20
2-Hexanone	371	Q4	43	"	217	ND	171	70-130	17	20
Chlorodibromomethane	28.3		2.7	"	27.1	ND	104	70-130	6	20
1,2-Dibromoethane (EDB)	25.4		2.7	"	27.1	ND	94	70-130	3	20
Chlorobenzene	29.1		2.7	"	27.1	ND	107	70-130	14	20
Ethylbenzene	31.7		2.7	"	27.1	ND	117	70-130	15	20
m&p-Xylene	59.1		5.4	"	54.2	ND	109	70-130	18	20
o-Xylene	32.3		2.7	"	27.1	ND	119	70-130	14	20
Styrene	31.4	Q6	2.7	"	27.1	ND	116	70-130	21	20
Bromoform	26.2		2.7	"	27.1	ND	97	70-130	5	20
1,1,2,2-Tetrachloroethane	23.2		2.7	"	27.1	ND	86	70-130	8	20
1,2,3-Trichloropropane	24.7		2.7	"	27.1	ND	91	70-130	7	20
1,3-Dichlorobenzene	29.7		2.7	"	27.1	ND	110	70-130		20
1,4-Dichlorobenzene	29.3		2.7	"	27.1	ND	108	70-130		20
1,2-Dichlorobenzene	28.3		2.7	"	27.1	ND	104	70-130		20
1,2-Dibromo-3-chloropropane	106		11	"	108	ND	98	70-130		20
Surrogate: 1,2-Dichloroethane-d4	*25.4*			"	*27.1*		*94*	*58-140*		
Surrogate: Toluene-d8	*27.1*			"	*27.1*		*100*	*50-160*		
Surrogate: 4-Bromofluorobenzene	*26.3*			"	*27.1*		*97*	*52-150*		
Surrogate: 1,2-Dichlorobenzene-d4	*24.8*			"	*27.1*		*92*	*61-150*		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:**	03/07/06 09:30
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Qualifiers and Comments

Q7	Surrogate spike recoveries for this sample were outside control limits.
Q6	Matrix spike/matrix spike duplicate precision criteria were not met for this analyte (see MS/MSD results for this batch in QC summary).
Q4	The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)
Q2	The laboratory control standard associated with this sample did not meet recovery criteria for this analyte (see LCS results for this batch in QC summary).
NR	Not reported.
J	The reported result for this analyte should be considered an estimated value.
C3	The initial calibration for this analyte did not meet calibration criteria.
A-01	Samples were received in containers not recommended for VOC analysis, above the recommended temperature range (2 - 6 degrees), and were extracted/analyzed past the recommended 48 hour hold time.
U	Not Detected
NR	Not Reported

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street Building 201
Richmond, CA 94804

Subject: **Analytical Testing Results - Project R06S25**
SDG: 06041A

From: **Brenda Bettencourt, Director**
EPA Region 9 Laboratory
PMD-2

To: **John Hillenbrand**
Private Site and DOE Section
SFD-8-2

Attached are the results from the analysis of samples from the **ASARCO Feb 2006 IDW Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Analyses included in this

SVOCs, TCLP

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:**	02/24/06 14:32
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
IDW-S-01-020706	0602012-01	Soil	02/07/06 18:00	02/09/06 14:50
IDW-S-02-020706	0602012-02	Soil	02/07/06 17:30	02/09/06 14:50
IDW-S-0X-020706	0602012-03	Soil	02/07/06 17:00	02/09/06 14:50

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602012-01**								Soil - Sampled: 02/07/06 18:00
Sample ID: **IDW-S-01-020706**								Semivolatile Organic Compounds by EPA Method 8270C
1,4-Dioxane	**ND**	**U**	**0.01**	mg/L	B6B0063	02/14/06	02/15/06	8270C/SOP315
Phenol	**ND**	**Q2, J, U**	**0.05**	"	"	"	"	8270C/SOP315
bis(2-Chloroethyl)ether	**ND**	**Q2, J, U**	**0.01**	"	"	"	"	8270C/SOP315
2-Chlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
1,3-Dichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
1,4-Dichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzyl alcohol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
1,2-Dichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2-Methylphenol	**ND**	**C3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
2,2'-oxybis(1-Chloropropane)	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
3&4-Methylphenol	**ND**	**Q2, J, C3, U**	**0.05**	"	"	"	"	8270C/SOP315
N-Nitrosodipropylamine	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Hexachloroethane	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Nitrobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Isophorone	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2-Nitrophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2,4-Dimethylphenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
bis(2-Chloroethoxy)methane	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,4-Dichlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
1,2,4-Trichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Naphthalene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Chloroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Hexachlorobutadiene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Chloro-3-methylphenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2-Methylnaphthalene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Hexachlorocyclopentadiene	**ND**	**C4, J, Q3, U**	**0.05**	"	"	"	"	8270C/SOP315
2,4,6-Trichlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2,4,5-Trichlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2-Chloronaphthalene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2-Nitroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Dimethyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Acenaphthylene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,6-Dinitrotoluene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
3-Nitroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Acenaphthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,4-Dinitrophenol	**ND**	**C4, J, Q3, U**	**0.05**	"	"	"	"	8270C/SOP315
4-Nitrophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Dibenzofuran	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,4-Dinitrotoluene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Diethyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Fluorene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Chlorophenyl phenyl ether	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Nitroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
4,6-Dinitro-2-methylphenol	**ND**	**Q3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
Diphenyl amine	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602012-01**								Soil - Sampled: 02/07/06 18:00
Sample ID: **IDW-S-01-020706**								Semivolatile Organic Compounds by EPA Method 8270C
4-Bromophenyl phenyl ether	**ND**	**U**	**0.01**	mg/L	B6B0063	02/14/06	02/15/06	8270C/SOP315
Hexachlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Pentachlorophenol	**ND**	**Q3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
Phenanthrene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Anthracene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Carbazole	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Di-n-butyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Fluoranthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Pyrene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Butyl benzyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(a)anthracene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
3,3'-Dichlorobenzidine	**ND**	**C3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
Chrysene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
bis(2-Ethylhexyl) phthalate	**0.006**	**C1, B1, J**	**0.01**	"	"	"	"	8270C/SOP315
Di-n-octyl phthalate	**ND**	**C3, J, U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(b)fluoranthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(k)fluoranthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(a)pyrene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Indeno(1,2,3-cd)pyrene	**ND**	**C3, J, U**	**0.01**	"	"	"	"	8270C/SOP315
Dibenz(a,h)anthracene	**ND**	**C3, J, U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(g,h,i)perylene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Surrogate: 1,4-Dioxane-d8	*0.0359*		*72 %*		*18-130%*	"	"	"
Surrogate: 2-Fluorophenol	*0.605*		*81 %*		*32-130%*	"	"	"
Surrogate: Phenol-d5	*0.585*		*79 %*		*42-120%*	"	"	"
Surrogate: 2-Chlorophenol-d4	*0.626*		*84 %*		*42-120%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*0.355*		*72 %*		*24-110%*	"	"	"
Surrogate: Nitrobenzene-d5	*0.420*		*85 %*		*27-140%*	"	"	"
Surrogate: 2-Fluorobiphenyl	*0.414*		*83 %*		*45-110%*	"	"	"
Surrogate: 2,4,6-Tribromophenol	*0.781*		*105 %*		*44-140%*	"	"	"
Surrogate: Terphenyl-d14	*0.638*		*129 %*		*28-140%*	"	"	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602012-02**								Soil - Sampled: 02/07/06 17:30
Sample ID: **IDW-S-02-020706**								Semivolatile Organic Compounds by EPA Method 8270C
1,4-Dioxane	**ND**	**U**	**0.01**	mg/L	B6B0063	02/14/06	02/15/06	8270C/SOP315
Phenol	**ND**	**Q2, J, U**	**0.05**	"	"	"	"	8270C/SOP315
bis(2-Chloroethyl)ether	**ND**	**Q2, J, U**	**0.01**	"	"	"	"	8270C/SOP315
2-Chlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
1,3-Dichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
1,4-Dichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzyl alcohol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
1,2-Dichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2-Methylphenol	**ND**	**C3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
2,2'-oxybis(1-Chloropropane)	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
3&4-Methylphenol	**ND**	**Q2, J, C3, U**	**0.05**	"	"	"	"	8270C/SOP315
N-Nitrosodipropylamine	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Hexachloroethane	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Nitrobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Isophorone	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2-Nitrophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2,4-Dimethylphenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
bis(2-Chloroethoxy)methane	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,4-Dichlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
1,2,4-Trichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Naphthalene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Chloroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Hexachlorobutadiene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Chloro-3-methylphenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2-Methylnaphthalene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Hexachlorocyclopentadiene	**ND**	**C4, J, Q3, U**	**0.05**	"	"	"	"	8270C/SOP315
2,4,6-Trichlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2,4,5-Trichlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2-Chloronaphthalene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2-Nitroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Dimethyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Acenaphthylene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,6-Dinitrotoluene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
3-Nitroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Acenaphthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,4-Dinitrophenol	**ND**	**C4, J, Q3, U**	**0.05**	"	"	"	"	8270C/SOP315
4-Nitrophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Dibenzofuran	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,4-Dinitrotoluene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Diethyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Fluorene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Chlorophenyl phenyl ether	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Nitroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
4,6-Dinitro-2-methylphenol	**ND**	**Q3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
Diphenyl amine	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID:	**0602012-02**							Soil - Sampled: 02/07/06 17:30
Sample ID:	**IDW-S-02-020706**							Semivolatile Organic Compounds by EPA Method 8270C
4-Bromophenyl phenyl ether	**ND**	**U**	**0.01**	mg/L	B6B0063	02/14/06	02/15/06	8270C/SOP315
Hexachlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Pentachlorophenol	**ND**	**Q3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
Phenanthrene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Anthracene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Carbazole	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Di-n-butyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Fluoranthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Pyrene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Butyl benzyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(a)anthracene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
3,3'-Dichlorobenzidine	**ND**	**C3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
Chrysene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
bis(2-Ethylhexyl) phthalate	**0.008**	**C1, B1, J**	**0.01**	"	"	"	"	8270C/SOP315
Di-n-octyl phthalate	**ND**	**C3, J, U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(b)fluoranthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(k)fluoranthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(a)pyrene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Indeno(1,2,3-cd)pyrene	**ND**	**C3, J, U**	**0.01**	"	"	"	"	8270C/SOP315
Dibenz(a,h)anthracene	**ND**	**C3, J, U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(g,h,i)perylene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Unknown 1	**0.1**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown 3	**0.01**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown ester	**0.01**	**N TIC, J**		"	"	"	"	8270C/SOP315
Surrogate: 1,4-Dioxane-d8	*0.0330*		*65 %*		*18-130%*	"	"	"
Surrogate: 2-Fluorophenol	*0.538*		*71 %*		*32-130%*	"	"	"
Surrogate: Phenol-d5	*0.516*		*68 %*		*42-120%*	"	"	"
Surrogate: 2-Chlorophenol-d4	*0.554*		*73 %*		*42-120%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*0.367*		*73 %*		*24-110%*	"	"	"
Surrogate: Nitrobenzene-d5	*0.372*		*74 %*		*27-140%*	"	"	"
Surrogate: 2-Fluorobiphenyl	*0.376*		*74 %*		*45-110%*	"	"	"
Surrogate: 2,4,6-Tribromophenol	*0.752*		*99 %*		*44-140%*	"	"	"
Surrogate: Terphenyl-d14	*0.637*		*126 %*		*28-140%*	"	"	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID:	**0602012-03**							Soil - Sampled: 02/07/06 17:00
Sample ID:	**IDW-S-0X-020706**							Semivolatile Organic Compounds by EPA Method 8270C
1,4-Dioxane	**ND**	**U**	**0.01**	mg/L	B6B0063	02/14/06	02/15/06	8270C/SOP315
Phenol	**ND**	**Q2, J, U**	**0.05**	"	"	"	"	8270C/SOP315
bis(2-Chloroethyl)ether	**ND**	**Q2, J, U**	**0.01**	"	"	"	"	8270C/SOP315
2-Chlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
1,3-Dichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
1,4-Dichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzyl alcohol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
1,2-Dichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2-Methylphenol	**ND**	**C3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
2,2'-oxybis(1-Chloropropane)	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
3&4-Methylphenol	**ND**	**Q2, J, C3, U**	**0.05**	"	"	"	"	8270C/SOP315
N-Nitrosodipropylamine	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Hexachloroethane	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Nitrobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Isophorone	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2-Nitrophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2,4-Dimethylphenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
bis(2-Chloroethoxy)methane	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,4-Dichlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
1,2,4-Trichlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Naphthalene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Chloroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Hexachlorobutadiene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Chloro-3-methylphenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2-Methylnaphthalene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Hexachlorocyclopentadiene	**ND**	**C4, J, Q3, U**	**0.05**	"	"	"	"	8270C/SOP315
2,4,6-Trichlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2,4,5-Trichlorophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
2-Chloronaphthalene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2-Nitroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Dimethyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Acenaphthylene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,6-Dinitrotoluene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
3-Nitroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Acenaphthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,4-Dinitrophenol	**ND**	**C4, J, Q3, U**	**0.05**	"	"	"	"	8270C/SOP315
4-Nitrophenol	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
Dibenzofuran	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
2,4-Dinitrotoluene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Diethyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Fluorene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Chlorophenyl phenyl ether	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
4-Nitroaniline	**ND**	**U**	**0.05**	"	"	"	"	8270C/SOP315
4,6-Dinitro-2-methylphenol	**ND**	**Q3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
Diphenyl amine	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID:	**0602012-03**							Soil - Sampled: 02/07/06 17:00
Sample ID:	**IDW-S-0X-020706**							Semivolatile Organic Compounds by EPA Method 8270C
4-Bromophenyl phenyl ether	**ND**	**U**	**0.01**	mg/L	B6B0063	02/14/06	02/15/06	8270C/SOP315
Hexachlorobenzene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Pentachlorophenol	**ND**	**Q3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
Phenanthrene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Anthracene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Carbazole	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Di-n-butyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Fluoranthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Pyrene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Butyl benzyl phthalate	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(a)anthracene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
3,3'-Dichlorobenzidine	**ND**	**C3, J, U**	**0.05**	"	"	"	"	8270C/SOP315
Chrysene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
bis(2-Ethylhexyl) phthalate	**0.007**	**C1, B1, J**	**0.01**	"	"	"	"	8270C/SOP315
Di-n-octyl phthalate	**ND**	**C3, J, U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(b)fluoranthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(k)fluoranthene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(a)pyrene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Indeno(1,2,3-cd)pyrene	**ND**	**C3, J, U**	**0.01**	"	"	"	"	8270C/SOP315
Dibenz(a,h)anthracene	**ND**	**C3, J, U**	**0.01**	"	"	"	"	8270C/SOP315
Benzo(g,h,i)perylene	**ND**	**U**	**0.01**	"	"	"	"	8270C/SOP315
Unknown 1	**0.08**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown 3	**0.01**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown ester	**0.02**	**N TIC, J**		"	"	"	"	8270C/SOP315
Surrogate: 1,4-Dioxane-d8	*0.0339*		*68 %*		*18-130%*	"	"	"
Surrogate: 2-Fluorophenol	*0.570*		*76 %*		*32-130%*	"	"	"
Surrogate: Phenol-d5	*0.484*		*64 %*		*42-120%*	"	"	"
Surrogate: 2-Chlorophenol-d4	*0.563*		*75 %*		*42-120%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*0.372*		*74 %*		*24-110%*	"	"	"
Surrogate: Nitrobenzene-d5	*0.379*		*76 %*		*27-140%*	"	"	"
Surrogate: 2-Fluorobiphenyl	*0.403*		*80 %*		*45-110%*	"	"	"
Surrogate: 2,4,6-Tribromophenol	*0.757*		*101 %*		*44-140%*	"	"	"
Surrogate: Terphenyl-d14	*0.623*		*124 %*		*28-140%*	"	"	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

R9Q

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

Prepared: 02/14/06 Analyzed: 02/15/06

Batch B6B0063 - Leachate Extraction - SVOCs, TCLP

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Blank (B6B0063-BLK1)

1,4-Dioxane	ND	U	0.01	mg/L
Phenol	ND	Q2, J, U	0.05	"
bis(2-Chloroethyl)ether	ND	Q2, J, U	0.01	"
2-Chlorophenol	ND	U	0.05	"
1,3-Dichlorobenzene	ND	U	0.01	"
1,4-Dichlorobenzene	ND	U	0.01	"
Benzyl alcohol	ND	U	0.05	"
1,2-Dichlorobenzene	ND	U	0.01	"
2-Methylphenol	ND	C3, J, U	0.05	"
2,2'-oxybis(1-Chloropropane)	ND	U	0.01	"
3&4-Methylphenol	ND	Q2, J, C3, U	0.05	"
N-Nitrosodipropylamine	ND	U	0.01	"
Hexachloroethane	ND	U	0.01	"
Nitrobenzene	ND	U	0.01	"
Isophorone	ND	U	0.01	"
2-Nitrophenol	ND	U	0.05	"
2,4-Dimethylphenol	ND	U	0.05	"
bis(2-Chloroethoxy)methane	ND	U	0.01	"
2,4-Dichlorophenol	ND	U	0.05	"
1,2,4-Trichlorobenzene	ND	U	0.01	"
Naphthalene	ND	U	0.01	"
4-Chloroaniline	ND	U	0.05	"
Hexachlorobutadiene	ND	U	0.01	"
4-Chloro-3-methylphenol	ND	U	0.05	"
2-Methylnaphthalene	ND	U	0.01	"
Hexachlorocyclopentadiene	ND	C4, J, Q3, U	0.05	"
2,4,6-Trichlorophenol	ND	U	0.05	"
2,4,5-Trichlorophenol	ND	U	0.05	"
2-Chloronaphthalene	ND	U	0.01	"
2-Nitroaniline	ND	U	0.05	"
Dimethyl phthalate	ND	U	0.01	"
Acenaphthylene	ND	U	0.01	"
2,6-Dinitrotoluene	ND	U	0.01	"
3-Nitroaniline	ND	U	0.05	"
Acenaphthene	ND	U	0.01	"
2,4-Dinitrophenol	ND	C4, J, Q3, U	0.05	"
4-Nitrophenol	ND	U	0.05	"
Dibenzofuran	ND	U	0.01	"
2,4-Dinitrotoluene	ND	U	0.01	"
Diethyl phthalate	ND	U	0.01	"
Fluorene	ND	U	0.01	"
4-Chlorophenyl phenyl ether	ND	U	0.01	"
4-Nitroaniline	ND	U	0.05	"
4,6-Dinitro-2-methylphenol	ND	Q3, J, U	0.05	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

Prepared: 02/14/06 Analyzed: 02/15/06

Batch B6B0063 - Leachate Extraction - SVOCs, TCLP

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Blank (B6B0063-BLK1)

Diphenyl amine	ND	U	0.01	"						
4-Bromophenyl phenyl ether	ND	U	0.01	"						
Hexachlorobenzene	ND	U	0.01	"						
Pentachlorophenol	ND	Q3, J, U	0.05	"						
Phenanthrene	ND	U	0.01	"						
Anthracene	ND	U	0.01	"						
Carbazole	ND	U	0.01	"						
Di-n-butyl phthalate	ND	U	0.01	"						
Fluoranthene	ND	U	0.01	"						
Pyrene	ND	U	0.01	"						
Butyl benzyl phthalate	ND	U	0.01	"						
Benzo(a)anthracene	ND	U	0.01	"						
3,3'-Dichlorobenzidine	ND	C3, J, U	0.05	"						
Chrysene	ND	U	0.01	"						
bis(2-Ethylhexyl) phthalate	ND	U	0.01	"						
Di-n-octyl phthalate	ND	C3, J, U	0.01	"						
Benzo(b)fluoranthene	ND	U	0.01	"						
Benzo(k)fluoranthene	ND	U	0.01	"						
Benzo(a)pyrene	ND	U	0.01	"						
Indeno(1,2,3-cd)pyrene	ND	C3, J, U	0.01	"						
Dibenz(a,h)anthracene	ND	C3, J, U	0.01	"						
Benzo(g,h,i)perylene	ND	U	0.01	"						
Surrogate: 1,4-Dioxane-d8	*0.0373*			"	*0.0500*		*75*	*18-130*		
Surrogate: 2-Fluorophenol	*0.579*			"	*0.750*		*77*	*32-130*		
Surrogate: Phenol-d5	*0.594*			"	*0.750*		*79*	*42-120*		
Surrogate: 2-Chlorophenol-d4	*0.598*			"	*0.750*		*80*	*42-120*		
Surrogate: 1,2-Dichlorobenzene-d4	*0.350*			"	*0.500*		*70*	*24-110*		
Surrogate: Nitrobenzene-d5	*0.397*			"	*0.500*		*79*	*27-140*		
Surrogate: 2-Fluorobiphenyl	*0.403*			"	*0.500*		*81*	*45-110*		
Surrogate: 2,4,6-Tribromophenol	*0.681*			"	*0.750*		*91*	*44-140*		
Surrogate: Terphenyl-d14	*0.643*			"	*0.500*		*129*	*28-140*		

Blank (B6B0063-BLK2)

1,4-Dioxane	ND	U	0.01	mg/L						
Phenol	ND	Q2, J, U	0.05	"						
bis(2-Chloroethyl)ether	ND	Q2, J, U	0.01	"						
2-Chlorophenol	ND	U	0.05	"						
1,3-Dichlorobenzene	ND	U	0.01	"						
1,4-Dichlorobenzene	ND	U	0.01	"						
Benzyl alcohol	ND	U	0.05	"						
1,2-Dichlorobenzene	ND	U	0.01	"						
2-Methylphenol	ND	J, C3, U	0.05	"						
2,2'-oxybis(1-Chloropropane)	ND	U	0.01	"						
3&4-Methylphenol	ND	Q2, J, C3, U	0.05	"						
N-Nitrosodipropylamine	ND	U	0.01	"						

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

Prepared: 02/14/06 Analyzed: 02/15/06

Batch B6B0063 - Leachate Extraction - SVOCs, TCLP

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Blank (B6B0063-BLK2)

Hexachloroethane	ND	U	0.01	"
Nitrobenzene	ND	U	0.01	"
Isophorone	ND	U	0.01	"
2-Nitrophenol	ND	U	0.05	"
2,4-Dimethylphenol	ND	U	0.05	"
bis(2-Chloroethoxy)methane	ND	U	0.01	"
2,4-Dichlorophenol	ND	U	0.05	"
1,2,4-Trichlorobenzene	ND	U	0.01	"
Naphthalene	ND	U	0.01	"
4-Chloroaniline	ND	U	0.05	"
Hexachlorobutadiene	ND	U	0.01	"
4-Chloro-3-methylphenol	ND	U	0.05	"
2-Methylnaphthalene	ND	U	0.01	"
Hexachlorocyclopentadiene	ND	C4, J, Q3, U	0.05	"
2,4,6-Trichlorophenol	ND	U	0.05	"
2,4,5-Trichlorophenol	ND	U	0.05	"
2-Chloronaphthalene	ND	U	0.01	"
2-Nitroaniline	ND	U	0.05	"
Dimethyl phthalate	ND	U	0.01	"
Acenaphthylene	ND	U	0.01	"
2,6-Dinitrotoluene	ND	U	0.01	"
3-Nitroaniline	ND	U	0.05	"
Acenaphthene	ND	U	0.01	"
2,4-Dinitrophenol	ND	C4, J, Q3, U	0.05	"
4-Nitrophenol	ND	U	0.05	"
Dibenzofuran	ND	U	0.01	"
2,4-Dinitrotoluene	ND	U	0.01	"
Diethyl phthalate	ND	U	0.01	"
Fluorene	ND	U	0.01	"
4-Chlorophenyl phenyl ether	ND	U	0.01	"
4-Nitroaniline	ND	U	0.05	"
4,6-Dinitro-2-methylphenol	ND	Q3, J, U	0.05	"
Diphenyl amine	ND	U	0.01	"
4-Bromophenyl phenyl ether	ND	U	0.01	"
Hexachlorobenzene	ND	U	0.01	"
Pentachlorophenol	ND	Q3, J, U	0.05	"
Phenanthrene	ND	U	0.01	"
Anthracene	ND	U	0.01	"
Carbazole	ND	U	0.01	"
Di-n-butyl phthalate	ND	U	0.01	"
Fluoranthene	ND	U	0.01	"
Pyrene	ND	U	0.01	"
Butyl benzyl phthalate	0.007	J	0.01	"
Benzo(a)anthracene	ND	U	0.01	"
3,3'-Dichlorobenzidine	ND	J, C3, U	0.05	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

Prepared: 02/14/06 Analyzed: 02/15/06

Batch B6B0063 - Leachate Extraction - SVOCs, TCLP — Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Blank (B6B0063-BLK2)

Chrysene	ND	U	0.01	"						
bis(2-Ethylhexyl) phthalate	0.007	J	0.01	"						
Di-n-octyl phthalate	ND	C3, J, U	0.01	"						
Benzo(b)fluoranthene	ND	U	0.01	"						
Benzo(k)fluoranthene	ND	U	0.01	"						
Benzo(a)pyrene	ND	U	0.01	"						
Indeno(1,2,3-cd)pyrene	ND	C3, J, U	0.01	"						
Dibenz(a,h)anthracene	ND	C3, J, U	0.01	"						
Benzo(g,h,i)perylene	ND	U	0.01	"						
Surrogate: 1,4-Dioxane-d8	*0.0370*			"	*0.0500*		*74*	*18-130*		
Surrogate: 2-Fluorophenol	*0.571*			"	*0.750*		*76*	*32-130*		
Surrogate: Phenol-d5	*0.568*			"	*0.750*		*76*	*42-120*		
Surrogate: 2-Chlorophenol-d4	*0.570*			"	*0.750*		*76*	*42-120*		
Surrogate: 1,2-Dichlorobenzene-d4	*0.335*			"	*0.500*		*67*	*24-110*		
Surrogate: Nitrobenzene-d5	*0.391*			"	*0.500*		*78*	*27-140*		
Surrogate: 2-Fluorobiphenyl	*0.392*			"	*0.500*		*78*	*45-110*		
Surrogate: 2,4,6-Tribromophenol	*0.686*			"	*0.750*		*91*	*44-140*		
Surrogate: Terphenyl-d14	*0.559*			"	*0.500*		*112*	*28-140*		

LCS (B6B0063-BS1)

1,4-Dioxane	0.112		0.01	mg/L	0.100		112	64-130		
Phenol	0.336		0.05	"	0.500		67	66-110		
bis(2-Chloroethyl)ether	0.095		0.01	"	0.100		95	50-120		
2-Chlorophenol	0.351		0.05	"	0.500		70	67-110		
1,3-Dichlorobenzene	0.054		0.01	"	0.100		54	39-98		
1,4-Dichlorobenzene	0.056		0.01	"	0.100		56	40-97		
Benzyl alcohol	0.368		0.05	"	0.500		74	62-140		
1,2-Dichlorobenzene	0.058		0.01	"	0.100		58	43-100		
2-Methylphenol	0.332		0.05	"	0.500		66	66-110		
2,2'-oxybis(1-Chloropropane)	0.071		0.01	"	0.100		71	55-120		
3&4-Methylphenol	0.347		0.05	"	0.500		69	69-110		
N-Nitrosodipropylamine	0.078		0.01	"	0.100		78	55-120		
Hexachloroethane	0.046		0.01	"	0.100		46	32-89		
Nitrobenzene	0.077		0.01	"	0.100		77	53-120		
Isophorone	0.102		0.01	"	0.100		102	66-110		
2-Nitrophenol	0.369		0.05	"	0.500		74	67-110		
2,4-Dimethylphenol	0.359		0.05	"	0.500		72	62-120		
bis(2-Chloroethoxy)methane	0.077		0.01	"	0.100		77	55-120		
2,4-Dichlorophenol	0.374		0.05	"	0.500		75	69-120		
1,2,4-Trichlorobenzene	0.059		0.01	"	0.100		59	42-100		
Naphthalene	0.070		0.01	"	0.100		70	45-110		
4-Chloroaniline	0.406		0.05	"	0.500		81	1.9-160		
Hexachlorobutadiene	0.047		0.01	"	0.100		47	31-90		
4-Chloro-3-methylphenol	0.476		0.05	"	0.500		95	71-120		
2-Methylnaphthalene	0.072		0.01	"	0.100		72	50-110		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/14/06 Analyzed: 02/15/06		
Batch B6B0063 - Leachate Extraction - SVOCs, TCLP								Semivolatile Organic Compounds by EPA Method 8270C - Quality Control		
LCS (B6B0063-BS1)										
Hexachlorocyclopentadiene	ND	U	0.05	"	0.100			7.4-46		
2,4,6-Trichlorophenol	0.492		0.05	"	0.500		98	68-120		
2,4,5-Trichlorophenol	0.387		0.05	"	0.500		77	73-120		
2-Chloronaphthalene	0.074		0.01	"	0.100		74	50-110		
2-Nitroaniline	0.477		0.05	"	0.500		95	69-120		
Dimethyl phthalate	0.094		0.01	"	0.100		94	63-140		
Acenaphthylene	0.083		0.01	"	0.100		83	48-110		
2,6-Dinitrotoluene	0.095		0.01	"	0.100		95	64-120		
3-Nitroaniline	0.513		0.05	"	0.500		103	48-140		
Acenaphthene	0.106		0.01	"	0.100		106	53-110		
2,4-Dinitrophenol	0.482		0.05	"	0.500		96	45-150		
4-Nitrophenol	0.551		0.05	"	0.500		110	58-150		
Dibenzofuran	0.088		0.01	"	0.100		88	60-120		
2,4-Dinitrotoluene	0.097		0.01	"	0.100		97	66-140		
Diethyl phthalate	0.089		0.01	"	0.100		89	64-140		
Fluorene	0.092		0.01	"	0.100		92	55-120		
4-Chlorophenyl phenyl ether	0.089		0.01	"	0.100		89	56-120		
4-Nitroaniline	0.530		0.05	"	0.500		106	47-150		
4,6-Dinitro-2-methylphenol	0.507		0.05	"	0.500		101	69-130		
Diphenyl amine	0.083		0.01	"	0.100		83	14-120		
4-Bromophenyl phenyl ether	0.089		0.01	"	0.100		89	61-130		
Hexachlorobenzene	0.088		0.01	"	0.100		88	68-110		
Pentachlorophenol	0.528		0.05	"	0.500		106	67-140		
Phenanthrene	0.094		0.01	"	0.100		94	60-120		
Anthracene	0.085		0.01	"	0.100		85	57-110		
Carbazole	0.079		0.01	"	0.100		79	49-140		
Di-n-butyl phthalate	0.098		0.01	"	0.100		98	61-150		
Fluoranthene	0.093		0.01	"	0.100		93	64-120		
Pyrene	0.100		0.01	"	0.100		100	62-120		
Butyl benzyl phthalate	0.111		0.01	"	0.100		111	59-160		
Benzo(a)anthracene	0.092		0.01	"	0.100		92	61-120		
3,3'-Dichlorobenzidine	0.501		0.05	"	0.500		100	42-140		
Chrysene	0.092		0.01	"	0.100		92	63-120		
bis(2-Ethylhexyl) phthalate	0.112		0.01	"	0.100		112	64-160		
Di-n-octyl phthalate	0.096		0.01	"	0.100		96	60-150		
Benzo(b)fluoranthene	0.091		0.01	"	0.100		91	59-120		
Benzo(k)fluoranthene	0.100		0.01	"	0.100		100	64-120		
Benzo(a)pyrene	0.086		0.01	"	0.100		86	56-110		
Indeno(1,2,3-cd)pyrene	0.097		0.01	"	0.100		97	61-120		
Dibenz(a,h)anthracene	0.107		0.01	"	0.100		107	64-120		
Benzo(g,h,i)perylene	0.097		0.01	"	0.100		97	63-120		
Surrogate: 1,4-Dioxane-d8	*0.0292*			*"*	*0.0500*		*58*	*18-130*		
Surrogate: 2-Fluorophenol	*0.465*			*"*	*0.750*		*62*	*32-130*		
Surrogate: Phenol-d5	*0.452*			*"*	*0.750*		*60*	*42-120*		
Surrogate: 2-Chlorophenol-d4	*0.470*			*"*	*0.750*		*63*	*42-120*		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:**	02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/14/06 Analyzed: 02/15/06		
Batch B6B0063 - Leachate Extraction - SVOCs, TCLP								Semivolatile Organic Compounds by EPA Method 8270C - Quality Control		
LCS (B6B0063-BS1)										
Surrogate: 1,2-Dichlorobenzene-d4	*0.272*			*"*	*0.500*		*54*	*24-110*		
Surrogate: Nitrobenzene-d5	*0.327*			*"*	*0.500*		*65*	*27-140*		
Surrogate: 2-Fluorobiphenyl	*0.340*			*"*	*0.500*		*68*	*45-110*		
Surrogate: 2,4,6-Tribromophenol	*0.715*			*"*	*0.750*		*95*	*44-140*		
Surrogate: Terphenyl-d14	*0.582*			*"*	*0.500*		*116*	*28-140*		
LCS (B6B0063-BS2)										
1,4-Dioxane	0.116		0.01	mg/L	0.100		116	64-130		
Phenol	0.318		0.05	"	0.500		64	66-110		
bis(2-Chloroethyl)ether	0.127		0.01	"	0.100		127	50-120		
2-Chlorophenol	0.378		0.05	"	0.500		76	67-110		
1,3-Dichlorobenzene	0.061		0.01	"	0.100		61	39-98		
1,4-Dichlorobenzene	0.063		0.01	"	0.100		63	40-97		
Benzyl alcohol	0.311		0.05	"	0.500		62	62-140		
1,2-Dichlorobenzene	0.068		0.01	"	0.100		68	43-100		
2-Methylphenol	0.339		0.05	"	0.500		68	66-110		
2,2'-oxybis(1-Chloropropane)	0.076		0.01	"	0.100		76	55-120		
3&4-Methylphenol	0.331		0.05	"	0.500		66	69-110		
N-Nitrosodipropylamine	0.073		0.01	"	0.100		73	55-120		
Hexachloroethane	0.049		0.01	"	0.100		49	32-89		
Nitrobenzene	0.080		0.01	"	0.100		80	53-120		
Isophorone	0.100		0.01	"	0.100		100	66-110		
2-Nitrophenol	0.384		0.05	"	0.500		77	67-110		
2,4-Dimethylphenol	0.367		0.05	"	0.500		73	62-120		
bis(2-Chloroethoxy)methane	0.078		0.01	"	0.100		78	55-120		
2,4-Dichlorophenol	0.388		0.05	"	0.500		78	69-120		
1,2,4-Trichlorobenzene	0.067		0.01	"	0.100		67	42-100		
Naphthalene	0.078		0.01	"	0.100		78	45-110		
4-Chloroaniline	0.403		0.05	"	0.500		81	1.9-160		
Hexachlorobutadiene	0.048		0.01	"	0.100		48	31-90		
4-Chloro-3-methylphenol	0.472		0.05	"	0.500		94	71-120		
2-Methylnaphthalene	0.077		0.01	"	0.100		77	50-110		
Hexachlorocyclopentadiene	ND	U	0.05	"	0.100			7.4-46		
2,4,6-Trichlorophenol	0.468		0.05	"	0.500		94	68-120		
2,4,5-Trichlorophenol	0.423		0.05	"	0.500		85	73-120		
2-Chloronaphthalene	0.075		0.01	"	0.100		75	50-110		
2-Nitroaniline	0.474		0.05	"	0.500		95	69-120		
Dimethyl phthalate	0.092		0.01	"	0.100		92	63-140		
Acenaphthylene	0.081		0.01	"	0.100		81	48-110		
2,6-Dinitrotoluene	0.086		0.01	"	0.100		86	64-120		
3-Nitroaniline	0.503		0.05	"	0.500		101	48-140		
Acenaphthene	0.109		0.01	"	0.100		109	53-110		
2,4-Dinitrophenol	0.529		0.05	"	0.500		106	45-150		
4-Nitrophenol	0.574		0.05	"	0.500		115	58-150		
Dibenzofuran	0.086		0.01	"	0.100		86	60-120		
2,4-Dinitrotoluene	0.096		0.01	"	0.100		96	66-140		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/14/06 Analyzed: 02/15/06		
Batch B6B0063 - Leachate Extraction - SVOCs, TCLP								Semivolatile Organic Compounds by EPA Method 8270C - Quality Control		
LCS (B6B0063-BS2)										
Diethyl phthalate	0.097		0.01	"	0.100		97	64-140		
Fluorene	0.090		0.01	"	0.100		90	55-120		
4-Chlorophenyl phenyl ether	0.088		0.01	"	0.100		88	56-120		
4-Nitroaniline	0.523		0.05	"	0.500		105	47-150		
4,6-Dinitro-2-methylphenol	0.511		0.05	"	0.500		102	69-130		
Diphenyl amine	0.081		0.01	"	0.100		81	14-120		
4-Bromophenyl phenyl ether	0.087		0.01	"	0.100		87	61-130		
Hexachlorobenzene	0.086		0.01	"	0.100		86	68-110		
Pentachlorophenol	0.538		0.05	"	0.500		108	67-140		
Phenanthrene	0.092		0.01	"	0.100		92	60-120		
Anthracene	0.086		0.01	"	0.100		86	57-110		
Carbazole	0.080		0.01	"	0.100		80	49-140		
Di-n-butyl phthalate	0.098		0.01	"	0.100		98	61-150		
Fluoranthene	0.094		0.01	"	0.100		94	64-120		
Pyrene	0.097		0.01	"	0.100		97	62-120		
Butyl benzyl phthalate	0.111		0.01	"	0.100		111	59-160		
Benzo(a)anthracene	0.091		0.01	"	0.100		91	61-120		
3,3'-Dichlorobenzidine	0.531		0.05	"	0.500		106	42-140		
Chrysene	0.091		0.01	"	0.100		91	63-120		
bis(2-Ethylhexyl) phthalate	0.113		0.01	"	0.100		113	64-160		
Di-n-octyl phthalate	0.097		0.01	"	0.100		97	60-150		
Benzo(b)fluoranthene	0.089		0.01	"	0.100		89	59-120		
Benzo(k)fluoranthene	0.097		0.01	"	0.100		97	64-120		
Benzo(a)pyrene	0.085		0.01	"	0.100		85	56-110		
Indeno(1,2,3-cd)pyrene	0.097		0.01	"	0.100		97	61-120		
Dibenz(a,h)anthracene	0.105		0.01	"	0.100		105	64-120		
Benzo(g,h,i)perylene	0.096		0.01	"	0.100		96	63-120		
Surrogate: 1,4-Dioxane-d8	*0.0324*			"	*0.0500*		*65*	*18-130*		
Surrogate: 2-Fluorophenol	*0.537*			"	*0.750*		*72*	*32-130*		
Surrogate: Phenol-d5	*0.422*			"	*0.750*		*56*	*42-120*		
Surrogate: 2-Chlorophenol-d4	*0.501*			"	*0.750*		*67*	*42-120*		
Surrogate: 1,2-Dichlorobenzene-d4	*0.332*			"	*0.500*		*66*	*24-110*		
Surrogate: Nitrobenzene-d5	*0.342*			"	*0.500*		*68*	*27-140*		
Surrogate: 2-Fluorobiphenyl	*0.348*			"	*0.500*		*70*	*45-110*		
Surrogate: 2,4,6-Tribromophenol	*0.707*			"	*0.750*		*94*	*44-140*		
Surrogate: Terphenyl-d14	*0.556*			"	*0.500*		*111*	*28-140*		
Matrix Spike (B6B0063-MS1)	**Source: 0602012-03**									
1,4-Dioxane	0.116		0.01	mg/L	0.100	ND	116	59-130		
Phenol	0.359		0.05	"	0.502	ND	72	53-120		
bis(2-Chloroethyl)ether	0.109		0.01	"	0.100	ND	109	0-200		
2-Chlorophenol	0.406		0.05	"	0.502	ND	81	53-110		
1,3-Dichlorobenzene	0.066		0.01	"	0.100	ND	66	0-200		
1,4-Dichlorobenzene	0.069		0.01	"	0.100	ND	69	27-101		
Benzyl alcohol	0.365		0.05	"	0.502	ND	73	0-200		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:**	02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/14/06 Analyzed: 02/15/06		
Batch B6B0063 - Leachate Extraction - SVOCs, TCLP								Semivolatile Organic Compounds by EPA Method 8270C - Quality Control		
Matrix Spike (B6B0063-MS1)	**Source: 0602012-03**									
1,2-Dichlorobenzene	0.073		0.01	"	0.100	ND	73	0-200		
2-Methylphenol	0.360		0.05	"	0.502	ND	72	0-200		
2,2'-oxybis(1-Chloropropane)	0.078		0.01	"	0.100	ND	78	0-200		
3&4-Methylphenol	0.362		0.05	"	0.502	ND	72	0-200		
N-Nitrosodipropylamine	0.077		0.01	"	0.100	ND	77	40-120		
Hexachloroethane	0.055		0.01	"	0.100	ND	55	0-200		
Nitrobenzene	0.092		0.01	"	0.100	ND	92	0-200		
Isophorone	0.102		0.01	"	0.100	ND	102	0-200		
2-Nitrophenol	0.426		0.05	"	0.502	ND	85	0-200		
2,4-Dimethylphenol	0.399		0.05	"	0.502	ND	79	0-200		
bis(2-Chloroethoxy)methane	0.083		0.01	"	0.100	ND	83	0-200		
2,4-Dichlorophenol	0.417		0.05	"	0.502	ND	83	0-200		
1,2,4-Trichlorobenzene	0.072		0.01	"	0.100	ND	72	31-100		
Naphthalene	0.082		0.01	"	0.100	ND	82	0-200		
4-Chloroaniline	0.414		0.05	"	0.502	ND	82	0-200		
Hexachlorobutadiene	0.054		0.01	"	0.100	ND	54	0-200		
4-Chloro-3-methylphenol	0.487		0.05	"	0.502	ND	97	61-130		
2-Methylnaphthalene	0.080		0.01	"	0.100	ND	80	0-200		
Hexachlorocyclopentadiene	ND	U	0.05	"	0.100	ND		0-200		
2,4,6-Trichlorophenol	0.503		0.05	"	0.502	ND	100	0-200		
2,4,5-Trichlorophenol	0.412		0.05	"	0.502	ND	82	0-200		
2-Chloronaphthalene	0.077		0.01	"	0.100	ND	77	0-200		
2-Nitroaniline	0.476		0.05	"	0.502	ND	95	0-200		
Dimethyl phthalate	0.094		0.01	"	0.100	ND	94	0-200		
Acenaphthylene	0.083		0.01	"	0.100	ND	83	0-200		
2,6-Dinitrotoluene	0.083		0.01	"	0.100	ND	83	0-200		
3-Nitroaniline	0.508		0.05	"	0.502	ND	101	0-200		
Acenaphthene	0.110		0.01	"	0.100	ND	110	31-120		
2,4-Dinitrophenol	0.529		0.05	"	0.502	ND	105	0-200		
4-Nitrophenol	0.570		0.05	"	0.502	ND	114	56-160		
Dibenzofuran	0.089		0.01	"	0.100	ND	89	0-200		
2,4-Dinitrotoluene	0.097		0.01	"	0.100	ND	97	38-160		
Diethyl phthalate	0.088		0.01	"	0.100	ND	88	0-200		
Fluorene	0.091		0.01	"	0.100	ND	91	0-200		
4-Chlorophenyl phenyl ether	0.090		0.01	"	0.100	ND	90	0-200		
4-Nitroaniline	0.520		0.05	"	0.502	ND	104	0-200		
4,6-Dinitro-2-methylphenol	0.486		0.05	"	0.502	ND	97	0-200		
Diphenyl amine	0.078		0.01	"	0.100	ND	78	0-200		
4-Bromophenyl phenyl ether	0.088		0.01	"	0.100	ND	88	0-200		
Hexachlorobenzene	0.090		0.01	"	0.100	ND	90	0-200		
Pentachlorophenol	0.557		0.05	"	0.502	ND	111	71-140		
Phenanthrene	0.095		0.01	"	0.100	ND	95	0-200		
Anthracene	0.084		0.01	"	0.100	ND	84	0-200		
Carbazole	0.082		0.01	"	0.100	ND	82	0-200		
Di-n-butyl phthalate	0.099		0.01	"	0.100	ND	99	0-200		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/14/06 Analyzed: 02/15/06		
Batch B6B0063 - Leachate Extraction - SVOCs, TCLP								Semivolatile Organic Compounds by EPA Method 8270C - Quality Control		
Matrix Spike (B6B0063-MS1)	**Source: 0602012-03**									
Fluoranthene	0.095		0.01	"	0.100	ND	95	0-200		
Pyrene	0.097		0.01	"	0.100	ND	97	46-130		
Butyl benzyl phthalate	0.112		0.01	"	0.100	ND	112	0-200		
Benzo(a)anthracene	0.091		0.01	"	0.100	ND	91	0-200		
3,3'-Dichlorobenzidine	0.490		0.05	"	0.502	ND	98	0-200		
Chrysene	0.094		0.01	"	0.100	ND	94	0-200		
bis(2-Ethylhexyl) phthalate	0.111		0.01	"	0.100	0.007	104	0-200		
Di-n-octyl phthalate	0.096		0.01	"	0.100	ND	96	0-200		
Benzo(b)fluoranthene	0.091		0.01	"	0.100	ND	91	0-200		
Benzo(k)fluoranthene	0.100		0.01	"	0.100	ND	100	0-200		
Benzo(a)pyrene	0.085		0.01	"	0.100	ND	85	0-200		
Indeno(1,2,3-cd)pyrene	0.100		0.01	"	0.100	ND	100	0-200		
Dibenz(a,h)anthracene	0.110		0.01	"	0.100	ND	110	0-200		
Benzo(g,h,i)perylene	0.099		0.01	"	0.100	ND	99	0-200		
Surrogate: 1,4-Dioxane-d8	*0.0331*			"	*0.0502*		*66*	*18-130*		
Surrogate: 2-Fluorophenol	*0.541*			"	*0.752*		*72*	*32-130*		
Surrogate: Phenol-d5	*0.478*			"	*0.752*		*64*	*42-120*		
Surrogate: 2-Chlorophenol-d4	*0.535*			"	*0.752*		*71*	*42-120*		
Surrogate: 1,2-Dichlorobenzene-d4	*0.344*			"	*0.502*		*69*	*24-110*		
Surrogate: Nitrobenzene-d5	*0.370*			"	*0.502*		*74*	*27-140*		
Surrogate: 2-Fluorobiphenyl	*0.356*			"	*0.502*		*71*	*45-110*		
Surrogate: 2,4,6-Tribromophenol	*0.726*			"	*0.752*		*97*	*44-140*		
Surrogate: Terphenyl-d14	*0.555*			"	*0.502*		*111*	*28-140*		
Matrix Spike Dup (B6B0063-MSD1)	**Source: 0602012-03**									
1,4-Dioxane	0.114		0.01	mg/L	0.0994	ND	115	59-130	2	20
Phenol	0.334		0.05	"	0.497	ND	67	53-120	7	20
bis(2-Chloroethyl)ether	0.100		0.01	"	0.0994	ND	101	0-200	9	200
2-Chlorophenol	0.387		0.05	"	0.497	ND	78	53-110	5	20
1,3-Dichlorobenzene	0.070		0.01	"	0.0994	ND	70	0-200	6	200
1,4-Dichlorobenzene	0.072		0.01	"	0.0994	ND	72	27-101	4	20
Benzyl alcohol	0.346		0.05	"	0.497	ND	70	0-200	5	200
1,2-Dichlorobenzene	0.076		0.01	"	0.0994	ND	76	0-200	4	200
2-Methylphenol	0.343		0.05	"	0.497	ND	69	0-200	5	200
2,2'-oxybis(1-Chloropropane)	0.077		0.01	"	0.0994	ND	77	0-200	1	200
3&4-Methylphenol	0.347		0.05	"	0.497	ND	70	0-200	4	200
N-Nitrosodipropylamine	0.077		0.01	"	0.0994	ND	77	40-120	0	20
Hexachloroethane	0.058		0.01	"	0.0994	ND	58	0-200	5	200
Nitrobenzene	0.088		0.01	"	0.0994	ND	89	0-200	4	200
Isophorone	0.104		0.01	"	0.0994	ND	105	0-200	2	200
2-Nitrophenol	0.410		0.05	"	0.497	ND	82	0-200	4	200
2,4-Dimethylphenol	0.384		0.05	"	0.497	ND	77	0-200	4	200
bis(2-Chloroethoxy)methane	0.081		0.01	"	0.0994	ND	81	0-200	2	200
2,4-Dichlorophenol	0.405		0.05	"	0.497	ND	81	0-200	3	200
1,2,4-Trichlorobenzene	0.075		0.01	"	0.0994	ND	75	31-100	4	20

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Prepared: 02/14/06 Analyzed: 02/15/06

Batch B6B0063 - Leachate Extraction - SVOCs, TCLP — Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Matrix Spike Dup (B6B0063-MSD1) **Source: 0602012-03**

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Naphthalene	0.081		0.01	"	0.0994	ND	81	0-200	1	200
4-Chloroaniline	0.416		0.05	"	0.497	ND	84	0-200	0.5	200
Hexachlorobutadiene	0.056		0.01	"	0.0994	ND	56	0-200	4	200
4-Chloro-3-methylphenol	0.494		0.05	"	0.497	ND	99	61-130	1	20
2-Methylnaphthalene	0.081		0.01	"	0.0994	ND	81	0-200	1	200
Hexachlorocyclopentadiene	ND	U	0.05	"	0.0994	ND		0-200		200
2,4,6-Trichlorophenol	0.495		0.05	"	0.497	ND	100	0-200	2	200
2,4,5-Trichlorophenol	0.396		0.05	"	0.497	ND	80	0-200	4	200
2-Chloronaphthalene	0.076		0.01	"	0.0994	ND	76	0-200	1	200
2-Nitroaniline	0.466		0.05	"	0.497	ND	94	0-200	2	200
Dimethyl phthalate	0.091		0.01	"	0.0994	ND	92	0-200	3	200
Acenaphthylene	0.083		0.01	"	0.0994	ND	84	0-200	0	200
2,6-Dinitrotoluene	0.092		0.01	"	0.0994	ND	93	0-200	10	200
3-Nitroaniline	0.495		0.05	"	0.497	ND	100	0-200	3	200
Acenaphthene	0.110		0.01	"	0.0994	ND	111	31-120	0	20
2,4-Dinitrophenol	0.531		0.05	"	0.497	ND	107	0-200	0.4	200
4-Nitrophenol	0.556		0.05	"	0.497	ND	112	56-160	2	20
Dibenzofuran	0.087		0.01	"	0.0994	ND	88	0-200	2	200
2,4-Dinitrotoluene	0.093		0.01	"	0.0994	ND	94	38-160	4	20
Diethyl phthalate	0.084		0.01	"	0.0994	ND	85	0-200	5	200
Fluorene	0.090		0.01	"	0.0994	ND	91	0-200	1	200
4-Chlorophenyl phenyl ether	0.088		0.01	"	0.0994	ND	89	0-200	2	200
4-Nitroaniline	0.503		0.05	"	0.497	ND	101	0-200	3	200
4,6-Dinitro-2-methylphenol	0.508		0.05	"	0.497	ND	102	0-200	4	200
Diphenyl amine	0.081		0.01	"	0.0994	ND	81	0-200	4	200
4-Bromophenyl phenyl ether	0.087		0.01	"	0.0994	ND	88	0-200	1	200
Hexachlorobenzene	0.087		0.01	"	0.0994	ND	88	0-200	3	200
Pentachlorophenol	0.550		0.05	"	0.497	ND	111	71-140	1	20
Phenanthrene	0.094		0.01	"	0.0994	ND	95	0-200	1	200
Anthracene	0.081		0.01	"	0.0994	ND	81	0-200	4	200
Carbazole	0.079		0.01	"	0.0994	ND	79	0-200	4	200
Di-n-butyl phthalate	0.093		0.01	"	0.0994	ND	94	0-200	6	200
Fluoranthene	0.090		0.01	"	0.0994	ND	91	0-200	5	200
Pyrene	0.096		0.01	"	0.0994	ND	97	46-130	1	20
Butyl benzyl phthalate	0.106		0.01	"	0.0994	ND	107	0-200	6	200
Benzo(a)anthracene	0.088		0.01	"	0.0994	ND	89	0-200	3	200
3,3'-Dichlorobenzidine	0.512		0.05	"	0.497	ND	103	0-200	4	200
Chrysene	0.091		0.01	"	0.0994	ND	92	0-200	3	200
bis(2-Ethylhexyl) phthalate	0.109		0.01	"	0.0994	0.007	103	0-200	2	200
Di-n-octyl phthalate	0.095		0.01	"	0.0994	ND	96	0-200	1	200
Benzo(b)fluoranthene	0.089		0.01	"	0.0994	ND	90	0-200	2	200
Benzo(k)fluoranthene	0.097		0.01	"	0.0994	ND	98	0-200	3	200
Benzo(a)pyrene	0.086		0.01	"	0.0994	ND	87	0-200	1	200
Indeno(1,2,3-cd)pyrene	0.098		0.01	"	0.0994	ND	99	0-200	2	200
Dibenz(a,h)anthracene	0.107		0.01	"	0.0994	ND	108	0-200	3	200

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
									Prepared: 02/14/06	Analyzed: 02/15/06
Batch B6B0063 - Leachate Extraction - SVOCs, TCLP									Semivolatile Organic Compounds by EPA Method 8270C - Quality Control	
Matrix Spike Dup (B6B0063-MSD1)	**Source: 0602012-03**									
Benzo(g,h,i)perylene	0.097		0.01	"	0.0994	ND	98	0-200	2	200
Surrogate: 1,4-Dioxane-d8	*0.0320*			"	*0.0497*		*64*	*18-130*		
Surrogate: 2-Fluorophenol	*0.526*			"	*0.746*		*71*	*32-130*		
Surrogate: Phenol-d5	*0.445*			"	*0.746*		*60*	*42-120*		
Surrogate: 2-Chlorophenol-d4	*0.512*			"	*0.746*		*69*	*42-120*		
Surrogate: 1,2-Dichlorobenzene-d4	*0.359*			"	*0.497*		*72*	*24-110*		
Surrogate: Nitrobenzene-d5	*0.356*			"	*0.497*		*72*	*27-140*		
Surrogate: 2-Fluorobiphenyl	*0.354*			"	*0.497*		*71*	*45-110*		
Surrogate: 2,4,6-Tribromophenol	*0.704*			"	*0.746*		*94*	*44-140*		
Surrogate: Terphenyl-d14	*0.569*			"	*0.497*		*114*	*28-140*		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041A
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:32
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Qualifiers and Comments

Q3	The quantitation limit standard did not meet recovery criteria for this analyte.
Q2	The laboratory control standard associated with this sample did not meet recovery criteria for this analyte (see LCS results for this batch in QC summary).
N TIC	Tentatively Idenitified Compound - This compound was identified only by match with mass spectral library. Identification and quantitation should be considered tentative and presumptive.
J	The reported result for this analyte should be considered an estimated value.
C4	The calibration verification check did not meet % difference criteria for this analyte.
C3	The initial calibration for this analyte did not meet calibration criteria.
C1	The reported concentration for this analyte is below the quantitation limit.
B1	The concentration of this analyte found in this sample was less than five times the concentration found in the associated method blank.
U	Not Detected
NR	Not Reported

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street Building 201
Richmond, CA 94804

Subject: **Analytical Testing Results - Project R06S25**
SDG: 06041C

From: **Brenda Bettencourt, Director**
EPA Region 9 Laboratory
PMD-2

To: **John Hillenbrand**
Private Site and DOE Section
SFD-8-2

Attached are the results from the analysis of samples from the **ASARCO Feb 2006 IDW Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Analyses included in this

Mercury	Metals, ICP
Metals, ICP/MS	

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand
Project Number: R06S25
Project: ASARCO Feb 2006 IDW Sampling

Private Site and DOE Section
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06041C
Reported: 02/21/06 14:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
MY2DA7	0602013-04	Water	02/07/06 18:15	02/09/06 14:50
MY2DA8	0602013-05	Water	02/07/06 17:15	02/09/06 14:50
MY2DA9	0602013-06	Water	02/07/06 17:45	02/09/06 14:50

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/21/06 14:52
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0602013-04								Water - Sampled: 02/07/06 18:15
Sample ID: MY2DA7								Metals by EPA 200 Series Methods
Mercury	**0.023**	**C1, J**	**0.030**	ug/L	B6B0071	02/15/06	02/15/06	245.1/SOP515
Boron	**100**		**100**	"	B6B0043	02/10/06	02/13/06	200.7/SOP505
Calcium	**130000**		**100**	"	"	"	"	200.7/SOP505
Iron	**ND**	**U**	**100**	"	"	"	"	200.7/SOP505
Magnesium	**100000**		**500**	"	"	"	"	200.7/SOP505
Potassium	**7100**		**5000**	"	"	"	"	200.7/SOP505
Sodium	**110000**		**500**	"	"	"	"	200.7/SOP505
Aluminum	**23**		**20**	"	B6B0044	02/10/06	02/14/06	200.8/SOP507
Antimony	**ND**	**U**	**1.0**	"	"	"	02/14/06	200.8/SOP507
Arsenic	**5.1**		**1.0**	"	"	"	"	200.8/SOP507
Barium	**43**		**1.0**	"	"	"	"	200.8/SOP507
Beryllium	**ND**	**U**	**0.50**	"	"	"	02/15/06	200.8/SOP507
Cadmium	**ND**	**U**	**1.0**	"	"	"	02/14/06	200.8/SOP507
Chromium	**16**		**1.0**	"	"	"	"	200.8/SOP507
Cobalt	**2.2**		**0.50**	"	"	"	"	200.8/SOP507
Copper	**3.4**		**2.0**	"	"	"	"	200.8/SOP507
Lead	**ND**	**U**	**2.0**	"	"	"	"	200.8/SOP507
Manganese	**17**		**2.0**	"	"	"	"	200.8/SOP507
Molybdenum	**9.6**		**0.50**	"	"	"	"	200.8/SOP507
Nickel	**ND**	**U**	**40**	"	"	"	02/14/06	200.8/SOP507
Selenium	**7.2**		**1.0**	"	"	"	02/14/06	200.8/SOP507
Silver	**0.48**	**C1, J**	**0.50**	"	"	"	"	200.8/SOP507
Thallium	**ND**	**U**	**2.0**	"	"	"	"	200.8/SOP507
Vanadium	**17**		**4.0**	"	"	"	"	200.8/SOP507
Zinc	**ND**	**U**	**5.0**	"	"	"	"	200.8/SOP507
Lab ID: 0602013-05								Water - Sampled: 02/07/06 17:15
Sample ID: MY2DA8								Metals by EPA 200 Series Methods
Mercury	**0.016**	**C1, J**	**0.030**	ug/L	B6B0071	02/15/06	02/15/06	245.1/SOP515
Boron	**100**		**100**	"	B6B0043	02/10/06	02/13/06	200.7/SOP505
Calcium	**130000**		**100**	"	"	"	02/13/06	200.7/SOP505
Iron	**ND**	**U**	**100**	"	"	"	02/13/06	200.7/SOP505
Magnesium	**110000**		**500**	"	"	"	02/13/06	200.7/SOP505
Potassium	**7200**		**5000**	"	"	"	"	200.7/SOP505
Sodium	**110000**		**500**	"	"	"	"	200.7/SOP505
Aluminum	**26**		**20**	"	B6B0044	02/10/06	02/14/06	200.8/SOP507
Antimony	**ND**	**U**	**1.0**	"	"	"	02/14/06	200.8/SOP507
Arsenic	**5.0**		**1.0**	"	"	"	"	200.8/SOP507
Barium	**43**		**1.0**	"	"	"	"	200.8/SOP507
Beryllium	**ND**	**U**	**0.50**	"	"	"	02/15/06	200.8/SOP507
Cadmium	**ND**	**U**	**1.0**	"	"	"	02/14/06	200.8/SOP507
Chromium	**16**		**1.0**	"	"	"	"	200.8/SOP507
Cobalt	**2.2**		**0.50**	"	"	"	"	200.8/SOP507
Copper	**3.4**		**2.0**	"	"	"	"	200.8/SOP507
Lead	**ND**	**U**	**2.0**	"	"	"	"	200.8/SOP507

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/21/06 14:52
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0602013-05								Water - Sampled: 02/07/06 17:15
Sample ID: MY2DA8								Metals by EPA 200 Series Methods
Manganese	**17**		**2.0**	ug/L	B6B0044	02/10/06	02/14/06	200.8/SOP507
Molybdenum	**9.4**		**0.50**	"	"	"	"	200.8/SOP507
Nickel	**ND**	**Q4, J, U**	**40**	"	"	"	02/14/06	200.8/SOP507
Selenium	**6.9**		**1.0**	"	"	"	02/14/06	200.8/SOP507
Silver	**0.29**	**C1, J**	**0.50**	"	"	"	"	200.8/SOP507
Thallium	**ND**	**U**	**2.0**	"	"	"	"	200.8/SOP507
Vanadium	**17**		**4.0**	"	"	"	"	200.8/SOP507
Zinc	**ND**	**U**	**5.0**	"	"	"	"	200.8/SOP507
Lab ID: 0602013-06								Water - Sampled: 02/07/06 17:45
Sample ID: MY2DA9								Metals by EPA 200 Series Methods
Mercury	**0.015**	**C1, J**	**0.030**	ug/L	B6B0071	02/15/06	02/15/06	245.1/SOP515
Aluminum	**870**		**200**	"	B6B0043	02/10/06	02/13/06	200.7/SOP505
Boron	**180**		**100**	"	"	"	"	200.7/SOP505
Calcium	**68000**		**100**	"	"	"	"	200.7/SOP505
Iron	**660**		**100**	"	"	"	"	200.7/SOP505
Magnesium	**15000**		**500**	"	"	"	"	200.7/SOP505
Potassium	**5200**		**5000**	"	"	"	"	200.7/SOP505
Sodium	**150000**		**500**	"	"	"	"	200.7/SOP505
Antimony	**ND**	**U**	**1.0**	"	B6B0044	02/10/06	02/14/06	200.8/SOP507
Arsenic	**7.0**		**1.0**	"	"	"	"	200.8/SOP507
Barium	**35**		**1.0**	"	"	"	"	200.8/SOP507
Beryllium	**ND**	**U**	**0.50**	"	"	"	02/15/06	200.8/SOP507
Cadmium	**ND**	**U**	**1.0**	"	"	"	02/14/06	200.8/SOP507
Chromium	**3.4**		**1.0**	"	"	"	"	200.8/SOP507
Cobalt	**0.59**		**0.50**	"	"	"	"	200.8/SOP507
Copper	**11**		**2.0**	"	"	"	"	200.8/SOP507
Lead	**ND**	**U**	**2.0**	"	"	"	"	200.8/SOP507
Manganese	**13**		**2.0**	"	"	"	"	200.8/SOP507
Molybdenum	**13**		**0.50**	"	"	"	"	200.8/SOP507
Nickel	**ND**	**U**	**20**	"	"	"	02/14/06	200.8/SOP507
Selenium	**0.96**	**C1, J**	**1.0**	"	"	"	02/14/06	200.8/SOP507
Silver	**ND**	**U**	**0.50**	"	"	"	"	200.8/SOP507
Thallium	**ND**	**U**	**2.0**	"	"	"	"	200.8/SOP507
Vanadium	**7.8**		**4.0**	"	"	"	"	200.8/SOP507
Zinc	**40**		**5.0**	"	"	"	"	200.8/SOP507

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/21/06 14:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

R9Q

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/10/06 Analyzed: 02/13/06		
Batch B6B0043 - 200 Series Digest - Metals, ICP								Metals by EPA 200 Series Methods - Quality Control		
Blank (B6B0043-BLK1)										
Aluminum	ND	U	200	ug/L						
Boron	ND	U	100	"						
Calcium	ND	U	100	"						
Iron	ND	U	100	"						
Magnesium	ND	U	500	"						
Potassium	ND	U	5000	"						
Sodium	ND	U	500	"						
LCS (B6B0043-BS1)										
Aluminum	2000		200	ug/L	2000		100	85-115		
Boron	290		100	"	300		97	85-115		
Calcium	1020		100	"	1000		102	85-115		
Iron	3110		100	"	3000		104	85-115		
Magnesium	2030		500	"	2000		102	85-115		
Potassium	10100		5000	"	10000		101	85-115		
Sodium	3020		500	"	3000		101	85-115		
Matrix Spike (B6B0043-MS1)	**Source: 0602013-05**									
Aluminum	1950		200	ug/L	2000	ND	98	70-130		
Boron	388		100	"	300	102	95	70-130		
Calcium	130000	Q10	100	"	1000	130000	0	70-130		
Iron	2950		100	"	3000	ND	98	70-130		
Magnesium	108000		500	"	2000	106000	100	70-130		
Potassium	17300		5000	"	10000	7240	101	70-130		
Sodium	114000	Q10	500	"	3000	112000	67	70-130		
Matrix Spike Dup (B6B0043-MSD1)	**Source: 0602013-05**									
Aluminum	1960		200	ug/L	2000	ND	98	70-130	0.5	20
Boron	395		100	"	300	102	98	70-130	2	20
Calcium	132000	Q10	100	"	1000	130000	200	70-130	2	20
Iron	2990		100	"	3000	ND	100	70-130	1	20
Magnesium	109000	Q10	500	"	2000	106000	150	70-130	0.9	20
Potassium	17300		5000	"	10000	7240	101	70-130	0	20
Sodium	115000		500	"	3000	112000	100	70-130	0.9	20
								Prepared: 02/10/06 Analyzed: 02/14/06		
Batch B6B0044 - 200 Series Digest - Metals, ICP/MS								Metals by EPA 200 Series Methods - Quality Control		
Blank (B6B0044-BLK1)										
Aluminum	ND	U	20	ug/L						
Antimony	ND	U	1.0	"						
Arsenic	ND	U	1.0	"						
Barium	ND	U	1.0	"						
Beryllium	ND	U	0.50	"						
Cadmium	ND	U	1.0	"						
Chromium	ND	U	1.0	"						
Cobalt	ND	U	0.50	"						
Copper	ND	U	2.0	"						

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:**	02/21/06 14:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
									Prepared: 02/10/06	Analyzed: 02/14/06
Batch B6B0044 - 200 Series Digest - Metals, ICP/MS									Metals by EPA 200 Series Methods - Quality Control	
Blank (B6B0044-BLK1)										
Lead	ND	U	2.0	"						
Manganese	ND	U	2.0	"						
Molybdenum	ND	U	0.50	"						
Nickel	ND	U	1.0	"						
Selenium	ND	U	1.0	"						
Silver	ND	U	0.50	"						
Thallium	ND	U	2.0	"						
Vanadium	ND	U	4.0	"						
Zinc	ND	U	5.0	"						
LCS (B6B0044-BS1)										
Aluminum	44.3		20	ug/L	40.0		111	85-115		
Antimony	40.9		1.0	"	40.0		102	85-115		
Arsenic	42.0		1.0	"	40.0		105	85-115		
Barium	39.1		1.0	"	40.0		98	85-115		
Beryllium	39.8		0.50	"	40.0		100	85-115		
Cadmium	39.6		1.0	"	40.0		99	85-115		
Chromium	42.1		1.0	"	40.0		105	85-115		
Cobalt	38.2		0.50	"	40.0		96	85-115		
Copper	38.1		2.0	"	40.0		95	85-115		
Lead	38.3		2.0	"	40.0		96	85-115		
Manganese	40.1		2.0	"	40.0		100	85-115		
Molybdenum	40.5		0.50	"	40.0		101	85-115		
Nickel	39.3		1.0	"	40.0		98	85-115		
Selenium	39.5		1.0	"	40.0		99	85-115		
Silver	38.9		0.50	"	40.0		97	85-115		
Thallium	36.1		2.0	"	40.0		90	85-115		
Vanadium	38.9		4.0	"	40.0		97	85-115		
Zinc	39.8		5.0	"	40.0		100	85-115		
Matrix Spike (B6B0044-MS1)	**Source: 0602013-05**									
Aluminum	64.4		20	ug/L	40.0	25.6	97	70-130		
Antimony	40.1		1.0	"	40.0	ND	100	70-130		
Arsenic	53.4		1.0	"	40.0	5.01	121	70-130		
Barium	80.7		1.0	"	40.0	43.4	93	70-130		
Beryllium	35.4		0.50	"	40.0	ND	88	70-130		
Cadmium	37.9		1.0	"	40.0	ND	95	70-130		
Chromium	61.8		1.0	"	40.0	16.3	114	70-130		
Cobalt	37.0		0.50	"	40.0	2.22	87	70-130		
Copper	34.9		2.0	"	40.0	3.42	79	70-130		
Lead	32.6		2.0	"	40.0	ND	82	70-130		
Manganese	54.1		2.0	"	40.0	17.1	92	70-130		
Molybdenum	50.3		0.50	"	40.0	9.39	102	70-130		
Nickel	55.8	Q4	40	"	40.0	ND	140	70-130		
Selenium	45.7		1.0	"	40.0	6.87	97	70-130		
Silver	35.3		0.50	"	40.0	0.287	88	70-130		
Thallium	31.4		2.0	"	40.0	ND	78	70-130		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/21/06 14:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
								Prepared: 02/10/06 Analyzed: 02/14/06		
Batch B6B0044 - 200 Series Digest - Metals, ICP/MS								Metals by EPA 200 Series Methods - Quality Control		
Matrix Spike (B6B0044-MS1)	**Source: 0602013-05**									
Vanadium	53.7		4.0	"	40.0	16.8	92	70-130		
Zinc	38.6		5.0	"	40.0	ND	96	70-130		
Matrix Spike Dup (B6B0044-MSD1)	**Source: 0602013-05**									
Aluminum	66.1		20	ug/L	40.0	25.6	101	70-130	3	20
Antimony	40.0		1.0	"	40.0	ND	100	70-130	0.2	20
Arsenic	53.4		1.0	"	40.0	5.01	121	70-130	0	20
Barium	79.0		1.0	"	40.0	43.4	89	70-130	2	20
Beryllium	33.5		0.50	"	40.0	ND	84	70-130	6	20
Cadmium	37.8		1.0	"	40.0	ND	94	70-130	0.3	20
Chromium	64.6		1.0	"	40.0	16.3	121	70-130	4	20
Cobalt	36.8		0.50	"	40.0	2.22	86	70-130	0.5	20
Copper	35.2		2.0	"	40.0	3.42	79	70-130	0.9	20
Lead	31.9		2.0	"	40.0	ND	80	70-130	2	20
Manganese	54.2		2.0	"	40.0	17.1	93	70-130	0.2	20
Molybdenum	49.7		0.50	"	40.0	9.39	101	70-130	1	20
Nickel	54.5	Q4	40	"	40.0	ND	136	70-130	2	20
Selenium	46.8		1.0	"	40.0	6.87	100	70-130	2	20
Silver	35.3		0.50	"	40.0	0.287	88	70-130	0	20
Thallium	30.8		2.0	"	40.0	ND	77	70-130	2	20
Vanadium	52.7		4.0	"	40.0	16.8	90	70-130	2	20
Zinc	39.4		5.0	"	40.0	ND	98	70-130	2	20
								Prepared & Analyzed: 02/15/06		
Batch B6B0071 - 245.1 Hg Prep. - Mercury								Metals by EPA 200 Series Methods - Quality Control		
Blank (B6B0071-BLK1)										
Mercury	ND	U	0.030	ug/L						
LCS (B6B0071-BS1)										
Mercury	0.210		0.030	ug/L	0.200		105	85-115		
Matrix Spike (B6B0071-MS1)	**Source: 0602013-05**									
Mercury	0.218		0.030	ug/L	0.200	0.016	101	70-130		
Matrix Spike Dup (B6B0071-MSD1)	**Source: 0602013-05**									
Mercury	0.217		0.030	ug/L	0.200	0.016	100	70-130	0.5	20

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/21/06 14:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Qualifiers and Comments

Q4	The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)
Q10	The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.
J	The reported result for this analyte should be considered an estimated value.
C1	The reported concentration for this analyte is below the quantitation limit.
U	Not Detected
NR	Not Reported

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street Building 201
Richmond, CA 94804

Subject: **Analytical Testing Results - Project R06S25**
SDG: 06041C

From: **Brenda Bettencourt, Director**
EPA Region 9 Laboratory
PMD-2

To: **John Hillenbrand**
Private Site and DOE Section
SFD-8-2

Attached are the results from the analysis of samples from the **ASARCO Feb 2006 IDW Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Analyses included in this
VOCs

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand
Project Number: R06S25
Project: ASARCO Feb 2006 IDW Sampling

Private Site and DOE Section
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06041C
Reported: 03/03/06 09:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
Y2DA7	0602013-01	Water	02/07/06 18:15	02/09/06 14:50
Y2DA8	0602013-02	Water	02/07/06 17:15	02/09/06 14:50
Y2DA9	0602013-03	Water	02/07/06 17:45	02/09/06 14:50

VOC: The samples were received above the recommended temperature range of 2 - 6 degrees C at 10 degrees C. This may affect the data quality. MS/MSD QC samples were not analyzed because insufficient sample was provided.

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:**	03/03/06 09:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0602013-01								Water - Sampled: 02/07/06 18:15
Sample ID: Y2DA7								Volatile Organic Compounds by EPA Method 524.2
Dichlorodifluoromethane	**ND**	**A2, J, U**	**0.5**	ug/L	B6B0057	02/13/06	02/13/06	524.2/SOP354
Chloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Vinyl chloride	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromomethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Trichlorofluoromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1-Dichloroethene	**ND**	**A2, U, J**	**0.5**	"	"	"	"	524.2/SOP354
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon 113)	**ND**	**A2, U, J**	**0.5**	"	"	"	"	524.2/SOP354
Acetone	**16**	**A2, J**	**4.0**	"	"	"	"	524.2/SOP354
Dichloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
trans-1,2-Dichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
tert-Butyl methyl ether (MTBE)	**ND**	**A2, J, U**	**2.0**	"	"	"	"	524.2/SOP354
1,1-Dichloroethane	**ND**	**A2, U, J**	**0.5**	"	"	"	"	524.2/SOP354
2,2-Dichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
cis-1,2-Dichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
2-Butanone (MEK)	**ND**	**A2, J, U**	**4.0**	"	"	"	"	524.2/SOP354
Bromochloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chloroform	**0.5**	**A2, J**	**0.5**	"	"	"	"	524.2/SOP354
1,1,1-Trichloroethane	**8.9**	**A2, J**	**0.5**	"	"	"	"	524.2/SOP354
Carbon tetrachloride	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1-Dichloropropene	**ND**	**A2, U, J**	**0.5**	"	"	"	"	524.2/SOP354
Benzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dichloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Trichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Dibromomethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromodichloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
cis-1,3-Dichloropropene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Toluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
trans-1,3-Dichloropropene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,2-Trichloroethane	**ND**	**A2, U, J**	**0.5**	"	"	"	"	524.2/SOP354
Tetrachloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,3-Dichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chlorodibromomethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dibromoethane (EDB)	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,1,2-Tetrachloroethane	**ND**	**A2, U, J**	**0.5**	"	"	"	"	524.2/SOP354
Ethylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
m&p-Xylene	**ND**	**A2, J, U**	**1.0**	"	"	"	"	524.2/SOP354
o-Xylene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Styrene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromoform	**ND**	**C3, J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
Isopropylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 03/03/06 09:52
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0602013-01								Water - Sampled: 02/07/06 18:15
Sample ID: Y2DA7								Volatile Organic Compounds by EPA Method 524.2
1,1,2,2-Tetrachloroethane	**ND**	**A2, U, J**	**0.5**	ug/L	B6B0057	02/13/06	02/13/06	524.2/SOP354
1,2,3-Trichloropropane	**ND**	**A2, U, J**	**0.5**	"	"	"	"	524.2/SOP354
Propylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
2-Chlorotoluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
4-Chlorotoluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,3,5-Trimethylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
tert-Butylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2,4-Trimethylbenzene	**ND**	**A2, U, J**	**0.5**	"	"	"	"	524.2/SOP354
sec-Butylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,3-Dichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
p-Isopropyltoluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,4-Dichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Butylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dibromo-3-chloropropane	**ND**	**C3, J, A2, U**	**2.0**	"	"	"	"	524.2/SOP354
1,2,4-Trichlorobenzene	**0.9**	**A2, J**	**0.5**	"	"	"	"	524.2/SOP354
Hexachlorobutadiene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Naphthalene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2,3-Trichlorobenzene	**0.8**	**A2, J**	**0.5**	"	"	"	"	524.2/SOP354
Surrogate: 1,2-Dichloroethane-d4	*5.40*		*108 %*		*76-130%*	"	"	"
Surrogate: Toluene-d8	*5.12*		*102 %*		*83-120%*	"	"	"
Surrogate: 4-Bromofluorobenzene	*4.96*		*99 %*		*74-110%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*4.77*		*95 %*		*69-120%*	"	"	"
Lab ID: 0602013-02								Water - Sampled: 02/07/06 17:15
Sample ID: Y2DA8								Volatile Organic Compounds by EPA Method 524.2
Dichlorodifluoromethane	**ND**	**A2, J, U**	**0.5**	ug/L	B6B0057	02/13/06	02/13/06	524.2/SOP354
Chloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Vinyl chloride	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromomethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Trichlorofluoromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1-Dichloroethene	**ND**	**J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon 113)	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Acetone	**15**	**J, A2**	**4.0**	"	"	"	"	524.2/SOP354
Dichloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
trans-1,2-Dichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
tert-Butyl methyl ether (MTBE)	**ND**	**A2, J, U**	**2.0**	"	"	"	"	524.2/SOP354
1,1-Dichloroethane	**ND**	**J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
2,2-Dichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
cis-1,2-Dichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
2-Butanone (MEK)	**ND**	**A2, J, U**	**4.0**	"	"	"	"	524.2/SOP354
Bromochloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chloroform	**0.5**	**A2, J**	**0.5**	"	"	"	"	524.2/SOP354

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 03/03/06 09:52
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602013-02**								Water - Sampled: 02/07/06 17:15
Sample ID: **Y2DA8**								Volatile Organic Compounds by EPA Method 524.2
1,1,1-Trichloroethane	**8.7**	**A2, J**	**0.5**	ug/L	B6B0057	02/13/06	02/13/06	524.2/SOP354
Carbon tetrachloride	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1-Dichloropropene	**ND**	**J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
Benzene	**ND**	**J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dichloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Trichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Dibromomethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromodichloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
cis-1,3-Dichloropropene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Toluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
trans-1,3-Dichloropropene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,2-Trichloroethane	**ND**	**J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
Tetrachloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,3-Dichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chlorodibromomethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dibromoethane (EDB)	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,1,2-Tetrachloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Ethylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
m&p-Xylene	**ND**	**A2, J, U**	**1.0**	"	"	"	"	524.2/SOP354
o-Xylene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Styrene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromoform	**ND**	**C3, J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
Isopropylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromobenzene	**ND**	**J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,2,2-Tetrachloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2,3-Trichloropropane	**ND**	**J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
Propylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
2-Chlorotoluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
4-Chlorotoluene	**ND**	**J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
1,3,5-Trimethylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
tert-Butylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2,4-Trimethylbenzene	**ND**	**J, A2, U**	**0.5**	"	"	"	"	524.2/SOP354
sec-Butylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,3-Dichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
p-Isopropyltoluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,4-Dichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Butylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dibromo-3-chloropropane	**ND**	**C3, J, A2, U**	**2.0**	"	"	"	"	524.2/SOP354
1,2,4-Trichlorobenzene	**0.9**	**J, A2**	**0.5**	"	"	"	"	524.2/SOP354
Hexachlorobutadiene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Naphthalene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2,3-Trichlorobenzene	**0.8**	**J, A2**	**0.5**	"	"	"	"	524.2/SOP354

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:**	03/03/06 09:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0602013-02								Water - Sampled: 02/07/06 17:15
Sample ID: Y2DA8								Volatile Organic Compounds by EPA Method 524.2
Surrogate: 1,2-Dichloroethane-d4	*5.47*		*109 %*		*76-130%*	*B6B0057*	*02/13/06*	*02/13/06*
Surrogate: Toluene-d8	*5.08*		*102 %*		*83-120%*	*"*	*"*	*"*
Surrogate: 4-Bromofluorobenzene	*4.94*		*99 %*		*74-110%*	*"*	*"*	*"*
Surrogate: 1,2-Dichlorobenzene-d4	*4.71*		*94 %*		*69-120%*	*"*	*"*	*"*
Lab ID: 0602013-03								Water - Sampled: 02/07/06 17:45
Sample ID: Y2DA9								Volatile Organic Compounds by EPA Method 524.2
Dichlorodifluoromethane	**ND**	**A2, J, U**	**0.5**	ug/L	B6B0057	02/13/06	02/13/06	524.2/SOP354
Chloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Vinyl chloride	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromomethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Trichlorofluoromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1-Dichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon 113)	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Acetone	**14**	**A2, J**	**4.0**	"	"	"	"	524.2/SOP354
Dichloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
trans-1,2-Dichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
tert-Butyl methyl ether (MTBE)	**ND**	**A2, J, U**	**2.0**	"	"	"	"	524.2/SOP354
1,1-Dichloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
2,2-Dichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
cis-1,2-Dichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
2-Butanone (MEK)	**ND**	**A2, J, U**	**4.0**	"	"	"	"	524.2/SOP354
Bromochloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chloroform	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,1-Trichloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Carbon tetrachloride	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1-Dichloropropene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Benzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dichloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Trichloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Dibromomethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromodichloromethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
cis-1,3-Dichloropropene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Toluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
trans-1,3-Dichloropropene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,2-Trichloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Tetrachloroethene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,3-Dichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chlorodibromomethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dibromoethane (EDB)	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Chlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,1,2-Tetrachloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 03/03/06 09:52
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602013-03**								Water - Sampled: 02/07/06 17:45
Sample ID: **Y2DA9**								Volatile Organic Compounds by EPA Method 524.2
Ethylbenzene	**ND**	**A2, J, U**	**0.5**	ug/L	B6B0057	02/13/06	02/13/06	524.2/SOP354
m&p-Xylene	**ND**	**A2, J, U**	**1.0**	"	"	"	"	524.2/SOP354
o-Xylene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Styrene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromoform	**ND**	**A2, C3, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Isopropylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Bromobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,1,2,2-Tetrachloroethane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2,3-Trichloropropane	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Propylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
2-Chlorotoluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
4-Chlorotoluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,3,5-Trimethylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
tert-Butylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2,4-Trimethylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
sec-Butylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,3-Dichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
p-Isopropyltoluene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,4-Dichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Butylbenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2-Dibromo-3-chloropropane	**ND**	**A2, C3, J, U**	**2.0**	"	"	"	"	524.2/SOP354
1,2,4-Trichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Hexachlorobutadiene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Naphthalene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
1,2,3-Trichlorobenzene	**ND**	**A2, J, U**	**0.5**	"	"	"	"	524.2/SOP354
Surrogate: 1,2-Dichloroethane-d4	*5.52*		*110 %*		*76-130%*	"	"	"
Surrogate: Toluene-d8	*5.13*		*103 %*		*83-120%*	"	"	"
Surrogate: 4-Bromofluorobenzene	*5.07*		*101 %*		*74-110%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*4.79*		*96 %*		*69-120%*	"	"	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 03/03/06 09:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

R9Q

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
										Prepared & Analyzed: 02/13/06
Batch B6B0057 - - General VOA - VOCs										Volatile Organic Compounds by EPA Method 524.2 - Quality Control
Blank (B6B0057-BLK1)										
Dichlorodifluoromethane	ND	U	0.5	ug/L						
Chloromethane	ND	U	0.5	"						
Vinyl chloride	ND	U	0.5	"						
Bromomethane	ND	U	0.5	"						
Chloroethane	ND	U	0.5	"						
Trichlorofluoromethane	ND	U	0.5	"						
1,1-Dichloroethene	ND	U	0.5	"						
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon 113)	ND	U	0.5	"						
Acetone	ND	U	4.0	"						
Dichloromethane	ND	U	0.5	"						
trans-1,2-Dichloroethene	ND	U	0.5	"						
tert-Butyl methyl ether (MTBE)	ND	U	2.0	"						
1,1-Dichloroethane	ND	U	0.5	"						
2,2-Dichloropropane	ND	U	0.5	"						
cis-1,2-Dichloroethene	ND	U	0.5	"						
2-Butanone (MEK)	ND	U	4.0	"						
Bromochloromethane	ND	U	0.5	"						
Chloroform	ND	U	0.5	"						
1,1,1-Trichloroethane	ND	U	0.5	"						
Carbon tetrachloride	ND	U	0.5	"						
1,1-Dichloropropene	ND	U	0.5	"						
Benzene	ND	U	0.5	"						
1,2-Dichloroethane	ND	U	0.5	"						
Trichloroethene	ND	U	0.5	"						
1,2-Dichloropropane	ND	U	0.5	"						
Dibromomethane	ND	U	0.5	"						
Bromodichloromethane	ND	U	0.5	"						
cis-1,3-Dichloropropene	ND	U	0.5	"						
4-Methyl-2-pentanone (MIBK)	ND	U	4.0	"						
Toluene	ND	U	0.5	"						
trans-1,3-Dichloropropene	ND	U	0.5	"						
1,1,2-Trichloroethane	ND	U	0.5	"						
Tetrachloroethene	ND	U	0.5	"						
1,3-Dichloropropane	ND	U	0.5	"						
2-Hexanone	ND	U	4.0	"						
Chlorodibromomethane	ND	U	0.5	"						
1,2-Dibromoethane (EDB)	ND	U	0.5	"						
Chlorobenzene	ND	U	0.5	"						
1,1,1,2-Tetrachloroethane	ND	U	0.5	"						
Ethylbenzene	ND	U	0.5	"						
m&p-Xylene	ND	U	1.0	"						
o-Xylene	ND	U	0.5	"						
Styrene	ND	U	0.5	"						
Bromoform	ND	C3, J, U	0.5	"						
Isopropylbenzene	ND	U	0.5	"						

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 03/03/06 09:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
										Prepared & Analyzed: 02/13/06
Batch B6B0057 - - General VOA - VOCs										Volatile Organic Compounds by EPA Method 524.2 - Quality Control
Blank (B6B0057-BLK1)										
Bromobenzene	ND	U	0.5	"						
1,1,2,2-Tetrachloroethane	ND	U	0.5	"						
1,2,3-Trichloropropane	ND	U	0.5	"						
Propylbenzene	ND	U	0.5	"						
2-Chlorotoluene	ND	U	0.5	"						
4-Chlorotoluene	ND	U	0.5	"						
1,3,5-Trimethylbenzene	ND	U	0.5	"						
tert-Butylbenzene	ND	U	0.5	"						
1,2,4-Trimethylbenzene	ND	U	0.5	"						
sec-Butylbenzene	ND	U	0.5	"						
1,3-Dichlorobenzene	ND	U	0.5	"						
p-Isopropyltoluene	ND	U	0.5	"						
1,4-Dichlorobenzene	ND	U	0.5	"						
1,2-Dichlorobenzene	ND	U	0.5	"						
Butylbenzene	ND	U	0.5	"						
1,2-Dibromo-3-chloropropane	ND	C3, J, U	2.0	"						
1,2,4-Trichlorobenzene	ND	U	0.5	"						
Hexachlorobutadiene	ND	U	0.5	"						
Naphthalene	ND	U	0.5	"						
1,2,3-Trichlorobenzene	ND	U	0.5	"						
Surrogate: 1,2-Dichloroethane-d4	*5.58*			*"*	*5.00*		*112*	*76-130*		
Surrogate: Toluene-d8	*5.02*			*"*	*5.00*		*100*	*83-120*		
Surrogate: 4-Bromofluorobenzene	*4.98*			*"*	*5.00*		*100*	*74-110*		
Surrogate: 1,2-Dichlorobenzene-d4	*4.81*			*"*	*5.00*		*96*	*69-120*		
LCS (B6B0057-BS1)										
Dichlorodifluoromethane	4.23		0.5	ug/L	5.00		85	5.7-180		
Chloromethane	4.77		0.5	"	5.00		95	47-140		
Vinyl chloride	5.08		0.5	"	5.00		102	60-140		
Bromomethane	5.49		0.5	"	5.00		110	50-160		
Chloroethane	5.22		0.5	"	5.00		104	68-140		
Trichlorofluoromethane	5.29		0.5	"	5.00		106	63-150		
1,1-Dichloroethene	5.15		0.5	"	5.00		103	62-140		
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon 113)	5.28		0.5	"	5.00		106	53-150		
Acetone	39.5		4.0	"	40.0		99	32-190		
Dichloromethane	4.93		0.5	"	5.00		99	62-120		
trans-1,2-Dichloroethene	5.33		0.5	"	5.00		107	70-140		
tert-Butyl methyl ether (MTBE)	20.4		2.0	"	20.0		102	59-150		
1,1-Dichloroethane	4.59		0.5	"	5.00		92	70-140		
2,2-Dichloropropane	4.66		0.5	"	5.00		93	60-150		
cis-1,2-Dichloroethene	4.39		0.5	"	5.00		88	67-140		
2-Butanone (MEK)	37.4		4.0	"	40.0		94	58-150		
Bromochloromethane	4.20		0.5	"	5.00		84	55-150		
Chloroform	4.47		0.5	"	5.00		89	62-140		
1,1,1-Trichloroethane	5.20		0.5	"	5.00		104	76-140		
Carbon tetrachloride	5.18		0.5	"	5.00		104	62-150		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 03/03/06 09:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
										Prepared & Analyzed: 02/13/06
Batch B6B0057 - - General VOA - VOCs										Volatile Organic Compounds by EPA Method 524.2 - Quality Control
LCS (B6B0057-BS1)										
1,1-Dichloropropene	5.14		0.5	"	5.00		103	75-130		
Benzene	5.21		0.5	"	5.00		104	79-120		
1,2-Dichloroethane	5.21		0.5	"	5.00		104	77-120		
Trichloroethene	5.14		0.5	"	5.00		103	79-140		
1,2-Dichloropropane	5.33		0.5	"	5.00		107	82-120		
Dibromomethane	5.13		0.5	"	5.00		103	80-120		
Bromodichloromethane	5.35		0.5	"	5.00		107	80-130		
cis-1,3-Dichloropropene	5.24		0.5	"	5.00		105	81-130		
Toluene	5.26		0.5	"	5.00		105	83-120		
trans-1,3-Dichloropropene	5.26		0.5	"	5.00		105	80-140		
1,1,2-Trichloroethane	5.28		0.5	"	5.00		106	80-120		
Tetrachloroethene	4.86		0.5	"	5.00		97	80-130		
1,3-Dichloropropane	5.22		0.5	"	5.00		104	78-120		
Chlorodibromomethane	5.25		0.5	"	5.00		105	80-130		
1,2-Dibromoethane (EDB)	5.25		0.5	"	5.00		105	83-120		
Chlorobenzene	5.17		0.5	"	5.00		103	85-120		
1,1,1,2-Tetrachloroethane	5.36		0.5	"	5.00		107	82-130		
Ethylbenzene	5.43		0.5	"	5.00		109	83-120		
m&p-Xylene	10.9		1.0	"	10.0		109	82-120		
o-Xylene	5.37		0.5	"	5.00		107	83-130		
Styrene	5.43		0.5	"	5.00		109	84-120		
Bromoform	5.22		0.5	"	5.00		104	72-140		
Isopropylbenzene	5.42		0.5	"	5.00		108	83-130		
Bromobenzene	5.02		0.5	"	5.00		100	84-120		
1,1,2,2-Tetrachloroethane	5.29		0.5	"	5.00		106	80-120		
1,2,3-Trichloropropane	5.09		0.5	"	5.00		102	79-130		
Propylbenzene	5.51		0.5	"	5.00		110	83-130		
2-Chlorotoluene	5.40		0.5	"	5.00		108	84-120		
4-Chlorotoluene	5.45		0.5	"	5.00		109	85-120		
1,3,5-Trimethylbenzene	5.55		0.5	"	5.00		111	84-120		
tert-Butylbenzene	5.31		0.5	"	5.00		106	83-130		
1,2,4-Trimethylbenzene	5.47		0.5	"	5.00		109	86-120		
sec-Butylbenzene	5.44		0.5	"	5.00		109	81-130		
1,3-Dichlorobenzene	5.20		0.5	"	5.00		104	83-120		
p-Isopropyltoluene	5.60		0.5	"	5.00		112	83-130		
1,4-Dichlorobenzene	5.40		0.5	"	5.00		108	79-120		
1,2-Dichlorobenzene	5.19		0.5	"	5.00		104	80-120		
Butylbenzene	5.58		0.5	"	5.00		112	83-130		
1,2-Dibromo-3-chloropropane	22.6		2.0	"	20.0		113	64-131		
1,2,4-Trichlorobenzene	4.99		0.5	"	5.00		100	74-140		
Hexachlorobutadiene	4.84		0.5	"	5.00		97	76-130		
Naphthalene	5.10		0.5	"	5.00		102	64-150		
1,2,3-Trichlorobenzene	4.88		0.5	"	5.00		98	58-150		
Surrogate: 1,2-Dichloroethane-d4	*5.06*			*"*	*5.00*		*101*	*76-130*		
Surrogate: Toluene-d8	*5.10*			*"*	*5.00*		*102*	*83-120*		
Surrogate: 4-Bromofluorobenzene	*5.09*			*"*	*5.00*		*102*	*74-110*		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 03/03/06 09:52
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
										Prepared & Analyzed: 02/13/06
Batch B6B0057 - - General VOA - VOCs										Volatile Organic Compounds by EPA Method 524.2 - Quality Control
LCS (B6B0057-BS1)										
Surrogate: 1,2-Dichlorobenzene-d4	*5.04*			*"*	*5.00*		*101*	*69-120*		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:**	03/03/06 09:52
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Qualifiers and Comments

J	The reported result for this analyte should be considered an estimated value.
C3	The initial calibration for this analyte did not meet calibration criteria.
A2	The sample received above the recommended temperature range of 2 - 6 degrees C.
U	Not Detected
NR	Not Reported

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street Building 201
Richmond, CA 94804

Subject: **Analytical Testing Results - Project R06S25**
SDG: 06041C

From: **Brenda Bettencourt, Director**
EPA Region 9 Laboratory
PMD-2

To: **John Hillenbrand**
Private Site and DOE Section
SFD-8-2

Attached are the results from the analysis of samples from the **ASARCO Feb 2006 IDW Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Analyses included in this
SVOCs

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand
Project Number: R06S25
Project: ASARCO Feb 2006 IDW Sampling

Private Site and DOE Section
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06041C
Reported: 02/24/06 14:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
Y2DA7	0602013-01	Water	02/07/06 18:15	02/09/06 14:50
Y2DA8	0602013-02	Water	02/07/06 17:15	02/09/06 14:50
Y2DA9	0602013-03	Water	02/07/06 17:45	02/09/06 14:50

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:43
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602013-01**								Water - Sampled: 02/07/06 18:15
Sample ID: **Y2DA7**								Semivolatile Organic Compounds by EPA Method 8270C
1,4-Dioxane	**0.5**	**C1, J**	**1.0**	ug/L	B6B0054	02/13/06	02/15/06	8270C/SOP315
Phenol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
bis(2-Chloroethyl)ether	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
2-Chlorophenol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
1,3-Dichlorobenzene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
1,4-Dichlorobenzene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Benzyl alcohol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
1,2-Dichlorobenzene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
2-Methylphenol	**ND**	**C3, J, U**	**5.0**	"	"	"	"	8270C/SOP315
2,2'-oxybis(1-Chloropropane)	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
3&4-Methylphenol	**ND**	**C3, J, U**	**5.0**	"	"	"	"	8270C/SOP315
N-Nitrosodipropylamine	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Hexachloroethane	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Nitrobenzene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Isophorone	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
2-Nitrophenol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
2,4-Dimethylphenol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
bis(2-Chloroethoxy)methane	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
2,4-Dichlorophenol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
1,2,4-Trichlorobenzene	**0.8**	**C1, J**	**1.0**	"	"	"	"	8270C/SOP315
Naphthalene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
4-Chloroaniline	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
Hexachlorobutadiene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
4-Chloro-3-methylphenol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
2-Methylnaphthalene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Hexachlorocyclopentadiene	**ND**	**C4, J, Q3, U**	**1.0**	"	"	"	"	8270C/SOP315
2,4,6-Trichlorophenol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
2,4,5-Trichlorophenol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
2-Chloronaphthalene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
2-Nitroaniline	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
Dimethyl phthalate	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Acenaphthylene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
2,6-Dinitrotoluene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
3-Nitroaniline	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
Acenaphthene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
2,4-Dinitrophenol	**ND**	**C4, J, Q3, U**	**5.0**	"	"	"	"	8270C/SOP315
4-Nitrophenol	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
Dibenzofuran	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
2,4-Dinitrotoluene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Diethyl phthalate	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Fluorene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
4-Chlorophenyl phenyl ether	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
4-Nitroaniline	**ND**	**U**	**5.0**	"	"	"	"	8270C/SOP315
4,6-Dinitro-2-methylphenol	**ND**	**Q3, J, U**	**5.0**	"	"	"	"	8270C/SOP315
Diphenyl amine	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:43
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602013-01**								Water - Sampled: 02/07/06 18:15
Sample ID: **Y2DA7**								Semivolatile Organic Compounds by EPA Method 8270C
4-Bromophenyl phenyl ether	**ND**	**U**	**1.0**	ug/L	B6B0054	02/13/06	02/15/06	8270C/SOP315
Hexachlorobenzene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Pentachlorophenol	**ND**	**Q3, J, U**	**5.0**	"	"	"	"	8270C/SOP315
Phenanthrene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Anthracene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Carbazole	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Di-n-butyl phthalate	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Fluoranthene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Pyrene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Butyl benzyl phthalate	**0.5**	**C1, J**	**1.0**	"	"	"	"	8270C/SOP315
Benzo(a)anthracene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
3,3'-Dichlorobenzidine	**ND**	**C3, J, U**	**5.0**	"	"	"	"	8270C/SOP315
Chrysene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
bis(2-Ethylhexyl) phthalate	**1.3**	**B1, J**	**1.0**	"	"	"	"	8270C/SOP315
Di-n-octyl phthalate	**ND**	**C3, J, U**	**1.0**	"	"	"	"	8270C/SOP315
Benzo(b)fluoranthene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Benzo(k)fluoranthene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Benzo(a)pyrene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
Indeno(1,2,3-cd)pyrene	**ND**	**C3, J, U**	**1.0**	"	"	"	"	8270C/SOP315
Dibenz(a,h)anthracene	**ND**	**C3, J, U**	**1.0**	"	"	"	"	8270C/SOP315
Benzo(g,h,i)perylene	**ND**	**U**	**1.0**	"	"	"	"	8270C/SOP315
4-Pyrazolin-3-one, 1-phenyl-	**4.9**	**N TIC, J**		"	"	"	"	8270C/SOP315
Indazole, nitro	**13**	**N TIC, J**		"	"	"	"	8270C/SOP315
Stigmasterol	**11**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown oxygenated	**2.0**	**N TIC, J**		"	"	"	"	8270C/SOP315
Surrogate: 1,4-Dioxane-d8	*3.06*		*64 %*		*18-130%*	"	"	"
Surrogate: 2-Fluorophenol	*50.0*		*70 %*		*32-130%*	"	"	"
Surrogate: Phenol-d5	*51.4*		*72 %*		*42-120%*	"	"	"
Surrogate: 2-Chlorophenol-d4	*52.8*		*74 %*		*42-120%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*31.3*		*66 %*		*24-110%*	"	"	"
Surrogate: Nitrobenzene-d5	*34.6*		*73 %*		*27-140%*	"	"	"
Surrogate: 2-Fluorobiphenyl	*35.7*		*75 %*		*45-110%*	"	"	"
Surrogate: 2,4,6-Tribromophenol	*69.1*		*97 %*		*44-140%*	"	"	"
Surrogate: Terphenyl-d14	*53.4*		*112 %*		*28-140%*	"	"	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:43
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602013-02**								Water - Sampled: 02/07/06 17:15
Sample ID: **Y2DA8**								Semivolatile Organic Compounds by EPA Method 8270C
1,4-Dioxane	**0.5**	**C1, J**	**0.9**	ug/L	B6B0054	02/13/06	02/16/06	8270C/SOP315
Phenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
bis(2-Chloroethyl)ether	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2-Chlorophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
1,3-Dichlorobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
1,4-Dichlorobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Benzyl alcohol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
1,2-Dichlorobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2-Methylphenol	**ND**	**C3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
2,2'-oxybis(1-Chloropropane)	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
3&4-Methylphenol	**ND**	**C3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
N-Nitrosodipropylamine	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Hexachloroethane	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Nitrobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Isophorone	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2-Nitrophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
2,4-Dimethylphenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
bis(2-Chloroethoxy)methane	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2,4-Dichlorophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
1,2,4-Trichlorobenzene	**0.8**	**C1, J**	**0.9**	"	"	"	"	8270C/SOP315
Naphthalene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
4-Chloroaniline	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
Hexachlorobutadiene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
4-Chloro-3-methylphenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
2-Methylnaphthalene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Hexachlorocyclopentadiene	**ND**	**C4, J, Q3, U**	**0.9**	"	"	"	"	8270C/SOP315
2,4,6-Trichlorophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
2,4,5-Trichlorophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
2-Chloronaphthalene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2-Nitroaniline	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
Dimethyl phthalate	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Acenaphthylene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2,6-Dinitrotoluene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
3-Nitroaniline	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
Acenaphthene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2,4-Dinitrophenol	**ND**	**C4, J, Q3, U**	**4.7**	"	"	"	"	8270C/SOP315
4-Nitrophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
Dibenzofuran	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2,4-Dinitrotoluene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Diethyl phthalate	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Fluorene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
4-Chlorophenyl phenyl ether	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
4-Nitroaniline	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
4,6-Dinitro-2-methylphenol	**ND**	**Q3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
Diphenyl amine	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:43
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602013-02**								Water - Sampled: 02/07/06 17:15
Sample ID: **Y2DA8**								Semivolatile Organic Compounds by EPA Method 8270C
4-Bromophenyl phenyl ether	**ND**	**U**	**0.9**	ug/L	B6B0054	02/13/06	02/16/06	8270C/SOP315
Hexachlorobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Pentachlorophenol	**ND**	**Q3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
Phenanthrene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Anthracene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Carbazole	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Di-n-butyl phthalate	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Fluoranthene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Pyrene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Butyl benzyl phthalate	**0.5**	**C1, J**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(a)anthracene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
3,3'-Dichlorobenzidine	**ND**	**C3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
Chrysene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
bis(2-Ethylhexyl) phthalate	**1.4**	**B1, J**	**0.9**	"	"	"	"	8270C/SOP315
Di-n-octyl phthalate	**ND**	**C3, J, U**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(b)fluoranthene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(k)fluoranthene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(a)pyrene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Indeno(1,2,3-cd)pyrene	**ND**	**C3, J, U**	**0.9**	"	"	"	"	8270C/SOP315
Dibenz(a,h)anthracene	**ND**	**C3, J, U**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(g,h,i)perylene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
13-Docosenamide, (Z)-	**11**	**N TIC, J**		"	"	"	"	8270C/SOP315
Alkane: Branched	**5.0**	**N TIC, J**		"	"	"	"	8270C/SOP315
Indazole, nitro	**11**	**N TIC, J**		"	"	"	"	8270C/SOP315
Stigmasterol	**11**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown 7	**4.9**	**N TIC, J**		"	"	"	"	8270C/SOP315
Surrogate: 1,4-Dioxane-d8	*3.13*		*66 %*		*18-130%*	"	"	"
Surrogate: 2-Fluorophenol	*48.4*		*68 %*		*32-130%*	"	"	"
Surrogate: Phenol-d5	*48.1*		*68 %*		*42-120%*	"	"	"
Surrogate: 2-Chlorophenol-d4	*49.0*		*69 %*		*42-120%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*27.9*		*59 %*		*24-110%*	"	"	"
Surrogate: Nitrobenzene-d5	*33.1*		*70 %*		*27-140%*	"	"	"
Surrogate: 2-Fluorobiphenyl	*33.2*		*70 %*		*45-110%*	"	"	"
Surrogate: 2,4,6-Tribromophenol	*64.2*		*90 %*		*44-140%*	"	"	"
Surrogate: Terphenyl-d14	*47.7*		*100 %*		*28-140%*	"	"	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:43
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602013-03**								Water - Sampled: 02/07/06 17:45
Sample ID: **Y2DA9**								Semivolatile Organic Compounds by EPA Method 8270C
1,4-Dioxane	**ND**	**U**	**0.9**	ug/L	B6B0054	02/13/06	02/16/06	8270C/SOP315
Phenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
bis(2-Chloroethyl)ether	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2-Chlorophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
1,3-Dichlorobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
1,4-Dichlorobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Benzyl alcohol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
1,2-Dichlorobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2-Methylphenol	**ND**	**C3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
2,2'-oxybis(1-Chloropropane)	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
3&4-Methylphenol	**ND**	**C3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
N-Nitrosodipropylamine	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Hexachloroethane	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Nitrobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Isophorone	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2-Nitrophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
2,4-Dimethylphenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
bis(2-Chloroethoxy)methane	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2,4-Dichlorophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
1,2,4-Trichlorobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Naphthalene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
4-Chloroaniline	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
Hexachlorobutadiene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
4-Chloro-3-methylphenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
2-Methylnaphthalene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Hexachlorocyclopentadiene	**ND**	**C4, J, Q3, U**	**0.9**	"	"	"	"	8270C/SOP315
2,4,6-Trichlorophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
2,4,5-Trichlorophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
2-Chloronaphthalene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2-Nitroaniline	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
Dimethyl phthalate	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Acenaphthylene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2,6-Dinitrotoluene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
3-Nitroaniline	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
Acenaphthene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2,4-Dinitrophenol	**ND**	**C4, J, Q3, U**	**4.7**	"	"	"	"	8270C/SOP315
4-Nitrophenol	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
Dibenzofuran	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
2,4-Dinitrotoluene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Diethyl phthalate	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Fluorene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
4-Chlorophenyl phenyl ether	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
4-Nitroaniline	**ND**	**U**	**4.7**	"	"	"	"	8270C/SOP315
4,6-Dinitro-2-methylphenol	**ND**	**Q3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
Diphenyl amine	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:43
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **0602013-03**								Water - Sampled: 02/07/06 17:45
Sample ID: **Y2DA9**								Semivolatile Organic Compounds by EPA Method 8270C
4-Bromophenyl phenyl ether	**ND**	**U**	**0.9**	ug/L	B6B0054	02/13/06	02/16/06	8270C/SOP315
Hexachlorobenzene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Pentachlorophenol	**ND**	**Q3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
Phenanthrene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Anthracene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Carbazole	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Di-n-butyl phthalate	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Fluoranthene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Pyrene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Butyl benzyl phthalate	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(a)anthracene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
3,3'-Dichlorobenzidine	**ND**	**C3, J, U**	**4.7**	"	"	"	"	8270C/SOP315
Chrysene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
bis(2-Ethylhexyl) phthalate	**1.1**	**B1, J**	**0.9**	"	"	"	"	8270C/SOP315
Di-n-octyl phthalate	**ND**	**C3, J, U**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(b)fluoranthene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(k)fluoranthene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(a)pyrene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
Indeno(1,2,3-cd)pyrene	**ND**	**C3, J, U**	**0.9**	"	"	"	"	8270C/SOP315
Dibenz(a,h)anthracene	**ND**	**C3, J, U**	**0.9**	"	"	"	"	8270C/SOP315
Benzo(g,h,i)perylene	**ND**	**U**	**0.9**	"	"	"	"	8270C/SOP315
13-Docosenamide, (Z)-	**2.4**	**N TIC, J**		"	"	"	"	8270C/SOP315
Ethanol, 2-[2-[2-[2-[p-(1,1...	**7.1**	**N TIC, J**		"	"	"	"	8270C/SOP315
Ethanol, 2-[2-[4-(1,1,3,3-t...	**30**	**N TIC, J**		"	"	"	"	8270C/SOP315
Ethanol, 2-butoxy-, phospha...	**2.4**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown 10	**3.6**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown 4	**7.9**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown 6	**18**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown 7	**2.2**	**N TIC, J**		"	"	"	"	8270C/SOP315
unknown C20H34O4	**13**	**N TIC, J**		"	"	"	"	8270C/SOP315
Surrogate: 1,4-Dioxane-d8	*2.60*		*55 %*		*18-130%*	"	"	"
Surrogate: 2-Fluorophenol	*42.0*		*59 %*		*32-130%*	"	"	"
Surrogate: Phenol-d5	*44.0*		*62 %*		*42-120%*	"	"	"
Surrogate: 2-Chlorophenol-d4	*43.9*		*62 %*		*42-120%*	"	"	"
Surrogate: 1,2-Dichlorobenzene-d4	*23.7*		*50 %*		*24-110%*	"	"	"
Surrogate: Nitrobenzene-d5	*28.9*		*61 %*		*27-140%*	"	"	"
Surrogate: 2-Fluorobiphenyl	*29.6*		*62 %*		*45-110%*	"	"	"
Surrogate: 2,4,6-Tribromophenol	*67.7*		*95 %*		*44-140%*	"	"	"
Surrogate: Terphenyl-d14	*42.8*		*90 %*		*28-140%*	"	"	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:43
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

R9Q

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

Prepared: 02/13/06 Analyzed: 02/15/06

Batch B6B0054 - 3520B CLLE - SVOCs Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Blank (B6B0054-BLK1)

1,4-Dioxane	ND	U	1.0	ug/L
Phenol	ND	U	5.0	"
bis(2-Chloroethyl)ether	ND	U	1.0	"
2-Chlorophenol	ND	U	5.0	"
1,3-Dichlorobenzene	ND	U	1.0	"
1,4-Dichlorobenzene	ND	U	1.0	"
Benzyl alcohol	ND	U	5.0	"
1,2-Dichlorobenzene	ND	U	1.0	"
2-Methylphenol	ND	J, C3, U	5.0	"
2,2'-oxybis(1-Chloropropane)	ND	U	1.0	"
3&4-Methylphenol	ND	J, C3, U	5.0	"
N-Nitrosodipropylamine	ND	U	1.0	"
Hexachloroethane	ND	U	1.0	"
Nitrobenzene	ND	U	1.0	"
Isophorone	ND	U	1.0	"
2-Nitrophenol	ND	U	5.0	"
2,4-Dimethylphenol	ND	U	5.0	"
bis(2-Chloroethoxy)methane	ND	U	1.0	"
2,4-Dichlorophenol	ND	U	5.0	"
1,2,4-Trichlorobenzene	ND	U	1.0	"
Naphthalene	ND	U	1.0	"
4-Chloroaniline	ND	U	5.0	"
Hexachlorobutadiene	ND	U	1.0	"
4-Chloro-3-methylphenol	ND	U	5.0	"
2-Methylnaphthalene	ND	U	1.0	"
Hexachlorocyclopentadiene	ND	C4, J, Q3, U	1.0	"
2,4,6-Trichlorophenol	ND	U	5.0	"
2,4,5-Trichlorophenol	ND	U	5.0	"
2-Chloronaphthalene	ND	U	1.0	"
2-Nitroaniline	ND	U	5.0	"
Dimethyl phthalate	ND	U	1.0	"
Acenaphthylene	ND	U	1.0	"
2,6-Dinitrotoluene	ND	U	1.0	"
3-Nitroaniline	ND	U	5.0	"
Acenaphthene	ND	U	1.0	"
2,4-Dinitrophenol	ND	C4, J, Q3, U	5.0	"
4-Nitrophenol	ND	U	5.0	"
Dibenzofuran	ND	U	1.0	"
2,4-Dinitrotoluene	ND	U	1.0	"
Diethyl phthalate	ND	U	1.0	"
Fluorene	ND	U	1.0	"
4-Chlorophenyl phenyl ether	ND	U	1.0	"
4-Nitroaniline	ND	U	5.0	"
4,6-Dinitro-2-methylphenol	ND	Q3, J, U	5.0	"
Diphenyl amine	ND	U	1.0	"

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:43
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
										Prepared: 02/13/06 Analyzed: 02/15/06
Batch B6B0054 - 3520B CLLE - SVOCs										Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
Blank (B6B0054-BLK1)										
4-Bromophenyl phenyl ether	ND	U	1.0	"						
Hexachlorobenzene	ND	U	1.0	"						
Pentachlorophenol	ND	Q3, J, U	5.0	"						
Phenanthrene	ND	U	1.0	"						
Anthracene	ND	U	1.0	"						
Carbazole	ND	U	1.0	"						
Di-n-butyl phthalate	ND	U	1.0	"						
Fluoranthene	ND	U	1.0	"						
Pyrene	ND	U	1.0	"						
Butyl benzyl phthalate	ND	U	1.0	"						
Benzo(a)anthracene	ND	U	1.0	"						
3,3'-Dichlorobenzidine	ND	C3, J, U	5.0	"						
Chrysene	ND	U	1.0	"						
bis(2-Ethylhexyl) phthalate	0.9	C1, J	1.0	"						
Di-n-octyl phthalate	ND	C3, J, U	1.0	"						
Benzo(b)fluoranthene	ND	U	1.0	"						
Benzo(k)fluoranthene	ND	U	1.0	"						
Benzo(a)pyrene	ND	U	1.0	"						
Indeno(1,2,3-cd)pyrene	ND	C3, J, U	1.0	"						
Dibenz(a,h)anthracene	ND	C3, J, U	1.0	"						
Benzo(g,h,i)perylene	ND	U	1.0	"						
Surrogate: 1,4-Dioxane-d8	*3.51*			*"*	*5.00*		*70*	*18-130*		
Surrogate: 2-Fluorophenol	*58.8*			*"*	*75.0*		*78*	*32-130*		
Surrogate: Phenol-d5	*60.0*			*"*	*75.0*		*80*	*42-120*		
Surrogate: 2-Chlorophenol-d4	*60.8*			*"*	*75.0*		*81*	*42-120*		
Surrogate: 1,2-Dichlorobenzene-d4	*34.6*			*"*	*50.0*		*69*	*24-110*		
Surrogate: Nitrobenzene-d5	*40.9*			*"*	*50.0*		*82*	*27-140*		
Surrogate: 2-Fluorobiphenyl	*41.0*			*"*	*50.0*		*82*	*45-110*		
Surrogate: 2,4,6-Tribromophenol	*68.0*			*"*	*75.0*		*91*	*44-140*		
Surrogate: Terphenyl-d14	*62.9*			*"*	*50.0*		*126*	*28-140*		
LCS (B6B0054-BS1)										
1,4-Dioxane	11.4		1.0	ug/L	10.0		114	64-130		
Phenol	39.8		5.0	"	50.0		80	66-110		
bis(2-Chloroethyl)ether	10.5		1.0	"	10.0		105	50-120		
2-Chlorophenol	42.2		5.0	"	50.0		84	67-110		
1,3-Dichlorobenzene	5.48		1.0	"	10.0		55	39-98		
1,4-Dichlorobenzene	5.82		1.0	"	10.0		58	40-97		
Benzyl alcohol	43.0		5.0	"	50.0		86	62-140		
1,2-Dichlorobenzene	6.40		1.0	"	10.0		64	43-100		
2-Methylphenol	39.6		5.0	"	50.0		79	66-110		
2,2'-oxybis(1-Chloropropane)	8.10		1.0	"	10.0		81	55-120		
3&4-Methylphenol	39.9		5.0	"	50.0		80	69-110		
N-Nitrosodipropylamine	8.02		1.0	"	10.0		80	55-120		
Hexachloroethane	4.14		1.0	"	10.0		41	32-89		
Nitrobenzene	8.82		1.0	"	10.0		88	53-120		
Isophorone	9.52		1.0	"	10.0		95	66-110		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041C
Project Number: R06S25	**75 Hawthorne Street**	**Reported:**	02/24/06 14:43
Project: ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Quality Control

Prepared: 02/13/06 Analyzed: 02/15/06

Batch B6B0054 - 3520B CLLE - SVOCs Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

LCS (B6B0054-BS1)

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
2-Nitrophenol	42.5		5.0	"	50.0		85	67-110		
2,4-Dimethylphenol	39.1		5.0	"	50.0		78	62-120		
bis(2-Chloroethoxy)methane	8.16		1.0	"	10.0		82	55-120		
2,4-Dichlorophenol	42.3		5.0	"	50.0		85	69-120		
1,2,4-Trichlorobenzene	6.39		1.0	"	10.0		64	42-100		
Naphthalene	7.92		1.0	"	10.0		79	45-110		
4-Chloroaniline	40.8		5.0	"	50.0		82	1.9-160		
Hexachlorobutadiene	3.96		1.0	"	10.0		40	31-90		
4-Chloro-3-methylphenol	44.8		5.0	"	50.0		90	71-120		
2-Methylnaphthalene	7.54		1.0	"	10.0		75	50-110		
Hexachlorocyclopentadiene	1.09		1.0	"	10.0		11	7.4-46		
2,4,6-Trichlorophenol	47.3		5.0	"	50.0		95	68-120		
2,4,5-Trichlorophenol	40.9		5.0	"	50.0		82	73-120		
2-Chloronaphthalene	7.41		1.0	"	10.0		74	50-110		
2-Nitroaniline	45.8		5.0	"	50.0		92	69-120		
Dimethyl phthalate	8.82		1.0	"	10.0		88	63-140		
Acenaphthylene	7.89		1.0	"	10.0		79	48-110		
2,6-Dinitrotoluene	8.94		1.0	"	10.0		89	64-120		
3-Nitroaniline	48.7		5.0	"	50.0		97	48-140		
Acenaphthene	10.3		1.0	"	10.0		103	53-110		
2,4-Dinitrophenol	48.2		5.0	"	50.0		96	45-150		
4-Nitrophenol	53.5		5.0	"	50.0		107	58-150		
Dibenzofuran	8.35		1.0	"	10.0		84	60-120		
2,4-Dinitrotoluene	9.23		1.0	"	10.0		92	66-140		
Diethyl phthalate	8.58		1.0	"	10.0		86	64-140		
Fluorene	8.63		1.0	"	10.0		86	55-120		
4-Chlorophenyl phenyl ether	8.30		1.0	"	10.0		83	56-120		
4-Nitroaniline	49.6		5.0	"	50.0		99	47-150		
4,6-Dinitro-2-methylphenol	45.9		5.0	"	50.0		92	69-130		
Diphenyl amine	7.81		1.0	"	10.0		78	14-120		
4-Bromophenyl phenyl ether	8.42		1.0	"	10.0		84	61-130		
Hexachlorobenzene	8.47		1.0	"	10.0		85	68-110		
Pentachlorophenol	52.4		5.0	"	50.0		105	67-140		
Phenanthrene	9.37		1.0	"	10.0		94	60-120		
Anthracene	7.79		1.0	"	10.0		78	57-110		
Carbazole	7.42		1.0	"	10.0		74	49-140		
Di-n-butyl phthalate	9.42		1.0	"	10.0		94	61-150		
Fluoranthene	8.87		1.0	"	10.0		89	64-120		
Pyrene	9.34		1.0	"	10.0		93	62-120		
Butyl benzyl phthalate	10.6		1.0	"	10.0		106	59-160		
Benzo(a)anthracene	9.03		1.0	"	10.0		90	61-120		
3,3'-Dichlorobenzidine	49.6		5.0	"	50.0		99	42-140		
Chrysene	8.73		1.0	"	10.0		87	63-120		
bis(2-Ethylhexyl) phthalate	11.4		1.0	"	10.0		114	64-160		
Di-n-octyl phthalate	9.28		1.0	"	10.0		93	60-150		
Benzo(b)fluoranthene	8.65		1.0	"	10.0		86	59-120		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:** 06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:** 02/24/06 14:43
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
									Prepared: 02/13/06	Analyzed: 02/15/06
Batch B6B0054 - 3520B CLLE - SVOCs									Semivolatile Organic Compounds by EPA Method 8270C - Quality Control	
LCS (B6B0054-BS1)										
Benzo(k)fluoranthene	9.64		1.0	"	10.0		96	64-120		
Benzo(a)pyrene	8.39		1.0	"	10.0		84	56-110		
Indeno(1,2,3-cd)pyrene	9.64		1.0	"	10.0		96	61-120		
Dibenz(a,h)anthracene	10.5		1.0	"	10.0		105	64-120		
Benzo(g,h,i)perylene	9.53		1.0	"	10.0		95	63-120		
Surrogate: 1,4-Dioxane-d8	*3.19*			"	*5.00*		*64*	*18-130*		
Surrogate: 2-Fluorophenol	*53.5*			"	*75.0*		*71*	*32-130*		
Surrogate: Phenol-d5	*52.8*			"	*75.0*		*70*	*42-120*		
Surrogate: 2-Chlorophenol-d4	*55.8*			"	*75.0*		*74*	*42-120*		
Surrogate: 1,2-Dichlorobenzene-d4	*31.8*			"	*50.0*		*64*	*24-110*		
Surrogate: Nitrobenzene-d5	*37.0*			"	*50.0*		*74*	*27-140*		
Surrogate: 2-Fluorobiphenyl	*34.9*			"	*50.0*		*70*	*45-110*		
Surrogate: 2,4,6-Tribromophenol	*69.4*			"	*75.0*		*93*	*44-140*		
Surrogate: Terphenyl-d14	*54.9*			"	*50.0*		*110*	*28-140*		

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	John Hillenbrand	**Private Site and DOE Section**	**SDG:**	06041C
Project Number:	R06S25	**75 Hawthorne Street**	**Reported:**	02/24/06 14:43
Project:	ASARCO Feb 2006 IDW Sampling	**San Francisco CA, 94105**		

Qualifiers and Comments

Q3	The quantitation limit standard did not meet recovery criteria for this analyte.
N TIC	Tentatively Idenitified Compound - This compound was identified only by match with mass spectral library. Identification and quantitation should be considered tentative and presumptive.
J	The reported result for this analyte should be considered an estimated value.
C4	The calibration verification check did not meet % difference criteria for this analyte.
C3	The initial calibration for this analyte did not meet calibration criteria.
C1	The reported concentration for this analyte is below the quantitation limit.
B1	The concentration of this analyte found in this sample was less than five times the concentration found in the associated method blank.
U	Not Detected
NR	Not Reported

Appendix I
Summary of Terrestrial and Wildlife Observations

ASARCO LLC Hayden Plant Site

Summary of Ecological Evaluation Site Visit of April 27-28, 2006

PREPARED FOR: U.S. Environmental Protection Agency, Region IX

PREPARED BY: Gary Santolo/CH2M HILL
Christine Arenal/CH2M HILL

DATE: January 5, 2007 (replacing draft version of October 25, 2006)

PROJECT NUMBER: 335404.FI.04

1. Introduction and Purpose

This technical memorandum presents the results of Task 3f from the *Final Workplan – Remedial Investigation at the ASARCO LLC Hayden Plant Site* (RI Workplan, CH2M HILL, 2005). The purpose of this task of the RI is to characterize the terrestrial and aquatic habitats in the project area. Additionally, the terrestrial and aquatic habitats in a reference area were characterized for comparison to the study area. These characterizations in the project and reference areas include general habitat mapping and wildlife observations, and were generally conducted according to guidance for ecological assessments provided by EPA (1997).

2. Participants

The site visit for the ecological evaluation occurred on April 27-28, 2006. Participants included Gary Santolo, Donna Roraback, and Allan Erickson from CH2M HILL (both days), Ned Black from the U.S. Environmental Protection Agency (EPA, April 27 only), Marc Dahlberg from Arizona Fish and Game (AFGD, April 27 only), Carrie Marr from the U.S. Fish and Wildlife Service (USFWS) (April 28 only), and Leucretia Holle from ASARCO (both days).

3. Field Equipment and Measurements

The equipment required for the ecological investigation, the calibration of this equipment, and the field measurements taken are described in the following subsections.

Equipment for Creating the Preliminary Habitat Maps

- High-resolution aerial photographs
- Topographic maps
- National Wetlands Inventory maps
- National Resources Conservation Service (NRCS) soil maps

Equipment for Walking Surveys/Habitat Characterization

- Digital camera
- Hand-held GPS unit
- Field parameter multi-meter
  - pH meter
  - Dissolved oxygen (DO) meter
  - Conductivity meter
  - Thermometer
  - Turbidity meter
- Tape measure
- Binoculars
- Diameter Breast-height (DBH) Tape
- Habitat assessment forms
- Wildlife observation forms

a. Calibration and Maintenance of Field Equipment

As indicated above, several instruments were used in the field effort, including a GPS instrument and field parameter meters (pH, conductivity, turbidity, thermometer, DO). To ensure that the instruments were operating properly and producing accurate and reliable data, routine calibration was performed prior to and during use in the field. Factory calibrations were performed at a frequency recommended by the manufacturer. Field calibrations were performed at least once per day, prior to instrument use. If field calibration revealed that the instrument was outside established accuracy limits, the instrument was serviced in the field. A backup instrument was available for each of the critical real-time instruments used in the field (e.g., multi-meter for measuring pH, DO, conductivity, temperature, and turbidity).

Preventive maintenance for field equipment was carried out in accordance with procedures and schedules outlined in the operation and maintenance handbook of each particular model. The maintenance responsibilities for field equipment were assigned collectively to the field team leader (Gary Santolo) and field team members (Donna Roraback and Allan Erickson). The field team using the equipment was responsible for checking the status of the equipment prior to use and reporting any problems encountered. The field team was also responsible for ensuring that critical spare parts were included as part of the field equipment checklist. Non-operational field equipment was removed from service and a replacement obtained[1].

All field instruments were properly protected against inclement weather conditions during the field investigation. Each instrument is specially designed to maintain its operating integrity during variable temperature ranges that are representative of ranges that were encountered during the working conditions. At the end of each working day, all field equipment was taken out of the field for overnight storage.

[1] Original equipment for water chemistry was not completely operational. Data were collected using equipment on loan from Arizona Fish and Game.

b. Field Measurements

Prior to beginning the field study, preliminary habitat maps were created using existing remote sensing data (i.e., recent, high-resolution aerial photographs of the area, topographic maps, National Wetlands Inventory maps, and NRCS soil maps). The resulting habitat maps were then verified by field surveys. Field measurements for each habitat type (terrestrial, aquatic – non-flowing systems, aquatic – flowing systems, and wetland) are outlined in the respective checklists included in the Checklist for Ecological Assessment/Sampling form from EPA (1997). This checklist for each site is provided in Appendix A. The checklist for each habitat type was used in the field for recording the field measurement data. A brief summary of the primary field measurements included in the field surveys are described below by basic habitat type.

Terrestrial Habitat Field Measurements

As part of the field survey within each delineated terrestrial habitat type at a selected location, a qualitative evaluation was conducted. The following primary measurements for terrestrial habitats were collected:

- Dominant plant species;
    - estimated percentage total vegetative cover
    - estimated vegetative cover height
- Any evidence of stressed vegetation (if present);
- Visual and auditory observations of wildlife species, as well as other indicators of wildlife use (e.g., burrows, tracks, scat, rubs, etc.);
- Digital photographs of each habitat type; and
- GPS coordinates of all locations for each habitat using a sub-meter accuracy GPS unit.

Additional information for terrestrial habitats were recorded as indicated in the terrestrial habitat checklist (Section II of the Checklist for Ecological Assessment/Sampling) provided in Appendix A. Examples of these additional measurements include percent cover, predominant tree size in wooded areas (Diameter at Breast Height; DBH), average scrub/shrub height, and average height of the dominant plant in open field habitat.

Aquatic Habitat Field Measurements

The qualitative evaluation for the aquatic habitats included the same primary measurements as outlined above for terrestrial habitats. In addition, the following measurements specific to aquatic habitats were recorded:

- Width and depth of water body (estimated)
- pH, temperature, DO, conductivity, and turbidity
- Flow velocity (if applicable)

Additional information for aquatic habitats was recorded as indicated in the aquatic habitat checklists (Section III and IV of the Checklist for Ecological Assessment/Sampling) provided in Appendix A. Examples of these additional measurements include general composition of the substrate (substrate types provided in checklist), source of water for non-flowing water bodies, and bank condition for flowing systems.

4. Ecological Investigation Field Procedures

The first steps for the field survey occurred prior to going into the field. These included determining the project and reference areas and creating preliminary habitat maps from aerial photographs of the project and reference areas. The procedures for these steps, along with the procedures for conducting the walking survey are described in this subsection.

a. Procedures for Determining the Project and Reference Area

The project area was defined in the RI Workplan (CH2M HILL, 2005) using available Site information. Generally, the project area includes all terrestrial and aquatic habitat within the rectangle trending northwest-southeast and superimposed over the Gila and San Pedro River valleys as shown in Figure 4-5 from the RI Workplan (attached). The project area spans five miles on both sides of a line extending from two miles east-southeast of Winkelman to northwest of Hayden about half way to the town of Kearny. This area also incorporates the towns of Hayden and Winkelman and associated ASARCO process facilities. Because little ecological habitat is expected in these residential and industrial areas, field surveys were not conducted within the towns or ASARCO facilities.

The reference area was selected from an area with similar terrestrial and aquatic habitats as the project area, and following guidance provided in EPA (1994). These included physical (water, sediment, soil, and habitat structure characteristics), climatic (regional and local), and biological (community characteristics) characteristics. A summary of these potential characteristics is presented in Table 1. These characteristics were considered in the selection of the reference area.

TABLE 1
Some Characteristics to Consider When Selecting Reference Locations

Category of Characteristic	Type of Characteristic	Characteristic Attributes
Physical	Water	Temperature, Chemistry, Depth, Flow
	Sediment	Total organic carbon; total acid-volatile sulfides; percent sand, silt, clay, water
	Soil	Particle size distribution, organic matter content, hydrologic regime, chemistry
	Habitat Structure	Stream/lake bottom structure, stream/lake-side cover, vertical stratification, horizontal variation, percent cover
Climatic	Regional	Latitude, proximity to mountains and large water bodies
	Local	Topography (valleys, hilltops), altitude, aspect (north- or south-facing slopes), solar radiation
Biological	Community Characteristics	Species abundance, species richness, diversity, trophic structure, history of species introductions

Notes: Table duplicated from EPA , 1997

b. Procedures for Creating Preliminary Habitat Maps from Aerial Photographs

Delineation of terrestrial and aquatic habitats was based primarily on existing remote sensing data. Initial habitat delineation was conducted using recent, high-resolution aerial photographs of the area, topographic maps, National Wetlands Inventory maps, and NRCS soil maps. Habitat types were classified broadly into four categories: river, stable riparian, ruderal (disturbed) riparian, and upland. The initial habitat delineation will be digitized into a GIS database and mapped on high resolution aerial photograph base maps.

c. Procedures for Conducting the Walking Survey

Limited field surveys were conducted to verify/ground-truth assigned terrestrial and aquatic habitat types as determined by the initial maps; to identify habitats in the vicinity of soil, sediment, and water sampling areas; and to record characteristic vegetation and general wildlife utilization patterns within the project area, as well as within a reference area (i.e., an area with similar vegetation, geology, slope, etc., but that is not impacted by the Site). Field surveys were planned to occur during the month of April, as this is a time when vegetation and wildlife, especially flowering plants and resident birds, would be most abundant. The time spent at each site was limited and wildlife observations were not systematic but opportunistic.

As part of the field survey within each delineated habitat type at a selected location, a qualitative evaluation was conducted in which the dominant plant species were identified, any evidence of stressed vegetation (if present) was recorded, and aquatic resources were qualitatively and quantitatively (to a limited extent) described. The data collected was in accordance with the terrestrial and aquatic habitat checklists provided in EPA (1997). This checklist was used in the field and completed checklists are reproduced in Appendix A. Photo-documentation of each habitat type was compiled for reference and documentation of future changes or improvements in habitat quality for the Site. The location of each habitat area was mapped using a sub-meter accuracy GPS unit.

As previously indicated, direct observation, calls, or sign of wildlife in the project area was recorded during the terrestrial and aquatic habitat characterization field surveys. This sampling was incidental to the habitat characterization efforts. No active survey techniques such as using kicknets to identify benthic invertebrates or searching under logs, rocks, and debris for herpetiles were used due to time constraints. Observations, including species, number present, observation, and remarks/comments, were recorded directly on the site checklist. Digital photos of sign were taken and locations of direct observations and sign were recorded directly on the site checklists. In addition to Site surveys, appropriate literature and database reviews and consultations with United States Fish & Wildlife Services (USFWS) and Arizona Game and Fish Department (AGFD) was conducted to determine the existence or potential utilization of the project area by species of special status, as designated by state or federal natural resource management agencies. Specifically, AGFD was contacted to request a query of the Natural Diversity Database prior to conducting surveys. This query identified protected species known to occur in the area. Observations of any special-status species or sensitive habitat areas observed during the field surveys were recorded.

GPS data collected in the field was exported into the habitat characterization GIS database for final mapping onto high resolution aerial photograph base maps. This task includes development of the initial Site map and collection of the GPS data for verifying the map. The final habitat characterization map will be developed as part of the Ecological Risk Assessment.

d. Procedures for Photograph Documentation

Documentation of the following information was digitally recorded for each photograph: date and time, name of the site and task, general description of the subject, location of the site photograph, and photograph number.

A copy of the photographs used for the Site descriptions will be placed in the project file with the information outlined above. A select set have been included to exemplify sites described in Appendix A.

5. Summary of Existing Information

The Gila-San Pedro River confluence area has been subject to considerable ecological characterization due to the presence of the southwestern willow flycatcher, a federally endangered species, in the area. The following list of flycatcher-related studies is available for use in the risk evaluations for this species:

- *Southwestern Willow Flycatcher Survey and Nest Monitoring Reports* for 2000 through 2003 (Paradzick et al., 2001; Smith et al., 2002; Smith et al., 2003; and Smith et al., 2004);
- *Southwestern Willow Flycatcher Breeding Site and Territory Summaries* for 2000 through 2002 (Sogge et al., 2001; Sogge et al., 2002; and Sogge et al., 2003);
- *Physiological Condition of Southwestern Willow Flycatchers in Native and Saltcedar Habitats* (Owen and Sogge, 2002);
- *A Quantitative Analysis of the Diet of Southwestern Willow Flycatchers in the Gila Valley, New Mexico* (DeLay et al., 2002);
- *Mapping and Monitoring Southwestern Willow Flycatcher Breeding Habitat in Arizona: A Remote Sensing Approach* (Dockens and Paradzick, 2004);
- *Banding and Population Genetics of Southwestern Willow Flycatchers in Arizona – 1997 Summary Report* (Paxton et al., 1997);
- *Food Habits of the Endangered Southwestern Willow Flycatcher* (Drost et al., 2001);
- *Survivorship and Movements of Southwestern Willow Flycatchers in Arizona – 2000* (Luff et al., 2000);
- *Survivorship and Movements of Southwestern Willow Flycatchers at Roosevelt Lake, Arizona – 2001 and 2003 reports* (Kenwood and Paxton, 2001; Newell et al., 2003);
- *Status, Ecology, and Conservation of the Southwestern Willow Flycatcher* (Finch and Stoleson, 2000);
- *Nestling sex ratio in the southwestern willow flycatcher* (Paxton et al., 2002); and
- *A multi-scaled model of southwestern willow flycatcher breeding habitat* (Hatten and Paradzick, 2003).

Additional ecological studies in the project area include a fish monitoring study being conducted by the AGFD (Voeltz, 2005), a herp (reptiles and amphibians) study being conducted by the Bureau of Reclamation (Messing, 2005), and the annual Christmas bird counts conducted in the area by the National Audubon Society (McCarthey, 2005). Brief descriptions of these three studies are provided below.

The AGFD is currently conducting a fish monitoring study that includes portions of the Gila River adjacent to and downstream of the Site and in areas within the San Pedro River (Voeltz, 2005). Two of the Gila River sites are located on ASARCO property, two are upstream of the property, two are downstream of the property, and one is upstream in the San Pedro River. This study is part of the annual sampling conducted in agreement with the Bureau of Reclamation to monitor 22 sites in the Gila River Basin. This study does not measure contaminant levels, but provides population/community data (e.g., species abundance and richness). It should be noted that the ASARCO property sites were dry during the November 2004 sampling, as were the sites in 2003. Information on species present in past years (1999 to 2002) is available.

The Bureau of Reclamation conducted a pilot study to compare the species diversity of herps (primarily lizards, but occasionally also toads) between mature Saltcedar habitat and mature cottonwood-willow habitat in southern Arizona (Messing, 2005). The Saltcedar site is located adjacent to the San Pedro River on ASARCO property and the cottonwood-willow habitat is located near The Nature Conservancy (TNC) preserve. There are three arrays (or sampling locations within each area). An array consists of a central five-gallon bucket dug into the ground and three outer buckets about 25 feet away connected by a drift fence. The arrays were checked every other day beginning in May-September 2004. A second collection effort was conducted May-September 2005, and some vegetation data was also collected. If approved by EPA, ASARCO, and TNC, metals analysis of surface soil and representative herps at each array (i.e., co-located soil and biota) would provide valuable information on chemicals of potential ecological concern (COPEC) concentrations in soil and biota in these areas, as well as limited information on contaminant uptake in reptiles. Arthropods (e.g., spiders) were also observed in the pitfall traps during the pilot study. Collection and chemical analysis of these terrestrial invertebrates is also recommended.

The National Audubon Society has been conducting nationwide Christmas bird counts in December and early January for over 100 years. For the past five years, Christmas bird counts have been done in the 15-mile radius area centered at Dudleyville, Arizona (McCarthey, 2005). This area includes the towns of Hayden and Winkelman and the ASARCO LLC Hayden properties. Volunteers survey for one day and the data is compiled for the entire area. This information is useful for documenting avian species in the general project area during the winter, but may not provide information specific to the project area.

Ecological information from the available studies will be assembled, summarized, and utilized to the extent possible to augment the more limited ecological surveys to be conducted as part of this RI.

6. Results

The locations of the sites surveyed and results of the cursory surveys conducted on April 27-28, 2006 are shown in Figure 2. The following descriptions recap the overall ecology of the site. Appendix A details the specific findings at each location:

The ASARCO Hayden Site is located in the Sonoran Basin and Range Ecoregion as delineated by EPA (2003). Soil conditions in this area strongly affect the distribution and composition of plant communities in this ecoregion and presumably at the site.

Large areas are dominated by shrubs such as cresote bush. Depending on the specific soil type and present in an area, common plant species my include paloverde (*Ceridium sp.*), and saguaro (*Carnegiea gigantea*). Aquatic and wash areas may include willows (*Salix sp.*), tamarisk, cottonwood, and cat's claw (*Acacia greggi*).

Because of the proximity of the site to the Gila and San Pedro Rivers, the site supports a variety of reptilian, mammalian, and avian species. The mammal community present at the site includes small herbivorous species (desert cottontail, pocket mouse, and antelope squirrel); a number of larger omnivores and predators (fox, bobcat, and coyote); and large herbivores (feral horse and mule deer). The bird community is diverse with particular bird communities associated with specific plant communities and seasons. Common herbivorous and insectivorous birds include a variety of sparrows and finches, phainopepla, red-winged blackbird, and cliff swallows. Birds of prey include Swainson's hawk and turkey vulture. Because the site is in close proximity to the Gila-San Pedro River confluence, the area is a breeding site for the federally endangered southwestern willow flycatcher.

Although no specific reptiles were observed during the site visit, the species diversity of reptiles at ASARCO is likely high, typical of the southwestern desert environment. Amphibians may also be abundant; however, amphibians are seasonal in their occurrence outside of the permanent rivers and streams.

Two sites, GR04 and GR10, showed signs of stressed upland vegetation. Dead cottonwoods were observed at GR-04 (see photo GR04-3 in Appendix A). They were upland and quite a distance from the river and were not included in the evaluation of the river. Other vegetation around the cottonwoods did not appear stressed and the cottonwoods may have been stressed by changes in their access to water. At GR10, multiple instances of shrubs with brown, chlorotic, or otherwise stressed foliage were observed. (see photo GR10-Stress1, GR10-Stress2, and GR10-Stress3 in Appendix A). Potential causes were not readily apparent.

7. References

CH2M HILL. 2005. ASARCO, Inc. Hayden Plant Site, Hayden, Gila County, Arizona. Final Remedial Investigation Work Plan. Prepared for the U.S. Environmental Protection Agency. Tempe, AZ. August.

DeLay, L.S., S.H. Stoleson, and M. Farnsworth. 2002. *A Quantitative Analysis of the Diet of Southwestern Willow Flycatchers in the Gila Valley, New Mexico.* Final Report to T&E Inc. March. 14 pp.

Dockens, P.E.T., and C.E. Paradzick. 2004. *Mapping and Monitoring Southwestern Willow Flycatcher Breeding Habitat in Arizona: A Remote Sensing Approach.* Technical Report 223, Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Phoenix, AZ. March. 82 pp.

Drost, C.A., E.H. Paxton, M.K. Sogge, and M.J. Witfield. 2001. *Food Habits of the Endangered Southwestern Willow Flycatcher.* U.S. Geological Survey. Final Report to the U.S. Bureau of Reclamation, Salt Lake City, UT. January. 24 pp.

Finch, D.M., and S.H. Stoleson. 2000. *Status, Ecology, and Conservation of the Southwestern Willow Flycatcher*. General Technical Report RMRS-GTR-60. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. September. 131 pp.

Hatten, J.R., and C.E. Paradzick. 2003. A multi-scaled model of southwestern willow flycatcher breeding habitat. *J. Wildl. Manage.* 67(4):774-788.

Kenwood, K.E., and E.H. Paxton. 2001. *Survivorship and Movements of Southwestern Willow Flycatchers at Roosevelt Lake, Arizona* – 2001. U.S. Geological Survey. Report to the U.S. Bureau of Reclamation, Phoenix, AZ. 45 pp.

Luff, J.A., E.H. Paxton, K.E. Kenwood, and M.K. Sogge. 2000. *Survivorship and Movements of Southwestern Willow Flycatchers in Arizona – 2000*. U.S. Geological Survey. Report to the U.S. Bureau of Reclamation, Phoenix, AZ. 46 pp.

McCarthey, T. 2005. Personal communication between Tracy McCarthey of the National Audubon Society Volunteers and Christine Arenal of CH2M HILL on January 24.

Messing, H. 2005. Personal communication between Henry Messing of the U.S. Department of the Interior, Bureau of Reclamation and Christine Arenal of CH2M HILL on January 24.

Newell, P. J., E.H. Paxton, and M.K. Sogge. 2003. *Survivorship and Movements of Southwestern Willow Flycatchers at Roosevelt Lake, Arizona* – 2003. U.S. Geological Survey. Report to the U.S. Bureau of Reclamation, Phoenix, AZ. 53 pp.

Owen, J.C., and M.K. Sogge. 2002. *Physiological Condition of Southwestern Willow Flycatchers in Native and Saltcedar Habitats.* U.S. Geological Survey Report to the Arizona Department of Transportation, Phoenix, AZ. 27 pp.

Paradzick, C.E., T.D. McCarthey, R.F. Davidson, J.W. Rourke, M.W. Sumner, and A.B. Smith. 2001. *Southwestern Willow Flycatcher 2000 Survey and Nest Monitoring Reports.*

Paxton, E., S. Langridge, and M.K. Sogge. 1997. *Banding and Population Genetics of Southwestern Willow Flycatchers in Arizona – 1997 Summary Report.* U.S. Geological Survey, Biological Resources Division, Colorado Plateau Field Station, Southwestern Willow Flycatcher Research Program, Flagstaff, AZ.

Paxton, E.H., M.K. Sogge, T.D. McCarthey, and P. Keim. 2002. Nestling sex ratio in the southwestern willow flycatcher. *Condor* 104:877-881.

Smith, A.B., C.E. Paradzick, A.A. Woodward, P.E.T. Dockens, and T.D. McCarthey. 2002. *Southwestern Willow Flycatcher 2001 Survey and Nest Monitoring Reports.* Technical Report 191, Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Phoenix, AZ. March. 63 pp.

Smith, A.B., A.A. Woodward, P.E.T. Dockens, J.S. Martin, and T.D. McCarthey. 2003. *Southwestern Willow Flycatcher 2002 Survey and Nest Monitoring Reports.* Technical Report 210, Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Phoenix, AZ. March. 49 pp.

Smith, A.B., P.E.T. Dockens, A.A. Tudor, H.C. English, and B.L. Allen. 2004. *Southwestern Willow Flycatcher 2003 Survey and Nest Monitoring Reports.* Technical Report 233, Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Phoenix, AZ. March. 65 pp.

Sogge, M.K., S.J. Sferra, T. McCarthey, S.O. Williams III, and B.E. Kus. 2001. *Southwestern Willow Flycatcher Breeding Site and Territory Summaries* – 2000. U.S. Geological Survey, Prepared for The Southwestern Willow Flycatcher Recovery Team, U.S. Fish and Wildlife Service, Region 2, Albuquerque, NM. November. 20 pp.

Sogge, M.K., S.J. Sferra, T. McCarthey, S.O. Williams III, and B.E. Kus. 2002. *Southwestern Willow Flycatcher Breeding Site and Territory Summaries* – 2001. U.S. Geological Survey, Prepared for The Southwestern Willow Flycatcher Recovery Team, U.S. Fish and Wildlife Service, Region 2, Albuquerque, NM. October. 20 pp.

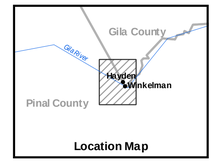
Sogge, M.K., P. Dockens, S.O. Williams III, B.E. Kus, and S.J. Sferra,. 2003. *Southwestern Willow Flycatcher Breeding Site and Territory Summaries* – 2002. U.S. Geological Survey, Prepared for The Southwestern Willow Flycatcher Recovery Team, U.S. Fish and Wildlife Service, Region 2, Albuquerque, NM. October. 20 pp.

U.S. Environmental Protection Agency (EPA). 1994. "Selecting and Using Reference Information in Superfund Ecological Risk Assessments." Office of Solid Waste and Emergency Response, *ECO Update*. Vol. 2, No. 4, Publication 9345.0-05I, EPA 540-F-94-050. September.

U.S. Environmental Protection Agency (EPA). 1997. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final*. Office of Solid Waste and Emergency Response. EPA 540-R-97-006. June.

U.S. Environmental Protection Agency (EPA). 2003. *Level III Ecoregions of the Continental United States.* National Health and Environmental Effects Research Laboratory.

Voeltz, J. 2005. Personal communication between Jeremy Voeltz of the State of Arizona Game and Fish Department and Christine Arenal of CH2M HILL on January 2



Legend

- Weston ESI Group
- Random Samples Grid Group
- School & Playground Group

Herd Study Sample Locations:

- Gila River Salt Cedar
- Lower San Pedro River Native Cottonwood/Willow
- Aquatic Habitat
- Project Area

Fig. 1
ASARCO LLC Hayden Site
Herp Study Sample Locations
Habitat Characterization Project Area

CH2MHILL

Figure 2. ASARCO surveys sites 27-28 April 2006

Appendix J
Data Validation Reports

Appendix J
Data Validation Reports

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM) RF
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager DL
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105068 Amendment 3

DATE: September 19, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	None Provided
SDG No.:	06-363
Laboratory:	CHESTER LabNet
Analysis:	PM10 and X-Ray Fluoresecence (XRF)
Samples:	6 Teflon Air Filter Samples (see Case Summary)
Collection Dates:	November 21, 27, and December 3, 2006
Reviewers:	Stan Kott, ESAT/Laboratory Data Consultants and Kevin Woodruff, ESAT/ICF International

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report

Case No.: None Provided
SDG No.: 06-363
Site: Asarco Hayden
Laboratory: CHESTER LabNet
Reviewers: Stan Kott, ESAT/LDC and
Kevin Woodruff, ESAT/ICF International
Date: September 19, 2007

I. CASE SUMMARY

Sample Information

Hayden Samples:	MY-112106, MY-112706, and MY-120306
Winkelman Samples:	HS-112106, HS-112706, and HS-120306
Concentration and Matrix:	Low Concentration 47mm Teflon Air Filter
Analysis:	PM10 and X-Ray Fluoresecence (XRF)
SOW:	EPA Compendium Methods IO-3.1 and IO-3.3
Collection Date:	November 21, 27, and December 3, 2006
Sample Receipt Date:	December 11, 2006
Preparation and Weighing Dates:	October 16 and December 12, 2006
XRF Analysis Date:	December 14, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	Not Provided

Laboratory QC

Method Blanks:	Not Applicable
Associated Samples:	Samples listed above
Laboratory Duplicate:	RT4359 (MY-112106)

Analysis: PM10 and XRF

Analyte	Sample Preparation Date	Analysis Date
PM10 Preparation/Weighing	October 16, 2006	December 12, 2006
XRF Metals	Not Applicable	December 14, 2006

Sampling Issues

None.

Additional Comments

As directed by the EPA TOM, a Tier 3 data review was performed.

The Hayden air monitoring station analytes and contract required quantitation limits (CRQLs) provided in Table 1A are from the Statement of Work, dated August 10, 2006, Table 1. The Winkleman air monitoring station analytes and CRQLs provided in Table 1A are from the Statement of Work, dated August 10, 2006, Table 2.

ESAT could not check calculations from instrument raw data counts to final results due to the complexity of the calculations and due to insufficient information about the instrument software algorithms. This difficulty is noted in analytical method IO-3.3 and by the laboratory. The µg/filter and µg/meter^3 (µg /m^3) concentrations were recalculated as per laboratory instructions. (See Attachment 1.)

The laboratory indicated that the instrument calculated arsenic concentrations for samples MY-112106 and MY-120306 were lowered by the analyst after examining the spectra. No adverse effect on data quality is expected. (See Attachment 2.)

Results reported in µg /m^3 are calculated using a standard 24±2.4 cubic meter sample size. No adverse effect on data quality is expected.

This report was prepared in accordance with the following documents:

- *Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Compendium Method IO-3.1, Selection, Preparation and Extraction of Filter Material*, June 1999;
- *Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Compendium Method IO-3.3, Determination of Metals in Ambient Particulate Matter Using X-Ray Fluorescence (XRF) Spectroscopy*, June 1999;
- *Statement of Work; 10 August 2006; Project: Perform Ambient Air Tests on Air Filters Gathered from the ASARCO Hayden Plant Site, AZ. Purchase Order: W91238-06-P-TBD; Issued by USACE Sacramento District*;
- *Standard Operating Procedure XR-002.02; Analysis of Elements in Air Particulates by X-Ray Fluoresence (Kevex 770); CHESTER LabNet*, July 3, 2003; and
- Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages.*

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preparation and Weighing	Yes	
3.	Calibration	Yes	
4.	Blank	Yes	A
5.	Standard Reference Materials (SRM)	Yes	
6.	Duplicate Sample Analysis	Yes	
7.	Matrix Spike Sample Analysis	N/A	
8.	Field Duplicate Sample Analysis	N/A	
9.	Sample Quantitation	No	B
10.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. The following results are reported without blank corrections in Table 1A.

- Antimony, barium, cadmium, and silver in samples HS-112106, HS-112706, and HS-120306

The laboratory indicated that, in order to lower the detection limit and uncertainty for cadmium, the counting time was extended to 1440 for the sp4 analytes by using instrument protocol 9. Since blank correction values were determined using instrument protocol 6 with a counting time of 180, the resulting higher uncertainties would increase the detection limit for cadmium. In order to maintain the lower detection limit, all sp4 analytes are reported without blank correction. (See Attachment 2.) Since the concentrations for the analytes listed above are less than three times their respective uncertainties, no adverse effect on data quality is expected.

The blank correction values are determined using ten blank Teflon air filters analyzed using protocol 6. Protocol 6 has a 180 counting time for the sp4 analytes. Blank correction values are determined at the initial calibration of the XRF instrument.

B. The following results are estimated and flagged "J" in Table 1A because a data processing sub-routine was not utilized to make corrections to the affected analyte results.

- Arsenic and selenium in samples MY-120306 and MY-112106

The laboratory indicates that whenever bismuth is detected, a separate data processing sub-routine is utilized to correct the data for arsenic and selenium. (See Attachment 2.) The data indicate bisumth concentrations of 0.0758 ± 0.0049 $\mu g/cm^2$ and 0.2361 ± 0.0125 $\mu g/cm^2$ for samples MY-120306 and MY-112106, respectively. Since arsenic and selenium data were not reprocessed, results reported for arsenic and selenium in the samples listed above are considered quantitatively uncertain.

ANALYTICAL RESULTS
Table 1A

Case No. : None
Site : Asarco Hayden
Lab : Chester LabNet
Reviewer : Stan Kott, ESAT/LDC
Date : September 19, 2007

SDG No. : 06-363

QUALIFIED DATA
Concentration in ug / m3

Analysis Type : PM10 Teflon Air Filters for Select Total Metals by XRF

Station Location :	Hayden			Hayden			Hayden			CRQL								
Sample ID :	MY-120306			MY-112706			MY-112106											
Filter Lot # :	6177003			6177003			6177003											
Collection Date :	12/03/2006			11/27/2006			11/21/2006											
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ANTIMONY	* 0.0100 ± 0.0039			* 0.0000 ± 0.0035			* 0.0054 ± 0.0042			4								
ARSENIC	0.0484 ± 0.0066	J	B	0.0098 ± 0.0018			0.1040 ± 0.0127	J	B	0.0008								
BARIUM	0.0186 ± 0.0056			* 0.0007 ± 0.0029			* 0.0599 ± 0.0088			0.52								
CADMIUM	* 0.0042 ± 0.0028			* 0.0032 ± 0.0025			0.0166 ± 0.0036			0.0037								
CHROMIUM	0.0025 ± 0.0007			* 0.0008 ± 0.0004			* 0.0016 ± 0.0007			0.00033								
COBALT	* 0.0000 ± 0.0105			* 0.0000 ± 0.0037			* 0.0000 ± 0.0171			0.00069								
COPPER	1.196 ± 0.1338			0.2930 ± 0.0329			3.997 ± 0.4905			0.75								
MANGANESE	0.0170 ± 0.0020			0.0079 ± 0.0010			0.0187 ± 0.0022			0.051								
NICKEL	* 0.0000 ± 0.0009			* 0.0008 ± 0.0008			* 0.0000 ± 0.0010			0.0040								
SELENIUM	0.0108 ± 0.0013	J	B	* 0.0008 ± 0.0004			0.0417 ± 0.0047	J	B	1.60								
SILVER	* 0.0013 ± 0.0026			* 0.0000 ± 0.0024			* 0.0031 ± 0.0029			0.079								
VANADIUM	* 0.0000 ± 0.0016			* 0.0000 ± 0.0008			* 0.0000 ± 0.0021			0.40								
PM10 Net Mass	47.42 ± 4.76			30.75 ± 3.10			49.25 ± 4.94			50								

* Concentration is less than three times the uncertainty

Station Location :	Winkelman			Winkelman			Winkelman			CRQL								
Sample ID :	HS-120306			HS-112706			HS-112106											
Filter Lot # :	6177003			6177003			6177003											
Collection Date :	12/03/2006			11/27/2006			11/21/2006											
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ANTIMONY	* 0.0004 ± 0.0011		A	* 0.0000 ± 0.0011		A	* 0.0000 ± 0.0012		A	4								
ARSENIC	* 0.0000 ± 0.0004			* 0.0007 ± 0.0010			* 0.0020 ± 0.0008			0.0008								
BARIUM	* 0.0033 ± 0.0017		A	* 0.0004 ± 0.0017		A	0.0080 ± 0.0025		A	0.52								
CADMIUM	* 0.0000 ± 0.0008		A	* 0.0007 ± 0.0008		A	* 0.0011 ± 0.0009		A	0.00083								
CHROMIUM	* 0.0003 ± 0.0004			* 0.0000 ± 0.0004			* 0.0000 ± 0.0004			0.00033								
COBALT	* 0.0000 ± 0.0011			* 0.0000 ± 0.0012			* 0.0000 ± 0.0021			0.00069								
COPPER	0.0107 ± 0.0014			0.1022 ± 0.0115			0.0700 ± 0.0079			0.75								
MANGANESE	* 0.0006 ± 0.0005			0.0016 ± 0.0005			0.0055 ± 0.0008			0.051								
NICKEL	* 0.0000 ± 0.0007			* 0.0000 ± 0.0007			* 0.0001 ± 0.0008			0.0040								
SELENIUM	* 0.0000 ± 0.0004			0.0011 ± 0.0004			* 0.0000 ± 0.0004			1.60								
SILVER	* 0.0006 ± 0.0008		A	* 0.0013 ± 0.0008		A	* 0.0000 ± 0.0008		A	0.079								
VANADIUM	* 0.0000 ± 0.0003			* 0.0011 ± 0.0004			* 0.0000 ± 0.0006			0.40								
PM10 Net Mass	6.50 ± 0.77			10.08 ± 1.09			17.33 ± 1.78			50								

* Concentration is less than three times the uncertainty

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, BG - Bachground Sample
CRQL - Contract Required Quantitation Limit

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Attachment 1

Gretchen-

Here's what I dug up to answer the questions. I had to zip the files since your e-mail server wouldn't allow the size of e-mail with uncompressed files.

Gravimetry-

I have attached two files that contain all the gravimetry for the project.
They include the temperature and humidity data.

I don't quite underatand the question about the batch quality checks for filter contamination. I read through IO-3.1 and didn't see anything in there about batch quality checks. Does she mean filter inspection? If she does, we don't have any data for that. If a filter is defective, it isn't used. We don't keep a record of defective filters.

XRF

The calibration and blank data are attached for the two instruments that were used to analyze the samples. XRF spectrometers are very stable and do not require calibration very often. The blank data is not specific to this project, but is from filters from the same lot of filters used for the Asarco project.

We do not guarantee that the reported MDLs will meet the CRQLs. This was discussed when we were bidding on the project. The samples are analyzed for the counting times required to achieve the required detection limits on interference free samples, but corrections are made for various reasons which can cause the detection limit to rise to above the CRQL.

I e-mailed the raw data for reports 06-363 and 07-021 on June 8. I am resending it in this e-mail.

As for the sample calculation, it isn't really possible to calculate the ug/cm2 concentrations by hand due to the complexity of XRF. The calculations to get to ug/filter and ug/m3 are quite easy; multiply the ug/cm2 number by the deposit area (11.3) for ug/filter and divide the ug/filter concentration by the volume (usually 24) to get ug/m3. I can send you our XRF SOP if you want to take a stab at calculating the ug/cm2 concentration.

Hopefully this is enough information. If Rose needs anything else, maybe it would be best if she could call me directly so I understand exactly what she wants.

Paul Duda
CHESTER LabNet
12242 SW Garden Place
Tigard, OR 97223
pduda@chesterlab.net
http:\\www.chesterlab.net
(503)624-2183 ext. 100
fax (503)624-2653

Attachment 2

Rose Fong/R9/USEPA/US
08/20/2007 11:30 AM

To Stan Kott/R9/USEPA/US@EPA
cc
bcc
Subject Fw: Asarco PM10 \ XRF Additional Questions

----- Forwarded by Rose Fong/R9/USEPA/US on 08/20/2007 11:30 AM -----

"Paul Duda"
<pduda@chesterlab.net>
08/16/2007 03:58 PM

To <Gretchen.Engel@CH2M.com>
cc <Melanie.West@CH2M.com>, <jennifer.holland@CH2M.com>, <kevin.murdock@CH2M.com>, Rose Fong/R9/USEPA/US@EPA, <balna.foehr@CH2M.com>
Subject RE: Asarco PM10 \ XRF Additional Questions

Gretchen-

Sorry for the delay. I've been on vacation and am just now getting caught up.

Attached is the missing gravimetry.

The As discrepancies for samples 06-T4357 and 06-T4359 were due to corrections done after the analyst examined the spectra. The printout you received did not have the hand corrections included. I scanned the pages in question and have attached them.

Whenever we detect Bismuth, As and Se are affected. A separate processing routine is utilised to make the corrections and unfortunately the printouts for that routine didn't make it into the electronic version of the file I sent earlier. A scanned copy is attached for samples 06-T4684 and 06-T4686.

The uncorrected concentrations and uncertainties were used for all the samples with discrepancies for Ag, Cd and Sb in order to keep the uncertainties low. These samples all had one condition run at protocol 9 in order to lower the Cd detection limit. Blank correction values are determined using similar media; 10 filters at protocol 6. The resulting uncertainties when applied to protocol 9 sensitivities will significantly raise the detection limits and defeat the purpose of increasing the counting times used for protocol 9 to lower the detection limit. All the Winkelman samples that are analyzed with extended counting times have the sp4 analytes reported without blank corrections. I hope this all makes sense. If not, I recommend talking to our XRF analyst, Rick Sarver. He can be reached at the phone number below.

Paul Duda
CHESTER LabNet
12242 SW Garden Place
Tigard, OR 97223
pduda@chesterlab.net
http:\\www.chesterlab.net
(503)624-2183 ext. 100
fax (503)624-2653

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105068 Amendment 3

DATE: March 27, 2008

SUBJECT: Tier 1A Data Evaluation Memo for the Asarco Hayden project, SDGs: 06-373, 07-009, 07-040, 07-056, 07-093, and 07-130

SUMMARY: 44 Teflon air filter samples received by CHESTER LabNet were analyzed for PM10 and select metals by X-Ray Fluorescence (XRF).

A forms-only evaluation of the data packages was performed to identify any key analytical issues/deficiencies affecting data quality. This evaluation approach is employed when in-depth data review is not required as indicated by the data user. During this limited evaluation, areas of concern were noted (see Lettered and Additional Comments).

The evaluation included: a review of the data package for completeness, review of the chain of custody forms (against laboratory reported information, for signatures, for sample condition upon receipt by the laboratory and for sample preservation), review of holding times, review of QC summaries, review of blanks for contamination, random check of reported results against raw data, and a random check of raw data for interference problems or system control problems.

The following data quality issues should be noted:

A. The PM10 and XRF metal results for sample MY-102806 in SDG 07-009 and sample MY-030907 in SDG 07-093 are rejected and should be flagged "R" due to compromised filter medium. Method IO-3.3, Section 8.3, specifies that filter samples are to be checked for invalidating conditions such as holes and tears which would prevent quantitative analysis.

B. The XRF metal results for sample MY-121506 in SDG 06-373 are estimated and should be flagged "J" due to the filter being sampled on the wrong side. Method IO-3.3, Section 8.2 specifies that the sample should be collected on the side of the filter with the supporting ring. The PM10 gravimetric data sheet indicates the filter was

sampled on the wrong side.

C. The following results are estimated and should be flagged "J" because of duplicate results outside the ESAT ∀35 relative percent difference (RPD) QC limit. Duplicate results that do not meet the ∀35 RPD criterion for precision are listed below.

SDG	Sample	Analyte	Duplicate RPD and uncertainty
07-040	MY-020707	Chromium	60.1 ± 46.2
07-093	HS-031507	Arsenic	40.6 ± 30.9
07-093	HS-031507	Selenium	192.6 ± 70.7
07-093	MY-032107	Barium	41.4 ± 41.7
07-093	MY-032107	Selenium	145.5 ± 28.7
07-130	MY-042007	Arsenic	-39.6 ± 36.7

Results for analytes listed above in the samples listed above are considered quantitatively uncertain.

D. The antimony, barium, cadmium, and silver results for all Winkelman samples are reported without blank corrections. The laboratory indicated that, in order to lower the detection limit and uncertainty for cadmium, the counting time was extended to 1440 for the sp4 analytes by using instrument protocol 9. Since blank correction values were determined using instrument protocol 6 with a counting time of 180, the resulting higher uncertainties would increase the detection limit for cadmium. In order to maintain the lower detection limit, all sp4 analytes are reported without blank correction. Since the concentrations for the analytes listed above are less than three times their respective uncertainties, no adverse effect on data quality is expected.

Additional Comments:

1. The Hayden air monitoring station analytes and contract required quantitation limits (CRQLs) are from the Statement of Work, dated August 10, 2006, Table 1. The Winkelman air monitoring station analytes and CRQLs are from the Statement of Work, dated August 10, 2006, Table 2.

2. The Chain of Custody (COC) record form did not specify a sample to be used for laboratory quality control (QC). As a result, the laboratory selected the QC samples. The effect on data quality is not known.

3. For SDG 07-040, samples HS-012607 and MY-012607 have an incorrect sample date of 1/27/07. The COC indicates the correct sample date is 1/26/07. No adverse effect on data quality is expected.

4. Results reported in µg /m^3 are calculated using a standard 24±2.4 cubic meter sample size. No adverse effect on data quality is expected.

A Table 1A was not requested.

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM) RF
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105068 Amendment 3

DATE: September 13, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	None Provided
SDG No.:	07-021
Laboratory:	CHESTER LabNet
Analysis:	PM10 and X-Ray Fluoresecence (XRF)
Samples:	4 Teflon Air Filter Samples (see Case Summary)
Collection Dates:	January 8 and 14, 2007
Reviewers:	Stan Kott, ESAT/Laboratory Data Consultants and Kevin Woodruff, ESAT/ICF International

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report

Case No.: None Provided
SDG No.: 07-021
Site: Asarco Hayden
Laboratory: CHESTER LabNet
Reviewers: Stan Kott, ESAT/LDC and
Kevin Woodruff, ESAT/ICF International
Date: September 13, 2007

I. CASE SUMMARY

Sample Information

Hayden Samples:	MY-010807 and MY-011407
Winkelman Samples:	HS-010807 and HS-011407
Concentration and Matrix:	Low Concentration 47mm Teflon Air Filter
Analysis:	PM10 and X-Ray Fluoresecence (XRF)
SOW:	EPA Compendium Methods IO-3.1 and IO-3.3
Collection Date:	January 8 and 14, 2007
Sample Receipt Date:	January 23, 2007
Preparation and Weighing Dates:	November 28, 2006 and January 23, 2007
Analysis Date:	January 26, 2007

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	Not Provided

Laboratory QC

Method Blanks:	Not Applicable
Associated Samples:	Samples listed above
Laboratory Duplicate:	RT4684 (MY-010807)
Analysis:	PM10 and XRF

Analyte	Sample Preparation Date	Analysis Date
PM10 Preparation/Weighing	November 28, 2006	January 23, 2007
XRF Metals	Not Applicable	January 26, 2007

Sampling Issues

None.

Additional Comments

As directed by the EPA TOM, a Tier 3 data review was performed.

The Hayden air monitoring station analytes and contract required quantitation limits (CRQLs) provided in Table 1A are from Statement of Work, dated August 10, 2006, Table 1. The Winkleman air monitoring station analytes and CRQLs provided in Table 1A are from Statement of Work, dated August 10, 2006, Table 2.

ESAT could not check calculations from instrument raw data counts to final results due to the complexity of the calculations and due to insufficient information about the instrument software algorithms. This difficulty is noted in analytical method IO-3.3 and by the laboratory. The µg/filter and µg/meter^3 (µg /m^3) concentrations were recalculated as per laboratory instructions. (See Attachment 1.)

The laboratory indicated that since bismuth was detected in samples MY-010807 and MY-011407, arsenic and selenium results were calculated using a separate data processing subroutine. No adverse effect on data quality is expected. (See Attachment 2.)

Results reported in µg /m^3 are calculated using a standard 24±2.4 cubic meter sample size. No adverse effect on data quality is expected.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- *Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Compendium Method IO-3.1, Selection, Preparation and Extraction of Filter Material*, June 1999;
- *Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Compendium Method IO-3.3, Determination of Metals in Ambient Particulate Matter Using X-Ray Fluorescence (XRF) Spectroscopy*, June 1999;
- *Statement of Work; 10 August 2006; Project: Perform Ambient Air Tests on Air Filters Gathered from the ASARCO Hayden Plant Site, AZ. Purchase Order: W91238-06-P-TBD; Issued by USACE Sacramento District*;
- *Standard Operating Procedure XR-002.02; Analysis of Elements in Air Particulates by X-Ray Fluoresence (Kevex 770); CHESTER LabNet*, July 3, 2003; and
- Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages.*

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preparation and Weighing	Yes	
3.	Calibration	Yes	
4.	Blank	Yes	A
5.	Standard Reference Materials (SRM)	Yes	
6.	Duplicate Sample Analysis	Yes	
7.	Matrix Spike Sample Analysis	N/A	
8.	Field Duplicate Sample Analysis	N/A	
9.	Sample Quantitation	Yes	
10.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. The following results are reported without blank corrections in Table 1A.

- Antimony, barium, cadmium, and silver in samples HS-010807 and HS-011407

The laboratory indicated that, in order to lower the detection limit and uncertainty for cadmium, the counting time was extended to 1440 for the sp4 analytes by using instrument protocol 9. Since blank correction values were determined using instrument protocol 6 with a counting time of 180, the resulting higher uncertainties would increase the detection limit for cadmium. In order to maintain the lower detection limit, all sp4 analytes are reported without blank correction. (See Attachment 2.) Since the concentrations for the analytes listed above are less than three times their respective uncertainties, no adverse effect on data quality is expected.

The blank correction values are determined using ten blank Teflon air filters analyzed using protocol 6. Protocol 6 has a 180 counting time for the sp4 analytes. Blank correction values are determined at the initial calibration of the XRF instrument.

ANALYTICAL RESULTS
Table 1A

Case No. : ACE(68)35637 SDG No. : 07-021
Site : Asarco Hayden
Lab : Chester LabNet
Reviewer : Stan Kott, ESAT/LDC
Date : September 13, 2007

QUALIFIED DATA
Concentration in ug / m3

Analysis Type : PM10 Teflon Air Filters for Select Total Metals by XRF

Station Location :	Hayden			Hayden			CRQL											
Sample ID :	MY-010807			MY-011407														
Filter Lot # :	6244035			6244035														
Collection Date :	01/08/2007			01/14/2007														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ANTIMONY	* 0.0114 ± 0.0042			* 0.0065 ± 0.0035			4											
ARSENIC	0.1524 ± 0.0178			0.0107 ± 0.0017			0.0008											
BARIUM	0.0427 ± 0.0057			* 0.0000 ± 0.0025			0.52											
CADMIUM	0.0141 ± 0.0034			* 0.0000 ± 0.0024			0.0037											
CHROMIUM	* 0.0012 ± 0.0005			* 0.0007 ± 0.0004			0.00033											
COBALT	* 0.0000 ± 0.0093			* 0.0000 ± 0.0028			0.00069											
COPPER	2.734 ± 0.3058			0.1662 ± 0.0187			0.75											
MANGANESE	0.0091 ± 0.0012			0.0071 ± 0.0009			0.051											
NICKEL	* 0.0000 ± 0.0010			* 0.0007 ± 0.0007			0.0040											
SELENIUM	0.1217 ± 0.0136			0.0011 ± 0.0004			1.60											
SILVER	* 0.0077 ± 0.0030			* 0.0000 ± 0.0023			0.079											
VANADIUM	* 0.0000 ± 0.0005			* 0.0000 ± 0.0007			0.40											
PM10 Net Mass	38.71 ± 3.893			16.79 ± 1.730			50											

* Concentration is less than three times the uncertainty

Station Location :	Winkelman			Winkelman			CRQL											
Sample ID :	HS-010807			HS-011407														
Filter Lot # :	6244035			6244035														
Collection Date :	01/08/2007			01/14/2007														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ANTIMONY	* 0.0000 ± 0.0011		A	* 0.0003 ± 0.0011		A	4											
ARSENIC	* 0.0000 ± 0.0004			0.0105 ± 0.0015			0.0008											
BARIUM	* 0.0000 ± 0.0014		A	* 0.0026 ± 0.0020		A	0.52											
CADMIUM	* 0.0000 ± 0.0008		A	* 0.0000 ± 0.0008		A	0.00083											
CHROMIUM	* 0.0000 ± 0.0003			* 0.0001 ± 0.0004			0.00033											
COBALT	* 0.0000 ± 0.0009			* 0.0000 ± 0.0016			0.00069											
COPPER	0.0159 ± 0.0020			0.0884 ± 0.0100			0.75											
MANGANESE	* 0.0011 ± 0.0004			0.0025 ± 0.0006			0.051											
NICKEL	* 0.0012 ± 0.0007			* 0.0000 ± 0.0007			0.0040											
SELENIUM	* 0.0000 ± 0.0003			0.0022 ± 0.0004			1.60											
SILVER	* 0.0000 ± 0.0008		A	* 0.0000 ± 0.0008		A	0.079											
VANADIUM	* 0.0000 ± 0.0003			* 0.0000 ± 0.0005			0.40											
PM10 Net Mass	4.250 ± 0.5952			11.00 ± 1.176			50											

* Concentration is less than three times the uncertainty

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, BG - Bachground Sample
CRQL - Contract Required Quantitation Limit

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Attachment 1

Gretchen-

Here's what I dug up to answer the questions. I had to zip the files since your e-mail server wouldn't allow the size of e-mail with uncompressed files.

Gravimetry-

I have attached two files that contain all the gravimetry for the project.
They include the temperature and humidity data.

I don't quite understand the question about the batch quality checks for filter contamination. I read through IO-3.1 and didn't see anything in there about batch quality checks. Does she mean filter inspection? If she does, we don't have any data for that. If a filter is defective, it isn't used. We don't keep a record of defective filters.

XRF

The calibration and blank data are attached for the two instruments that were used to analyze the samples. XRF spectrometers are very stable and do not require calibration very often. The blank data is not specific to this project, but is from filters from the same lot of filters used for the Asarco project.

We do not guarantee that the reported MDLs will meet the CRQLs. This was discussed when we were bidding on the project. The samples are analyzed for the counting times required to achieve the required detection limits on interference free samples, but corrections are made for various reasons which can cause the detection limit to rise to above the CRQL.

I e-mailed the raw data for reports 06-363 and 07-021 on June 8. I am resending it in this e-mail.

As for the sample calculation, it isn't really possible to calculate the ug/cm2 concentrations by hand due to the complexity of XRF. The calculations to get to ug/filter and ug/m3 are quite easy; multiply the ug/cm2 number by the deposit area (11.3) for ug/filter and divide the ug/filter concentration by the volume (usually 24) to get ug/m3. I can send you our XRF SOP if you want to take a stab at calculating the ug/cm2 concentration.

Hopefully this is enough information. If Rose needs anything else, maybe it would be best if she could call me directly so I understand exactly what she wants.

Paul Duda
CHESTER LabNet
12242 SW Garden Place
Tigard, OR 97223
pduda@chesterlab.net
http:\\www.chesterlab.net
(503)624-2183 ext. 100
fax (503)624-2653

Attachment 2

Rose Fong/R9/USEPA/US
08/20/2007 11:30 AM

To Stan Kott/R9/USEPA/US@EPA
cc
bcc
Subject Fw: Asarco PM10 \ XRF Additional Questions

----- Forwarded by Rose Fong/R9/USEPA/US on 08/20/2007 11:30 AM -----

"Paul Duda"
<pduda@chesterlab.net>
08/16/2007 03:58 PM

To <Gretchen.Engel@CH2M.com>
cc <Melanie.West@CH2M.com>, <jennifer.holland@CH2M.com>, <kevin.murdock@CH2M.com>, Rose Fong/R9/USEPA/US@EPA, <beine.foehr@CH2M.com>
Subject RE: Asarco PM10 \ XRF Additional Questions

Gretchen-

Sorry for the delay. I've been on vacation and am just now getting caught up.

Attached is the missing gravimetry.

The As discrepancies for samples 06-T4357 and 06-T4359 were due to corrections done after the analyst examined the spectra. The printout you received did not have the hand corrections included. I scanned the pages in question and have attached them.

Whenever we detect Bismuth, As and Se are affected. A separate processing routine is utilized to make the corrections and unfortunately the printouts for that routine didn't make it into the electronic version of the file I sent earlier. A scanned copy is attached for samples 06-T4684 and 06-T4686.

The uncorrected concentrations and uncertainties were used for all the samples with discrepancies for Ag, Cd and Sb in order to keep the uncertainties low. These samples all had one condition run at protocol 9 in order to lower the Cd detection limit. Blank correction values are determined using similar media; 10 filters at protocol 6. The resulting uncertainties when applied to protocol 9 sensitivities will significantly raise the detection limits and defeat the purpose of increasing the counting times used for protocol 9 to lower the detection limit. All the Winkelman samples that are analyzed with extended counting times have the sp4 analytes reported without blank corrections. I hope this all makes sense. If not, I recommend talking to our XRF analyst, Rick Sarver. He can be reached at the phone number below.

Paul Duda
CHESTER LabNet
12242 SW Garden Place
Tigard, OR 97223
pduda@chesterlab.net
http:\\www.chesterlab.net
(503)624-2183 ext. 100
fax (503)624-2653

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105122

DATE: April 11, 2008

SUBJECT: Tier 1A Data Evaluation Memo for the Asarco Hayden project, SDGs: 07-161, 07-181, 07-194, 07-232, 07-265, and 07-377

SUMMARY: 41 Teflon air filter samples received by CHESTER LabNet were analyzed for PM10 and select metals by X-Ray Fluorescence (XRF).

A forms-only evaluation of the data packages was performed to identify any key analytical issues/deficiencies affecting data quality. This evaluation approach is employed when in-depth data review is not required as indicated by the data user. During this limited evaluation, areas of concern were noted (see Lettered and Additional Comments).

The evaluation included: a review of the data package for completeness, review of the chain of custody forms (against laboratory reported information, for signatures, for sample condition upon receipt by the laboratory and for sample preservation), review of holding times, review of QC summaries, review of blanks for contamination, random check of reported results against raw data, and a random check of raw data for interference problems or system control problems.

The following data quality issues should be noted:

A. PM10 and XRF analyte results for sample HS-050207 in SDG 07-161, sample MY-050207 in SDG 07-181, and sample MY-070707 in SDG 07-265 are rejected and should be flagged "R" due to compromised filter medium. For PM10 analysis, the *Quality Assurance Handbook for Air Pollution Measurements Systems*, Volume II: Part 1, Section 12 and, for XRF analysis, the *Method IO-3.3*, Section 8.3, specify that filter samples are to be checked for invalidating conditions such as holes, tears, non-uniform deposit density (NUDD), or other flaws which may affect the collection efficiency of the filter and quantitative analysis. The PM10 and XRF sample data sheets indicate invalidating conditions for the samples listed above were present.

B. The XRF results for the analytes in the samples listed below are rejected and should be flagged "R" due to a non-uniform analyte deposit noted on the XRF sample data sheets. Method IO-3.3, section 8.3, specifies that a non-uniform deposit density cannot be quantitatively measured by XRF.

SDG	Sample	Analyte
07-161	HS-051407	Copper
07-265	HS-070707	Zinc
07-377	MY-092907	Manganese
07-377	MY-100507	Manganese
07-377	MY-101107	Manganese

C. The XRF analyte results for the following samples are estimated and should be flagged "J" due to a non-uniform metal deposit present in the sample. If one of the analytes in a sample cannot be quantitatively measured (as stated in Comment B) the quantitation of the other metals in the sample may not be correct.

- Antimony, arsenic, barium, cadmium, chromium, cobalt, manganese, nickel, selenium, silver, and vanadium in sample HS-051407
- Antimony, arsenic, barium, cadmium, chromium, cobalt, copper, manganese, nickel, selenium, silver, and vanadium in sample HS-070707
- Antimony, arsenic, barium, cadmium, chromium, cobalt, copper, nickel, selenium, silver, and vanadium in sample MY-092907, MY-100507, and MY-101107

Results for analytes listed above in the samples listed above are considered quantitatively uncertain.

D. The following results are estimated and should be flagged "J" because of duplicate results outside the ESAT ±35 relative percent difference (RPD) QC limit. Duplicate results that do not meet the ±35 RPD criterion for precision are listed below.

SDG	Sample	Analyte	Duplicate RPD and uncertainty
07-161	MY-051407	Barium	36.6 ± 51.5
07-232	MY-070107	Chromium	-50.6 ± 26.9
07-377	MY-101107	Antimony	-53.7 ± 90.7
07-377	MY-101107	Selenium	-48.0 ± 25.0

Results for analytes listed above in the samples listed above are considered quantitatively uncertain.

E. The antimony, barium, cadmium, and silver results for all Winkelman samples are reported without blank corrections. The laboratory indicated that, in order to lower the detection limit and uncertainty for cadmium, the counting time was extended to 1440 for the sp4 analytes by using instrument protocol 9. Since blank correction values were determined using instrument protocol 6 with a counting time of 180, the resulting higher uncertainties would increase the detection limit for cadmium. In order to maintain the lower detection limit, all sp4 analytes are reported without blank correction. The effect on data quality is not known.

Additional Comments:

1. The Hayden air monitoring station analytes and contract required quantitation limits (CRQLs) are from the Statement of Work, dated August 10, 2006, Table 1. The Winkelman air monitoring station analytes and CRQLs are from the Statement of Work, dated August 10, 2006, Table 2.

2. The Chain of Custody (COC) record form did not specify a sample to be used for laboratory quality control (QC). As a result, the laboratory selected the QC samples. The effect on data quality is not known.

3. For SDG 07-194, two Hayden samples have identical sample identification of MY-061307. The laboratory was able to identify the samples by the 6/13/2007 and 6/19/2007 sampling dates listed on the COC and their respective filter lot numbers. No adverse effect on data quality is expected.

4. For SDG 07-265, bismuth was found in Hayden samples MY-071907 and MY-073107 and Winkelman samples HS-070107, HS-071307 and HS-071907. The arsenic and selenium results for these samples were corrected for bismuth interference as required by the laboratory's protocol. No adverse effect on data quality is expected.

5. Results reported in µg /m^3 are calculated using a standard 24±2.4 cubic meter sample size. No adverse effect on data quality is expected.

A Table 1A was not requested.

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105122

DATE: April 17, 2008

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	None Provided
SDG No.:	07-325
Laboratory:	CHESTER LabNet
Analysis:	PM10 and X-Ray Fluoresecence (XRF)
Samples:	8 Teflon Air Filter Samples (see Case Summary)
Collection Dates:	August 24, 30, September 5, 11, and 17, 2007
Reviewers:	Stan Kott, ESAT/Laboratory Data Consultants and Kevin Woodruff, ESAT/ICF International

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report

Case No.: None Provided
SDG No.: 07-325
Site: Asarco Hayden
Laboratory: CHESTER LabNet
Reviewers: Stan Kott, ESAT/LDC and
Kevin Woodruff, ESAT/ICF International
Date: April 17, 2008

I. CASE SUMMARY

Sample Information

Hayden Samples:	MY-083007, MY-090507, MY-091107, and MY-091707
Winkelman Samples:	HS-082407, HS-090507, HS-091107, and HS-091707
Matrix:	47mm Teflon Air Filter
Analyses:	PM10 and X-Ray Fluoresecence (XRF)
SOW:	EPA Compendium Methods IO-3.1 and IO-3.3
Collection Date:	August 24, 30, September 5, 11, and 17, 2007
Sample Receipt Date:	September 21, 2007
Preparation / Weighing Dates:	July 20 and August 9 / September 24, 2007
XRF Analysis Date:	September 28 through October 2, 2007

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	Not Provided

Laboratory QC

Method Blanks:	Not Applicable
Associated Samples:	Samples listed above
Laboratory Replicate:	RT3893 (MY-091107)
Analysis:	PM10 and XRF

Analyte	Sample Preparation Date	Analysis Date
PM10 Preparation/Weighing	July 20 and August 9, 2007	September 24, 2007
XRF Metals	Not Applicable	September 28 through October 2, 2007

Sampling Issues

None.

Additional Comments

As directed by the EPA TOM, a Tier 3 data review was performed.

The laboratory gravimetric data were evaluated for quality control (QC) criteria and errors in calculations and checked against the raw data supplied by Chester LabNet. No errors were found.

The Hayden air monitoring station analytes and contract required quantitation limits (CRQLs) provided in Table 1A are from the Statement of Work, dated August 10, 2006, Table 1. The Winkleman air monitoring station analytes and CRQLs provided in Table 1A are from the Statement of Work, dated August 10, 2006, Table 2.

ESAT could not check calculations from instrument raw data counts to final results due to the complexity of the calculations and due to insufficient information about the instrument software algorithms. This difficulty is noted in analytical method IO-3.3 and by the laboratory. The µg/filter and µg/meter^3 (µg /m^3) concentrations were recalculated as per laboratory instructions. (See Attachment 1.)

Results reported in µg /m^3 are calculated using a standard 24±2.4 cubic meter sample size. No adverse effect on data quality is expected.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- *Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Compendium Method IO-3.1, Selection, Preparation and Extraction of Filter Material*, June 1999;

- *Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Compendium Method IO-3.3, Determination of Metals in Ambient Particulate Matter Using X-Ray Fluorescence (XRF) Spectroscopy*, June 1999;

- *Quality Assurance Handbook for Air Pollution Measurements Systems, Volume II: Part 1, Ambient Air Quality Monitoring Program Quality System Development, EPA-454/R-98-004, August 1998;*

- *Statement of Work; 10 August 2006; Project: Perform Ambient Air Tests on Air Filters Gathered from the ASARCO Hayden Plant Site, AZ. Purchase Order: W91238-06-P-TBD; Issued by USACE Sacramento District*;

- *Standard Operating Procedure XR-006.01; Analysis of Elements in Air Particulates by X-Ray Fluoresence (Kevex 771); CHESTER LabNet,* August 6, 2003; and

- Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages.*

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preparation and Weighing	Yes	
3.	Calibration	Yes	
4.	Blank	Yes	
5.	Standard Reference Materials (SRM)	Yes	
6.	Replicate Sample Analysis	No	A
7.	Matrix Spike Sample Analysis	N/A	
8.	Field Duplicate Sample Analysis	N/A	
9.	Sample Quantitation	Yes	
10.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. The following results are estimated and are flagged "J" in Table 1A because of replicate results outside the ESAT ±35 relative percent difference (RPD) QC limit. Replicate results that do not meet the ±35 RPD criterion for precision are listed below.

Sample	Analyte	Replicate RPD and uncertainty
MY-091107	Antimony	-42.1 ± 42.5
MY-091107	Manganese	-41.8 ± 14.8

Results for analytes listed above in sample MY-091107 are considered quantitatively uncertain.

Replicate analyses demonstrate the analytical precision obtained for each sample matrix. The imprecision between replicate results may be due to sample non-homogeneity or poor laboratory technique.

Attachment 1

Gretchen-

Here's what I dug up to answer the questions. I had to zip the files since your e-mail server wouldn't allow the size of e-mail with uncompressed files.

Gravimetry-

I have attached two files that contain all the gravimetry for the project.
They include the temperature and humidity data.

I don't quite understand the question about the batch quality checks for filter contamination. I read through IO-3.1 and didn't see anything in there about batch quality checks. Does she mean filter inspection? If she does, we don't have any data for that. If a filter is defective, it isn't used. We don't keep a record of defective filters.

XRF

The calibration and blank data are attached for the two instruments that were used to analyze the samples. XRF spectrometers are very stable and do not require calibration very often. The blank data is not specific to this project, but is from filters from the same lot of filters used for the Asarco project.

We do not guarantee that the reported MDLs will meet the CRQLs. This was discussed when we were bidding on the project. The samples are analyzed for the counting times required to achieve the required detection limits on interference free samples, but corrections are made for various reasons which can cause the detection limit to rise to above the CRQL.

I e-mailed the raw data for reports 06-363 and 07-021 on June 8. I am resending it in this e-mail.

As for the sample calculation, it isn't really possible to calculate the ug/cm2 concentrations by hand due to the complexity of XRF. The calculations to get to ug/filter and ug/m3 are quite easy; multiply the ug/cm2 number by the deposit area (11.3) for ug/filter and divide the ug/filter concentration by the volume (usually 24) to get ug/m3. I can send you our XRF SOP if you want to take a stab at calculating the ug/cm2 concentration.

Hopefully this is enough information. If Rose needs anything else, maybe it would be best if she could call me directly so I understand exactly what she wants.

Paul Duda
CHESTER LabNet
12242 SW Garden Place
Tigard, OR 97223
pduda@chesterlab.net
http:\\www.chesterlab.net
(503)624-2183 ext. 100
fax (503)624-2653

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS
Table 1A

Case No. : None
SDG No. : 07-325
Site : Asarco Hayden
Lab : Chester LabNet
Reviewer : Stan Kott, ESAT/LDC
Date : April 17, 2008

QUALIFIED DATA
Concentration in ug / m3

Analysis Type : PM10 Teflon Air Filters for Select Total Metals by XRF

Station Location :	Hayden			Hayden			Hayden			Hayden								
Sample ID :	MY-083007			MY-090507			MY-091107			MY-091707			CRQL					
Filter Lot # :	7129003			7129003			7129003			7129003								
Collection Date :	8/30/2007			9/5/2007			9/11/2007			9/17/2007								
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ANTIMONY	0.0102 + 0.0030			* 0.0000 ± 0.0024			0.0120 + 0.0032	J	A	* 0.0014 ± 0.0025			4					
ARSENIC	0.1794 ± 0.0202			0.0071 ± 0.0011			0.1894 ± 0.0213			0.0251 ± 0.0030			0.0008					
BARIUM	0.0287 ± 0.0052			* 0.0029 ± 0.0043			0.0403 ± 0.0063			* 0.0076 ± 0.0041			0.52					
CADMIUM	0.0351 ± 0.0045			* 0.0002 ± 0.0018			0.0324 ± 0.0043			* 0.0032 ± 0.0019			0.0037					
CHROMIUM	0.0025 ± 0.0007			* 0.0014 ± 0.0007			* 0.0016 ± 0.0007			* 0.0006 ± 0.0007			0.00033					
COBALT	* 0.0000 ± 0.0014			* 0.0000 ± 0.0015			* 0.0000 ± 0.0017			* 0.0000 ± 0.0013			0.00069					
COPPER	3.677 ± 0.4112			0.6116 ± 0.0685			3.697 ± 0.4134			0.3699 ± 0.0415			0.75					
MANGANESE	0.0072 ± 0.0011			0.0344 ± 0.0046			0.0193 ± 0.0030	J	A	0.0328 ± 0.0044			0.051					
NICKEL	* 0.0000 ± 0.0009			* 0.0000 ± 0.0008			* 0.0000 ± 0.0010			* 0.0000 ± 0.0008			0.0040					
SELENIUM	0.0838 ± 0.0094			0.0104 ± 0.0012			0.0551 ± 0.0062			0.0062 ± 0.0008			1.60					
SILVER	0.0175 ± 0.0028			* 0.0022 ± 0.0017			* 0.0034 ± 0.0021			* 0.0000 ± 0.0017			0.079					
VANADIUM	* 0.0022 ± 0.0014			0.0149 ± 0.0020			* 0.0022 ± 0.0014			0.0074 ± 0.0013			0.40					
PM10 Net Mass	35.00 ± 3.525			43.54 ± 4.374			40.58 ± 4.080			41.29 ± 4.1501			50					

* Concentration is less than three times the uncertainty

Station Location :	Winkelman			Winkelman			Winkelman			Winkelman								
Sample ID :	HS-082407			HS-090507			HS-091107			HS-091707			CRQL					
Filter Lot # :	7129003			7129003			7129003			7129003								
Collection Date :	8/24/2007			9/5/2007			9/11/2007			9/17/2007								
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ANTIMONY	* 0.0000 ± 0.0008			0.0027 + 0.0009			* 0.0007 ± 0.0008			* 0.0000 ± 0.0008			4					
ARSENIC	0.0079 ± 0.0012			* 0.0017 ± 0.0007			* 0.0000 ± 0.0006			* 0.0000 ± 0.0006			0.0008					
BARIUM	* 0.0051 ± 0.0023			* 0.0021 ± 0.0023			* 0.0000 ± 0.0017			0.0108 ± 0.0032			0.52					
CADMIUM	0.0024 + 0.0007			* 0.0000 ± 0.0006			* 0.0003 ± 0.0006			* 0.0000 ± 0.0006			0.00083					
CHROMIUM	* 0.0001 ± 0.0004			* 0.0000 ± 0.0004			* 0.0000 ± 0.0004			* 0.0002 ± 0.0005			0.00033					
COBALT	* 0.0000 ± 0.0010			* 0.0000 ± 0.0010			* 0.0014 ± 0.0008			* 0.0000 ± 0.0012			0.00069					
COPPER	0.3176 ± 0.0356			0.2216 ± 0.0249			0.0191 ± 0.0023			0.0555 ± 0.0064			0.75					
MANGANESE	0.0096 ± 0.0012			0.0129 ± 0.0021			0.0022 ± 0.0005			0.0307 ± 0.0041			0.051					
NICKEL	* 0.0000 ± 0.0007			* 0.0000 ± 0.0007			* 0.0000 ± 0.0007			* 0.0001 ± 0.0007			0.0040					
SELENIUM	0.0024 ± 0.0004			0.0041 ± 0.0006			* 0.0000 ± 0.0003			* 0.0000 ± 0.0003			1.60					
SILVER	0.0026 ± 0.0007			0.0020 ± 0.0006			* 0.0011 ± 0.0006			* 0.0008 ± 0.0006			0.079					
VANADIUM	0.0017 ± 0.0006			0.0028 ± 0.0007			* 0.0000 ± 0.0005			* 0.0038 ± 0.0009			0.40					
PM10 Net Mass	19.62 ± 2.006			22.71 ± 2.309			6.042 ± 0.7339			32.29 ± 3.256			50					

* Concentration is less than three times the uncertainty

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, BG - Bachground Sample
CRQL - Contract Required Quantitation Limit

ICF Consulting / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Project Officer (TOPO)
Quality Assurance (QA) Program, PMD-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: 68-W-01-028
Technical Direction Form No.: 00905068

DATE: January 27, 2006~~January 27, 2006~~

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	34768
SDG No.:	MY29L5
Laboratory:	CompuChem (LIBRTY)
Analysis:	Total Metals plus Boron, Molybdenum, and Cyanide
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	November 16 and 17, 2005
Reviewer:	Kendra DeSantolo, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Edward Messer, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [X] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 34768
SDG No.: MY29L5
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Kendra DeSantolo, ESAT/LDC
Date: January 23, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY29L5 through MY29L9, MY29M0 through MY29M5, MY29M7, MY29M8, MY29M9, MY29N1, MY29N2, MY29N3, MY29N5, MY29N6, and MY29N7
Concentration and Matrix:	Medium Concentration Soil
Analysis:	Total Metals plus Boron, Molybdenum, and Cyanide
SOW:	ILM05.3 and Modified Analysis Request (MAR) 1318.3
Collection Date:	November 16 and 17, 2005
Sample Receipt Date:	November 23, 2005
Preparation Date:	November 28 and 29, 2005
Analysis Date:	November 28, 29, and 30, 2005

Field QC

Field Blanks (FB):	Not provided
Equipment Blanks (EB):	Not provided
Background Samples (BG):	Not provided
Field Duplicates (D1):	MY29L6 and MY29L7

Laboratory QC

Method Blanks & Associated Samples:	PBS and samples listed above
Matrix Spike:	MY29M0S
Duplicates:	MY29M0D
ICP Serial Dilution:	MY29M0L

Analysis: Total Metals plus Boron, Molybdenum, and Cyanide

Analyte	Sample Preparation and Digestion/Distillation Date	Analysis Date
ICP-AES Metals	November 28, 2005	November 28, 2005
Mercury	November 28, 2005	November 29, 2005
Cyanide	November 29, 2005	November 30, 2005
Percent Solids	November 28, 2005	November 29, 2005

CLP PO Action

1. The CRQL standard (CRI) was not analyzed at the contract required quantitation limits (CRQLs) specified in MAR Modification Reference Number 1318.3 for the metal analytes.

2. The laboratory indicates in the SDG Narrative that the matrix spike sample was spiked at twice the concentration specified in the SOW.

Sampling Issues

1. Cyanide was not listed on the Traffic Report/Chain of Custody (TR/COC) report forms. Region 9 instructed the laboratory to follow the scheduling and analyze for cyanide.

2. The sampler did not provide a signature in the Sampler Signature block on the TR/COC record forms. No adverse effect on data quality is expected.

3. The TR/COC analysis key indicates analysis for Br. The laboratory analyzed for boron (B) as specified in MAR 1318.3.

Additional Comments

The samples of this SDG were analyzed for CLP total metals plus total boron and total molybdenum by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1318.3. Mercury was analyzed by the CLP cold vapor atomic absorption method. Cyanide was analyzed by the CLP spectrophotometric method.

MAR 1318.3 requires CRQLs that differ from the standard CRQLs provided in the SOW. See Table 1A for the required modified CRQLs.

The laboratory informed Region 9 that the current method detection limit (MDL) for selenium was 0.34 mg/kg. MAR 1318.3 required a 0.30 mg/kg CRQL for selenium. Region 9 allowed the laboratory to increase the sample size to 2 grams to achieve the ICP-AES CRQLs required by MAR 1318.3.

The laboratory indicated in the SDG Narrative that the matrix spike sample was inadvertently spiked at two times the required concentration ("double spiked"). The effect on data quality is not known.

The laboratory diluted and reanalyzed all samples, except MY29N2, at a 3 time or 5 time dilution to stay within the instrument=s linear range for calcium, copper, iron, manganese, and zinc. No adverse effect on data quality is expected.

The laboratory indicated in the SDG Narrative that the results from the diluted analysis for manganese in sample MY29M5 and calcium in sample MY29M9 were below the 25% cutoff for these analytes specified in the SOW. Since the diluted results were less than the linear range of the instrument and greater than the continuing calibration verifications (CCVs) concentrations for the respective analytes, no adverse effect on data quality is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: 1318.3, Title: Lowered CRQLs with the addition of B and Mo, November 17, 2005;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	No	B
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	C
5.	ICP Interference Check Sample (ICS)	No	D
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	E
9.	ICP Serial Dilution Analysis	No	F
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	G
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are estimated and flagged "J" in Table 1A because the CRQL standard (CRI) was not analyzed at the modified CRQLs specified in MAR 1318.3.

X Antimony in samples MY29L5, MY29L6, MY29M3, MY29M4, MY29M8, MY29N1, and MY29N2
X Mercury in samples MY29L6, MY29L7, MY29L9, MY29M3, MY29M5, MY29M9, MY29N3, and MY29N5
X Selenium in samples MY29M7 and MY29N1
X Thallium in samples MY29L6, MY29L7, and MY29M5

The SOW requires a CRI be analyzed to verify the instrument can achieve the specified CRQLs. Results above the MDL but less than two times the CRQL are considered quantitatively uncertain. The results reported for the analytes listed above in the samples listed above are estimated.

The inorganic SOW specifies that the laboratory must analyze a CRI standard immediately following the initial calibration verification (ICV), at the beginning, end, and after every 20 analytical samples for each analytical run in order to verify linearity near the CRQL.

C. The following results are reported as non-detected (U) in Table 1A due to low level preparation blank contamination.

X Sodium in samples MY29L6, MY29L7, MY29L8, MY29M0, MY29M1, MY29M3, MY29M4, MY29N5, MY29M7, MY29M8, MY29M9, MY29N1, MY29N2, MY29N3, and MY29N5

The value for sodium (66.3 mg/kg) in preparation blank sample PBS is greater than the MDL but less than the CRQL. Sample results greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the CRQL.

A preparation blank is an analytical control that contains distilled, deionized water, or baked sand for solid matrices, and reagents, which is carried through the entire analytical procedure. The preparation blank is used to determine the level of contamination introduced by the laboratory during preparation and analysis.

D. The following results are estimated and are flagged "J" in Table 1A due to possible ICP interelement interference problems.

X Arsenic in samples MY29M0 and MY29M5
X Cadmium in samples MY29L5, MY29L7, MY29L8, MY29L9, MY29M0, MY29M1, MY29M3 through MY29M5, MY29M7 through MY29M9, MY29N1, MY29N2, MY29N3, and MY29N5 through MY29N7
X Thallium in samples MY29N3 and MY29N5

Results for arsenic, cadmium, and thallium in the samples listed above were reported from an undiluted analysis that contained copper and iron concentrations greater than the true value specified for the ICP interference check sample (ICS). Therefore, the applied interelement correction (IEC) factor may not compensate sufficiently for the interference. The results for the above listed analytes may be biased low.

The ICP ICS solutions A and AB are analyzed to determine the effects of high concentrations of interfering elements on each analyte determined by ICP. Solution A consists of the interferents (Al, Ca, Fe, and Mg), and Solution AB consists of the analytes mixed with the interferents.

When the estimated concentration produced by the interfering element is greater than twice the CRQL and also is greater than 10% of the reported concentration of the affected element, the results of the affected elements are estimated.

E. The following results are estimated and flagged "J-", "J", or "UJ" in Table 1A because matrix spike recovery results are outside method QC limits.

X Antimony, arsenic, beryllium, cadmium, cobalt, molybdenum, nickel, and selenium in all samples

Matrix spike recoveries for these analytes in QC sample MY29M0S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for each analyte are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	3	-97
Arsenic	69	-31
Beryllium	72	-28
Cadmium	71	-29
Cobalt	74	-26
Molybdenum	67	-33
Nickel	72	-28
Selenium	69	-31

Results above the MDL are considered quantitatively uncertain. Results reported for antimony, arsenic, beryllium, cadmium, cobalt, molybdenum, nickel, and selenium in all samples may be biased low and, where non-detected, false negatives may exist.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes (except silver) fall outside the control limits of 75-125%, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery results were obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	46
Arsenic	108
Beryllium	18
Cadmium	122
Cobalt	78
Molybdenum	78
Nickel	77
Selenium	397

Since the post-digestion spike recovery was acceptable for arsenic, cadmium, cobalt, molybdenum, and nickel, the low pre-digestion spike recovery result obtained for these analytes may indicate sample non-homogeneity, poor laboratory technique or matrix effects which may interfere with accurate analysis, depressing the analytical result.

Since both the post- and pre-digestion spikes did not meet the QC criteria for antimony and beryllium, matrix effects may be present in the sample digestate which may depress the analyte signal during analysis. The selenium post- and pre-digestion spikes did not meet the QC criteria due to possible sample digestate matrix effects which may interfere with the analyte signal during analysis.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

F. The following results are estimated and flagged "J" or "UJ" in Table 1A because ICP serial dilution results are outside method QC limits.

X Aluminum, arsenic, barium, boron, cadmium, chromium, cobalt, lead, magnesium, molybdenum, nickel, and vanadium in all samples

The percent difference for the ICP serial dilution analysis of sample MY29M0L did not meet the 10% criterion for the analytes shown below.

Analyte	% Difference
Aluminum	+12
Arsenic	+13
Barium	+11
Boron	+45
Cadmium	+12
Chromium	+17
Cobalt	+20
Lead	+21
Magnesium	+16
Molybdenum	+17
Nickel	+22
Vanadium	+16

Results reported for the analytes listed above in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The resuls for the diluted sample were higher than the original. Therefore, the reported sample results may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

G. A relative percent difference (RPD) of 48 was obtained for calcium in the analysis of field duplicate pair samples MY29L6 and MY29L7. Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ∀35 RPD criterion for precision. The effect on data quality is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, sample non-homogeneity,, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS
Table 1A

Case No. : 34768 SDG No. : MY29L5
Site : ASARCO
Lab : CompuChem (LIBRTY)
RGviewer : Kendra DeSantolo, ESAT/LDC
Date : January 23, 2006

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : Medium Concentration Soil Samples For Total Metals plus Boron, Molybdenum, and Cyanide

Station Location :	SPW-SED-12AS-111605			SPW-SED-11AS-111605			SPW-SED-11AD-111605			SPW-SED-14AS-111605			SPW-SED-13AS-111605			SPW-SED-01AS-111605			SPW-SED-06AS-111605		
Sample ID :	MY29L5			MY29L6 D1			MY29L7 D1			MY29L8			MY29L9			MY29M0			MY29M1		
Collection Date :	11/16/2005			11/16/2005			11/16/2005			11/16/2005			11/16/2005			11/16/2005			11/16/2005		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	16000	J	F	3580	J	F	3850	J	F	6560	J	F	11400	J	F	18500	J	F	13400	J	F
ANTIMONY	1.0	J-	BE	0.97	J-	BE	2.1	J-	E	1.2	J-	E	1.4	J-	E	1.2	J-	E	1.5	J-	E
ARSENIC	14.3	J	EF	17.7	J	EF	19.0	J	EF	9.5	J	EF	13.5	J	EF	23.1	J	DEF	28.9	J	EF
BARIUM	41.1L	J	AF	27.8L	J	AF	31.2L	J	AF	36.9L	J	AF	53.9L	J	AF	57.5L	J	AF	59.6L	J	AF
BERYLLIUM	0.26U	J	E	0.26U	J	E	0.26U	J	E	0.26U	J	E	0.27U	J	E	0.27U	J	E	0.26U	J	E
CADMIUM	2.6	J	DEF	2.2	J	EF	2.3	J	DEF	1.6	J	DEF	1.9	J	DEF	2.9	J	DEF	4.8	J	DEF
CALCIUM	54500			13500		G	8280		G	33000			43600			65200			56100		
CHROMIUM	17.3	J	F	10.9	J	F	11.0	J	F	9.0	J	F	16.0	J	F	18.2	J	F	15.0	J	F
COBALT	26.1	J	EF	7.1	J	EF	8.2	J	EF	9.8	J	EF	17.4	J	EF	30.2	J	EF	20.1	J	EF
COPPER	6060			2860			3050			2230			5170			10500			7050		
IRON	26900			11400			13100			12900			26900			35200			24700		
LEAD	35.6	J	F	62.6	J	F	64.6	J	F	38.6	J	F	65.3	J	F	51.5	J	F	129	J	F
MAGNESIUM	17900	J	F	2680	J	F	2880	J	F	6080	J	F	11000	J	F	17600	J	F	13500	J	F
MANGANESE	481			98.3			109			196			355			676			406		
MERCURY	0.051U			0.061	J	B	0.068	J	B	0.021L	J	A	0.058	J	B	0.050L	J	A	0.14		
NICKEL	31.3	J	EF	8.2L	J	AEF	8.8L	J	AEF	11.5	J	EF	24.4	J	EF	32.5	J	EF	25.3	J	EF
POTASSIUM	1040			1180			1260			1250			1320			1270			1590		
SELENIUM	0.15U	J	E	0.76	J	E	0.80	J	E	0.65	J	E	0.15U	J	E	0.16U	J	E	0.15U	J	E
SILVER	1.2			1.3			1.5			1.1			1.3			3.1			3.9		
SODIUM	264			250U		C	250U		C	251U		C	339			259U		C	252U		C
THALLIUM	1.7			0.39	J	B	0.48	J	B	0.81			1.3			1.1			1.4		
VANADIUM	64.7	J	F	18.8	J	F	20.9	J	F	30.4	J	F	49.9	J	F	65.4	J	F	51.0	J	F
ZINC	211			93.9			104			95.1			200			270			256		
CYANIDE	2.5U			2.5U			2.5U			2.5U			2.6U			2.6U			2.5U		
MOLYBDENUM	35.1	J	EF	28.6	J	EF	32.7	J	EF	41.2	J	EF	39.0	J	EF	64.2	J	EF	32.7	J	EF
BORON	2.4	J	F	1.1	J	F	1.3	J	F	1.7	J	F	3.1	J	F	3.1	J	F	2.6	J	F
PERCENT SOLIDS	98.8%			99.8%			99.8%			99.6%			97.7%			96.5%			99.4%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 34768 SDG No. : MY29L5
Site : ASARCO
Lab : CompuChem (LIBRTY)
Reviewer : Kendra DeSantolo, ESAT/LDC
Date : January 23, 2006

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : Medium Concentration Soil Samples For Total Metals plus Boron, Molybdenum, and Cyanide

Station Location :	SPW-SED-03AS-111605			SPW-SED-05AS-111605			SPW-SED-04AS-111605			SPW-SED-02AS-111605			SPW-SED-15AS-111705			SPW-SED-07AS-111705			SPW-SED-08AS-111705		
Sample ID :	MY29M2			MY29M3			MY29M4			MY29M5			MY29M7			MY29M8			MY29M9		
Collection Date :	11/16/2005			11/16/2005			11/16/2005			11/16/2005			11/17/2005			11/17/2005			11/17/2005		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	16000	J	F	10200	J	F	18100	J	F	17800	J	F	11800	J	F	14000	J	F	11800	J	F
ANTIMONY	1.5	J-	E	0.99	J-	BE	1.0	J-	BE	2.0	J-	E	1.5	J-	E	1.0	J-	BE	1.3	J-	E
ARSENIC	23.2	J	EF	24.7	J	EF	15.1	J	EF	29.7	J	DEF	16.4	J	EF	5.5	J	EF	18.3	J	EF
BARIUM	68.1L	J	AF	70.0L	J	AF	39.1L	J	AF	66.6L	J	AF	70.4L	J	AF	66.8L	J	AF	94.0	J	F
BERYLLIUM	0.26U	J	E	0.26U	J	E	0.27U	J	E	0.27U	J	E	0.26U	J	E	0.26U	J	E	0.26U	J	E
CADMIUM	3.5	J	EF	3.3	J	DEF	2.2	J	DEF	3.4	J	DEF	2.1	J	DEF	0.94	J	DEF	3.8	J	DEF
CALCIUM	79500			46500			51100			61900			34500			35200			36500		
CHROMIUM	16.6	J	F	13.1	J	F	17.2	J	F	18.3	J	F	13.9	J	F	9.8	J	F	11.6	J	F
COBALT	22.9	J	EF	14.6	J	EF	26.7	J	EF	29.7	J	EF	16.4	J	EF	15.8	J	EF	16.6	J	EF
COPPER	7230			6260			5970			12500			4920			926			4950		
IRON	29300			17700			27900			36200			22200			17500			19900		
LEAD	118	J	F	89.7	J	F	30.9	J	F	67.0	J	F	60.8	J	F	24.1	J	F	90.4	J	F
MAGNESIUM	17100	J	F	9470	J	F	17800	J	F	17300	J	F	10700	J	F	11100	J	F	11700	J	F
MANGANESE	482			291			599			622			369			451			358		
MERCURY	0.12			0.076	J	B	0.020L	J	A	0.093	J	B	0.047L	J	A	0.051U			0.082	J	B
NICKEL	29.4	J	EF	19.8	J	EF	31.1	J	EF	32.2	J	EF	18.5	J	EF	14.4	J	EF	18.2	J	EF
POTASSIUM	1480			2030			1150			1470			1570			1080			2150		
SELENIUM	0.15U	J	E	0.32	J	E	0.15U	J	E	1.2	J	E	0.22	J	BE	0.15U	J	E	0.97	J	E
SILVER	3.8			3.4			1.4			4.9			2.3			0.29			3.3		
SODIUM	265			252U		C	256U		C	256U		C	254U		C	253U		C	253U		C
THALLIUM	2.0			0.85			1.6			0.62	J	B	1.4			2.1			1.3		
VANADIUM	65.9	J	F	38.1	J	F	69.6	J	F	63.3	J	F	50.3	J	F	53.5	J	F	43.7	J	F
ZINC	264			207			192			283			176			71.9			250		
CYANIDE	2.5U			2.5U			2.6U			2.6U			2.5U			2.5U			2.5U		
MOLYBDENUM	31.4	J	EF	38.5	J	EF	35.4	J	EF	86.0	J	EF	41.8	J	EF	3.8	J	EF	32.7	J	EF
BORON	4.0	J	F	3.2	J	F	2.7	J	F	3.5	J	F	3.5	J	F	2.4	J	F	3.2	J	F
PERCENT SOLIDS	98.8%			99.2%			97.8%			97.6%			98.6%			98.7%			98.8%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 34768 SDG No. : MY29L5
Site : ASARCO
Lab : CompuChem (LIBRTY)
Reviewer : Kendra DeSantolo, ESAT/LDC
Date : January 23, 2006

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : Medium Concentration Soil Samples For Total Metals plus Boron, Molybdenum, and Cyanide

Station Location :	SPW-SED-09AS-111705			SPW-SED-10AS-111705			PHW-SED-01AS-111705			PHW-SED-02BS-111705			PHW-SED-03AS-111705			PHW-SED-04AS-111705			MDL		
Sample ID :	MY29N1			MY29N2			MY29N3			MY29N5			MY29N6			MY29N7					
Collection Date :	11/17/2005			11/17/2005			11/17/2005			11/17/2005			11/17/2005			11/17/2005					
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	11400	J	F	10200	J	F	15500	J	F	13800	J	F	15600	J	F	16200	J	F	2.0		
ANTIMONY	0.96	J-	BE	0.85	J-	BE	3.3	J-	E	3.2	J-	E	2.1	J-	E	2.2	J-	E	0.20		
ARSENIC	13.0	J	EF	9.0	J	EF	35.7	J	EF	37.9	J	EF	36.4	J	EF	25.4	J	EF	0.30		
BARIUM	95.8	J	F	74.2L	J	AF	70.5L	J	AF	72.8L	J	AF	89.3	J	F	84.8	J	F	0.072		
BERYLLIUM	0.26U	J	E	0.26U	J	E	0.27U	J	E	0.28U	J	E	0.26U	J	E	0.26U	J	E	0.012		
CADMIUM	2.0	J	DEF	1.8	J	DEF	3.7	J	DEF	4.1	J	DEF	3.9	J	DEF	3.4	J	DEF	0.032		
CALCIUM	22600			30100			57800			36400			50400			51400			21.8		
CHROMIUM	9.8	J	F	10.1	J	F	19.1	J	F	23.9	J	F	20.3	J	F	19.9	J	F	0.079		
COBALT	13.6	J	EF	13.7	J	EF	33.2	J	EF	40.6	J	EF	27.9	J	EF	29.8	J	EF	0.062		
COPPER	3150			2440			6030			11100			8270			6070			0.17		
IRON	17700			16300			43300			58900			33700			35000			3.1		
LEAD	57.8	J	F	45.4	J	F	130	J	F	140	J	F	110	J	F	104	J	F	0.19		
MAGNESIUM	8430	J	F	8920	J	F	14300	J	F	13300	J	F	14200	J	F	16000	J	F	2.5		
MANGANESE	333			332			502			505			563			576			0.73		
MERCURY	0.050L	J	A	0.050U			0.065	J	B	0.076	J	B	0.11			0.030L	J	A	0.020		
NICKEL	14.3	J	EF	15.3	J	EF	32.6	J	EF	39.7	J	EF	32.5	J	EF	33.9	J	EF	0.16		
POTASSIUM	2060			1460			1480			1320			1890			1630			3.7		
SELENIUM	0.18	J	BE	0.15U	J	E	0.56	J	E	2.0	J	E	0.67	J	E	0.15U	J	E	0.34		
SILVER	2.4			1.2			3.1			3.9			4.0			2.1			0.15		
SODIUM	253U		C	251U		C	255U		C	265U		C	292			283			20.6		
THALLIUM	0.93			1.3			2.0	J	D	1.7	J	D	1.4			2.1			0.33		
VANADIUM	40.8	J	F	42.6	J	F	68.9	J	F	63.2	J	F	67.0	J	F	72.7	J	F	0.069		
ZINC	170			121			510			497			478			525			0.38		
CYANIDE	2.5U			2.5U			2.6U			2.7U			2.5U			2.5U			0.26		
MOLYBDENUM	22.4	J	EF	13.3	J	EF	40.2	J	EF	48.8	J	EF	65.8	J	EF	45.2	J	EF	0.32		
BORON	3.3	J	F	2.6	J	F	2.9	J	F	3.4	J	F	3.1	J	F	2.9	J	F	0.10		
PERCENT SOLIDS	98.8%			99.5%			98.0%			94.2%			98.2%			98.7%			N/A		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 34768 SDG No. : MY29L5
Site : ASARCO
Lab : CompuChem (LIBRTY)
Reviewer : Kendra DeSantolo, ESAT/LDC
Date : January 23, 2006

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : Medium Concentration Soil Samples For Total Metals plus Boron, Molybdenum, and Cyanide

Sample ID :	CRQL																				
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	50.0																				
ANTIMONY	0.99																				
ARSENIC	0.39																				
BARIUM	161.3																				
BERYLLIUM	0.52																				
CADMIUM	0.40																				
CALCIUM	500																				
CHROMIUM	0.40																				
COBALT	9.7																				
COPPER	16.6																				
IRON	200																				
LEAD	7.7																				
MAGNESIUM	500																				
MANGANESE	100																				
MERCURY	0.050																				
NICKEL	18.2																				
POTASSIUM	500																				
SELENIUM	0.30																				
SILVER	0.50																				
SODIUM	500																				
THALLIUM	0.70																				
VANADIUM	2.0																				
ZINC	38.9																				
CYANIDE	2.5																				
MOLYBDENUM	2.0																				
BORON	0.50																				

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ICF Consulting / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Project Officer (TOPO)
Quality Assurance (QA) Program, PMD-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: 68-W-01-028
Technical Direction Form No.: 00905090

DATE: May 24, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None
Case No.:	35036
SDG No.:	MY2DM3
Laboratory:	CompuChem (LIBRTY)
Analysis:	CLP Total Metals and Total Cyanide
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 20, 21, and 22, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35036
SDG No.: MY2DM3
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Stan Kott, ESAT/LDC
Date: May 24, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY2DM3 through MY2DM9, MY2DN0 through MY2DN9, MY2DP0, MY2DP1, and MY2DP2
Concentration and Matrix:	Low and Medium Concentration Soil
Analysis:	CLP Total Metals and Total Cyanide
SOW:	ILM05.3 and Modified Analysis Request 1337.0
Collection Date:	February 20, 21, and 22, 2006
Sample Receipt Date:	February 25, 2006
Preparation Date:	March 1 and 2, 2006
Analysis Date:	March 6, 9, 16, 17, 18, and 23, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY2DN9 and MY2DP0

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank-Soil (PBS) and samples listed above
Matrix Spike:	MY2DP2S
Duplicates:	MY2DP2D
ICP Serial Dilution:	MY2DP2L

Analysis: Total Metals and Total Cyanide

Analyte	Sample Preparation and Digestion/Distillation Date	Analysis Date
ICP-AES Metals	March 2, 2006	March 16, 17, 18, and 23, 2006
Mercury	March 2, 2006	March 6, 2006
Cyanide	March 1, 2006	March 9, 2006
Percent Solids	March 2, 2006	March 3, 2006

CLP PO Action

None.

Sampling Issues

1. The Traffic Report/Chain of Custody (TR/COC) record form did not specify a sample to be used for laboratory quality control (QC). The laboratory selected sample MY2DP2 for laboratory QC analysis.

2. One of the coolers containing samples for this SDG arrived at the laboratory with a temperature of 6.8ºC. This temperature exceeds the temperature of 4º∀ 2ºC specified in the Statement of Work (SOW); however, no adverse effect on data quality is expected.

Additional Comments

The SDG Narrative requires minor editing to correct sample receipt date and laboratory QC sample identity. A corrected SDG Narrative was requested from the laboratory but has not been received to date. Data quality is not likely to be affected and this report is considered final.

The samples in this SDG were analyzed for CLP total metals plus boron and molybdenum by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1337.0. Mercury was analyzed by the CLP cold vapor atomic absorption method. Cyanide was analyzed by the CLP spectrophotometric method.

The SDG Narrative states that Region 9 approved an increase in the contract required quantitation limit (CRQL) for selenium from 0.30 mg/kg to 0.50 mg/kg.

To achieve the modified mercury CRQL specified in MAR 1337.0, the laboratory increased the mercury analysis sample size from 0.2 g to 0.5 g as permitted by MAR 1337.0.

Samples MY2DM6 through MY2DN4 and MY2DN8 through MY2DP0 were analyzed from diluted samples due to high analyte concentrations or interference problems. No adverse effect on data quality is expected.

CADRE R-flagged copper results for samples MY2DN1 through MY2DN4, MY2DP0, and MY2DP1, analyzed on March 19, 2006, because the last of five CRI analyses exceeded the 180 percent expanded recovery criterion specified in the National Functional Guidelines (NFG). Since the reported copper data for the samples listed above were analyzed between acceptable CRI recoveries, the R flags for the copper data in the Table 1A were removed.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: 1337.0, January 18, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	B
5.	ICP Interference Check Sample (ICS)	No	C
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	D
9.	ICP Serial Dilution Analysis	No	E
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	F
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are reported as non-detected (U) in Table 1A due to low level preparation blank (PBS) contamination.

X Beryllium in samples MY2DN0, MY2DN1, MY2DN2, and MY2DN4 through MY2DP0
X Molybdenum in sample MY2DN6
X Sodium in samples MY2DM7, MY2DN1, MY2DN7, and MY2DP2

The beryllium (0.059 mg/kg), molybdenum (0.11 mg/kg), and sodium (48.6 mg/kg) results in preparation blank PBS are greater than the respective MDLs but less than the respective CRQLs. Sample results greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the respective CRQL.

A preparation blank is an analytical control that contains distilled, deionized water, or baked sand for solid matrices, and reagents, which is carried through the entire analytical procedure. The preparation blank is used to determine the level of contamination introduced by the laboratory during preparation and analysis.

C. The following results are estimated and are flagged "J-" or "J+" in Table 1A due to possible ICP interelement interference problems.

X Cadmium, selenium, and thallium in samples MY2DM3, MY2DM5 through MY2DM9, MY2DN1, MY2DN5, MY2DN7 through MY2DN9, MY2DP0, and MY2DP1
X Arsenic in samples MY2DM7, MY2DM8, MY2DN1, MY2DN5, MY2DN8, MY2DN9, and MY2DP0
X Chromium in samples MY2DM6 through MY2DM9, and MY2DN8 through MY2DP0
X Zinc in sample MY2DN1

Results for cadmium, selenium, and thallium in the samples listed above were reported from an undiluted analysis that contained iron concentrations greater than the true value specified for the ICP interference check sample (ICS). Therefore, the applied interelement correction (IEC) factor may not compensate sufficiently for the interference. The results for cadmium may be biased high and false positives may exist. The results for selenium and thallium may be biased low and false negatives may exist.

Results for arsenic, chromium, and zinc in the samples listed above were reported from an undiluted analysis that contained copper concentrations greater than the true value specified for the ICP ICS. Therefore, the applied interelement correction (IEC) factor may not compensate sufficiently for the interference. The results for arsenic, chromium, and zinc in the samples listed above may be biased high and false positives may exist.

The ICP ICS solutions A and AB are analyzed to determine the effects of high concentrations of interfering elements on each analyte determined by ICP. Solution A consists of the interferents (Al, Ca, Fe, and Mg), and Solution AB consists of the analytes mixed with the interferents.

When the estimated concentration produced by the interfering element is greater than twice the CRQL and also is greater than 10% of the reported concentration of the affected element, the results of the affected elements are estimated.

D. The following results are estimated and flagged "J", "J-" or "UJ" in Table 1A because matrix spike recovery results are outside method QC limits.

X Antimony, arsenic, boron, molybdenum, selenium, and zinc in all samples

Matrix spike recoveries for the samples listed above in QC sample MY2DP2S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for each analyte are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	66	-34
Arsenic	62	-38
Boron	43	-57
Molybdenum	60	-40
Selenium	71	-29
Zinc	65	-35

Results above the MDL are considered quantitatively uncertain. Results reported for the analytes listed above in all samples may be biased low.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes (except silver) fall outside the control limits of 75-125%, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery results for sample MY2DP2A were obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	77
Arsenic	90
Boron	54
Molybdenum	79
Selenium	82
Zinc	78

Since the post-digestion spike recoveries were acceptable, the low pre-digestion spike recovery results obtained for antimony, arsenic, molybdenum, selenium, and zinc may indicate sample non-homogeneity, poor laboratory technique, or matrix effects which may interfere with accurate analysis, depressing analytical results. Since both the post- and pre-digestion spikes for boron did not meet the QC criteria, matrix effects may be present in the sample digestate which may depress the analyte signal during analysis.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

E. The following results are estimated and flagged "J" or "UJ" in Table 1A because ICP serial dilution results are outside method QC limits.

X Aluminum, barium, chromium, cobalt, iron, lead, magnesium, manganese, molybdenum, nickel, vanadium, and zinc in all samples

The percent difference for the ICP serial dilution analysis of sample MY2EW9L did not meet the 10% criterion for the analytes shown below.

Analyte	% Difference
Aluminum	+15
Barium	+13
Chromium	+14
Cobalt	+15
Iron	+15
Lead	+17
Magnesium	+16
Manganese	+15
Molybdenum	+15
Nickel	+13
Vanadium	+13
Zinc	+16

Results reported for the analytes listed above in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The results for the diluted sample were higher than the original. Therefore, the reported sample results may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

F. A relative percent difference (RPD) of 42 was obtained for cadmium in the analysis of field duplicate pair samples MY2DN9 and MY2DP0. Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ∀35 RPD criterion for precision. The effect on data quality is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, sample non-homogeneity, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

In Reference to
Case: 35036 SDG No.: MY2DM3

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM

Telephone Record Log

Date of Call: May 24, 2006

Laboratory Name: CompuChem (LIBRTY)

Lab Contact: Alice Evens or Bob Meierer

Region: 9

Regional Contact: Steve Remaley, CLP PO

ESAT Reviewer: Stan Kott, ESAT/LDC

Call Initiated By: ___ Laboratory X Region

In reference to data for the following sample(s):

SDG No.: MY2DM3 for all samples

Summary of Questions/issues Discussed:

The following item was noted during the review of this sample delivery group (SDG) data package. Please respond within 4 days as specified in ILM05.3 Statement of Work (SOW), Exhibit B, Section 2, 2.2. Send response and resubmissions to

ICF International/Laboratory Data Consultants, Inc.,
Environmental Services Assistance Team, USEPA Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804, FAX 510 412-2304.

1. The SDG Narrative indicates samples were received on February 11 and 16, 2006. The sample log-in sheet indicates samples were received on February 25, 2006. Please review the data and provide a corrected SDG Narrative.

2. The SDG Narrative indicates sample MY2DM0 was selected for laboratory QC analysis. The QC summaries in the data package indicate sample MY2DP2 was selected for QC analysis. Please review the data and provide a corrected SDG Narrative.

3. The SOW specifies that percent solids samples be dried at 103-105ºC. Please provide the oven temperature for the percent solids analyzed on March 2 and 3, 2006.

Summary of Resolution: To be determined.

Regional Contact Signature Date of Resolution

ANALYTICAL RESULTS
Table 1A

Case No. : 35036 SDG No. : MY2DM3
Site : ASARCO
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : May 24, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples
For Total Metals and Cyanide

Station Location :	HGC-10-SED-0-022006			HGC-20-SED-0-022006			HGC-33-SED-0-022106			HGC-30-SED-0-022106			SR77-01-SED-0-022106			KS-01-SED-0-022106			KS-02-SED-0-022106		
Sample ID :	MY2DM3			MY2DM4			MY2DM5			MY2DM6			MY2DM7			MY2DM8			MY2DM9		
Collection Date :	2/20/2006			2/20/2006			2/21/2006			2/21/2006			2/21/2006			2/21/2006			2/21/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	10900	J	E	5470	J	E	32700	J	E	15400	J	E	12600	J	E	15700	J	E	6810	J	E
ANTIMONY	0.80L	J	AD	0.50L	J	AD	2.7	J	D	3.5	J	D	2.6	J	D	5.2	J	D	20.9	J	D
ARSENIC	3.7	J	D	1.3	J	D	13.2	J	D	81.1	J	D	39.1	J+	CD	224	J+	CD	345	J	D
BARIUM	115L	J	AE	58.5L	J	AE	313L	J	AE	150L	J	AE	112L	J	AE	144L	J	AE	66.4L	J	AE
BERYLLIUM	0.44L	J	A	0.34L	J	A	1.1L	J	A	0.45L	J	A	0.41L	J	A	0.44L	J	A	0.55U		
CADMIUM	0.52	J+	C	0.15L	J	A	1.3	J+	C	9.5	J+	C	8.3	J+	C	25.8	J+	C	3.2	J+	C
CALCIUM	15700			4800			63400			17600			60000			120000			73700		
CHROMIUM	14.3	J	E	5.4	J	E	39.2	J	E	11.6	J	CE	25.5	J	CE	6.7	J	CE	34.4	J	CE
COBALT	10.7	J	E	5.2L	J	AE	32.0	J	E	27.3	J	E	15.8	J	E	75.2	J	E	42.8	J	E
COPPER	391			154			1600			9320			8130			56200			18400		
IRON	17300	J	E	9630	J	E	49600	J	E	25900	J	E	27200	J	E	49000	J	E	197000	J	E
LEAD	19.8	J	E	6.6L	J	AE	53.4	J	E	191	J	E	231	J	E	253	J	E	547	J	E
MAGNESIUM	6590	J	E	2700	J	E	22900	J	E	9920	J	E	10400	J	E	12900	J	E	2080	J	E
MANGANESE	382	J	E	236	J	E	941	J	E	418	J	E	382	J	E	383	J	E	65.2L	J	AE
MERCURY	0.022L	J	A	0.021U			0.098L	J	A	0.25			0.15			0.49			1.5		
NICKEL	17.8L	J	AE	6.3L	J	AE	54.7	J	E	31.3	J	E	34.3	J	E	72.9	J	E	32.6	J	E
POTASSIUM	3500			1450			9110			4300			1440			1810			2940		
SELENIUM	0.50U	J-	CD	0.52U	J	D	1.2L	J-	ACD	3.6	J-	CD	3.3	J-	CD	15.4	J-	CD	86.9	J-	CD
SILVER	0.19L	J	A	0.52U			0.73L	J	A	4.8			6.2			13.1			34.6		
SODIUM	529			301L	J	A	2610			849			501U		B	385L	J	A	1140		
THALLIUM	0.71U	J-	C	0.56L	J	A	3.4	J-	C	0.69L	J-	AC	0.70U	J-	C	1.2	J-	C	5.0	J-	C
VANADIUM	32.6	J	E	17.0	J	E	105	J	E	46.3	J	E	42.9	J	E	84.2	J	E	105	J	E
ZINC	97.9	J	DE	57.8	J	DE	260	J	DE	406	J	DE	400	J	DE	1460	J	DE	120	J	DE
CYANIDE	2.5U			2.6U			6.9U			2.5U			2.5U			0.52L	J	A	2.6U		
MOLYBDENUM	7.0	J	DE	3.5	J	DE	23.2	J	DE	65.4	J	DE	37.6	J	DE	240	J	DE	1510	J	DE
BORON	6.0	J-	D	2.5	J-	D	22.6	J-	D	7.5	J-	D	3.3	J-	D	7.8	J-	D	0.93	J-	D
PERCENT SOLIDS	99.1%			95.9%			36.3%			98.8%			99.8%			98.4%			94.7%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35036 SDG No. : MY2DM3
Site : ASARCO
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : May 24, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples
For Total Metals and Cyanide

Station Location :	KS-03-SED-0-022106			KS-04-SED-0-022106			KS-06-SED-0-022106			KS-08-SED-0-022106			KS-09-SED-90-022106			UP-01-SED-0-022106			WSC-08-SED-0-022106		
Sample ID :	MY2DN0			MY2DN1			MY2DN2			MY2DN3			MY2DN4			MY2DN5			MY2DN6		
Collection Date :	2/21/2006			2/21/2006			2/21/2006			2/21/2006			2/21/2006			2/21/2006			2/21/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	5500	J	E	3090	J	E	4720	J	E	10500	J	E	9720	J	E	21700	J	E	4640	J	E
ANTIMONY	12.2	J	D	14.5	J	D	14.5	J	D	13.0	J	D	9.9	J	D	0.94L	J	AD	0.21L	J	AD
ARSENIC	140	J	D	60.1	J+	CD	2.0U	J	D	114	J	D	91.6	J	D	10.9	J+	CD	2.1	J	D
BARIUM	161L	J	AE	46.4L	J	AE	40.6L	J	AE	69.8L	J	AE	67.4L	J	AE	99.0L	J	AE	49.2L	J	AE
BERYLLIUM	0.52U		B	0.53U		B	0.52U		B	1.1U			0.53U		B	0.52U		B	0.52U		B
CADMIUM	15.3			4.1	J+	C	17.9			7.7			25.9			1.7	J+	C	0.090L	J	A
CALCIUM	198000			22600			14800			35200			31900			84300			9940		
CHROMIUM	0.40U	J	E	0.40U	J	E	2.0U	J	E	0.82U	J	E	2.0U	J	E	21.9	J	E	8.1	J	E
COBALT	47.8	J	E	99.1	J	E	120	J	E	75.8	J	E	135	J	E	22.2	J	E	5.1L	J	AE
COPPER	56700			68200			192000			92800			133000			1540			38.4		
IRON	54100	J	E	227000	J	E	182000	J	E	146000	J	E	142000	J	E	26100	J	E	9630	J	E
LEAD	391	J	E	325	J	E	333	J	E	539	J	E	552	J	E	41.1	J	E	7.0L	J	AE
MAGNESIUM	5150	J	E	1880	J	E	3980	J	E	7790	J	E	7680	J	E	22000	J	E	2880	J	E
MANGANESE	183	J	E	73.5L	J	AE	223	J	E	242	J	E	313	J	E	797	J	E	149	J	E
MERCURY	0.42			0.13			0.066			0.25			0.17			0.053			0.020U		
NICKEL	54.2	J	E	78.5	J	E	78.9	J	E	68.0	J	E	113	J	E	27.9	J	E	7.8L	J	AE
POTASSIUM	1410			1180			1710			2430			2290			1670			869		
SELENIUM	32.2	J	D	67.6	J-	CD	101	J	D	111	J	D	83.2	J	D	0.94	J-	CD	0.50U	J	D
SILVER	29.6			27.6			35.7			63.4			30.9			0.81			0.50U		
SODIUM	261L	J	A	506U		B	262L	J	A	641			394L	J	A	250L	J	A	247L	J	A
THALLIUM	2.5			2.4	J-	C	5.1			2.1			5.9			0.40L	J-	AC	0.70U		
VANADIUM	26.9	J	E	31.1	J	E	31.7	J	E	53.8	J	E	48.5	J	E	71.8	J	E	26.5	J	E
ZINC	662	J	DE	278	J	CDE	1770	J	DE	630	J	DE	2100	J	DE	113	J	DE	27.6L	J	ADE
CYANIDE	2.5U			2.5U			2.5U			2.6U			2.6U			2.5U			2.5U		
MOLYBDENUM	488	J	DE	1060	J	DE	2280	J	DE	1490	J	DE	2060	J	DE	4.4	J	DE	2.0U	J	BDE
BORON	2.5	J-	D	0.51U	J-	D	0.50U	J-	D	6.6	J-	D	2.6	J-	D	3.2	J-	D	2.3	J-	D
PERCENT SOLIDS	99.4%			98.8%			99.5%			97.6%			97.9%			99.6%			99.8%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35036 SDG No. : MY2DM3
Site : ASARCO
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : May 24, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples For Total Metals and Cyanide

Station Location :	WSC-18-SED-0-022106			PCON-05-SED-0-022106			PCON-06-SED-0-022106			PCON-X-SED-0-022106			UPA-01-SED-0-022206			UPA-07-SED-0-022206			MDL		
Sample ID :	MY2DN7			MY2DN8			MY2DN9 D1			MY2DP0 D1			MY2DP1			MY2DP2					
Collection Date :	2/21/2006			2/21/2006			2/21/2006			2/21/2006			2/22/2006			2/22/2006					
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	5400	J	E	13200	J	E	15700	J	E	15200	J	E	30000	J	E	9760	J	E	3.1		
ANTIMONY	0.50L	J	AD	3.7	J	D	3.9	J	D	3.9	J	D	1.3	J	D	1.2	J	D	0.18		
ARSENIC	2.3	J	D	17.6	J+	CD	76.2	J+	CD	74.9	J+	CD	6.7	J	D	9.1	J	D	32.0		
BARIUM	54.2L	J	AE	100L	J	AE	227	J	E	218	J	E	60.6L	J	AE	74.2L	J	AE	0.047		
BERYLLIUM	0.54U		B	0.53U		B	0.52U		B	0.52U		B	0.52U			0.42L	J	A	0.022		
CADMIUM	0.030L	J+	AC	2.6	J+	C	8.9	J+	CF	13.7	J+	CF	1.6	J+	C	0.92			0.011		
CALCIUM	11300			33600			69100			74000			14800			3540			7.1		
CHROMIUM	10.9	J	E	4.4	J	CE	5.2	J	CE	4.9	J	CE	7.3	J	E	11.8	J	E	0.13		
COBALT	8.0L	J	AE	42.8	J	E	29.2	J	E	28.5	J	E	29.1	J	E	11.8	J	E	0.033		
COPPER	65.8			25500			23300			20700			854			882			0.083		
IRON	13500		E	59200	J	E	36800	J	E	34600	J	E	33700	J	E	21100	J	E	2.3		
LEAD	10.4	J	E	96.7	J	E	257	J	E	277	J	E	36.3	J	E	41.1	J	E	0.11		
MAGNESIUM	3740	J	E	9410	J	E	14300	J	E	14300	J	E	17600	J	E	4720	J	E	0.88		
MANGANESE	270	J	E	360	J	E	540	J	E	522	J	E	686	J	E	276	J	E	0.035		
MERCURY	0.021U			0.11			0.28			0.27			0.031L	J	A	0.052			0.042		
NICKEL	10.9L	J	AE	35.1	J	E	39.7	J	E	38.7	J	E	17.5L	J	AE	12.8L	J	AE	0.092		
POTASSIUM	1020			4730			2090			2250			1330			2670			2.1		
SELENIUM	0.52U	J-	CD	13.1	J-	CD	13.5	J-	CD	12.7	J-	CD	0.95	J-	CD	0.75	J	D	0.35		
SILVER	0.52U			5.3			19.0			16.7			0.37L	J	A	0.51			0.067		
SODIUM	520U		B	760			254L	J	A	261L	J	A	799			501U		B	13.3		
THALLIUM	0.49L	J-	AC	1.6	J-	C	0.63L	J-	AC	0.70U	J-	C	0.71U	J-	C	0.87			0.40		
VANADIUM	34.0	J	E	60.6	J	E	66.9	J	E	65.3	J	E	86.3	J	E	41.6	J	E	0.023		
ZINC	35.1L	J	ADE	410	J	DE	518	J	DE	544	J	DE	99.3	J	DE	106	J	DE	0.18		
CYANIDE	2.6U			2.6U			2.5U			2.5U			2.5U			2.5U			0.16		
MOLYBDENUM	1.0L	J	ADE	383	J	DE	128	J	DE	129	J	DE	3.5	J	DE	15.9	J	DE	0.068		
BORON	1.5	J-	D	2.5	J-	D	5.3	J-	D	4.9	J-	D	1.9	J-	D	1.5	J-	D	0.031		
PERCENT SOLIDS	96.2%			98.0%			99.7%			99.5%			99.2%			99.8%			N/A		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35036 SDG No. : MY2DM3
Site : ASARCO
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : May 24, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples For Total Metals and Cyanide

Sample ID :	CRQL																				
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	50.0																				
ANTIMONY	0.99																				
ARSENIC	0.39																				
BARIUM	161.3																				
BERYLLIUM	0.52																				
CADMIUM	0.40																				
CALCIUM	500																				
CHROMIUM	0.40																				
COBALT	9.7																				
COPPER	16.6																				
IRON	200																				
LEAD	7.7																				
MAGNESIUM	500																				
MANGANESE	100																				
MERCURY	0.050																				
NICKEL	18.2																				
POTASSIUM	500																				
SELENIUM	0.50																				
SILVER	0.50																				
SODIUM	500																				
THALLIUM	0.70																				
VANADIUM	2.0																				
ZINC	38.9																				
CYANIDE	2.5																				
MOLYBDENUM	2.0																				
BORON	0.50																				

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ICF Consulting / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Project Officer (TOPO)
Quality Assurance (QA) Program, PMD-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: 68-W-01-028
Technical Direction Form No.: 00905090

DATE: May 18, 2006

SUBJECT: Review of Analytical Data, Tier 2

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None
Case No.:	35036
SDG No.:	MY2DP4
Laboratory:	CompuChem (LIBRTY)
Analysis:	CLP Total Metals and Total Cyanide
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 22 and 23, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report

Case No.: 35036
SDG No.: MY2DP4
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Stan Kott, ESAT/LDC
Date: May 18, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY2DP4 through MY2DR3
Concentration and Matrix:	Low and Medium Concentration Soil
Analysis:	CLP Total Metals and Total Cyanide
SOW:	ILM05.3 and Modification Reference Number 1337.0
Collection Date:	February 22 and 23, 2006
Sample Receipt Date:	February 25, 2006
Preparation Date:	March 2 and 9, 2006
Analysis Date:	March 9, 10, 13, and 15, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY2DQ2 and MY2DQ3
(D2):	MY2DQ6 and MY2DQ7

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank-Soil (PBS) and samples listed above
Matrix Spike:	MY2DQ8S
Duplicates:	MY2DQ8D
ICP Serial Dilution:	MY2DQ8L

Analysis: CLP Total Metals and Total Cyanide

Analyte	Sample Preparation and Digestion/Distillation Date	Analysis Date
ICP-AES Metals	March 2, 2006	March 13 and 15, 2006
Mercury	March 9, 2006	March 13, 2006
Cyanide	March 2, 2006	March 9, 2006
Percent Solids	March 9, 2006	March 10, 2006

CLP PO Action

None.

Sampling Issues

None.

Additional Comments

As directed by the TOPO, a Tier 2 review was performed (forms review of CADRE R-flagged results only). For this sample delivery group (SDG), only copper results for samples MY2DQ1 through MY2DQ7 and MY2DQ9 through MY2DR3 "R" flagged by CADRE were reviewed. The results for analytes not listed above were not reviewed.

The copper result (16.9 mg/kg) reported on Form 1A for sample MY2DQ3 has a "J" flag indicating the result is greater than the MDL but less than the CRQL. This "J" flag was not indicated on the original CADRE Table 1A.

A revised CADRE Table 1A is attached.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: 1337.0, January 18, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	A
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	Yes	
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	Yes	
12.	Sample Quantitation	Yes	
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. CADRE R-flagged copper results for samples MY2DQ1 through MY2DQ7 and MY2DQ9 through MY2DR3, analyzed on March 15, 2006, because the 188 percent recovery (%R) for copper in the last of five CRI analyses exceeded the 180 %R expanded recovery criterion specified in the National Functional Guidelines (NFG). Since the reported copper data for the samples listed above were analyzed between acceptable CRI recoveries, the R flags for the copper data in the CADRE Table 1A are not warranted.

The reviewed copper results are presented in bold in the revised CADRE Table 1A attached.

The inorganic SOW specifies that the laboratory must analyze a CRI standard immediately following the initial calibration verification (ICV), at the beginning, end, and after every 20 analytical samples for each analytical run in order to verify linearity near the CRQL.

ANALYTICAL RESULTS
Tier 2 Table 1A

Case No. : 35036 SDG No. : MY2DP4
Site : ASARCO
Lab : LIBERTY ANALYTICAL CORPORATION
Reviewer : Stan Kott, ESAT/LDC
Date : May 18, 2006

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : LOW Concentration Soil
Samples For Total Metals and Cyanide

Station Location :	PCON-11-SED-0-022206			PCON-14-SED-0-022206			PCON-20-SED-0-022206			PCON-21-SED-0-022206			PCON-22-SED-0-022206			PCON-23-SED-0-022206			PCON-24-SED-0-022206		
Sample ID :	MY2DP4			MY2DP5			MY2DP6			MY2DP7			MY2DP8			MY2DP9			MY2DQ0		
Collection Date :	2/22/2006			2/22/2006			2/22/2006			2/22/2006			2/22/2006			2/22/2006			2/22/2006		
Dilution Factor :	1.0			1.0			1.0			1.0			1.0			1.0			1.0		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	20600			21200			6990			22800			14300			4480			12900		
ANTIMONY	3.2	J		1.7	J		38.2	J		7.3	J		4.1	J		27.6	J		2.8	J	
ARSENIC	40.0			0.41U	U		1720			140			91.3			635			13.2		
BARIUM	173			68.7J			138J			244			124J			105J			85.3J		
BERYLLIUM	0.48J	UJ		1.0			0.12J	UJ		0.69			0.10J	UJ		0.10J	UJ		0.38J	UJ	
CADMIUM	11.1			2.8			11.3			15.0			8.6			9.0			2.6		
CALCIUM	19500			32500			13100			12700			31400			6100			9810		
CHROMIUM	9.5			0.42U	U		22.9			14.0			7.9			48.0			14.5		
COBALT	62.4			51.9			37.8			61.9			38.5			44.7			41.0		
COPPER	53800			46300			14100			35000			18500			12600			10200		
IRON	68000			36700			118000			45400			43600			150000			52900		
LEAD	231			68.7			260			329			200			222			65.4		
MAGNESIUM	14300			12000			5770			17300			11600			4180			10100		
MANGANESE	555			605			553			789			446			411			596		
MERCURY	0.41			0.095			0.17			0.48			0.17			0.085			0.052		
NICKEL	63.6			65.8			41.9			82.7			38.8			33.4			33.7		
POTASSIUM	7900			4050			3280			8940			2720			2180			6280		
SELENIUM	22.8	J		8.5	J		11.0	J		17.1	J		10.8	J		9.0	J		7.5	J	
SILVER	14.2			2.9			22.8			18.8			12.3			17.7			3.0		
SODIUM	728			2280			239J	J		468J	J		340J	J		271J	J		303J	J	
THALLIUM	1.7	J		0.74U	U		0.89	J		1.2	J		0.72	J		1.4	J		1.0	J	
VANADIUM	93.3			62.8			40.4			105			62.8			28.0			60.5		
ZINC	793			199			913			832			575			889			613		
CYANIDE	0.32J	J-		0.21J	J-		0.51J	J-		0.38J	J-		2.5U	U		2.8	J-		2.7U	U	
MOLYBDENUM	1240			122			203			278			188			189			231		
BORON	4.1			3.6			2.4			5.8			3.3			1.6			2.5		
Percent Solids	97.9%			94.3%			99.7%			98.3%			98.9%			99.7%			93.5%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Tier 2 Table 1A

Case No. : 35036 SDG No. : MY2DP4
Site : ASARCO
Lab : LIBERTY ANALYTICAL CORPORATION
Reviewer : Stan Kott, ESAT/LDC
Date : May 18, 2006

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : LOW Concentration Soil
Samples For Total Metals and Cyanide

Station Location :	PCON-25-SED-0-022206			UPA-04-SED-1-022206			UPA-0X-SED-1-022206			KAW-02-SED-0-022206			WSC-31-SED-0-022306			PSMT-01-SES-0-022306			PSMT-X-SED-0-0222306		
Sample ID :	MY2DQ1			MY2DQ2			MY2DQ3			MY2DQ4			MY2DQ5			MY2DQ6			MY2DQ7		
Collection Date :	2/22/2006			2/22/2006			2/22/2006			2/22/2006			2/23/2006			2/23/2006			2/23/2006		
Dilution Factor :	1.0			1.0			1.0			1.0			1.0			1.0			1.0		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	1620			7000			7390			2590			10100			1070			498		
ANTIMONY	10.6	J		0.39J	J		0.28J	J		0.84J	J		1.0	J		30.7	J		36.8	J	
ARSENIC	18.1			1.8			2.2			1.6			4.0			107			121		
BARIUM	23.7J			88.5J			88.4J			23.2J			91.2J			265			239		
BERYLLIUM	0.52U	U		0.30J	UJ		0.31J	UJ		0.070J	UJ		0.21J	UJ		0.050J	UJ		0.050J	UJ	
CADMIUM	8.0			0.080J	UJ		0.11J	UJ		0.30J	UJ		0.69			22.8			17.6		
CALCIUM	2310			16800			19200			2210			60800			1350			1270		
CHROMIUM	0.40U	U		5.9			6.1			3.8			12.7			0.40U	U		0.40U	U	
COBALT	115			5.7J			5.9J			7.5J			10.2			151			162		
COPPER	**59700**		A	**16.6J**		A	**16.9J**		A	**2900**		A	**454**		A	**369000**		A	**380000**		A
IRON	163000			11500			12000			11200			14900			104000			108000		
LEAD	348			5.1J			5.5J			9.6			23.2			1200			1230		
MAGNESIUM	3130			3960			4200			1900			8560			1620			911		
MANGANESE	232			258			252			61.1J			359			82.2J			64.7J		
MERCURY	0.020U	U		0.020U	U		0.020U	U		0.025	J		0.24			0.065			0.074		
NICKEL	43.9			7.2J			7.6J			7.0J			16.1J			231			232		
POTASSIUM	616			1210			1260			1600			1950			182J	J		147J	J	
SELENIUM	24.4	J		0.51U	UJ		0.51U	UJ		2.3	J		0.67	J		162	J		176	J	
SILVER	24.3			0.51U	U		0.51U	U		0.78	J		0.39J	J		119			118		
SODIUM	240J	J		139J	J		152J	J		101J	J		554			125J	J		90.8J	J	
THALLIUM	3.7			0.72U	U		0.71U	U		0.70U	U		0.71U	U		3.2			3.3		
VANADIUM	26.6			22.4			23.2			14.1			37.3			6.9			4.5	UJ	
ZINC	4430			30.3J			31.2J			34.7J			123			2400			2260		
CYANIDE	2.5U	U		2.6U	U		2.5U	U		2.5U	U		0.39J	J		2.5U	U		2.5U	U	
MOLYBDENUM	1020			0.25J			0.12J			55.0			2.2			284			300		
BORON	4.9			2.5			2.6			0.85			5.1			4.6			4.5		
Percent Solids	99.8%			97.8%			98.1%			99.6%			98.2%			99.1%			99.1%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed
REVIEWED RESULTS ARE PRESENTED IN BOLD.

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Tier 2 Table 1A

Case No. : 35036 SDG No. : MY2DP4
Site : ASARCO
Lab : LIBERTY ANALYTICAL CORPORATION
Reviewer : Stan Kott, ESAT/LDC
Date : May 18, 2006

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : LOW Concentration Soil
Samples For Total Metals and Cyanide

Station Location :	SDD-01-SED-0-022306			SDD-02-SED-0-022306			SDD03-SED-0-022306			SD-01-SED-0-022306			HDS-I-101-09-106-02230			HDS-A-101-09-106-0223			Lab Blank		
Sample ID :	MY2DQ8			MY2DQ9			MY2DR0			MY2DR1			MY2DR2			MY2DR3			PBS		
Collection Date :	2/23/2006			2/23/2006			2/23/2006			2/23/2006			2/23/2006			2/23/2006					
Dilution Factor :	1.0			1.0			1.0			1.0			1.0			1.0			1.0		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	23100			17500			18300			1220			10100			12100			3.2J		
ANTIMONY	7.5	J		3.7	J		2.6	J		10.4	J		2.9	J		5.8	J		0.99U		
ARSENIC	361			232			74.0			24.7			30.6			147			0.39U		
BARIUM	217			176			87.4J			27.8J			190			251			161U		
BERYLLIUM	0.38J	UJ		0.35J	UJ		0.30J	UJ		0.52U	U		0.22J	UJ		0.46J	UJ		0.020J		
CADMIUM	94.7			82.4			18.8			9.6			6.4			18.0			-0.04000J		
CALCIUM	41300			62700			61300			1850			32100			26400			500U		
CHROMIUM	72.0			16.4			3.8			0.40U	U		4.8			8.3			0.18J		
COBALT	46.8			32.8			29.2			84.9			20.5			24.5			-0.05000J		
COPPER	12100			**10200**		A	**27000**		A	**47200**		A	**12400**		A	**21200**		A	0.45J		
IRON	64200			34400			53000			187000			28700			29400			5.1J		
LEAD	308			220			112			468			1700			705			0.24J		
MAGNESIUM	15300			14600			16000			3250			7880			7920			2.2J		
MANGANESE	557			647			581			232			428			396			0.040J		
MERCURY	0.49			0.44			0.13			0.020	J		0.38			1.9			0.020U		
NICKEL	40.9			35.5			24.8			32.1			71.6			31.2			18.2U		
POTASSIUM	2410			1850			1020			416J	J		4750			3670			500U		
SELENIUM	17.4	J		8.2	J		7.9	J		18.8	J		10.6	J		18.1	J		0.50U		
SILVER	11.0			9.8			7.6			24.5			6.6			15.9			0.50U		
SODIUM	441J	J		388J	J		294J	J		236J	J		5730			1420			55.2J		
THALLIUM	0.73U	U		0.44J	UJ		0.71J	UJ		2.4	UJ		0.71U	U		0.71U	U		0.70U		
VANADIUM	70.6			65.0			69.0			24.4			44.5			42.0			2.0U		
ZINC	5300			3340			1380			5920			3080			1350			0.38J		
CYANIDE	2.6U	U		2.6U	U		2.6U	U		2.5U	U		0.57J	J		0.80J	J		2.5U		
MOLYBDENUM	235			103			119			1060			135			331			0.11J		
BORON	4.8			3.9			2.6			7.3			31.1			9.8			0.50U		
Percent Solids	96.5%			97.6%			97.6%			100.0%			98.7%			98.5%			100.0%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed
REVIEWED RESULTS ARE PRESENTED IN BOLD.

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Tier 2 Table 1A

Case No. : 35036 SDG No. : MY2DP4
Site : ASARCO
Lab : LIBERTY ANALYTICAL CORPORATION
Reviewer : Stan Kott, ESAT/LDC
Date : May 18, 2006

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : LOW Concentration Soil Samples For Total Metals

Station Location : / Sample ID : / Collection Date : / Dilution Factor :	CRQL																				
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	20.0																				
ANTIMONY	6.0																				
ARSENIC	1.0																				
BARIUM	20.0																				
BERYLLIUM	0.50																				
CADMIUM	0.50																				
CALCIUM	500																				
CHROMIUM	1.0																				
COBALT	5.0																				
COPPER	2.5																				
IRON	10.0																				
LEAD	1.0																				
MAGNESIUM	500																				
MANGANESE	1.5																				
MERCURY	0.10																				
NICKEL	4.0																				
POTASSIUM	500																				
SELENIUM	3.5																				
SILVER	1.0																				
SODIUM	500																				
THALLIUM	2.5																				
VANADIUM	5.0																				
ZINC	6.0																				
CYANIDE	2.5																				
MOLYBDENUM	2.0																				
BORON	0.50																				

Percent Solids

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ICF Consulting / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Project Officer (TOPO)
Quality Assurance (QA) Program, PMD-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: 68-W-01-028
Technical Direction Form No.: 00905090

DATE: May 18, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None
Case No.:	35036
SDG No.:	MY2ES4
Laboratory:	CompuChem (LIBRTY)
Analysis:	CLP Total Metals and Total Cyanide
Samples:	15 Soil Samples (see Case Summary)
Collection Date:	March 7 and 8, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [X] Action

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report

Case No.: 35036
SDG No.: MY2ES4
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Stan Kott, ESAT/LDC
Date: May 18, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY2ES4 through MY2ES7, MY2EW2 through MY2EW9, MY2EX0, MY2EX1, and MY2EX2
Concentration and Matrix:	Low Concentration Soil
Analysis:	CLP Total Metals and Total Cyanide
SOW:	ILM05.3 and Modified Analysis Request 1337.0
Collection Date:	March 7 and 8, 2006
Sample Receipt Date:	March 10, 2006
Preparation Date:	March 20 and 21, 2006
Analysis Date:	March 21, 22, April 3, and 4, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	Not Provided

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank-Soil (PBS) and samples listed above
Matrix Spike:	MY2EW9S
Duplicates:	MY2EW9D
ICP Serial Dilution:	MY2EW9L

Analysis: Total Metals and Total Cyanide

Analyte	Sample Preparation and Digestion/Distillation Date	Analysis Date
ICP-AES Metals	March 21, 2006	April 3 and 4, 2006
Mercury	March 21, 2006	March 22, 2006
Cyanide	March 20, 2006	March 21, 2006
Percent Solids	March 21, 2006	March 22, 2006

CLP PO Action

Modified Analysis Request 1337.0 specifies molybdenum to be spiked at 20 mg/kg in the matrix spike sample. The laboratory inadvertently spiked molybdenum at 2000 mg/kg.

Sampling Issues

None.

Additional Comments

The samples in this SDG were analyzed for CLP total metals plus boron and molybdenum by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1337.0. Mercury was analyzed by the CLP cold vapor atomic absorption method. Cyanide was analyzed by the CLP spectrophotometric method.

The SDG Narrative states that Region 9 approved an increase in contract required quantitation limit (CRQL) for selenium from 0.30 mg/kg to 0.50 mg/kg.

The laboratory increased the mercury analysis sample size from 0.2 g to 0.5 g as permitted by MAR 1337.0.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: 1337.0, January 18, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	B
9.	ICP Serial Dilution Analysis	No	C
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	Yes	
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit but below the contract required quantitation limit (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are estimated and flagged "J" in Table 1A because matrix spike recovery results are outside method QC limits.

X Antimony, copper, and lead in all samples

Matrix spike recoveries for the samples listed above in QC sample MY2EW9S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for each analyte are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	26	-74
Copper	72	-28
Lead	135	+35

Results above the MDL are considered quantitatively uncertain. Results reported for antimony and copper in all samples may be biased low. Results reported for lead in all samples may be biased high.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes (except silver) fall outside the control limits of 75-125%, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery results for sample MY2EW9A were obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	88
Copper	99
Lead	103

Since the post-digestion spike recoveries were acceptable, the low pre-digestion spike recovery results obtained for antimony and copper and the high pre-digestion spike recovery result obtained for lead may indicate sample non-homogeneity, poor laboratory technique, or matrix effects which may interfere with accurate analysis, depressing antimony and copper results and enhancing lead results.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

C. The following results are estimated and flagged "J" in Table 1A because ICP serial dilution results are outside method QC limits.

X Boron, chromium, cobalt, iron, lead, manganese, nickel, and sodium in all samples

The percent difference for the ICP serial dilution analysis of sample MY2EW9L did not meet the 10% criterion for the analytes shown below.

Analyte	% Difference
Boron	+17
Chromium	+11
Cobalt	+13
Iron	+11
Lead	+13
Manganese	+11
Nickel	+14
Sodium	+17

Results reported for the analytes listed above in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The results for the diluted sample were higher than the original. Therefore, the reported sample results may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS
Table 1A

Case No. : 35036 SDG No. : MY2ES4
Site : ASARCO
Lab : LIBERTY ANALYTICAL CORPORATION
Reviewer : Stan Kott, ESAT/LDC
Date : May 18, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples
For Total Metals and Cyanide

Station Location :	GR-SED-01-030706			GR-SED-X-030706			GR-SED-02-030706			GR-SED-03-030706			GR-SED-04-00806			SPR-SED-01-030806			SPR-SED-02-030806		
Sample ID :	MY2ES4			MY2ES5			MY2ES6			MY2ES7			MY2EW2			MY2EW3			MY2EW4		
Collection Date :	3/7/2006			3/7/2006			3/7/2006			3/7/2006			3/8/2006			3/8/2006			3/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	17500			18500			17800			19400			6750			4250			4540		
ANTIMONY	1.1	J	B	1.1	J	B	1.2L	J	AB	1.1L	J	AB	0.48L	J	AB	0.56L	J	AB	0.45L	J	AB
ARSENIC	2.1			1.4			4.4			5.0			1.1			2.6			2.0		
BARIUM	59.6L	J	A	59.4L	J	A	151L	J	A	177L	J	A	51.8L	J	A	69.6L	J	A	61.4L	J	A
BERYLLIUM	0.54U			0.55U			0.29L	J	A	0.46L	J	A	0.090L	J	A	0.22L	J	A	0.15L	J	A
CADMIUM	0.42U			0.42U			0.82U			0.060L	J	A	0.52U			0.12L	J	A	0.47U		
CALCIUM	32100			30300			39600			41900			8940			8080			7800		
CHROMIUM	14.4	J	C	14.0	J	C	14.0	J	C	15.5	J	C	6.0	J	C	2.9	J	C	4.3	J	C
COBALT	16.2	J	C	16.6	J	C	14.5L	J	AC	14.8L	J	AC	5.8L	J	AC	3.2L	J	AC	4.9L	J	AC
COPPER	45.0	J	B	62.2	J	B	191	J	B	392	J	B	29.3	J	B	143	J	B	16.8L	J	AB
IRON	28500	J	C	28800	J	C	22500	J	C	22500	J	C	10700	J	C	5480	J	C	8710	J	C
LEAD	9.8	J	BC	9.5	J	BC	11.7L	J	ABC	15.5L	J	ABC	3.4L	J	ABC	10.5	J	BC	6.7L	J	ABC
MAGNESIUM	9960			10900			9260			9910			3120			2110			2890		
MANGANESE	515	J	C	585	J	C	2270	J	C	2410	J	C	201	J	C	183	J	C	173	J	C
MERCURY	0.021U			0.021U			0.041U			0.049U			0.026U			0.023U			0.024U		
NICKEL	14.0L	J	AC	13.1L	J	AC	18.3L	J	AC	21.8L	J	AC	7.8L	J	AC	5.2L	J	AC	7.3L	J	AC
POTASSIUM	781			747			2520			2570			585L	J	A	876			715		
SELENIUM	0.52U			0.53U			1.3			1.3			0.65U			0.58U			0.59U		
SILVER	0.15L	J	A	0.53U			1.0U			1.2U			0.65U			0.58U			0.59U		
SODIUM	966	J	C	1100	J	C	2030	J	C	1230	J	C	1050	J	C	364L	J	AC	387L	J	AC
THALLIUM	0.73U			0.54L	J	A	1.4U			1.7U			0.91U			0.81U			0.83U		
VANADIUM	91.2			91.2			54.6			49.8			29.2			8.7			14.2		
ZINC	48.9			53.0			55.5L	J	A	63.9L	J	A	22.0L	J	A	20.0L	J	A	18.1L	J	A
CYANIDE	2.6U			2.7U			5.1U			6.1U			3.2U			2.9U			3.0U		
MOLYBDENUM	2.1U			2.1U			1.4L	J	A	2.2L	J	A	0.20L	J	A	1.6L	J	A	1.9L	J	A
BORON	2.4	J	C	2.5	J	C	10.2	J	C	10.9	J	C	1.7	J	C	1.4	J	C	1.9	J	C
PERCENT SOLIDS	96.1%			94.2%			48.9%			40.8%			77.2%			86.4%			84.6%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35036 SDG No. : MY2ES4
Site : ASARCO
Lab : LIBERTY ANALYTICAL CORPORATION
Reviewer : Stan Kott, ESAT/LDC
Date : May 18, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples For Total Metals and Cyanide

Station Location :	GR-SED-X-030806			GR-SED-06-030806			GR-SED-05-0308-6			GR-SED-07-030806			GR-SED-08-030806			GR-SED-09-030806			GR-SED-10-030806		
Sample ID :	MY2EW5			MY2EW6			MY2EW7			MY2EW8			MY2EW9			MY2EX0			MY2EX1		
Collection Date :	3/8/2006			3/8/2006			3/8/2006			3/8/2006			3/8/2006			3/8/2006			3/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	14500			13200			12800			20300			18900			13000			16300		
ANTIMONY	0.98L	J	AB	0.93L	J	AB	0.77L	J	AB	0.97L	J	AB	1.2L	J	AB	0.64L	J	AB	1.0L	J	AB
ARSENIC	2.9			2.7			2.7			4.6			4.2			2.8			4.5		
BARIUM	107L	J	A	97.9L	J	A	99.1L	J	A	154L	J	A	145L	J	A	113L	J	A	140L	J	A
BERYLLIUM	0.35L	J	A	0.39L	J	A	0.34L	J	A	0.54L	J	A	0.61L	J	A	0.40L	J	A	0.49L	J	A
CADMIUM	0.040L	J	A	0.69U			0.52U			0.040L	J	A	0.66U			1.1U			0.030L	J	A
CALCIUM	21700			21800			19900			36500			33900			27000			32300		
CHROMIUM	12.1	J	C	12.2	J	C	11.2	J	C	17.2	J	C	21.0	J	C	11.1	J	C	14.2	J	C
COBALT	10.0L	J	AC	9.3L	J	AC	8.8L	J	AC	14.6L	J	AC	13.6L	J	AC	9.2L	J	AC	12.1L	J	AC
COPPER	129	J	B	88.2	J	B	96.0	J	B	158	J	B	177	J	B	109	J	B	147	J	B
IRON	18200	J	C	17300	J	C	16000	J	C	24700	J	C	26300	J	C	15100	J	C	19600	J	C
LEAD	12.5	J	BC	11.7L	J	ABC	17.6	J	BC	16.4	J	BC	18.5	J	BC	11.6L	J	ABC	15.0	J	BC
MAGNESIUM	6520			5960			5720			9850			9070			6190			8050		
MANGANESE	473	J	C	437	J	C	458	J	C	1080	J	C	1010	J	C	1410	J	C	1470	J	C
MERCURY	0.027U			0.034U			0.026U			0.039L	J	A	0.033U			0.056U			0.034L	J	A
NICKEL	13.7L	J	AC	12.6L	J	AC	12.5L	J	AC	20.6L	J	AC	19.3L	J	AC	14.3L	J	AC	17.8L	J	AC
POTASSIUM	1850			2230			1740			3220			3320			2210			2800		
SELENIUM	0.68U			0.86U			0.66U			1.0U			0.82U			1.4U			0.93L	J	A
SILVER	0.68U			0.86U			0.66U			1.0U			0.82U			1.4U			0.97U		
SODIUM	729	J	C	664L	J	AC	681	J	C	2790	J	C	1550	J	C	867L	J	AC	1160	J	C
THALLIUM	0.95U			1.2U			0.57L	J	A	1.4U			1.1U			1.9U			1.4U		
VANADIUM	43.4			39.1			38.3			53.4			60.7			30.9			41.2		
ZINC	46.7L	J	A	47.8L	J	A	41.0L	J	A	70.7L	J	A	74.9			44.6L	J	A	63.5L	J	A
CYANIDE	3.4U			4.3U			3.3U			5.1U			4.1U			6.9U			4.8U		
MOLYBDENUM	0.60L	J	A	1.8L	J	A	0.46L	J	A	2.2L	J	A	2.4L	J	A	1.5L	J	A	1.5L	J	A
BORON	4.9	J	C	5.6	J	C	4.6	J	C	9.9	J	C	8.8	J	C	7.1	J	C	8.6	J	C
PERCENT SOLIDS	73.8%			58.2%			76.3%			49.4%			60.9%			36.0%			51.7%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35036 SDG No. : MY2ES4
Site : ASARCO
Lab : LIBERTY ANALYTICAL CORPORATION
Reviewer : Stan Kott, ESAT/LDC
Date : May 18, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples
For Total Metals and Cyanide

Station Location :	GR-SED-11-030806			MDL			CRQL														
Sample ID :	MY2EX2																				
Collection Date :	3/8/2006																				
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	20000			3.1			50.0														
ANTIMONY	0.99L	J	AB	0.18			0.99														
ARSENIC	5.5			0.32			0.39														
BARIUM	176L	J	A	0.047			161.3														
BERYLLIUM	0.75L	J	A	0.022			0.52														
CADMIUM	0.11L	J	A	0.011			0.40														
CALCIUM	36900			7.1			500														
CHROMIUM	17.9	J	C	0.13			0.40														
COBALT	13.6L	J	AC	0.033			9.7														
COPPER	144	J	B	0.083			16.6														
IRON	23800	J	C	2.3			200														
LEAD	21.1	J	BC	0.11			7.7														
MAGNESIUM	9300			0.88			500														
MANGANESE	1170	J	C	0.035			100														
MERCURY	0.030L	J	A	0.042			0.050														
NICKEL	20.1L	J	A	0.092			18.2														
POTASSIUM	3760			2.1			500														
SELENIUM	0.82U			0.35			0.50														
SILVER	0.82U			0.067			0.50														
SODIUM	1390	J	C	13.3			500														
THALLIUM	1.2			0.40			0.70														
VANADIUM	50.0			0.023			2.0														
ZINC	74.1			0.18			38.9														
CYANIDE	4.1U			0.32			10.0														
MOLYBDENUM	1.4L	J	A	0.068			2.0														
BORON	10.8	J	C	0.031			0.50														
PERCENT SOLIDS	61.3%			N/A			N/A														

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ICF Consulting / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Project Officer (TOPO)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: 68-W-01-028
Technical Direction Form No.: 00905092

DATE: June 1, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None
Case No.:	35130
SDG No.:	MY2FG2
Laboratory:	CompuChem (LIBRTY)
Analysis:	CLP Total Metals by ICP-MS and Total Mercury
Samples:	15 Water Samples (see Case Summary)
Collection Date:	March 7 and 8, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35130
SDG No.: MY2FG2
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Stan Kott, ESAT/LDC
Date: June 1, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY2FG2 through MY2FG9 and MY2FH0 through MY2FH6
Concentration and Matrix:	Low Concentration Water
Analysis:	CLP Total Metals by ICP-MS and Total Mercury
SOW:	ILM05.3 and Modified Analysis Request 1340.0
Collection Date:	March 7 and 8, 2006
Sample Receipt Date:	March 16, 2006
Preparation Date:	April 3 and 5, 2006
Analysis Date:	April 3, 4, and 5, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	Not Provided

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank-Water (PBW) and samples listed above
Matrix Spike:	MY2FG9S
Duplicates:	MY2FG9D
ICP Serial Dilution:	MY2FG9L

Analysis: CLP Total Metals by ICP-MS and Total Mercury

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	April 3 and 5, 2006	April 4 and 5, 2006
Mercury	April 3, 2006	April 3, 2006
Percent Solids	Not Applicable	Not Applicable

CLP PO Action

None.

Sampling Issues

1. The sampler provided the station location instead of the CLP inorganic sample number on both Traffic Report/Chain of Custody (TR/COC) record forms for this SDG. The laboratory contacted the Sample Management Office (SMO) and was provided with CLP sample numbers for this SDG. No adverse effect on data quality is expected.

2. There is no sampler's signature provided in the Sampler Signature field or sample relinquish information on the TR/COC record form for samples MY2FH2 through MY2FH6. No adverse effect on data quality is expected.

3. The cooler containing samples for this SDG arrived at the laboratory at a temperature of 6.7ºC. This temperature exceeds the 4º∀ 2ºC specified in the Statement of Work (SOW); however, no adverse effect on data quality is expected.

Additional Comments

A Form 9 requires minor editing to correct several Contract Required Quantitation Limit (CRQL) values. A corrected Form 9 was requested from the laboratory but has not been received to date. Data quality is not likely to be affected and this report is considered final.

The samples in this SDG were analyzed for CLP total metals by ICP-MS plus aluminum, boron, iron, and molybdenum by ICP-MS under Modified Analysis Request (MAR), Modification Reference Number 1340.0. Mercury was analyzed by the CLP cold vapor atomic absorption method. Cyanide analysis is specified in MAR 1340.0; however, the laboratory indicates cyanide samples were not provided for this SDG.

The results for aluminum and iron for samples MY2FG2 through MY2FH6 in this SDG were determined by inductively coupled plasma-mass spectroscopy (ICP-MS). Note that aluminum and iron results are also reported for samples MY2FG2 through MY2FH6 in SDG MY2FG3, determined by inductively coupled plasma- atomic emission spectroscopy (ICP-AES).

The laboratory indicates the original sample preparation batch, prepared April 3, 2006, was contaminated with copper. The samples were prepared again on April 5, 2006 and analyzed for copper on April 5 and 6, 2006. No adverse effect on data quality is expected.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: 1340.0, February 23, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	B
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	No	C
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	Yes	
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are reported as non-detected (U) in Table 1A due to low level preparation blank (PBW) contamination.

X Antimony in all samples
X Iron in sample MY2FH6

Antimony (0.17 µg/L) and iron (10.2 µg/L) results in preparation blank PBW are greater than their respective MDLs but less than their respective CRQLs. In addition, antimony was found in the initial calibration blank (ICB) at 1.4 µg/L and in the continuing calibration blanks (CCBs) ranging between 0.64 µg/L and 0.75 µg/L which are greater than the MDL but less than the CRQL. Sample results greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at their respective CRQL.

A preparation blank is an analytical control that contains distilled, deionized water, or baked sand for solid matrices, and reagents, which is carried through the entire analytical procedure. The preparation blank is used to determine the level of contamination introduced by the laboratory during preparation and analysis.

An initial calibration blank (ICB) consists of deionized, distilled water and reagents. It is analyzed at the beginning of each analytical run, immediately after the initial calibration verification (ICV) standard to monitor analyte carry-over.

A continuing calibration blank (CCB) consists of deionized, distilled water and reagents. It is analyzed after the continuing calibration verification (CCV) standard, at a frequency of every 10 samples and at the end of the analytical run to monitor analyte carry-over.

C. The following results are estimated and flagged "J" in Table 1A because an ICP serial dilution result is outside method QC limits.

X Vanadium in all samples

The percent difference for the ICP serial dilution analysis of sample MY2FG9L did not meet the 10% criterion for vanadium shown below.

Analyte	% Difference
Vanadium	+15

Results reported for the analytes listed above in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The results for the diluted sample were higher than the original. Therefore, the reported sample results for vanadium may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

In Reference to
Case: 35130 SDG No.: MY2FG2

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM

Telephone Record Log

Date of Call: May 31, 2006

Laboratory Name: CompuChem (LIBRTY)

Lab Contact: Alice Evens or Bob Meierer

Region: 9

Regional Contact: Steve Remaley, CLP PO

ESAT Reviewer: Stan Kott, ESAT/LDC

Call Initiated By: ___ Laboratory X Region

In reference to data for the following samples: SDG No.: MY2FG2 all samples

Summary of Questions/issues Discussed:

The following items were noted during the review of this sample delivery group (SDG) data package. Please respond within 4 days as specified in ILM05.3 Statement of Work (SOW), Exhibit B, Section 2, 2.2. Send response and resubmissions to

ICF International/Laboratory Data Consultants, Inc.,
Environmental Services Assistance Team, USEPA Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804, FAX 510 412-2304.

1. The SDG Narrative indicates this SDG was analyzed according to Modification Reference Number (MRN): 1340.0; however, a copy of this document was not provided with the SDG Narrative. Please provide a copy of MRN: 1340.0.

2. Form 9, Method Detection Limits (page 49), does not reflect the CRQL concentration specified for beryllium, boron, cadmium, and silver in MRN: 1340.0. Please review the information and provide a corrected Form 9.

Summary of Resolution: To be determined.

Regional Contact Signature _____ Date of Resolution _____

ANALYTICAL RESULTS
Table 1A

Case No. : 35130 SDG No. : MY2FG2
Site : ASARCO
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : June 1, 2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples For CLP Total Metals By ICP-MS and Total Mercury

Station Location :	GR-SW-01-030706			GR-SW-02-030706			GR-SW-03-030706			GR-SW-04-030806			GR-SW-05-030806			GR-SW-06-030806			GR-SW-07-030806		
Sample ID :	MY2FG2			MY2FG3			MY2FG4			MY2FG5			MY2FG6			MY2FG7			MY2FG8		
Collection Date :	3/7/2006			3/7/2006			3/7/2006			3/8/2006			3/8/2006			3/8/2006			3/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	738			904			816			944			1030			821			754		
ANTIMONY	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B
ARSENIC	3.0			3.0			2.9			2.8			2.8			2.9			2.7		
BARIUM	63.6			63.0			61.5			64.5			62.5			62.0			64.5		
BERYLLIUM	0.66U			0.66U			0.66U			0.66U			0.66U			0.66U			0.66U		
CADMIUM	0.25U			0.25U			0.25U			0.25U			0.25U			0.25U			0.25U		
CHROMIUM	0.52L	J	A	0.61L	J	A	0.60L	J	A	0.66L	J	A	0.67L	J	A	0.59L	J	A	0.55L	J	A
COBALT	0.50L	J	A	0.46L	J	A	0.48L	J	A	0.44L	J	A	0.45L	J	A	0.43L	J	A	0.45L	J	A
COPPER	4.9			5.4			6.0			4.5			5.6			6.5			6.8		
IRON	505			581			527			580			628			545			507		
LEAD	0.70L	J	A	0.68L	J	A	0.72L	J	A	0.66L	J	A	0.68L	J	A	0.72L	J	A	1.0		
MANGANESE	105			97.9			97.4			89.8			81.3			80.5			94.1		
MERCURY	0.20U			0.20U			0.20U			0.20U			0.20U			0.20U			0.20U		
NICKEL	2.1			2.1			2.0			2.1			2.0			1.9			1.9		
SELENIUM	0.54L	J	A	0.45L	J	A	0.38L	J	A	0.54L	J	A	0.49L	J	A	0.38L	J	A	0.40L	J	A
SILVER	0.36U			0.36U			0.081L	J	A	0.36U			0.36U			0.057L	J	A	0.36U		
THALLIUM	1.0U			1.0U			1.0U			1.0U			1.0U			1.0U			1.0U		
VANADIUM	6.2	J	C	6.2	J	C	6.1	J	C	5.9	J	C	5.6	J	C	5.7	J	C	5.9	J	C
ZINC	2.2			2.4			2.5			4.5			3.2			2.8			3.0		
MOLYBDENUM	4.3L	J	A	4.4L	J	A	4.4L	J	A	4.6L	J	A	4.3L	J	A	4.4L	J	A	4.6L	J	A
BORON	129			128			125			131			124			124			130		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35130 SDG No. : MY2FG2
Site : ASARCO
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : June 1, 2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples For CLP Total Metals By ICP-MS and Total Mercury

Station Location :	GR-SW-08-030806			GR-SW-09-030806			GR-SW-10-030806			GR-SW-11-030806			GR-SW-X-030706			GR-SW-X-030806			SPR-SW-01-030806		
Sample ID :	MY2FG9			MY2FH0			MY2FH1			MY2FH2			MY2FH3			MY2FH4			MY2FH5		
Collection Date :	3/8/2006			3/8/2006			3/8/2006			3/8/2006			3/7/2006			3/8/2006			3/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	1090			1040			981			1090			869			1020			765		
ANTIMONY	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B
ARSENIC	3.0			3.2			2.8			3.1			2.8			2.9			5.2		
BARIUM	65.7			68.7			63.0			68.1			63.0			65.9			81.2		
BERYLLIUM	0.085L	J	A	0.66U			0.66U			0.066L	J	A	0.66U			0.66U			0.66U		
CADMIUM	0.25U			0.25U			0.25U			0.25U			0.25U			0.25U			0.12L	J	A
CHROMIUM	0.80L	J	A	0.75L	J	A	0.68L	J	A	0.81L	J	A	0.57L	J	A	0.71L	J	A	0.72L	J	A
COBALT	0.53L	J	A	0.56L	J	A	0.49L	J	A	0.63L	J	A	0.49L	J	A	0.48L	J	A	0.58L	J	A
COPPER	5.4			6.2			7.1			7.6			4.1			5.3			70.2		
IRON	718			687			640			738			597			664			552		
LEAD	0.87L	J	A	0.87L	J	A	0.86L	J	A	1.0			0.70L	J	A	0.72L	J	A	4.3		
MANGANESE	139			145			134			146			104			86.4			31.6		
MERCURY	0.20U			0.20U			0.20U			0.20U			0.20U			0.20U			0.20U		
NICKEL	2.3			2.1			2.0			2.3			2.0			2.0			1.3		
SELENIUM	0.90L	J	A	0.97L	J	A	0.49L	J	A	0.43L	J	A	0.49L	J	A	0.42L	J	A	0.37L	J	A
SILVER	0.36U			0.36U			0.36U			0.041L	J	A	0.36U			0.36U			0.050L	J	A
THALLIUM	1.0U			1.0U			1.0U			1.0U			1.0U			1.0U			1.0U		
VANADIUM	6.0	J	C	6.4	J	C	5.9	J	C	6.4	J	C	6.2	J	C	6.1	J	C	4.9	J	C
ZINC	3.6			4.2			3.3			3.7			2.5			3.1			7.1		
MOLYBDENUM	5.3L	J	A	5.3L	J	A	4.9L	J	A	5.4L	J	A	4.3L	J	A	4.6L	J	A	17.8L	J	A
BORON	130			139			125			136			126			133			188		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35130 SDG No. : MY2FG2
Site : ASARCO
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : June 1, 2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples For CLP Total Metals By ICP-MS and Total Mercury

Station Location :	SPR-SW-02-030806			MDL			CRQL														
Sample ID :	MY2FH6																				
Collection Date :	3/8/2006																				
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	64.5L	J	A	8.7			87.0														
ANTIMONY	2.0U		B	0.046			2.0														
ARSENIC	5.5			0.049			1.0														
BARIUM	68.1			0.92			4.0														
BERYLLIUM	0.66U			0.065			0.66														
CADMIUM	0.25U			0.059			0.25														
CHROMIUM	0.24L	J	A	0.17			2.0														
COBALT	0.20L	J	A	0.14			1.0														
COPPER	8.8			0.28			2.0														
IRON	300U		B	7.3			300														
LEAD	0.14L	J	A	0.055			1.0														
MANGANESE	92.0			0.032			1.0														
MERCURY	0.20U			0.032			0.20														
NICKEL	0.55L	J	A	0.29			1.0														
SELENIUM	0.29L	J	A	0.15			5.0														
SILVER	0.36U			0.022			0.36														
THALLIUM	1.0U			0.073			1.0														
VANADIUM	4.4	J	C	0.040			1.0														
ZINC	2.4			0.30			2.0														
MOLYBDENUM	20.1L	J	A	0.085			182														
BORON	225			0.19			1.6														

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ICF Consulting / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Project Officer (TOPO)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: 68-W-01-028
Technical Direction Form No.: 00905090

DATE: June 1, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None
Case No.:	35130
SDG No.:	MY2FG3
Laboratory:	CompuChem (LIBRTY)
Analysis:	Select CLP Total Metals By ICP-AES
Samples:	15 Water Samples (see Case Summary)
Collection Date:	March 7 and 8, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35130
SDG No.: MY2FG3
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Stan Kott, ESAT/LDC
Date: May 31, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY2FG2 through MY2FG9 and MY2FH0 through MY2FH6
Concentration and Matrix:	Low Concentration Water
Analysis:	Select CLP Total Metals By ICP-AES
SOW:	ILM05.3
Collection Date:	March 7 and 8, 2006
Sample Receipt Date:	March 16, 2006
Preparation Date:	March 22, 2006
Analysis Date:	April 3, and 4, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	Not Provided

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank-Water (PBW) and samples listed above
Matrix Spike:	MY2FG9S
Duplicates:	MY2FG9D
ICP Serial Dilution:	MY2FG9L

Analysis: Select CLP Total Metals By ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	March 22, 2006	April 3 and 4, 2006
Percent Solids	Not Applicable	Not Applicable

CLP PO Action

None.

Sampling Issues

1. The sampler provided the station location instead of the CLP inorganic sample number on both Traffic Report/Chain of Custody (TR/COC) record forms for this SDG. The laboratory contacted the Sample Management Office (SMO) and was provided with CLP sample numbers for this SDG. No adverse effect on data quality is expected.

2. There is no sampler's signature provided in the Sampler Signature field or sample relinquish information on the TR/COC record form for samples MY2FH2 through MY2FH6. No adverse effect on data quality is expected.

3. The cooler containing samples for this SDG arrived at the laboratory at a temperature of 6.7ºC. This temperature exceeds the 4º∀ 2ºC specified in the Statement of Work (SOW); however, no adverse effect on data quality is expected.

Additional Comments

The results for aluminum and iron for samples MY2FG2 through MY2FH6 in this SDG were determined by inductively coupled plasma-atomic emission spectroscopy (ICP-AES). Note that the aluminum and iron results are also reported for samples MY2FG2 through MY2FH6 in SDG MY2FG2, determined by inductively coupled plasma-mass spectroscopy (ICP-MS).

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	No	B
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	Yes	
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are estimated and flagged "J" in Table 1A because an ICP serial dilution result is outside method QC limits.

X Potassium in all samples

The percent difference for the ICP serial dilution analysis of sample MY2EW9L did not meet the 10% criterion for potassium shown below.

Analyte	% Difference
Potassium	-14

Results reported for the analytes listed above in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The results for the diluted sample were lower than the original. Therefore, the reported sample results for potassium may be biased high.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS
Table 1A

Case No. : 35130 SDG No. : MY2FG3
Site : ASARCO
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : June 1, 2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type : LOW Concentration Water Samples For Select Total Metals By ICP-AES

Station Location :	GR-SW-01-030706			GR-SW-02-030706			GR-SW-03-030706			GR-SW-04-030806			GR-SW-05-030806			GR-SW-06-030806			GR-SW-07-030806		
Sample ID :	MY2FG2			MY2FG3			MY2FG4			MY2FG5			MY2FG6			MY2FG7			MY2FG8		
Collection Date :	3/7/2006			3/7/2006			3/7/2006			3/8/2006			3/8/2006			3/8/2006			3/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	369			985			481			597			456			451			1080		
CALCIUM	58800			58400			58200			58400			58800			56500			59200		
IRON	306			702			377			434			340			345			771		
MAGNESIUM	17100			17100			16900			17000			17100			16400			17200		
POTASSIUM	4840L	J	AB	4960L	J	AB	4790L	J	AB	4890L	J	AB	4850L	J	AB	4670L	J	AB	4980L	J	AB
SODIUM	127000			126000			126000			127000			127000			122000			127000		

Station Location :	GR-SW-08-030806			GR-SW-09-030806			GR-SW-10-030806			GR-SW-11-030806			GR-SW-X-030706			GR-SW-X-030806			SPR-SW-01-030806		
Sample ID :	MY2FG9			MY2FH0			MY2FH1			MY2FH2			MY2FH3			MY2FH4			MY2FH5		
Collection Date :	3/8/2006			3/8/2006			3/8/2006			3/8/2006			3/7/2006			3/8/2006			3/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	966			258			1190			1180			1140			668			307		
CALCIUM	63400			66400			68500			68700			60500			59400			135000		
IRON	682			232			861			840			817			484			273		
MAGNESIUM	18300			18900			19700			19700			17700			17300			30200		
POTASSIUM	4980L	J	AB	4960L	J	AB	5280	J	B	5270	J	B	5160	J	B	4910L	J	AB	5140	J	B
SODIUM	127000			132000			135000			134000			130000			127000			152000		

Station Location :	SPR-SW-02-030806			MDL			CRQL														
Sample ID :	MY2FH6																				
Collection Date :	3/8/2006																				
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	200U			30.7			200														
CALCIUM	123000			195			5000														
IRON	43.5L	J	A	20.5			100														
MAGNESIUM	27400			41.7			5000														
POTASSIUM	6570	J	B	11.3			5000														
SODIUM	175000			121			5000														

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit, N/A - Not Applicable, NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank, TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105020

DATE: October 11, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	Not Provided
Case No.:	35241
SDG No.:	MY2GE5
Laboratory:	CompuChem (LIBRTY)
Analysis:	CLP Total Metals plus Boron and Molybdenum
Samples:	20 Dust Samples (see Case Summary)
Collection Date:	May 17 and 18, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35241
SDG No.: MY2GE5
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Stan Kott, ESAT/LDC
Date: October 11, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY2GE5 through MY2GE9, MY2GF0 through MY2GF9, and MY2GG0 through MY2GG4
Concentration and Matrix:	Low and Medium Concentration Dust
Analysis:	CLP Total Metals plus Boron and Molybdenum
SOW:	ILM05.3 and Modification Reference Number 1337.1
Collection Date:	May 17 and 18, 2006
Sample Receipt Date:	May 20, 2006
Preparation Date:	June 3, 2006
Analysis Date:	June 4, 5, 6, 7, 8, and 9, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY2GE8 and MY2GE9
(D2):	MY2GF7 and MY2GF8

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank-Solid (PBS) and samples listed above
Matrix Spike:	MY2GF4S
Duplicates:	MY2GF4D
ICP Serial Dilution:	MY2GF4L

Analysis: CLP Total Metals plus Boron and Molybdenum

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	June 3, 2006	June 4, 5, 7, 8, and 9, 2006
Mercury	June 3, 2006	June 5 and 6, 2006
Percent Solids	Not Analyzed	Not Analyzed

CLP PO Action

None.

Sampling Issues

No collection time was provided for sample MY2GF8 on the Traffic Report/Chain of Custody (TR/COC).

Additional Comments

Form 1 edits are required from the laboratory. These edits were requested from the laboratory but have not been received to date. Data quality is not likely to be affected and this report is considered final. Refer to the attached communication record log (CRL) for details.

The samples in this SDG were analyzed for CLP total metals plus boron and molybdenum by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1337.1. Mercury was analyzed by the CLP cold vapor atomic absorption method. Cyanide analysis is specified in MAR 1337.1; however, the laboratory indicates Region 9 did not require cyanide analysis for this SDG.

The laboratory states in the SDG Narrative that there was insufficient sample to perform the percent solids analysis. Region 9 instructed the laboratory to assume 100% solids on Form 1s. Since the percent solids could not be verified, the results provided in Table 1A are on an as received basis. The effect on data quality is not known.

The laboratory indicates the volume of sample MY2GF1 was insufficient to perform both ICP metals and mercury analyses. The laboratory used 0.15 grams of sample for ICP analysis instead of 1.0 grams specified in the SOW. The ICP metals CRQLs for sample MY2GF1were adjusted accordingly. Mercury analysis was not performed on sample MY2GF1.

All samples of this SDG, except MY2GF1, required 2, 5, 10, 20, or 25-fold dilution to bring analyte concentrations within the instrument's linear range. No adverse effect on data quality is expected.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: 1337.1, May 3, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	B
5.	ICP Interference Check Sample (ICS)	No	C
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	D
9.	ICP Serial Dilution Analysis	No	E
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	F
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are reported as non-detected (U) in Table 1A due to low level continuing calibration blank (CCB) contamination.

X Beryllium in samples MY2GG0, MY2GG1, and MY2GG2

The beryllium (0.044 mg/kg) concentration in CCB9 is greater than the MDL but less than the CRQL. Sample results associated with CCB9 that are greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the CRQL.

A continuing calibration blank (CCB) consists of deionized, distilled water and reagents. It is analyzed after the continuing calibration verification (CCV) standard, at a frequency of every 10 samples and at the end of the analytical run to monitor analyte carry-over.

C. The following results are estimated and are flagged "J" in Table 1A due to possible ICP interelement interference problems.

X Cadmium in samples MY2GE5 through MY2GF0, MY2GF2 through MY2GF8, MY2GG0, MY2GG1, MY2GG3, and MY2GG4
X Selenium in all samples except MY2GF2
X Thallium in all samples except MY2GF1 and MY2GF9

Results for cadmium, selenium, and thallium in the samples listed above were reported from an undiluted analysis that contained iron concentrations greater than the true value specified for the ICP interference check sample (ICS). Therefore, the applied interelement correction (IEC) factor may not compensate sufficiently for the interference. The cadmium results for the samples listed above may be biased high. The selenium and thallium results for the samples listed above biased low and, where non-detected, false negatives may exist.

The ICP ICS solutions A and AB are analyzed to determine the effects of high concentrations of interfering elements on each analyte determined by ICP. Solution A consists of the interferents (Al, Ca, Fe, and Mg), and Solution AB consists of the analytes mixed with the interferents.

When the estimated concentration produced by the interfering element is greater than twice the CRQL and also is greater than 10% of the reported concentration of the affected element, the results of the affected elements are estimated.

D. The following results are estimated and flagged "J" in Table 1A because matrix spike recovery results are outside method QC limits.

X Antimony, manganese, and selenium in all samples

Matrix spike recoveries for antimony, manganese, and selenium in QC sample MY2GF4S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for each analyte are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	25	-75
Manganese	65	-35
Selenium	69	-31

Results above the MDL are considered quantitatively uncertain. Results reported for antimony, manganese, and selenium in all samples may be biased low.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes (except silver) fall outside the control limits of 75-125%, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery results for QC sample MY2GF4A were obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	83
Manganese	81
Selenium	87

Since the post-digestion spike recoveries were acceptable, the low pre-digestion spike recovery results obtained for antimony, manganese, and selenium may indicate sample non-homogeneity, poor laboratory technique or matrix effects which may interfere with accurate analysis, depressing the analytical result.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

E. The following results are estimated and flagged "J" in Table 1A because ICP serial dilution results are outside method QC limits.

X Boron, calcium, lead, magnesium, and zinc in all samples

The percent difference for the ICP serial dilution analysis of sample MY2GF4L did not meet the 10% criterion for the analytes shown below.

Analyte	% Difference
Boron	+28
Calcium	+11
Lead	+12
Magnesium	+11
Zinc	+26

Results reported for the analytes listed above in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The result for the diluted sample was higher than the original. Therefore, the reported sample results for the analytes listed above may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

F. The following relative percent differences (RPDs) were obtained for field duplicate pair D1: MY2GE8 and MY2GE9 and are listed below.

Analyte	RPD
Boron	42
Copper	36
Iron	63
Selenium	39
Silver	39
Zinc	62

Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ∀35 RPD criterion for precision. The effect on the quality of the data is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, sample non-homogeneity, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

In Reference to
Case: 35241 SDG No.: MY2GE5

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM

Communication Record Log

Date of Call: _____October 11, 2006_____

Laboratory Name: CompuChem (LIBRTY)

Lab Contact: ____Alice Evens or Bob Meierer____

Region 9 Contact: Steve Remaley, CLP PO_____

ESAT Reviewer: Stan Kott, ESAT/LDC___

Call Initiated By: ___ Laboratory __X__ Region

In reference to data for the following sample(s): All

Summary of Questions/issues Discussed:

The following items were noted during the review of this sample delivery group (SDG) data package. Please respond within 4 days as specified in ILM05.3 Statement of Work (SOW), Exhibit B, Section 2, 2.2. Send response and resubmissions to

ICF International/Laboratory Data Consultants, Inc.,
Environmental Services Assistance Team, USEPA Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804, FAX 510 412-2304.

1. All Form 1s flag thallium results with "*" indicating duplicate analysis results were not within control limits. Form 6 (Duplicates) does not flag thallium results. Please review data and provide corrected forms.

2. Amended Form 1s for samples MY2GE5 through MY2GF8, provided in the data package, flag selenium with an "E" indicating a serial dilution result outside control limits. Form 8 (Serial Dilutions) does not flag selenium results. Please review data and provided corrected forms.

3. Modification Reference Number (MRN) 1337.1 specifies that non-detected results are to be reported at the CRQLs specified in MRN 1337.1. Please review the data and provide corrected Form 1s for samples MY2GE5 through MY2GF8 that reflect the thallium CRQL specified in MRN 1337.1.

4. The results for the following analytes are greater than the MDL but less than the CRQL and require a "J" flag:
   - Beryllium in samples MY2GE5 through MY2GE9 and MY2GF0 through MY2GF8,
   - Barium in samples MY2GF0, MY2GF1, and MY2GF2,
   - Cobalt in samples MY2GE6, MY2GF0, and MY2GF1.

   Please review the data and provide corrected Form 1s.

5. The SDG Narrative states that the sampler did not designate a sample for laboratory QC. The laboratory used sample MY2GF4 for laboratory QC as specified on the COC. Please review the data and provide a corrected narrative.

ANALYTICAL RESULTS

Case No. : 35241 SDG No. : MY2GE5 **Table 1A**

Site : ASARCO HAYDEN

Lab : COMPUCHEM (LIBRTY)

Reviewer : Stan Kott, ESAT/LDC

Date : October 11, 2006

QUALIFIED DATA

Concentration in mg/kg (As Received)

Analysis Type : Low and Medium Concentration Dust Samples For Total Metals

Station Location :	HDI-101-07-047			WDI-101-12-093			HDI-101-07-099			HDI-101-09-111B			HDI-1X			HDI-101-07-149		
Sample ID :	MY2GE5			MY2GE6			MY2GE7			MY2GE8 D1			MY2GE9 D1			MY2GF0		
Collection Date :	5/17/2006			5/17/2006			5/17/2006			5/17/2006			5/17/2006			5/17/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	5970			30800			13800			11000			13900			9030		
ANTIMONY	3.5	J	D	110	J	D	8.2	J	D	13.4	J	D	11.6	J	D	1.3	J	D
ARSENIC	43.7			10.2			119			130			170			8.3		
BARIUM	298			459			210			171			217			137L	J	A
BERYLLIUM	0.16L	J	A	0.17L	J	A	0.19L	J	A	0.20L	J	A	0.27L	J	A	0.21L	J	A
CADMIUM	8.2	J	C	5.0	J	C	28.6	J	C	31.8	J	C	40.0	J	C	2.2	J	C
CALCIUM	76300	J	E	22300	J	E	51100	J	E	23900	J	E	24900	J	E	95100	J	E
CHROMIUM	41.4			20.1			24.9			24.7			23.1			17.5		
COBALT	31.1			5.5L			31.8			40.9			35.0			8.6L	J	A
COPPER	6670			915			29100			25800		F	37000		F	1420		
IRON	17500			16300			78300			171000		F	88900		F	19000		
LEAD	816	J	E	227	J	E	329	J	E	400	J	E	505	J	E	107	J	E
MAGNESIUM	6040	J	E	5400	J	E	7220	J	E	6710	J	E	8510	J	E	8830	J	E
MANGANESE	211	J	D	235	J	D	448	J	D	702	J	D	511	J	D	305	J	D
MERCURY	1.1			0.069			0.45			0.91			0.98			1.4		
NICKEL	20.2			32.6			41.9			82.4			57.3			24.3		
POTASSIUM	3190			3040			3000			3760			4720			2530		
SELENIUM	11.4	J	CD	2.5	J	CD	23.2	J	CD	24.3	J	CDF	36.2	J	CDF	1.3	J	CD
SILVER	6.7			0.96			10.3			20.3			30.2			0.97		
SODIUM	8930			6700			5310			12200			9650			7640		
THALLIUM	0.70U	J	C	0.70U	J	C	0.70U	J	C	0.70U	J	C	0.70U	J	C	0.70U	J	C
VANADIUM	20.7			21.8			31.9			39.6			52.7			29.2		
ZINC	2980	J	E	7220	J	E	9530	J	E	28400	J	EF	15000	J	EF	497	J	E
MOLYBDENUM	53.5			13.2			233			225			316			13.5		
BORON	32.4	J	E	71.2	J	E	33.1	J	E	26.9	J	EF	17.6	J	EF	27.2	J	E
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Detection Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35241 SDG No. : MY2GE5
Site : ASARCO HAYDEN
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : October 11, 2006

QUALIFIED DATA
Concentration in mg/kg (As Received)

Analysis Type : Low and Medium Concentration Dust Samples For Total Metals

Station Location :	HDI-101-07-111			HDA-101-07-111			HDI-101-09-077			HDA-101-09-077			HDI-101-07-09T			HDI-101-09-104		
Sample ID :	MY2GF1			MY2GF2			MY2GF3			MY2GF4			MY2GF5			MY2GF6		
Collection Date :	5/17/2006			5/17/2006			5/17/2006			5/17/2006			5/17/2006			5/17/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	173000			7640			12300			9280			10000			8580		
ANTIMONY	36.7	J	D	12.7	J	D	4.3	J	D	3.1	J	D	7.3	J	D	4.2	J	D
ARSENIC	209			126			75.5			71.1			49.7			43.0		
BARIUM	654L	J	A	138L	J	A	928			227			909			253		
BERYLLIUM	0.76L	J	A	0.26L	J	A	0.39L	J	A	0.31L	J	A	0.17L	J	A	0.25L	J	A
CADMIUM	465			23.8	J	C	14.8	J	C	8.8	J	C	8.7	J	C	9.8	J	C
CALCIUM	154000	J	E	39700	J	E	21400	J	E	28600	J	E	27800	J	E	18900	J	E
CHROMIUM	117			23.2			24.0			21.2			18.4			21.2		
COBALT	42.9L	J	A	32.3			22.2			14.6			18.2			14.0		
COPPER	28800			32200			15000			10100			15300			7970		
IRON	53200			39100			29100			19800			39000			18500		
LEAD	827	J	E	499	J	E	6050	J	E	620	J	E	186	J	E	216	J	E
MAGNESIUM	19800	J	E	5890	J	E	9070	J	E	6700	J	E	6200	J	E	6970	J	E
MANGANESE	927	J	D	254	J	D	378	J	D	275	J	D	286	J	D	274	J	D
MERCURY	NA			2.9			3.2			1.8			0.20			0.23		
NICKEL	136			43.8			34.0			24.3			42.0			25.6		
POTASSIUM	20500			2630			5880			3170			3040			5250		
SELENIUM	98.6	J	CD	31.8	J	D	16.7	J	CD	8.5	J	CD	13.6	J	CD	17.3	J	CD
SILVER	22.1			10.9			10.9			5.2			8.3			6.2		
SODIUM	39700			3930			2840			1390			3670			3870		
THALLIUM	4.7U			0.70U	J	C	0.70U	J	C	0.70U	J	C	0.70U	J	C	0.70U	J	C
VANADIUM	84.2			34.9			51.7			38.4			28.1			35.0		
ZINC	8670	J	E	7450	J	E	1580	J	E	1220	J	E	7760	J	E	1520	J	E
MOLYBDENUM	314			248			169			119			133			127		
BORON	880	J	E	43.2	J	E	16.2	J	E	8.1	J	E	29.2	J	E	23.5	J	E
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable
NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Detection Limit

ANALYTICAL RESULTS

Case No. : 35241 SDG No. : MY2GE5 **Table 1A**

Site : ASARCO HAYDEN

Lab : COMPUCHEM (LIBRTY)

Reviewer : Stan Kott, ESAT/LDC

Date : October 11, 2006

QUALIFIED DATA

Concentration in mg/kg (As Received)

Analysis Type : Low and Medium Concentration Dust Samples For Total Metals

Station Location :	HDA-101-09-104			HDA-2X			HDI-101-09-070			HDA-101-09-070			HDI-101-07-061			HDA-101-07-061		
Sample ID :	MY2GF7 D2			MY2GF8 D2			MY2GF9			MY2GG0			MY2GG1			MY2GG2		
Collection Date :	5/17/2006			5/17/2006			5/17/2006			5/17/2006			5/18/2006			5/18/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	10100			9710			8320			7870			11200			10700		
ANTIMONY	2.9	J	D	2.7	J	D	3.0	J	D	2.3	J	D	6.7	J	D	10.2	J	D
ARSENIC	78.1			75.1			19.1			45.0			94.0			259		
BARIUM	192			190			3340			223			347			964		
BERYLLIUM	0.30L	J	A	0.30L	J	A	0.22L	J	A	0.52U		B	0.52U		B	0.52U		B
CADMIUM	8.8	J	C	8.4	J	C	23.0			5.6	J	C	19.4	J	C	51.4		
CALCIUM	18500	J	E	18900	J	E	45400	J	E	23800	J	E	35500	J	E	36900	J	E
CHROMIUM	15.7			15.1			29.9			25.0			33.6			23.9		
COBALT	16.2			16.1			15.9L			11.6			18.6			36.8		
COPPER	10600			10100			4300			7980			14000			34600		
IRON	20300			19600			15600			16800			22800			41700		
LEAD	546	J	E	480	J	E	54400	J	E	521	J	E	475	J	E	1100	J	E
MAGNESIUM	6800	J	E	6690	J	E	5070	J	E	5290	J	E	8410	J	E	8320	J	E
MANGANESE	300	J	D	337	J	D	209	J	D	204	J	D	294	J	D	334	J	D
MERCURY	0.80			0.81			1.4			1.4			1.5			1.0		
NICKEL	24.5			24.0			22.1			26.1			35.0			45.5		
POTASSIUM	3520			3310			3550			2530			3880			3630		
SELENIUM	9.2	J	CD	8.5	J	CD	6.6	J	CD	6.0	J	CD	18.6	J	CD	30.1	J	CD
SILVER	6.3			5.7			1.0U			4.2			9.0			13.1		
SODIUM	1690			1840			7360			1680			5040			2700		
THALLIUM	0.70U	J	C	0.70U	J	C	1.4U			0.70U	J	C	0.70U	J	C	0.70U	J	C
VANADIUM	40.4			38.5			23.9			30.2			35.2			41.3		
ZINC	675	J	E	661	J	E	8930	J	E	634	J	E	3330	J	E	3780	J	E
MOLYBDENUM	150			134			58.4			86.4			116			287		
BORON	7.4	J	E	7.6	J	E	90.5	J	E	19.5	J	E	59.7	J	E	10.1	J	E
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Detection Limit

ANALYTICAL RESULTS

Case No. : 35241 SDG No. : MY2GE5 **Table 1A**

Site : ASARCO HAYDEN

Lab : COMPUCHEM (LIBRTY)

Reviewer : Stan Kott, ESAT/LDC **QUALIFIED DATA** Analysis Type : Low and Medium Concentration

Date : October 11, 2006 **Concentration in mg/kg (As Received)** Dust Samples For Total Metals

Station Location :	HDI-101-07-117			HDI-101-07-052						MRN 1337.1								
Sample ID :	MY2GG3			MY2GG4			MDL			CRQL								
Collection Date :	5/18/2006			5/18/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	19100			14000			3.1			50								
ANTIMONY	3.8	J	D	3.6	J	D	0.18			0.99								
ARSENIC	39.6			31.3			0.32			0.39								
BARIUM	173			127L	J	A	0.047			161.3								
BERYLLIUM	0.20L	J	A	0.13L	J	A	0.022			0.52								
CADMIUM	12.0	J	C	7.3	J	C	0.011			0.4								
CALCIUM	31000	J	E	39100	J	E	7.1			500								
CHROMIUM	22.0			24.2			0.13			0.4								
COBALT	14.9			13.1			0.033			9.7								
COPPER	8840			10400			0.83			16.6								
IRON	60300			19200			2.3			200								
LEAD	164	J	E	193	J	E	0.11			7.7								
MAGNESIUM	6890	J	E	6010	J	E	0.88			500								
MANGANESE	364	J	D	238	J	D	0.035			100								
MERCURY	0.18			0.38			0.042			0.05								
NICKEL	44.9			32.7			0.092			18.2								
POTASSIUM	3740			3120			2.1			500								
SELENIUM	10.0	J	CD	7.4	J	CD	0.35			0.5								
SILVER	5.7			7.0			0.067			0.5								
SODIUM	7180			3910			13.3			50								
THALLIUM	0.70U	J	C	0.70U	J	C	0.4			0.7								
VANADIUM	36.0			28.9			0.023			2								
ZINC	9710	J	E	1000	J	E	0.18			38.9								
MOLYBDENUM	83.6			66.2			0.068			2								
BORON	30.0	J	E	41.1	J	E	0.031			10								
Percent Solids	100.0%			100.0%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Detection Limit

MRN - Modification Reference Number

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105021

DATE: October 27, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	Not Provided
Case No.:	35595
SDG No.:	MY2S00
Laboratory:	CompuChem (LIBRTY)
Analysis:	CLP Total Metals by ICP-AES plus Boron and Molybdenum, Total Mercury, and Total Cyanide
Samples:	15 Sediment Samples (see Case Summary)
Collection Date:	August 22 and 23, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35595
SDG No.: MY2S00
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Stan Kott, ESAT/LDC
Date: October 27, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY2S00, MY2S02, MY2S04, MY2S06, MY2S08, MY2S10, MY2S12, MY2S14, MY2S16, MY2S18, MY2S20, MY2S22, MY2S24, MY2S26, and MY2S28
Concentration and Matrix:	Low Concentration Sediment
Analysis:	CLP Total Metals by ICP-AES plus Boron and Molybdenum, Total Mercury, and Total Cyanide
SOW:	ILM05.3 and Modification Request Number 1337.1
Collection Date:	August 22 and 23, 2006
Sample Receipt Date:	August 24, 2006
Preparation Date:	August 29 and September 1, 2006
Analysis Date:	September 5, 6, 8, and 9, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY2S02 and MY2S04
(D2):	MY2S18 and MY2S20

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank-Soil (PBS) and samples listed above
Matrix Spike:	MY2S12S
Duplicates:	MY2S12D
ICP Serial Dilution:	MY2S12L

Analysis:	CLP Total Metals by ICP-AES plus Boron and Molybdenum, Total Mercury, and Total Cyanide

Analyte	Sample Preparation and Digestion/Distillation Date	Analysis Date
ICP-AES Metals	September 1, 2006	September 8 and 9, 2006
Mercury	September 1, 2006	September 5, 2006
Cyanide	August 29, 2006	September 6, 2006
Percent Solids	September 1, 2006	September 2, 2006

CLP PO Action

None.

Sampling Issues

The sample coolers arrived at the laboratory with temperatures of 8.2º, 9.3º, 9.8º, and 10.0ºC. These temperatures exceed the 4º∀2ºC temperature specified in the Statement of Work (SOW). No adverse effect on the quality of the data is expected.

Additional Comments

The samples in this SDG were analyzed for CLP total metals by ICP-AES plus boron and molybdenum under Modified Analysis Request (MAR), Modification Reference Number 1337.1. Mercury was analyzed by the CLP cold vapor atomic absorption method. Cyanide was analyzed by the CLP spectrophotometric method.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: 1337.1, May 3, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	B
5.	ICP Interference Check Sample (ICS)	No	C
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	D
9.	ICP Serial Dilution Analysis	No	E
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	Yes	
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are reported as non-detected (U) in Table 1A due to low level PBS contamination.

X Molybdenum in samples MY2S08, MY2S12, MY2S16, MY2S18, MY2S20, MY2S22, MY2S24, MY2S26, and MY2S28
X Sodium in samples MY2S08, MY2S10, MY2S12, MY2S14, MY2S16, MY2S18, MY2S20, MY2S22, MY2S24, and MY2S26

The molybdenum concentration (0.099 mg/kg) and sodium concentration (88.1 mg/kg) in PBS is greater than the MDL but less than the CRQL. Sample results that are greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the respective CRQL.

A preparation blank is an analytical control that contains distilled, deionized water, or baked sand for solid matrices, and reagents, which is carried through the entire analytical procedure. The preparation blank is used to determine the level of contamination introduced by the laboratory during preparation and analysis.

C. The following results are estimated and are flagged "J" in Table 1A due to possible ICP interelement interference problems.

X Thallium in samples MY2S00, MY2S02, MY2S04, MY2S06, MY2S16, MY2S18, MY2S20, MY2S22, MY2S24, and MY2S28

Results for thallium in the samples listed above were reported from an undiluted analysis that contained iron concentrations greater than the true value specified for the ICP interference check sample (ICS). Therefore, the applied interelement correction (IEC) factor may not compensate sufficiently for the interference. The thallium results for the samples listed above may be biased low and, where non-detected, false negatives may exist.

The ICP ICS solutions A and AB are analyzed to determine the effects of high concentrations of interfering elements on each analyte determined by ICP. Solution A consists of the interferents (Al, Ca, Fe, and Mg), and Solution AB consists of the analytes mixed with the interferents.

When the estimated concentration produced by the interfering element is greater than twice the CRQL and also is greater than 10% of the reported concentration of the affected element, the results of the affected elements are estimated.

D. The following results are estimated and flagged "J" or "UJ" in Table 1A because a matrix spike recovery result is outside method QC limits.

X Antimony in all samples

Matrix spike recovery for antimony in QC sample MY2D12S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for antimony are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	27	-73

Results above the MDL are considered quantitatively uncertain. Results reported for antimony in all samples may be biased low and, where non-detected, false negatives may exist.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes (except silver) fall outside the control limits of 75-125%, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery result for sample MY2S12A was obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	84

Since the post-digestion spike recovery was acceptable, the low pre-digestion spike recovery result (27%) obtained for antimony may indicate sample non-homogeneity, poor laboratory technique or matrix effects which may interfere with accurate analysis, depressing the analytical result.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

E. The following results are estimated and flagged "J" in Table 1A because ICP serial dilution results are outside method QC limits.

X Boron, lead, and nickel in all samples

The percent difference for the ICP serial dilution analysis of sample MY2W18L did not meet the 10% criterion for the analytes shown below.

Analyte	% Difference
Boron	+21
Lead	+12
Nickel	+11

Results reported for the analytes listed above in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The boron, lead, and nickel results for the diluted sample were higher than the original. The reported boron, lead, and nickel sample results may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS
Table 1A

Case No. : 35595 SDG No. : MY2S00
Site : ASARCO HAYDEN
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : October 27, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment Samples for CLP Total Metals and Cyanide

Station Location :	GR-SED-01-082206			GR-SED-02-082206			GR-SED-1X-082206			GR-SED-03-082206			GR-SED-04-082206			SPR-SED-01-082206		
Sample ID :	MY2S00			MY2S02 D1			MY2S04 D1			MY2S06			MY2S08			MY2S10		
Collection Date :	8/22/2006			8/22/2006			8/22/2006			8/22/2006			8/22/2006			8/22/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	16200			18400			19600			20400			8850			4430		
ANTIMONY	0.57L	J	AD	0.71L	J	AD	0.64L	J	AD	0.52L	J	AD	0.47L	J	AD	0.21L	J	AD
ARSENIC	2.0			2.4			2.4			2.7			2.5			1.4		
BARIUM	82.8L	J	A	126L	J	A	133L	J	A	158L	J	A	67.1L	J	A	101L	J	A
BERYLLIUM	0.52L	J	A	0.60			0.63L	J	A	0.67			0.35L	J	A	0.34L	J	A
CADMIUM	0.47U			0.46U			0.49U			0.50U			0.46U			0.43U		
CALCIUM	22200			22000			23700			31800			13300			8020		
CHROMIUM	11.8			8.8			10.1			10.2			6.4			4.1		
COBALT	11.9			10.5L	J	A	11.0L	J	A	10.5L	J	A	6.4L	J	A	3.4L	J	A
COPPER	57.5			74.8			80.4			71.9			49.9			9.1L	J	A
IRON	24200			19200			21000			20600			11600			6620		
LEAD	8.3L	J	AE	8.4L	J	AE	9.3L	J	AE	9.5L	J	AE	5.9L	J	AE	7.1L	J	AE
MAGNESIUM	9200			7910			8270			8400			4260			2420		
MANGANESE	508			440			497			461			286			155		
MERCURY	0.059U			0.058U			0.051L	J	A	0.099			0.059U			0.058U		
NICKEL	15.1L	J	AE	13.7L	J	AE	14.8L	J	AE	14.0L	J	AE	10.0L	J	AE	7.0L	J	AE
POTASSIUM	1210			1730			1860			1950			889			1020		
SELENIUM	1.0			0.78			0.80			0.86			0.59			0.53U		
SILVER	0.59U			0.57U			0.61U			0.63U			0.57U			0.53U		
SODIUM	748			831			892			826			621U		B	549U		B
THALLIUM	1.2	J	C	1.2	J	C	1.0	J	C	1.1	J	C	0.80U			0.75U		
VANADIUM	75.8			53.0			57.6			52.9			28.8			11.1		
ZINC	46.6			42.6L	J	A	46.9L	J	A	45.9L	J	A	24.2L	J	A	17.0L	J	A
CYANIDE	3.1U			2.9U			3.1U			3.3U			3.1U			2.7U		
MOLYBDENUM	2.4U			2.3U			2.4U			2.5U			2.5U		B	2.1U		
BORON	1.6L	J	AE	2.2L	J	AE	2.6L	J	AE	3.0L	J	AE	1.8L	J	AE	0.90L	J	AE
Percent Solids	81.3%			86.9%			81.8%			74.8%			80.5%			91.1%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable
NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35595 SDG No. : MY2S00
Site : ASARCO HAYDEN
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : October 27, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment Samples for CLP Total Metals and Cyanide

Station Location :	SPR-SED-02-082206			GR-SED-05-082206			GR-SED-06-082306			GR-SED-07-082306			GR-SED-2X-082306			GR-SED-08-082306		
Sample ID :	MY2S12			MY2S14			MY2S16			MY2S18 D2			MY2S20 D2			MY2S22		
Collection Date :	8/22/2006			8/22/2006			8/23/2006			8/23/2006			8/23/2006			8/23/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	11000			4240			11400			17200			14800			18400		
ANTIMONY	0.49L	J	AD	1.2U	J	D	0.68L	J	AD	0.58L	J	AD	0.60L	J	AD	0.70L	J	AD
ARSENIC	4.2			1.1			4.3			5.1			4.2			5.3		
BARIUM	177L	J	A	76.4L	J	A	141L	J	A	164L	J	A	152L	J	A	170L	J	A
BERYLLIUM	0.76			0.25L	J	A	0.75			1.0			0.85			0.92		
CADMIUM	0.53U			0.50U			0.48U			0.59U			0.56U			0.68U		
CALCIUM	40600			8140			31500			31600			28100			34800		
CHROMIUM	11.8			4.3			18.4			14.7			13.6			14.7		
COBALT	6.6L	J	A	3.2L	J	A	7.9L	J	A	10.1L	J	A	9.6L	J	A	11.5L	J	A
COPPER	35.4			11.6L	J	A	68.1			134			117			142		
IRON	13700			6890			18700			19400			18400			20400		
LEAD	15.9	J	E	4.9L	J	AE	18.1	J	E	17.8	J	E	15.2	J	E	19.8	J	E
MAGNESIUM	6060			2260			5930			8550			7430			8670		
MANGANESE	399			113L	J	A	467			574			567			665		
MERCURY	0.066U			0.063U			0.077			0.088			0.091			0.10		
NICKEL	12.5L	J	AE	6.1L	J	AE	14.0L	J	AE	18.0L	J	AE	16.1L	J	AE	19.0L	J	AE
POTASSIUM	2840			969			2580			3730			3140			3490		
SELENIUM	0.66U			0.63U			0.73			0.70L	J	A	0.70U			0.82L	J	A
SILVER	0.66U			0.63U			0.61U			0.74U			0.70U			0.84U		
SODIUM	656U		B	627U		B	661U		B	750U		B	726U		B	845U		B
THALLIUM	0.60L	J	A	0.88U			0.85U	J	C	1.0U	J	C	0.81L	J	AC	1.2U	J	C
VANADIUM	26.5			14.6			47.5			40.0			39.8			42.1		
ZINC	48.0L	J	A	14.5L	J	A	51.6			63.1			55.9			66.9		
CYANIDE	3.3U			3.1U			3.3U			3.8U			3.6U			4.2U		
MOLYBDENUM	2.6U		B	2.5U			2.6U		B	3.0U		B	2.9U		B	3.4U		B
BORON	4.1L	J	AE	0.81L	J	AE	5.4L	J	AE	8.3L	J	AE	6.0L	J	AE	6.9L	J	AE
Percent Solids	76.2%			79.7%			75.7%			66.6%			68.9%			59.2%		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable
NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35595 SDG No. : MY2S00
Site : ASARCO HAYDEN
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : October 27, 2006

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment Samples for CLP Total Metals and Cyanide

Station Location :	GR-SED-09-082306			GR-SED-10-082306			GR-SED-11-082306			MDL			CRQL					
Sample ID :	MY2S24			MY2S26			MY2S28											
Collection Date :	8/23/2006			8/23/2006			8/22/2006											
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	14900			13100			13700			3.1			50.0					
ANTIMONY	0.43L	J	AD	0.44L	J	AD	0.40L	J	AD	0.18			0.99					
ARSENIC	4.9			4.6			3.6			0.32			0.39					
BARIUM	180L	J	A	168L	J	A	140L	J	A	0.047			161.3					
BERYLLIUM	1.0			0.83			0.68L	J	A	0.022			0.52					
CADMIUM	0.59U			0.56U			0.58U			0.011			0.40					
CALCIUM	32700			28600			28100			7.1			500					
CHROMIUM	12.7			12.4			13.3			0.13			0.40					
COBALT	8.8L	J	A	8.5L	J	A	9.8L	J	A	0.033			9.7					
COPPER	93.0			91.7			107			0.083			16.6					
IRON	16900			15700			17500			2.3			200					
LEAD	21.2	J	E	18.5	J	E	13.9	J	E	0.11			7.7					
MAGNESIUM	7520			7050			7440			0.88			500					
MANGANESE	573			473			576			0.035			100					
MERCURY	0.087			0.087			0.076			0.042			0.050					
NICKEL	15.6L	J	AE	16.5L	J	AE	16.7L	J	AE	0.092			18.2					
POTASSIUM	3590			3080			2630			2.1			500					
SELENIUM	0.60L	J	A	0.51L	J	A	0.90			0.35			0.50					
SILVER	0.73U			0.69U			0.73U			0.067			0.50					
SODIUM	775U		B	751U		B	936			13.3			500					
THALLIUM	1.0U	J	C	0.97U			0.76L	J	AC	0.40			0.70					
VANADIUM	30.9			30.3			38.4			0.023			2.0					
ZINC	66.0			58.2			50.2L	J	A	0.18			38.9					
CYANIDE	3.9U			3.8U			3.7U			0.16			2.5					
MOLYBDENUM	3.1U		B	3.0U		B	2.9U		B	0.068			2.0					
BORON	6.2L	J	AE	5.5L	J	AE	5.2L	J	AE	0.031			10.0					
Percent Solids	64.5%			66.6%			67.8%			N/A			N/A					

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable
NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105021

DATE: October 25, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	Not Provided
Case No.:	35595
SDG No.:	MY2W12
Laboratory:	CompuChem (LIBRTY)
Analysis:	CLP Dissolved Metals by ICP-MS plus Aluminum, Boron, Iron, and Molybdenum and Dissolved Mercury
Samples:	15 Water Samples (see Case Summary)
Collection Date:	August 22 and 23, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35595
SDG No.: MY2W12
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Stan Kott, ESAT/LDC
Date: October 25, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY2W12 through MY2W26
Concentration and Matrix:	Low Concentration Water
Analysis:	CLP Dissolved Metals by ICP-MS plus Aluminum, Boron, Iron, and Molybdenum and Dissolved Mercury
SOW:	ILM05.3 and Modification Request Number 1340.0
Collection Date:	August 22 and 23, 2006
Sample Receipt Date:	August 24, 2006
Preparation Date:	September 12, 2006
Analysis Date:	September 12 and 13, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY2W13 and MY2W14
(D2):	MY2W21 and MY2W22

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank-Water (PBW) and samples listed above
Matrix Spike:	MY2W18S
Duplicates:	MY2W18D
ICP Serial Dilution:	MY2W18L

Analysis: CLP Dissolved Metals by ICP-MS plus Aluminum, Boron, Iron, and Molybdenum and Dissolved Mercury

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-MS Metals	September 12, 2006	September 14, 2006
Mercury	September 12, 2006	September 13, 2006
Percent Solids	Not Applicable	Not Applicable

CLP PO Action

None.

Sampling Issues

1. Water sample numbers on the Traffic Report/Chain of Custody (TR/COC) were incorrect. The laboratory was provided new water sample numbers from the Sample Management Office (SMO) as per Region 9 resolution. (See Attachment for corrected sample numbers.)

2. The sample coolers arrived at the laboratory with temperatures of 8.2º, 9.3º, 9.8º, and 10.0ºC. These temperatures exceed the 4º∀2ºC temperature specified in the Statement of Work (SOW). Since the water samples were preserved to a pH less than 2, no adverse effect on the quality of the data is expected.

Additional Comments

The samples in this SDG were analyzed for CLP dissolved metals by ICP-MS plus aluminum, boron, iron, and molybdenum under Modified Analysis Request (MAR), Modification Reference Number 1340.0. Mercury was analyzed by the CLP cold vapor atomic absorption method. Cyanide analysis is specified in MAR 1340.0 and requested on the TR/COC; however, no cyanide analysis data were provided with this SDG.

Note that samples were analyzed for aluminum and iron by ICP-MS in this sample delivery group (SDG) and by ICP-AES in Case 35595, SDG MY2W13.

Sample MY2W20 was analyzed at a 2-fold dilution as required by the SOW because the 138 percent recovery for the scandium internal standard exceeds the 125 percent recovery control limit. The results for aluminum, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, iron, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc are reported from this 2-fold dilution. Sample MY2W21 was analyzed at a 2-fold dilution due to an aluminum concentration exceeding the instrument's linear range. No adverse effect on the quality of the data is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: 1340.0, February 23, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
	d. ICP-MS Tuning Analysis		
4.	Blanks	Yes	B
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	No	C
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	No	D
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	E
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are reported as non-detected (U) in Table 1A due to low level initial calibration blank (ICB) and continuing calibration blank (CCB) contamination.

X Antimony in all samples

The antimony concentration (0.17 µg/L) in the ICB is greater than the MDL but less than the CRQL. The antimony concentrations in the CCBs range from 0.077 µg/L to 0.086 µg/L and are greater than the MDL but less than the CRQL. Sample results that are greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the CRQL.

An initial calibration blank (ICB) consists of deionized, distilled water and reagents. It is analyzed at the beginning of each analytical run, immediately after the initial calibration verification (ICV) standard to monitor analyte carry-over.

A continuing calibration blank (CCB) consists of deionized, distilled water and reagents. It is analyzed after the continuing calibration verification (CCV) standard, at a frequency of every 10 samples and at the end of the analytical run to monitor analyte carry-over.

C. The following results are estimated and flagged "J" in Table 1A because of laboratory duplicate results outside method QC limits.

X Zinc in all samples

Laboratory duplicate results for sample MY2W18D do not meet ∀20 relative percent difference (RPD) and ∀CRQL absolute difference criteria for precision as listed below.

Analyte	Laboratory Duplicate Result	CRQL
Zinc	6.6 µg/L difference	2.0

Results for zinc in all samples are considered quantitatively uncertain.

Duplicate analyses demonstrate the analytical precision obtained for each sample matrix. The imprecision between duplicate results may be due to high levels of solids in the sample or poor laboratory technique.

D. The following results are estimated and flagged "J" in Table 1A because ICP serial dilution results are outside method QC limits.

X Iron, molybdenum, and nickel in all samples

The percent difference for the ICP serial dilution analysis of sample MY2W18L did not meet the 10% criterion for the analytes shown below.

Analyte	% Difference
Iron	+20
Molybdenum	-20
Nickel	+16

Results reported for the analytes listed above in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The iron and nickel results for the diluted sample were higher than the original. The reported iron and nickel sample results may be biased low. The molybdenum result for the diluted sample was lower than the original. The reported potassium sample results may be biased high.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

E. The following relative percent differences (RPDs) or absolute differences were obtained for the field duplicate pairs listed below.

	MY2W13 D1 MY2W14 D1	MY2W21 D2 MY2W22 D2
Analyte	Result	Result
Aluminum	--	80 RPD
Barium	21 RPD	37 RPD
Chromium	--	2.7 µg/L difference
Cobalt	--	57 RPD
Copper	--	27 RPD
Iron	--	48 RPD
Lead	--	55 RPD
Manganese	46 RPD	49 RPD
Nickel	--	31 RPD
Zinc	21.3 µg/L difference	52 RPD

Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ∀20 RPD or ∀CRQL absolute difference criteria for precision. The effect on the quality of the data is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, sample non-homogeneity, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Joan Purdie

From: Garey, David [dgarey2@fedcsc.com]
Sent: Monday, August 28, 2006 11:50 AM
To: 'jpurdie@compuchemlabs.com'
Subject: RE: Region 09 | Case 35595 | Lab LIBRTY | Issue Multiple | FINAL

Yes, that is my error.

-----Original Message-----
From: jpurdie@compuchemlabs.com [mailto:jpurdie@compuchemlabs.com]
Sent: Monday, August 28, 2006 11:53 AM
To: dgarey2@fedcsc.com
Subject: RE: Region 09 | Case 35595 | Lab LIBRTY | Issue Multiple | FINAL

May I insert a M at the beginning of each id?

-----Original Message-----
From: Garey, David [mailto:dgarey2@fedcsc.com]
Sent: Monday, August 28, 2006 11:46 AM
To: Alice Evans; Joan Purdie
Cc: Mary O'Donnell
Subject: Region 09 | Case 35595 | Lab LIBRTY | Issue Multiple | FINAL

Update to Issue 2 below.

Please find below the associated DM sample IDs for the water samples:

MY2BZ9 - Y2W12
MY2S01 - Y2W13
MY2S03 - Y2W14
MY2S05 - Y2W15
MY2S07 - Y2W16
MY2S09 - Y2W17
MY2S11 - Y2W18
MY2S13 - Y2W19
MY2S15 - Y2W20
MY2S17 - Y2W21
MY2S19 - Y2W22
MY2S21 - Y2W23
MY2S23 - Y2W24
MY2S25 - Y2W25
MY2S27 - Y2W26

Thanks,

David

-----Original Message-----
From: jpurdie@compuchemlabs.com [mailto:jpurdie@compuchemlabs.com]
Sent: Friday, August 25, 2006 12:15 PM
To: dgarey2@fedcsc.com
Subject: RE: Region 09 | Case 35595 | Lab LIBRTY | Issue Multiple |

ANALYTICAL RESULTS
Table 1A

Case No. : 35595 SDG No. : MY2W12
Site : ASARCO HAYDEN
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : October 25, 2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples for Dissolved Metals by ICP-MS and Dissolved Mercury

Station Location :	GR-SW-01-082206			GR-SW-02-082206			GR-SW-1X-082206			GR-SW-03-082206			GR-SW-04-082206			SPR-SW-01-082206		
Sample ID :	MY2W12			MY2W13 D1			MY2W14 D1			MY2W15			MY2W16			MY2W17		
Collection Date :	8/22/2006			8/22/2006			8/22/2006			8/22/2006			8/22/2006			8/22/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	4.3L	J	A	28.3L	J	A	84.3L	J	A	11.1L	J	A	4.0L	J	A	90.5		
ANTIMONY	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B
ARSENIC	7.0			5.6			6.5			6.3			6.0			5.6		
BARIUM	69.0			56.8		E	70.2		E	64.8			63.1			203		
BERYLLIUM	0.022L	J	A	0.66U			0.021L	J	A	0.031L	J	A	0.023L	J	A	0.66U		
CADMIUM	0.25U			0.25U			0.25U			0.25U			0.25U			0.25U		
CHROMIUM	2.0U			2.0U			2.0U			2.0U			2.0U			0.090L	J	A
COBALT	0.32L	J	A	0.30L	J	A	0.38L	J	A	0.31L	J	A	0.30L	J	A	0.54L	J	A
COPPER	0.61L	J	A	2.6			1.1L	J	A	1.1L	J	A	0.82L	J	A	0.58L	J	A
IRON	254L	J	AD	243L	J	AD	370	J	D	260L	J	AD	233L	J	AD	829	J	D
LEAD	0.16L	J	A	0.074L	J	A	0.22L	J	A	0.21L	J	A	0.064L	J	A	0.30L	J	A
MANGANESE	6.2			12.9		E	20.5		E	5.7			4.4			89.5		
MERCURY	0.20U			0.20U			0.20U			0.20U			0.20U			0.20U		
NICKEL	2.8	J	D	2.3	J	D	2.8	J	D	2.8	J	D	2.6	J	D	3.0	J	D
SELENIUM	3.9L	J	A	0.76L	J	A	0.76L	J	A	0.85L	J	A	0.82L	J	A	2.8L	J	A
SILVER	0.36U			0.36U			0.36U			0.36U			0.36U			0.36U		
THALLIUM	1.0U			1.0U			1.0U			1.0U			1.0U			1.0U		
VANADIUM	9.7			8.9			10.2			9.8			9.6			7.7		
ZINC	2.1	J	C	4.3	J	CE	25.6	J	CE	19.1	J	C	16.3	J	C	2.8	J	C
MOLYBDENUM	4.4L	J	AD	3.9L	J	AD	4.2L	J	AD	4.4L	J	AD	4.1L	J	AD	16.7L	J	AD
BORON	115			111			113			119			112			150		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable
NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35595 SDG No. : MY2W12
Site : ASARCO HAYDEN
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : October 25, 2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples for Dissolved Metals by ICP-MS and Dissolved Mercury

Station Location :	SPR-SW-02-082206			GR-SW-05-082206			GR-SW-06-082306			GR-SW-07-082306			GR-SW-2X-082306			GR-SW-08-082306		
Sample ID :	MY2W18			MY2W19			MY2W20			MY2W21 D2			MY2W22 D2			MY2W23		
Collection Date :	8/22/2006			8/22/2006			8/23/2006			8/23/2006			8/23/2006			8/23/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	9.8L	J	A	3.5L	J	A	16400			13500		E	7030		E	6.9L	J	A
ANTIMONY	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B	2.0U		B
ARSENIC	5.6			6.1			9.8			8.3			7.9			6.3		
BARIUM	212			66.8			298			245		E	169		E	88.2		
BERYLLIUM	0.021L	J	A	0.027L	J	A	1.3L	J	A	0.94			0.55L	J	A	0.66U		
CADMIUM	0.25U			0.25U			0.42L	J	A	0.32			0.17L	J	A	0.25U		
CHROMIUM	2.0U			2.0U			9.8			6.7		E	4.0		E	2.0U		
COBALT	0.55L	J	A	0.30L	J	A	8.0			5.4		E	3.0		E	0.34L	J	A
COPPER	0.93L	J	A	2.4			43.5			29.9		E	22.7		E	2.5		
IRON	878	J	D	222L	J	AD	11700	J	D	8160	J	DE	5020	J	DE	368	J	D
LEAD	0.089L	J	A	0.059L	J	A	27.7			20.6		E	11.7		E	0.20L	J	A
MANGANESE	110			15.3			613			394		E	238		E	18.5		
MERCURY	0.20U			0.20U			0.076L	J	A	0.068L	J	A	0.035L	J	A	0.20U		
NICKEL	2.4	J	D	2.5	J	D	13.0	J	D	9.2	J	DE	6.7	J	DE	2.6	J	D
SELENIUM	1.3L	J	A	0.72L	J	A	1.3L	J	A	2.2L	J	A	1.6L	J	A	1.1L	J	A
SILVER	0.36U			0.36U			0.064L	J	A	0.053L	J	A	0.36U			0.36U		
THALLIUM	1.0U			1.0U			0.94			0.15L	J	A	0.077L	J	A	1.0U		
VANADIUM	8.0			10.7			27.6			20.1			16.8			9.9		
ZINC	2.2	J	C	4.4	J	C	68.5	J	C	48.9	J	CE	28.7	J	CE	2.8	J	C
MOLYBDENUM	21.9L	J	AD	4.3L	J	AD	2.5L	J	AD	3.9L	J	AD	5.2L	J	AD	7.0L	J	AD
BORON	175			113			127			121			126			128		

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable
NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS
Table 1A

Case No. : 35595 SDG No. : MY2W12
Site : ASARCO HAYDEN
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : October 25, 2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples for Dissolved Metals by ICP-MS and Dissolved Mercury

Station Location :	GR-SW-09-082306			GR-SW-10-082306			GR-SW-11-082306			MDL			CRQL					
Sample ID :	MY2W24			MY2W25			MY2W26											
Collection Date :	8/23/2006			8/23/2006			8/22/2006											
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	108			634			7.8L	J	A	2.4			87					
ANTIMONY	2.0U		B	2.0U		B	2.0U		B	0.059			2.0					
ARSENIC	6.2			6.9			6.6			0.082			1.0					
BARIUM	85.2			93.6			94.3			0.053			4.0					
BERYLLIUM	0.66U			0.027L	J	A	0.66U			0.018			0.66					
CADMIUM	0.25U			0.018L	J	A	0.25U			0.016			0.25					
CHROMIUM	0.099L	J	A	0.43L	J	A	2.0U			0.045			2.0					
COBALT	0.41L	J	A	0.74L	J	A	0.42L	J	A	0.021			1.0					
COPPER	3.9			4.2			7.9			0.021			2.0					
IRON	435	J	D	881	J	D	378	J	D	2.5			300					
LEAD	0.24L	J	A	1.1			0.084L	J	A	0.015			1.0					
MANGANESE	33.6			73.6			83.9			0.037			1.0					
MERCURY	0.20U			0.20U			0.20U			0.032			0.20					
NICKEL	2.7	J	D	3.5	J	D	2.8	J	D	0.046			1.0					
SELENIUM	0.80L	J	A	1.3L	J	A	1.2L	J	A	0.24			5.0					
SILVER	0.36U			0.36U			0.36U			0.012			0.36					
THALLIUM	1.0U			1.0U			1.0U			0.011			1.0					
VANADIUM	10.3			11.4			10.7			0.029			1.0					
ZINC	3.1	J	C	9.0	J	C	2.6	J	C	0. 25			2.0					
MOLYBDENUM	5.9L	J	AD	6.4L	J	AD	6.7L	J	AD	0.044			182					
BORON	121			128			120			0.56			1.6					

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable
NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105021

DATE: October 24, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	Not Provided
Case No.:	35595
SDG No.:	MY2W13
Laboratory:	CompuChem (LIBRTY)
Analysis:	Select CLP Dissolved Metals by ICP-AES
Samples:	15 Water Samples (see Case Summary)
Collection Date:	August 22 and 23, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35595
SDG No.: MY2W13
Site: Asarco Hayden
Laboratory: CompuChem (LIBRTY)
Reviewer: Stan Kott, ESAT/LDC
Date: October 24, 2006

I. CASE SUMMARY

Sample Information

Samples:	MY2W12 through MY2W26
Concentration and Matrix:	Low Concentration Water
Analysis:	Select CLP Dissolved Metals by ICP-AES
SOW:	ILM05.3
Collection Date:	August 22 and 23, 2006
Sample Receipt Date:	August 24, 2006
Preparation Date:	September 1, 2006
Analysis Date:	September 7, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY2W13 and MY2W14
(D2):	MY2W21 and MY2W22

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank-Water (PBW) and samples listed above
Matrix Spike:	MY2W18S
Duplicates:	MY2W18D
ICP Serial Dilution:	MY2W18L

Analysis: Select CLP Dissolved Metals by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	September 1, 2006	September 7, 2006
Percent Solids	Not Applicable	Not Applicable

CLP PO Action

None.

Sampling Issues

1. Water sample identifications on the Traffic Report/Chain of Custody (TR/COC) were incorrect. The laboratory was provided new water sample identifications from the Sample Management Office (SMO) as per Region 9 resolution. (See Attachment for corrected sample numbers.)

2. The sample coolers arrived at the laboratory with temperatures of 8.2º, 9.3º, 9.8º, and 10.0ºC. These temperatures exceed the 4º∀ 2ºC temperature specified in the Statement of Work (SOW). Since the water samples were preserved to a pH less than 2, no adverse effect on the quality of the data is expected.

Additional Comments

Note that samples were analyzed for aluminum and iron by ICP-AES in this sample delivery group (SDG) and by ICP-MS in Case 35595, SDG MY2W12.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	No	B
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	C
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are estimated and flagged "J" in Table 1A because an ICP serial dilution result is outside method QC limits.

X Potassium in all samples

The percent difference for the ICP serial dilution analysis of sample MY2W18L did not meet the 10% criterion for the analytes shown below.

Analyte	% Difference
Potassium	-19

Results reported for potassium in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The potassium result for the diluted sample was lower than the original. Therefore, the reported potassium sample results may be biased high.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

C. The following relative percent differences (RPDs) were obtained for field duplicate pair MY2W21 and MY2W22 and are listed below.

Analyte	RPD
Aluminum	29
Iron	28

Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ∀20 RPD criterion for precision. The effect on the quality of the data is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, sample non-homogeneity, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Joan Purdie

From: Garey, David [dgarey2@fedcsc.com]
Sent: Monday, August 28, 2006 11:50 AM
To: 'jpurdie@compuchemlabs.com'
Subject: RE: Region 09 | Case 35595 | Lab LIBRTY | Issue Multiple | FINAL

Yes, that is my error.

-----Original Message-----
From: jpurdie@compuchemlabs.com [mailto:jpurdie@compuchemlabs.com]
Sent: Monday, August 28, 2006 11:53 AM
To: dgarey2@fedcsc.com
Subject: RE: Region 09 | Case 35595 | Lab LIBRTY | Issue Multiple | FINAL

May I insert a M at the beginning of each id?

-----Original Message-----
From: Garey, David [mailto:dgarey2@fedcsc.com]
Sent: Monday, August 28, 2006 11:46 AM
To: Alice Evans; Joan Purdie
Cc: Mary O'Donnell
Subject: Region 09 | Case 35595 | Lab LIBRTY | Issue Multiple | FINAL

Update to Issue 2 below.

Please find below the associated DM sample IDs for the water samples:

MY2BZ9 - Y2W12
MY2S01 - Y2W13
MY2S03 - Y2W14
MY2S05 - Y2W15
MY2S07 - Y2W16
MY2S09 - Y2W17
MY2S11 - Y2W18
MY2S13 - Y2W19
MY2S15 - Y2W20
MY2S17 - Y2W21
MY2S19 - Y2W22
MY2S21 - Y2W23
MY2S23 - Y2W24
MY2S25 - Y2W25
MY2S27 - Y2W26

Thanks,

David

-----Original Message-----
From: jpurdie@compuchemlabs.com [mailto:jpurdie@compuchemlabs.com]
Sent: Friday, August 25, 2006 12:15 PM
To: dgarey2@fedcsc.com
Subject: RE: Region 09 | Case 35595 | Lab LIBRTY | Issue Multiple |

ANALYTICAL RESULTS
Table 1A

Case No. : 35595 SDG No. : MY2W13
Site : ASARCO HAYDEN
Lab : COMPUCHEM (LIBRTY)
Reviewer : Stan Kott, ESAT/LDC
Date : October 24, 2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples for Select Dissolved Metals by ICP-AES

Station Location :	GR-SW-01-082206			GR-SW-02-082206			GR-SW-1X-082206			GR-SW-03-082206			GR-SW-04-082206			SPR-SW-01-082206		
Sample ID :	MY2W12			MY2W13 D1			MY2W14 D1			MY2W15			MY2W16			MY2W17		
Collection Date :	8/22/2006			8/22/2006			8/22/2006			8/22/2006			8/22/2006			8/22/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	200U			41.8L	J	A	90.8L	J	A	200U			200U			113L	J	A
CALCIUM	36700			37400			38100			36500			37200			128000		
IRON	100U			28.9L	J	A	83.2L	J	A	100U			100U			52.4L	J	A
MAGNESIUM	11900			12100			12200			11900			12000			25200		
POTASSIUM	5500	J	B	5320	J	B	5490	J	B	5500	J	B	5250	J	B	8010	J	B
SODIUM	87400			88400			89300			87900			87400			119000		

Station Location :	SPR-SW-02-082206			GR-SW-05-082206			GR-SW-06-082306			GR-SW-07-082306			GR-SW-2X-082306			GR-SW-08-082306		
Sample ID :	MY2W18			MY2W19			MY2W20			MY2W21 D2			MY2W22 D2			MY2W23		
Collection Date :	8/22/2006			8/22/2006			8/23/2006			8/23/2006			8/23/2006			8/23/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	1860			200U			22600			14100		C	10500		C	200U		
CALCIUM	135000			36900			91200			80700			69200			58100		
IRON	1210			100U			16500			9670		C	7300		C	100U		
MAGNESIUM	26400			11900			21100			18900			17800			16100		
POTASSIUM	8720	J	B	5460	J	B	10900	J	B	9240	J	B	8820	J	B	6100	J	B
SODIUM	127000			86800			92100			97500			101000			102000		

Station Location :	GR-SW-09-082306			GR-SW-10-082306			GR-SW-11-082306			MDL			CRQL					
Sample ID :	MY2W24			MY2W25			MY2W26											
Collection Date :	8/23/2006			8/23/2006			8/22/2006											
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ALUMINUM	126L	J	A	698			200U			30.7			200					
CALCIUM	52000			55400			56400			195			5000					
IRON	87.1L	J	A	580			100U			20.5			100					
MAGNESIUM	15200			15900			16100			41.7			5000					
POTASSIUM	5990	J	B	6260	J	B	6160	J	B	11.3			5000					
SODIUM	100000			102000			103000			121			5000					

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable
NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105046

DATE: March 8, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	35920
SDG No.:	MY30P0
Laboratory:	Bonner Analytical Testing Co. (BONNER)
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 2 and 8, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35920
SDG No.: MY30P0
Site: Asarco Hayden
Laboratory: Bonner Analytical Testing Co. (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: March 8, 2007

I. CASE SUMMARY

Sample Information

Samples:	MY30P0 through MY30P9, MY30Q0, MY30Q2 through MY30Q9, and MY30R0
Concentration and Matrix:	Medium Concentration Soil
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
SOW:	ILM05.3 and Modification Reference Number 1414.0
Collection Date:	February 8, 2006
Sample Receipt Date:	November 21, 2006
Preparation Date:	November 28 and 30, 2006
Analysis Date:	November 29, December 5 and 6, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY30P9 and MY30Q0

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank- Solid (PBS) and samples listed above
Matrix Spike:	MY30P0S
Duplicates:	MY30P0D
ICP Serial Dilution:	MY30P0L

Analysis: Total Arsenic, Copper, and Lead by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	November 30, 2006	December 5 and 6, 2006
Percent Solids	November 28, 2006	November 29, 2006

CLP PO Action

None.

Sampling Issues

The Traffic Report/Chain of Custody (TR/COC) record forms specified two samples, MY30P0 and MY30Q9, to be used for laboratory quality control (QC). After contacting the Sample Management Office (SMO), the laboratory selected sample MY30P0 for QC analysis. No adverse effect on data quality is expected.

Additional Comments

The samples in this SDG were analyzed for total arsenic, copper, and lead by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1414.0.

The following samples were analyzed at the following dilutions due to copper concentrations that exceeded the instrument's linear range: two-fold – MY30P0, MY30P7, MY30P8, MY30Q6, and MY30Q9; three-fold – MY30P6 and MY30Q4; four-fold – MY30Q2; and ten-fold – MY30Q3. No adverse effect on data quality is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: *1414.0*, November 8, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	Yes	
10.	Field Duplicate Sample Analysis	Yes	
11.	Sample Quantitation	Yes	
12.	Overall Assessment	Yes	

N/A = Not Applicable

III. OVERALL ASSESSMENT OF DATA

All of the method requirements specified in the USEPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) and Modification Reference Number 1414.0 have been met. Reported results for arsenic, copper, and lead in all of the samples were appropriate and correctly calculated.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS

Table 1A

Case No. : 35920 SDG No. : MY30P0

Site : ASARCO

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : March 8, 2007

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples for Total Metals by ICP-AES

Station Location :	HSS-E-0-101-09-107-SU			HSS-F-0-101-09-107-SU			HSS-G-0-101-09-107-SU			HSS-H-0-101-09-107-SU			HSS-I-0-101-09-107-SU			HSS-J-1-101-09-107-SU		
Sample ID :	MY30P0			MY30P1			MY30P2			MY30P3			MY30P4			MY30P5		
Collection Date :	2/8/2006			2/8/2006			2/8/2006			2/8/2006			2/8/2006			2/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	37.9			41.3			26.1			23.0			25.2			9.9		
COPPER	8630			5480			6590			6190			5860			5070		
LEAD	566			841			144			167			652			162		
Percent Solids	98.9%			97.9%			98.9%			98.7%			98.2%			97.3%		

Station Location :	HSS-A-0-101-09-108-SU			HSS-B-0-101-09-108-RE			HSS-C-0-101-09-108-SU			HSS-D-0-101-09-108-SU			HSS-X-0-101-09-108-SU			HSS-F-0-101-09-108-SU		
Sample ID :	MY30P6			MY30P7			MY30P8			MY30P9 D1			MY30Q0 D1			MY30Q2		
Collection Date :	2/8/2006			2/8/2006			2/8/2006			2/8/2006			2/8/2006			2/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	33.1			40.2			45.9			27.5			31.8			58.7		
COPPER	16200			10300			10200			3320			3590			19700		
LEAD	133			487			2100			167			218			314		
Percent Solids	99.2%			98.6%			98.7%			98.1%			85.0%			99.1%		

Station Location :	HSS-G-0-101-09-108-SU			HSS-H-0-101-09-108-SU			HSS-I-0-101-09-108-SU			HSS-J-1-101-09-108-SU			HSS-A-0-101-09-064-SU			HSS-B-0-101-09-064-SU		
Sample ID :	MY30Q3			MY30Q4			MY30Q5			MY30Q6			MY30Q7			MY30Q8		
Collection Date :	2/8/2006			2/8/2006			2/8/2006			2/2/2006			2/8/2006			2/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	51.5			62.6			41.1			58.1			28.9			15.2		
COPPER	20600			14500			7050			11300			6120			4980		
LEAD	421			496			2470			936			140			127		
Percent Solids	99.1%			98.7%			98.1%			98.7%			98.7%			99.5%		

Station Location :	HSS-D-0-101-09-064-SU			HSS-E-0-101-09-064-SU			MDL			CRQL								
Sample ID :	MY30Q9			MY30R0														
Collection Date :	2/8/2006			2/8/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	42.1			22.7			0.44			1.0								
COPPER	10700			6660			0.12			2.5								
LEAD	294			126			0.45			1.0								
Percent Solids	99.0%			98.3%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105046

DATE: March 6, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	35920
SDG No.:	MY3194
Laboratory:	Bonner Analytical Testing Co. (BONNER)
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 9 and 10, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [ ] Yes [X] No

Data Validation Report

Case No.: 35920
SDG No.: MY3194
Site: Asarco Hayden
Laboratory: Bonner Analytical Testing Co. (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: March 6, 2007

I. CASE SUMMARY

Sample Information

Samples:	MY3194, MY3195, MY3197, MY3198, MY3199, MY31A0 through MY31A9, and MY31B0 through MY31B4
Concentration and Matrix:	Medium Concentration Soil
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
SOW:	ILM05.3 and Modification Reference Number 1414.0
Collection Date:	February 9 and 10, 2006
Sample Receipt Date:	November 21, 2006
Preparation Date:	November 27 and 28, 2006
Analysis Date:	November 28 and 29, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY31A0 and MY3199
(D2):	MY31A4 and MY31A5
(D3):	MY31B2 and MY31B3

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank- Solid (PBS) and samples listed above
Matrix Spike:	MY31A6S
Duplicates:	MY31A6D
ICP Serial Dilution:	MY31A6L

Analysis: Total Arsenic, Copper, and Lead by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	November 28, 2006	November 29, 2006
Percent Solids	November 27, 2006	November 28, 2006

CLP PO Action

None.

Sampling Issues

None.

Additional Comments

The samples in this SDG were analyzed for total arsenic, copper, and lead by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1414.0.

Samples MY31A1, MY31B1, and MY31B4 were analyzed at two, three, and five-fold dilutions, respectively, due to copper concentrations that exceeded the instrument's linear range. No adverse effect on data quality is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: *1414.0*, November 8, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	No	A
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	Yes	
10.	Field Duplicate Sample Analysis	Yes	
11.	Sample Quantitation	Yes	
12.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. The following results are estimated and flagged "J" in Table 1A because a laboratory duplicate result is outside method QC limits.

X Lead in all samples

The lead result for laboratory duplicate sample MY31A6D does not meet the ∀35 relative percent difference (RPD) criterion for precision as listed below.

Analyte	Laboratory Duplicate, RPD
Lead	102

Results for lead in all samples are considered quantitatively uncertain.

Duplicate analyses demonstrate the analytical precision obtained for each sample matrix. The imprecision between duplicate results may be due to sample non-homogeneity or poor laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS

Table 1A

Case No. : 35920 SDG No. : MY3194

Site : ASARCO

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : March 6, 2007

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples for Select Total Metals by ICP-AES

Station Location :	HSS-X-1-101-09-088-SU			HSS-A-0-101-09-084-SU			HSS-C-0-101-09-084-SU			HSS-D-0-101-09-084-SU			HSS-E-0-101-09-084-SU			HSS-X-0-101-09-084-SU		
Sample ID :	MY31A0 D1			MY31A1			MY31A2			MY31A3			MY31A4 D2			MY31A5 D2		
Collection Date :	2/10/2006			2/10/2006			2/10/2006			2/10/2006			2/10/2006			2/10/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	3.0			45.6			35.4			36.6			26.9			25.9		
COPPER	122			9290			6510			7750			6550			6210		
LEAD	21.9	J	A	642	J	A	1300	J	A	1060	J	A	626	J	A	633	J	A
Percent Solids	97.8%			98.5%			98.9%			98.7%			99.1%			98.9%		

Station Location :	HSS-F-0-101-09-084-SU			HSS-G-0-101-09-084-SU			HSS-H-0-101-09-084-RE			HSS-I-0-101-09-084-SU			HSS-J-1-101-09-084-SU			HSS-A-0-101-07-035AN-RE		
Sample ID :	MY31A6			MY31A7			MY31A8			MY31A9			MY31B0			MY31B1		
Collection Date :	2/10/2006			2/10/2006			2/10/2006			2/10/2006			2/10/2006			2/9/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	35.0			19.9			34.3			28.9			8.5			17.3		
COPPER	7710			4490			7100			7930			707			19100		
LEAD	1100	J	A	511	J	A	1840	J	A	951	J	A	152	J	A	48.1	J	A
Percent Solids	98.5%			98.7%			98.8%			98.5%			97.4%			98.6%		

Station Location :	HSS-B-0-101-07-035AN-SU			HSS-X-0-101-07-035AN-SU			HSS-C-0-101-07-035AN-SU			HSS-E-0-101-09-088-SU			HSS-F-0-101-09-088-SU			HSS-H-0-101-09-088-SU		
Sample ID :	MY31B2 D3			MY31B3 D3			MY31B4			MY3194			MY3195			MY3197		
Collection Date :	2/9/2006			2/9/2006			2/9/2006			2/10/2006			2/10/2006			2/10/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	13.3			12.8			54.9			20.9			10.9			7.3		
COPPER	7640			7510			31100			4060			2220			1270		
LEAD	78.4	J	A	68.1	J	A	128	J	A	704	J	A	196	J	A	215	J	A
Percent Solids	96.8%			96.6%			99.1%			97.5%			97.9%			97.7%		

Station Location :	HSS-I-0-101-09-088-SU			HSS-J-1-101-09-088-SU			MDL			CRQL								
Sample ID :	MY3198			MY3199 D1														
Collection Date :	2/10/2006			2/10/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	7.5			3.1			0.44			1.0								
COPPER	761			123			0.12			2.5								
LEAD	117	J	A	23.6	J	A	0.45			1.0								
Percent Solids	97.6%			97.7%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105046

DATE: March 6, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	35920
SDG No.:	MY31Q2
Laboratory:	Bonner Analytical Testing Co. (BONNER)
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 2, 6, and 7, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35920
SDG No.: MY31Q2
Site: Asarco Hayden
Laboratory: Bonner Analytical Testing Co. (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: March 6, 2007

I. CASE SUMMARY

Sample Information

Samples:	MY31Q2 through MY31Q9, MY31R0 through MY31R9, MY31S0, and MY31S1
Concentration and Matrix:	Medium Concentration Soil
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
SOW:	ILM05.3 and Modification Reference Number 1414.0
Collection Date:	February 2, 6, and 7, 2006
Sample Receipt Date:	November 28, 2006
Preparation Date:	November 30 and December 1, 2006
Analysis Date:	December 1, 13, and 14, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY31Q9 and MY31R0
(D2):	MY31S1 and MY31S2 (See Additional Comments)

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank- Solid (PBS) and samples listed above
Matrix Spike:	MY31R1S
Duplicates:	MY31R1D
ICP Serial Dilution:	MY31R1L

Analysis: Total Arsenic, Copper, and Lead by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	December 1, 2006	December 13 and 14, 2006
Percent Solids	November 30, 2006	December 1, 2006

CLP PO Action

None.

Sampling Issues

1. The Traffic Report/Chain of Custody (TR/COC) record forms specified two samples, MY31R1 and MY31S0, to be used for laboratory quality control (QC). The laboratory selected sample MY31R1 for QC analysis. The effect on data quality is not known.

2. The cooler containing samples MY31Q1 through MY31Q9 and MY31R0 through MY31R5 arrived at the laboratory with a temperature of 9.5ºC. This temperature exceeds the temperature of 4º±2ºC specified in the Statement of Work (SOW). Since these soil samples were only analyzed for arsenic, copper, and lead, no adverse effect on data quality is expected.

Additional Comments

The samples in this SDG were analyzed for total arsenic, copper, and lead by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1414.0.

The recovery results for copper in CRQL Check Standard (CRI) CRI06 and CRI08 were 220 percent and 148 percent, respectively. These results exceed the 70-130 percent control limits specified in the SOW. However, Region 9 advised the laboratory that copper results that are greater than five times the CRQL (12.5 mg/kg) do not have to be re-analyzed and may be reported. See attached e-mails.

Samples MY31Q2, MY31R4, MY31R8, MY31R9, and MY31S0 were analyzed at a three-fold dilution due to copper concentrations that exceeded the instrument's linear range. No adverse effect on data quality is expected.

The results for sample MY31S2, the field duplicate of sample MY31S1, are included in Case: 35920 SDG: MY31S2.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

X Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;

X *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: *1414.0*, November 8, 2006;

X *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.3, March 2004; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	No	A
10.	Field Duplicate Sample Analysis	Yes	
11.	Sample Quantitation	Yes	
12.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. The following results are estimated and flagged "J" in Table 1A because an ICP serial dilution result is outside method QC limits.

X Lead in all samples

The percent difference for the ICP serial dilution analysis of sample MY31R1L did not meet the 10% criterion for lead as shown below.

Analyte	% Difference
Lead	+13

Results reported for lead in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The lead result for the diluted sample was higher than the original. Therefore, the reported sample results for lead may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

000194

From: Nebelsick.John@epamail.epa.gov [mailto:Nebelsick.John@epamail.epa.gov]
Sent: Monday, December 11, 2006 10:55 AM
To: Heather Bauer
Subject: Fw: (12-6) | Case 35920 | Lab BONNER | Issue Laboratory problems

Heather, Was the response below ever sent to Bonner? He sent me another e-mail today requesting a response.
Thanks,

John Nebelsick
Analytical Services Branch
402-697-2572 (Omaha)
703-603-8845 (D.C.)
Sent by EPA Wireless E-Mail Services.

----- Original Message -----
From: John Nebelsick
Sent: 12/06/2006 04:20 PM
To: Heather Bauer" <hbauer3@fedcsc.com>; Al Mayo" <amayo@fedcsc.com>
Subject: Re: (12-6) | Case 35920 | Lab BONNER | Issue Laboratory problems

Heather, Please sent the response to the lab.
Thanks,

John Nebelsick
Analytical Services Branch
402-697-2572 (Omaha)
703-603-8845 (D.C.)
Sent by EPA Wireless E-Mail Services.

----- Original Message -----
From: "Bauer, Heather" [hbauer3@fedcsc.com]
Sent: 12/06/2006 08:58 AM
To: John Nebelsick; Mayo, Alfred" <amayo@fedcsc.com>
Subject: (12-6) | Case 35920 | Lab BONNER | Issue Laboratory problems

John,
Following is the response from Region 9 to BONNER's issues with MA 1414.0. Please let me know if this response should be sent to BONNER.

Issue 1. Per BONNER, this flex regards about 450 samples from Region 9, analyzing for Cu, Pb and As. Currently the lab is diluting about 50 to 75% of all the samples for Cu, with a linear range of 80 ppm. (Typical dilutions are a 3X to 5X.) The lab is wondering due to the excessive levels; if the region would disregard two consecutive failed CRIs due to carry over. This is not happening all the

12/14/2006

000195

time but the lab has had to reanalyze about half of the SDGs so far. From the data they have looked at so fare they don't think any samples have been below 10 to 20 ppm.

Region 9 Response: The Region presumes that this means that the CRI is above control limits due to carry over. The Region thinks that if the lab could apply the 5X rule, any samples that are at above 5X the value of the CRI can be reported regardless of whether the CRI passes or fails. Samples that are less than or equal to 5X the CRI that fails due to carryover should be reanalyzed.

Thanks,
Heather

Heather Bauer
CSC
Environmental Coordinator
(703) 818-4220
hbauer3@fedcsc.com

From: Rudolph, Elizabeth
Sent: Wednesday, December 06, 2006 8:27 AM
To: Bauer, Heather
Cc: Kramer, Caroline
Subject: FW: (12-6) | Case 35920 | Lab BONNER | Issue Laboratory problems

Good morning Heather,

Please see Region 9's response below. Would you like me to pass this on to BONNER or wait for a response from John?

Thanks,
Beth

-----Original Message-----
From: Bauer.Richard@epamail.epa.gov [mailto:Bauer.Richard@epamail.epa.gov]**On Behalf Of** R9RSCC@epamail.epa.gov
Sent: Tuesday, December 05, 2006 5:59 PM
To: Rudolph, Elizabeth
Cc: odonnell.mary@epa.gov; R9RSCC@epa.gov
Subject: Re: (12-6) | Case 35920 | Lab BONNER | Issue Laboratory problems

I presume this means that the CRI is above control limits due to carry over. I think that the lab could apply the 5X rule, any samples that are at above 5X the value of the CRI can be reported regardless of whether the CRI passes or fails. Samples that are less than or equal to 5X the a CRI that fails due to carryover should be reanalyzed.

****
Region 9 RSCC
EPA Region 9 Laboratory

12/14/2006

ANALYTICAL RESULTS

Table 1A

Case No. : 35920 SDG No. : MY31Q2

Site : ASARCO

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : March 6, 2007

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples for Select Total Metals by ICP-AES

Station Location :	HSS-D-0-101-07-047-RE			HSS-E-0-101-07-047-SU			HSS-G-0-101-07-047-SU			HSS-H-0-101-07-047-SU			HSS-I-0-101-07-047-SU			HSS-J-1-101-07-047-SU		
Sample ID :	MY31Q2			MY31Q3			MY31Q4			MY31Q5			MY31Q6			MY31Q7		
Collection Date :	2/6/2006			2/6/2006			2/6/2006			2/6/2006			2/6/2006			2/6/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	65.3			22.3			31.6			22.8			42.1			11.5		
COPPER	16100			6120			9460			6550			9960			816		
LEAD	827	J	A	327	J	A	841	J	A	329	J	A	908	J	A	60.7	J	A
Percent Solids	97.8%			98.5%			97.1%			98.1%			98.3%			96.6%		

Station Location :	HSS-A-0-101-07-062-SU			HSS-B-0-101-07-062-SU			HSS-X-0-101-07-062-SU			HSS-C-0-101-07-062-SU			HSS-D-0-101-07-062-SU			HSS-E-0-101-07-062-SU		
Sample ID :	MY31Q8			MY31Q9 D1			MY31R0 D1			MY31R1			MY31R2			MY31R3		
Collection Date :	2/2/2006			2/2/2006			2/6/2006			2/6/2006			2/6/2006			2/2/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	10.1			10.6			10.9			21.4			16.7			17.2		
COPPER	4330			2930			2780			8370			4420			5180		
LEAD	70.3	J	A	76.4	J	A	104	J	A	106	J	A	89.1	J	A	75.9	J	A
Percent Solids	97.4%			98.6%			98.4%			98.5%			98.3%			97.9%		

Station Location :	HSS-G-0-101-07-062-RE			HSS-H-0-101-07-062-SU			HSS-I-0-101-07-062-SU			HSS-J-1-101-07-062-SU			HSS-C-0-101-07-089T-SU			HSS-D-0-101-07-089T-SU		
Sample ID :	MY31R4			MY31R5			MY31R6			MY31R7			MY31R8			MY31R9		
Collection Date :	2/2/2006			2/2/2006			2/2/2006			2/2/2006			2/7/2006			2/7/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	54.7			18.8			13.9			11.6			64.2			63.6		
COPPER	13600			4750			3530			1320			19000			15500		
LEAD	253	J	A	94.1	J	A	72.2	J	A	47.5	J	A	176	J	A	189	J	A
Percent Solids	98.4%			98.0%			98.7%			98.0%			99.2%			98.7%		

Station Location :	HSS-E-0-101-07-089T-SU			HSS-F-0-101-07-089T-SU			MDL			CRQL								
Sample ID :	MY31S0			MY31S1 D2														
Collection Date :	2/7/2006			2/7/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	32.4			60.6			0.25			1.0								
COPPER	15600			4300			0.11			2.5								
LEAD	109	J	A	90.2	J	A	0.31			1.0								
Percent Solids	99.0%			99.4%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105091 Amendment 1

DATE: November 8, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	36715
SDG No.:	MY3F64
Laboratory:	Bonner Analytical Testing Co. (BONNER)
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 2 and 8, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 36715
SDG No.: MY3F64
Site: Asarco Hayden
Laboratory: Bonner Analytical Testing Co. (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: November 8, 2007

I. CASE SUMMARY

Sample Information

Samples:	MY3F64 through MY3F70 and MY3H39 through MY3H51
Concentration and Matrix:	Low Concentration Soil
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
SOW:	ILM05.4 and Modification Reference Number 1470.0
Collection Date:	February 2 and 8, 2006
Sample Receipt Date:	August 23, 2007
Preparation Date:	August 29, 2007
Analysis Date:	September 7 and 11, 2007

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY3F65 and MY3F70
Field Duplicates (D2):	MY3H39 and MY3H48
Field Duplicates (D3):	MY3H49 and MY3H58 (See Additional Comments)

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank- Solid (PBS) and samples listed above
Matrix Spike:	MY3H41S
Duplicates:	MY3H41D
ICP Serial Dilution:	MY3H41L

Analysis: Total Arsenic, Copper, and Lead by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	August 29, 2007	September 7 and 11, 2007
Percent Solids	Not Prepared	Not Analyzed

CLP PO Action

None.

Sampling Issues

Temperature indicator bottles were not present in the sample coolers. The sample temperature was determined by the laboratory to be 5°C. No adverse effect on data quality is expected.

Additional Comments

The samples in this SDG were analyzed for total arsenic, copper, and lead by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1470.0.

The above MAR instructed the laboratory to dilute all samples prior to analysis. Samples MY3H50 and MY3H51 were analyzed at a two-fold dilution for arsenic, copper, and lead. Samples MY3F64 through MY3F69 and MY3H39 through MY3H49 were analyzed at a three-fold dilution for arsenic, copper, and lead. Sample MY3F70 was analyzed at a three-fold dilution for arsenic and lead and a ten-fold dilution for copper. No adverse effect on data quality is expected.

The laboratory was given permission by the Region to store the samples of this SDG in an unrefrigerated, dry secure area instead of a refrigerated storage area. The effect on data quality is not known.

The laboratory was instructed by the Region that total solids analysis was not required if the samples are dry. No adverse effect on data quality is expected.

The holding time for the soil samples in this SDG was approximately nineteen months. Holding time limits for soil samples have not been established and the effect on data quality is not known.

The results for sample MY3H58, the field duplicate of sample MY3H49, are included in Case 36715 SDG MY3H52.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: *1470.0,* August 15, 2007;
- *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.4, December 2006; and
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	A
9.	ICP Serial Dilution Analysis	No	B
10.	Field Duplicate Sample Analysis	No	C
11.	Sample Quantitation	Yes	
12.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. The following results are estimated and flagged "J" in Table 1A because a matrix spike recovery result is outside method QC limits.

- Arsenic in all samples

Matrix spike recovery for arsenic in QC sample MY3H41S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for arsenic are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Arsenic	142	+42

Results above the MDL are considered quantitatively uncertain. Results reported for arsenic in all samples may be biased high.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes (except silver) fall outside the control limits of 75-125%, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery result for sample MY3H41A was obtained.

Analyte	Post-Digestion Spike, % Recovery
Arsenic	122

Since the post-digestion spike recovery was acceptable, the high pre-digestion spike recovery result (142%) obtained for arsenic may indicate sample non-homogeneity, poor laboratory technique or matrix effects which may interfere with accurate analysis, enhancing the analytical result.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

B. The following results are estimated and flagged "J" in Table 1A because an ICP serial dilution result is outside method QC limits.

- Lead in all samples

The percent difference for the ICP serial dilution analysis of sample MY3H41L did not meet the 10% criterion for lead as shown below.

Analyte	% Difference
Lead	-26

Results reported for lead in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The lead result for the diluted sample was lower than the original. Therefore, the reported lead sample results may be biased high.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

C. Relative percent differences (RPDs) of 81 and 158 were obtained for arsenic and copper, respectively, in the analysis of field duplicate pair samples MY3F65 and MY3F70. Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ±35 RPD criterion for precision. The effect on data quality is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, sample non-homogeneity, or poor sampling or laboratory technique.

ANALYTICAL RESULTS
Table 1A

Case No.: 36715 SDG No.: MY3F64
Site: ASARCO
Lab: BONNER ANALYTICAL TESTING CO. (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: November 8, 2007

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type: Low Concentration Soil Samples for Select CLP Total Metals by ICP-AES

Station Location:	HSS-E-0-101-07-089Q			HSS-F-0-101-07-089Q			HSS-G-0-101-07-089Q			HSS-H-0-101-07-089Q			HSS-I-0-101-07-089Q			HSS-J-1-101-07-089Q		
Sample ID:	MY3F64			MY3F65 D1			MY3F66			MY3F67			MY3F68			MY3F69		
Collection Date:	2/2/2006			2/2/2006			2/2/2006			2/2/2006			2/2/2006			2/2/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	4.7	J	A	10.1	J	AC	58.6	J	A	17.9	J	A	9.4	J	A	11.6	J	A
COPPER	3930			5400		C	10600			8380			5180			1950		
LEAD	24.7	J	B	51.5	J	B	156	J	B	45.2	J	B	28.3	J	B	31.9	J	B
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location:	HSS-X-0-101-07-089Q			HSS-A-0-101-09-137			HSS-B-0-101-09-137			HSS-C-0-101-09-137			HSS-D-0-101-09-137			HSS-E-0-101-09-137		
Sample ID:	MY3F70 D1			MY3H39 D2			MY3H40			MY3H41			MY3H42			MY3H43		
Collection Date:	2/2/2006			2/8/2006			2/8/2006			2/8/2006			2/8/2006			2/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	23.7	J	AC	23.1	J	A	24.7	J	A	17.4	J	A	13.7	J	A	30.9	J	A
COPPER	45900		C	4530			1710			3690			1900			750		
LEAD	65.4	J	B	80.6	J	B	48.3	J	B	78.8	J	B	33.2	J	B	30.9	J	B
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location:	HSS-F-0-101-09-137			HSS-H-0-101-09-137			HSS-I-0-101-09-137			HSS-J-1-101-09-137			HSS-X-0-101-09-137			HSS-A-0-101-09-140		
Sample ID:	MY3H44			MY3H45			MY3H46			MY3H47			MY3H48 D2			MY3H49 D3		
Collection Date:	2/8/2006			2/8/2006			2/8/2006			2/8/2006			2/8/2006			2/8/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	25.9	J	A	41.1	J	A	32.0	J	A	12.1	J	A	24.5	J	A	30.7	J	A
COPPER	5390			7370			8140			2160			3560			7150		
LEAD	91.2	J	B	131	J	B	158	J	B	113	J	B	72.2	J	B	171	J	B
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location:	HSS-B-0-101-09-140			HSS-C-0-101-09-140			MDL			CRQL								
Sample ID:	MY3H50			MY3H51														
Collection Date:	2/8/2006			2/8/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	7.1	J	A	34.0	J	A	0.47			1.0								
COPPER	1850			9040			0.17			2.5								
LEAD	30.4	J	B	140	J	B	0.46			1.0								
Percent Solids	100.0%			100.0%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM) RF
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105091 Amendment 1

DATE: November 8, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	Not provided
Case No.:	36715
SDG No.:	MY3GB6
Laboratory:	Bonner Analytical Testing Co. (BONNER)
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	January 31 and February 1, 2006
Reviewer:	Dennis Mayugba, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Attachment

00105091-8575/36715/MY3GB6RPT.doc

Data Validation Report

Case No.: 36715
SDG No.: MY3GB6
Site: Asarco Hayden
Laboratory: Bonner Analytical Testing Co. (BONNER)
Reviewer: Dennis Mayugba, ESAT/LDC
Date: November 8, 2007

I. CASE SUMMARY

Sample Information

Samples:	MY3GB6 through MY3GB9, MY3GC0 through MY3GC9, and MY3GD0 through MY3GD5
Concentration and Matrix:	Total Metals Low Concentration Soil
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
SOW:	ILM05.4 and Modification Reference Number 1470.0
Collection Date:	January 31 and February 1, 2006
Sample Receipt Date:	August 22, 2007
Preparation Dates:	August 28, 2007
Analysis Date:	September 5 and 6, 2007

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY3GC2 and MY3GC3
Field Duplicates (D2):	MY3GD2 and MY3GD3

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank- Solid (PBS) and samples listed above
Matrix Spike:	MY3GC7S
Duplicates:	MY3GC7D
ICP Serial Dilution:	MY3GC7L

Analysis: Total Arsenic, Copper, and Lead by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	August 28, 2007	September 5 and 6, 2007
Percent Solids	Not Prepared	Not Analyzed

CLP PO Action

None.

Sampling Issues

1. Temperature blanks were not present in the shipment of samples received on August 22, 2007 for Case number 36715. The lab was instructed to note the issue and the method used to determine temperature in the SDG narrative, and proceed with the analysis. No adverse effect on data quality is expected.

Additional Comments

The samples in this SDG were analyzed for total arsenic, copper, and lead by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1470.0.

The above MAR instructed the laboratory to dilute all samples prior to analysis. Samples MY3GB6 through MY3GB8 and MY3GC0 through MY3GD3 were analyzed at a three-fold dilution for arsenic, copper, and lead. No adverse effect on data quality is expected.

The laboratory was given permission by the Region to store the samples of this SDG in an unrefrigerated, dry secure area instead of a refrigerated storage area. The effect on data quality is not known.

The laboratory was instructed by the Region that total solids analysis was not required if the samples are dry. No adverse effect on data quality is expected.

The holding time for the soil samples in this SDG was approximately nineteen months. Holding time limits for soil samples have not been established and the effect on data quality is not known.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: *1470.0,* August 15, 2007;
- *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.4, December 2006; and
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)	NA	
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	No	B
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	C
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

B. The following results are estimated and flagged "J" in Table 1A because an ICP serial dilution result is outside method QC limits.

- Arsenic in all samples

The percent difference for the ICP serial dilution analysis of sample MY3GC7L did not meet the 10% criterion for the analyte shown below.

Analyte	% Difference
Arsenic	-12

Results reported for arsenic in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The result for the diluted sample was lower than the original. Therefore, the reported sample results may be biased high.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

C. A relative percent difference (RPD) of 60 was obtained for lead in the analysis of field duplicate pair samples MY3GC2 and MY3GC3. An RPD of 44 was obtained for arsenic in the analysis of field duplicate pair samples MY3GD2 and MY3GD3. Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a 35 RPD criterion for precision. The effect on data quality is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, sample non-homogeneity, or poor sampling or laboratory technique.

ANALYTICAL RESULTS
Table 1A

Case No. : 36715 SDG No. : MY3GB6
Site : ASARCO
Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
Reviewer : Dennis Mayugba, ESAT/LDC
Date : November 8, 2007

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples for Select CLP Total Metals by ICP-AES

Station Location :	HSS-J-1-101-07-111			HSS-E-0-101-07-111			HSS-F-0-101-07-111			HSS-G-0-101-07-111			HSS-H-0-101-07-111			HSS-I-0-101-07-111		
Sample ID :	MY3GB6			MY3GB7			MY3GB8			MY3GB9			MY3GC0			MY3GC1		
Collection Date :	2/1/2006			2/1/2006			2/1/2006			2/1/2006			2/1/2006			2/1/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	6.9	J	B	15.2	J	B	4.9	J	B	3.0	J	B	11.0	J	B	9.7	J	B
COPPER	3320			6020			2820			1220			2200			5580		
LEAD	130			150			30.1			29.2			55.9			71.4		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	HSS-A-0-101-07-129			HSS-X-0-101-07-129			HSS-J-1-101-07-129			HSS-B-0-101-07-129			HSS-C-0-101-07-129			HSS-E-0-101-07-129		
Sample ID :	MY3GC2 D1			MY3GC3 D1			MY3GC4			MY3GC5			MY3GC6			MY3GC7		
Collection Date :	2/1/2006			2/1/2006			2/1/2006			2/1/2006			2/1/2006			2/1/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	16.8	J	B	17.7	J	B	5.1	J	B	33.7	J	B	28.4	J	B	24.3	J	B
COPPER	5220			5980			1150			9620			6060			4310		
LEAD	320		C	172		C	94.2			348			347			121		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	HSS-F-0-101-07-129			HSS-G-0-101-07-129			HSS-H-0-101-07-129			HSS-I-0-101-07-129			HSS-A-0-101-07-142A			HSS-X-0-101-07-142A		
Sample ID :	MY3GC8			MY3GC9			MY3GD0			MY3GD1			MY3GD2 D2			MY3GD3 D2		
Collection Date :	2/1/2006			2/1/2006			2/1/2006			2/1/2006			1/31/2006			1/31/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	18.8	J	B	19.1	J	B	5.1	J	B	24.0	J	B	7.5	J	BC	11.7	J	BC
COPPER	6520			3120			3350			4830			1460			1960		
LEAD	187			242			71.9			139			108			136		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	HSS-B-0-101-07-142A			HSS-C-0-101-07-142A			MDL			CRQL								
Sample ID :	MY3GD4			MY3GD5														
Collection Date :	1/31/2006			1/31/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	0.51L	J	AB	0.98L	J	AB	3.5			1.0								
COPPER	307			408			1.1			2.5								
LEAD	23.5			17.1			3.8			1.0								
Percent Solids	100.0%			100.0%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM) RF
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager SK FOR DL
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105091 Amendment 1

DATE: November 9, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	Not provided
Case No.:	36715
SDG No.:	MY3H63
Laboratory:	Bonner Analytical Testing Co. (BONNER)
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 10, 21, and 22, 2006
Reviewer:	Dennis Mayugba, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Attachment

00105091-8576/36715/MY3H63RPT.doc

Data Validation Report

Case No.: 36715
SDG No.: MY3H63
Site: Asarco Hayden
Laboratory: Bonner Analytical Testing Co. (BONNER)
Reviewer: Dennis Mayugba, ESAT/LDC
Date: November 9, 2007

I. CASE SUMMARY

Sample Information

Samples:	MY3H63 through MY3H69, MY3H70, MY3H71, MY3H72, MY3H74 through MY3H79, and MY3H80 through MY3H83
Concentration and Matrix:	Low Concentration Soil
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
SOW:	ILM05.4 and Modification Reference Number 1470.0
Collection Date:	February 10, 21, and 22, 2006
Sample Receipt Date:	August 25, 2007
Preparation Dates:	August 31, 2007
Analysis Date:	September 13, 2007

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY3H69 and MY3H70
Field Duplicates (D2):	MY3H79 and MY3H80

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank- Solid (PBS) and samples listed above
Matrix Spike:	MY3H74S
Duplicates:	MY3H74D
ICP Serial Dilution:	MY3H74L

Analysis: Total Arsenic, Copper, and Lead by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	August 31, 2007	September 13, 2007
Percent Solids	Not Prepared	Not Analyzed

CLP PO Action

None.

Sampling Issues

1. Temperature blanks were not present in the shipment of samples received on August 25, 2007 for Case number 36715, SDG MY3H63. The lab was instructed to note the issue and the method used to determine temperature in the SDG narrative, and proceed with the analysis. No adverse effect on data quality is expected.

Additional Comments

- The samples in this SDG were analyzed for total arsenic, copper, and lead by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1470.0.

  The above MAR instructed the laboratory to dilute all samples prior to analysis. Samples were analyzed for arsenic, copper, and lead at the following dilutions:
  3-fold: MY3H68, MY3H74, MY3H75, MY3H78, MY3H82, and MY3H83;
  6-fold: MY3H65, MY3H79, MY3H80, and MY3H81;
  8-fold: MY3H64;
  10-fold: MY3H72;
  12-fold: MY3H76:
  15-fold: MY3H66, MY3H67, and MY3H71;
  20-fold: MY3H69 and MY3H70;
  30-fold: MY3H63 and MY3H77. No adverse effect on data quality is expected.

  The laboratory was given permission by the Region to store the samples of this SDG in an unrefrigerated, dry secure area instead of a refrigerated storage area. The effect on data quality is not known.

  The laboratory was instructed by the Region that total solids analysis was not required if the samples are dry. No adverse effect on data quality is expected.

  The holding time for the soil samples in this SDG was approximately nineteen months. Holding time limits for soil samples have not been established and the effect on data quality is not known.

  All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) have been met.

  Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

  This report was prepared in accordance with the following documents:

  - Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
  - *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: *1470.0,* August 15, 2007;
  - *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.4, December 2006; and

- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	Yes	
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	Yes	
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

ANALYTICAL RESULTS
Table 1A

Case No. : 36715 SDG No. : MY3H63
Site : ASARCO
Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
Reviewer : Dennis Mayugba, ESAT/LDC
Date : November 9, 2007

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples for Select CLP Total Metals by ICP-AES

Station Location :	KS-11-SED-0			KS-12-SED-0			KS-13-SED-0			KS-14-SED-0			KS-15-SED-0			PCON-01-SED-1		
Sample ID :	MY3H63			MY3H64			MY3H65			MY3H66			MY3H67			MY3H68		
Collection Date :	2/21/2006			2/21/2006			2/21/2006			2/10/2006			2/21/2006			2/21/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	106			54.2			38.5			90.7			70.2			30.1		
COPPER	66800			31400			9420			48600			19800			7170		
LEAD	172			242			179			450			254			67.7		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	PCON-02-SED-1			PCON-X1-SED-1			PCON-03-SED-1			PCON-04-SED-1			PCON-08-SED-0			PCON-09-SED-0		
Sample ID :	MY3H69 D1			MY3H70 D1			MY3H71			MY3H72			MY3H74			MY3H75		
Collection Date :	2/21/2006			2/21/2006			2/21/2006			2/21/2006			2/22/2006			2/22/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	19.2L	J	A	24.6			65.4			43.5			5.3			8.5		
COPPER	40100			41100			19100			20700			3540			3300		
LEAD	48.5			50.2			259			117			18.8			37.5		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	PC0N-10-SED-0			PC0N-12-SED-0			PC0N-13-SED-0			PC0N-15-SED-0			PC0N-X2-SED-0			PC0N-16-SED-0		
Sample ID :	MY3H76			MY3H77			MY3H78			MY3H79 D2			MY3H80 D2			MY3H81		
Collection Date :	2/22/2006			2/22/2006			2/22/2006			2/22/2006			2/22/2006			2/22/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	34.8			68.1			27.8			18.7			21.2			13.4		
COPPER	24900			69300			5740			10900			11200			9510		
LEAD	72.6			163			84.3			62.2			51.6			47.4		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	PC0N-17-SED-0			PC0N-18-SED-0			MDL			CRQL								
Sample ID :	MY3H82			MY3H83														
Collection Date :	2/22/2006			2/22/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	12.9			10.5			0.31			1.0								
COPPER	7530			2440			0.071			2.5								
LEAD	21.3			38.9			0.26			1.0								
Percent Solids	100.0%			100.0%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM) RF
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105091 Amendment 1

DATE: November 13, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	Not provided
Case No.:	36715
SDG No.:	MY3HC7
Laboratory:	Bonner Analytical Testing Co. (BONNER)
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 20, 21, and 22, 2006
Reviewer:	Dennis Mayugba, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [ ] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Attachment

00105091-8577/36715/MY3HC7RPT.doc

Data Validation Report

Case No.: 36715
SDG No.: MY3HC7
Site: Asarco Hayden
Laboratory: Bonner Analytical Testing Co. (BONNER)
Reviewer: Dennis Mayugba, ESAT/LDC
Date: November 13, 2007

I. CASE SUMMARY

Sample Information

Samples:	MY3HC7, MY3HC9, MY3HD0 through MY3HD9, MY3HE0 through MY3HE7
Concentration and Matrix:	Low Concentration Soil
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
SOW:	ILM05.4 and Modification Reference Number 1470.0
Collection Date:	February 20, 21, and 22, 2006
Sample Receipt Date:	August 25, 2007
Preparation Dates:	August 28, 2007
Analysis Date:	September 14 and 15, 2007

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY3HD0 and MY3HD1
Field Duplicates (D2):	MY3HD9 and MY3HE0

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank- Solid (PBS) and samples listed above
Matrix Spike:	MY3HD5S
Duplicates:	MY3HD5D
ICP Serial Dilution:	MY3HD5L

Analysis: Total Arsenic, Copper, and Lead by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	August 28, 2007	September 14 and 15, 2007
Percent Solids	Not Prepared	Not Analyzed

CLP PO Action

None.

Sampling Issues

1. Temperature blanks were not present in the shipment of samples received on August 25, 2007 for Case number 36715, SDG MY3HC7. The lab was instructed to note the issue and the method used to determine temperature in the SDG narrative, and proceed with the analysis. No adverse effect on data quality is expected.

Additional Comments

The samples in this SDG were analyzed for total arsenic, copper, and lead by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1470.0.

The above MAR instructed the laboratory to dilute samples prior to analysis. Samples were analyzed for arsenic, copper, and lead at the following dilutions:
2-fold: MY3HD2 through MY3HD5, MY3HD7, MY3HD8, MY3HE0, MY3HE1, MY3HE5, MY3HE6, and MY3HE7;
3-fold: MY3HD0, MY3HD1, MY3HD6, MY3HE3, and MY3HE4;
4-fold: MY3HC7 and MY3HC9. No adverse effect on data quality is expected.

The laboratory was given permission by the Region to store the samples of this SDG in an unrefrigerated, dry secure area instead of a refrigerated storage area. The effect on data quality is not known.

The laboratory was instructed by the Region that total solids analysis was not required if the samples are dry. No adverse effect on data quality is expected.

The holding time for the soil samples in this SDG was approximately nineteen months. Holding time limits for soil samples have not been established and the effect on data quality is not known.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: *1470.0,* August 15, 2007;
- *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.4, December 2006; and
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	Yes	
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	Yes	
12.	Sample Quantitation	Yes	
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. OVERALL ASSESSMENT OF DATA

All of the method requirements specified in the USEPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) have been met. Reported results for total arsenic, copper, and lead in all of the samples were appropriate and correctly calculated.

ANALYTICAL RESULTS
Table 1A

Case No. : 36715 SDG No. : MY3HC7
Site : ASARCO
Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
Reviewer : Dennis Mayugba, ESAT/LDC
Date : November 13, 2007

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples for Select CLP Total Metals by ICP-AES

Station Location :	UPA-08-SED-0			UPA-09-SED-0			WSC-01-SED-0			WSC-X1-SED-0			WSC-02-SED-0			WSC-03-SED-0		
Sample ID :	MY3HC7			MY3HC9			MY3HD0 D1			MY3HD1 D1			MY3HD2			MY3HD3		
Collection Date :	2/22/2006			2/22/2006			2/20/2006			2/20/2006			2/20/2006			2/20/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	11.1			6.4			14.9			13.4			3.4			4.7		
COPPER	5160			7250			1170			1080			727			730		
LEAD	17.7			12.0			35.1			35.5			19.3			29.8		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	WSC-04-SED-0			WSC-05-SED-0			WSC-06-SED-0			WSC-07-SED-0			WSC-09-SED-0			WSC-10-SED-0		
Sample ID :	MY3HD4			MY3HD5			MY3HD6			MY3HD7			MY3HD8			MY3HD9 D2		
Collection Date :	2/20/2006			2/20/2006			2/20/2006			2/20/2006			2/21/2006			2/21/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	4.5			6.8			7.4			5.8			3.0			2.5		
COPPER	392			876			1210			216			77.8			58.2		
LEAD	16.0			20.6			42.5			25.2			9.0			8.0		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	WSC-X2-SED-0			WSC-11-SED-0			WSC-12-SED-0			WSC-13-SED-0			WSC-14-SED-0			WSC-15-SED-0		
Sample ID :	MY3HE0 D2			MY3HE1			MY3HE2			MY3HE3			MY3HE4			MY3HE5		
Collection Date :	2/21/2006			2/21/2006			2/21/2006			2/21/2006			2/21/2006			2/21/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	3.6			3.5			2.3			4.1			4.5			3.1		
COPPER	62.3			58.0			306			311			198			62.1		
LEAD	8.2			7.3			20.3			22.1			13.6			6.5		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	WSC-16-SED-0			WSC-17-SED-0			MDL			CRQL								
Sample ID :	MY3HE6			MY3HE7														
Collection Date :	2/21/2006			2/21/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	2.8			3.2			0.31			1.0								
COPPER	20.0			60.5			0.071			2.5								
LEAD	3.4			6.4			0.26			1.0								
Percent Solids	100.0%			100.0%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM) RF
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105091 Amendment 1

DATE: November 9, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	36715
SDG No.:	MY3HR3
Laboratory:	Bonner Analytical Testing Co. (BONNER)
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 13, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 36715
SDG No.: MY3HR3
Site: Asarco Hayden
Laboratory: Bonner Analytical Testing Co. (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: November 9, 2007

I. CASE SUMMARY

Sample Information

Samples:	MY3HR3 through MY3HR9, MY3HS0 through MY3HS9, and MY3HT0 through MY3HT2
Concentration and Matrix:	Low Concentration Soil
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
SOW:	ILM05.4 and Modification Reference Number 1470.0
Collection Date:	February 13, 2006
Sample Receipt Date:	August 30, 2007
Preparation Date:	September 17, 2007
Analysis Date:	September 21, 2007

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY3HR8 and MY3HR9
Field Duplicates (D2):	MY3HS8 and MY3HS9

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank- Solid (PBS) and samples listed above
Matrix Spike:	MY3HS3S
Duplicates:	MY3HS3D
ICP Serial Dilution:	MY3HS3L

Analysis: Total Arsenic, Copper, and Lead by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	September 17, 2007	September 21, 2007
Percent Solids	Not Prepared	Not Analyzed

CLP PO Action

None.

Sampling Issues

Temperature indicator bottles were not present in the sample coolers. The sample temperature was determined by the laboratory to be 4°C. No adverse effect on data quality is expected.

Additional Comments

The samples in this SDG were analyzed for total arsenic, copper, and lead by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1470.0.

The laboratory was given permission by the Region to store the samples of this SDG in an unrefrigerated, dry secure area instead of a refrigerated storage area. The effect on data quality is not known.

The laboratory was instructed by the Region that total solids analysis was not required if the samples are dry. No adverse effect on data quality is expected.

The holding time for the soil samples in this SDG was approximately nineteen months. Holding time limits for soil samples have not been established and the effect on data quality is not known.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: *1470.0,* August 15, 2007;
- *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.4, December 2006; and
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	Yes	
10.	Field Duplicate Sample Analysis	Yes	
11.	Sample Quantitation	Yes	
12.	Overall Assessment	Yes	

N/A = Not Applicable

III. OVERALL ASSESSMENT OF DATA

All of the method requirements specified in the USEPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) have been met. Reported results for total arsenic, copper, and lead in all of the samples were appropriate and correctly calculated.

ANALYTICAL RESULTS
Table 1A

Case No. : 36715 SDG No. : MY3HR3
Site : ASARCO
Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
Reviewer : Stan Kott, ESAT/LDC
Date : November 9, 2007

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples for Select CLP Total Metals by ICP-AES

Station Location :	WSS-D-0-101-12-073			WSS-E-0-101-12-073			WSS-G-0-101-12-073			WSS-H-0-101-12-073			WSS-I-0-101-12-073			WSS-A-0-101-12-075		
Sample ID :	MY3HR3			MY3HR4			MY3HR5			MY3HR6			MY3HR7			MY3HR8 D1		
Collection Date :	2/13/2006			2/13/2006			2/13/2006			2/13/2006			2/13/2006			2/13/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	1.4			3.0			5.1			5.2			3.0			2.8		
COPPER	191			353			507			677			313			461		
LEAD	39.8			87.7			101			134			58.1			63.2		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	WSS-X-0-101-12-075			WSS-B-1-101-12-075			WSS-B-0-101-12-075			WSS-C-0-101-12-075			WSS-D-0-101-12-075			WSS-E-0-101-12-075		
Sample ID :	MY3HR9 D1			MY3HS0			MY3HS1			MY3HS2			MY3HS3			MY3HS4		
Collection Date :	2/13/2006			2/13/2006			2/13/2006			2/13/2006			2/13/2006			2/13/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	3.2			1.6			5.6			1.1			3.0			1.8		
COPPER	444			170			796			181			313			547		
LEAD	59.2			98.1			211			17.5			72.7			36.6		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	WSS-F-0-101-12-075			WSS-G-0-101-12-075			WSS-I-0-101-12-075			WSS-A-0-101-12-093			WSS-X-0-101-12-093			WSS-C-0-101-12-093		
Sample ID :	MY3HS5			MY3HS6			MY3HS7			MY3HS8 D2			MY3HS9 D2			MY3HT0		
Collection Date :	2/13/2006			2/13/2006			2/13/2006			2/13/2006			2/13/2006			2/13/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	5.4			3.3			1.9			3.0			3.3			4.3		
COPPER	758			541			248			665			635			837		
LEAD	146			54.9			47.2			92.1			79.9			73.1		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	WSS-D-0-101-12-093			WSS-E-0-101-12-093			MDL			CRQL								
Sample ID :	MY3HT1			MY3HT2														
Collection Date :	2/13/2006			2/13/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	4.2			3.1			0.47			1.0								
COPPER	393			511			0.17			2.5								
LEAD	50.6			66.6			0.46			1.0								
Percent Solids	100.0%			100.0%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ICF International / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
Private Site/DOE Section, SFD-8-2

THROUGH: Rose Fong, ESAT Task Order Manager (TOM) RF
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager SK FOR DL
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105091 Amendment 1

DATE: November 9, 2007

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	None Provided
Case No.:	36715
SDG No.:	MY3J55
Laboratory:	Bonner Analytical Testing Co. (BONNER)
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
Samples:	20 Soil Samples (see Case Summary)
Collection Date:	February 13, 15, and 24, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] FYI [ ] Action

SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 36715
SDG No.: MY3J55
Site: Asarco Hayden
Laboratory: Bonner Analytical Testing Co. (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: November 9, 2007

I. CASE SUMMARY

Sample Information

Samples:	MY3J55 through MY3J59, MY3J60 through MY3J69, and MY3J70 through MY3J74
Concentration and Matrix:	Low Concentration Soil
Analysis:	Total Arsenic, Copper, and Lead by ICP-AES
SOW:	ILM05.4 and Modification Reference Number 1470.0
Collection Date:	February 13, 15, and 24, 2006
Sample Receipt Date:	August 31, 2007
Preparation Date:	September 19, 2007
Analysis Date:	September 21 and 22, 2007

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Not Provided
Background Samples (BG):	Not Provided
Field Duplicates (D1):	MY3J62 and MY3J63
Field Duplicates (D2):	MY3J72 and MY3J73

Laboratory QC

Method Blanks & Associated Samples:	Preparation Blank- Solid (PBS) and samples listed above
Matrix Spike:	MY3J60S
Duplicates:	MY3J60D
ICP Serial Dilution:	MY3J60L

Analysis: Total Arsenic, Copper, and Lead by ICP-AES

Analyte	Sample Preparation and Digestion Date	Analysis Date
ICP-AES Metals	September 19, 2007	September 21 and 22, 2007
Percent Solids	Not Prepared	Not Analyzed

CLP PO Action

None.

Sampling Issues

Temperature indicator bottles were not present in the sample coolers. The sample temperature was determined by the laboratory to be 1°C. No adverse effect on data quality is expected.

Additional Comments

The samples in this SDG were analyzed for total arsenic, copper, and lead by ICP-AES under Modified Analysis Request (MAR), Modification Reference Number 1470.0.

The laboratory was given permission by the Region to store the samples of this SDG in an unrefrigerated, dry secure area instead of a refrigerated storage area. The effect on data quality is not known.

The laboratory was instructed by the Region that total solids analysis was not required if the samples are dry. No adverse effect on data quality is expected.

The holding time for the soil samples in this SDG was approximately nineteen months. Holding time limits for soil samples have not been established and the effect on data quality is not known.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW) have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- *Request for Quote for Modified Analysis* (SOW flexibility clause), Modification Reference Number: *1470.0,* August 15, 2007;
- *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration* ILM05.4, December 2006; and
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	Yes	
10.	Field Duplicate Sample Analysis	Yes	
11.	Sample Quantitation	Yes	A
12.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

ANALYTICAL RESULTS
Table 1A

Case No. : 36715 SDG No. : MY3J55
Site : ASARCO
Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
Reviewer : Stan Kott, ESAT/LDC
Date : November 9, 2007

QUALIFIED DATA
Concentration in mg/Kg (Dry Weight)

Analysis Type : Low Concentration Soil Samples for Select CLP Total Metals by ICP-AES

Station Location :	WSS-D-0-101-12-150			WSS-E-0-101-12-150			WSS-F-0-101-12-150			WSS-H-0-101-12-150			WSS-I-0-101-12-150			WSS-K-101-12-150		
Sample ID :	MY3J55			MY3J56			MY3J57			MY3J58			MY3J59			MY3J60		
Collection Date :	2/14/2006			2/14/2006			2/14/2006			2/14/2006			2/14/2006			2/24/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	30.2			52.0			3.2			4.7			6.2			22.4		
COPPER	5710			6790			703			5680			1550			3230		
LEAD	673			517			98.7			59.5			110			112		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	WSS-L-0-101-12-150			WSS-A-0-101-12-154A			WSS-X-0-101-12-154A			WSS-C-1-101-12-154A			WSS-C-0-101-12-154A			WSS-D-0-101-12-154A		
Sample ID :	MY3J61			MY3J62 D1			MY3J63 D1			MY3J64			MY3J65			MY3J66		
Collection Date :	2/24/2006			2/15/2006			2/15/2006			2/15/2006			2/15/2006			2/15/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	55.9			4.6			5.6			0.61J	J	A	3.6			3.1		
COPPER	4720			918			1030			39.4			487			293		
LEAD	1160			154			167			11.0			90.7			62.9		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	WSS-E-0-101-12-154A			WSS-F-0-101-12-154A			WSS-G-0-101-12-154A			WSS-H-0-101-12-154A			WSS-I-0-101-12-154A			WSS-A-0-101-12-155		
Sample ID :	MY3J67			MY3J68			MY3J69			MY3J70			MY3J71			MY3J72 D2		
Collection Date :	2/15/2006			2/15/2006			2/15/2006			2/15/2006			2/15/2006			2/15/2006		
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	2.9			4.0			6.3			2.7			2.8			6.5		
COPPER	307			361			1070			484			482			746		
LEAD	83.7			78.9			107			102			100			1250		
Percent Solids	100.0%			100.0%			100.0%			100.0%			100.0%			100.0%		

Station Location :	WSS-X-0-101-12-155			WSS-B-0-101-12-155			MDL			CRQL								
Sample ID :	MY3J73 D2			MY3J74														
Collection Date :	2/15/2006			2/15/2006														
PARAMETER	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**	**Result**	**Val**	**Com**
ARSENIC	7.1			1.3			0.31			1.0								
COPPER	899			264			0.071			2.5								
LEAD	1510			96.3			0.26			1.0								
Percent Solids	100.0%			100.0%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.
Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.
MDL - Method Detection Limit
N/A - Not Applicable NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs
FB - Field Blank, EB - Equipment Blank,
TB - Trip Blank, BG - Background Sample
CRQL - Contract Required Quantitation Limit

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ICF Consulting / Laboratory Data Consultants
Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: John Hillenbrand, Remedial Project Manager
CWA Compliance Office, WTR-7

THROUGH: Rose Fong, ESAT Task Order Project Officer (TOPO)
Quality Assurance (QA) Program, PMD-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: 68-W-01-028
Technical Direction Form No.: 00905091 Amendment 1

DATE: May 25, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Asarco Hayden
Site Account No.:	09 JS LA00
CERCLIS ID No.:	NA
Case No.:	35104
SDG No.:	Y2ES5
Laboratory:	A4 Scientific, Inc. (A4)
Analysis:	Volatiles
Samples:	7 Water Samples (see Case Summary)
Collection Date:	March 2, 3, and 6, 2006
Reviewer:	Calvin Tanaka, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

Table 1A is not provided with this report. Please contact Rose Fong (QA Program/EPA) at (415) 972-3812 if Table 1A is needed.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Ray Flores, CLP PO USEPA Region 6
Steve Remaley, CLP PO USEPA Region 9

CLP PO: [X] Attention [X] Action
SAMPLING ISSUES: [X] Yes [ ] No

Data Validation Report

Case No.: 35104
SDG No.: Y2ES5
Site: Asarco Hayden
Laboratory: A4 Scientific, Inc.
Reviewer: Calvin Tanaka, ESAT/LDC
Date: May 25, 2006

I. CASE SUMMARY

Sample Information

Samples:	Y2ER9, Y2ES1, Y2ES3, Y2ES5, Y2ET2, Y2ET3, and Y2ET4
Concentration and Matrix:	Trace Concentration Water
Analysis:	Volatiles
SOW:	SOM01.1
Collection Date:	March 2, 3, and 6, 2006
Sample Receipt Date:	March 8, and 9, 2006
Extraction Date:	Not Applicable
Analysis Date:	March 13, 15, and 16, 2006

Field QC

Field Blanks (FB):	Not Provided
Equipment Blanks (EB):	Y2ET4
Background Samples (BG):	Not Provided
Field Duplicates (D1):	Not Provided

Laboratory QC

Method Blanks & Associated Samples:

VBLK17:	Y2ET4
VBLK23:	Y2ER9, Y2ES1, Y2ES3, Y2ES5, and Y2ET2
VBLK25:	Y2ET3, Y2ET3MS, Y2ET3MSD, storage blank VHBLK01

Tables

1B: Data Qualifier Definitions for Organic Data Review
2: Calibration Summary

CLP PO Action

1. Nondetected results for 1,4-dioxane are qualified as rejected (R) due to very low response factors (<0.01) in the initial and continuing calibrations (see Comment A).

2. Nondetected result for vinyl chloride in sample Y2ET2 is qualified as rejected (R) due to a very low deuterated monitoring compound (DMC) recovery (see Comment B).

CLP PO Attention

1. Detected results for acetone, methylene chloride, and chloroform are qualified as nondetected and estimated (U,J) due to method blank and equipment blank contamination (see Comment D).

2. Results for some analytes are qualified as estimated (J) due to calibration problems (see Comment E).

3. Results for some analytes are qualified as estimated (J) due to deuterated monitoring compound (DMC) recovery problems (see Comment F).

4. Results for some analytes in samples Y2ER9, Y2ES1, Y2ES3, Y2ES5, and Y2ET2 are qualified as estimated (J) due to internal standard (IS) area problems (see Comment G).

Sampling Issues

1. Detected results for acetone and chloroform are qualified as nondetected and estimated (U,J) due to equipment blank contamination (see Comment D).

2. For sample Y2ET3, two vials were broken when received by the laboratory.

3. Sampler signature is missing on the traffic report & chain of custody records (attached, p. 6 and 7 in data package).

Additional Comments

Other than laboratory and field artifacts (approximate retention times of 3.6, 4.5, 8.2, 12.5, 14.2, and 14.4 minutes), tentatively identified compounds (TICs) were found in the samples Y3ER9, Y2ET2, and Y2ET3 (see attached Form 1Js).

This report was prepared in accordance with the following documents:

X ESAT Region 9 Standard Operating Procedure 901, *Guidelines for Data Review of Contract Laboratory Program Analytical Services Volatile and Semivolatile Data Packages*;

X *USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration,* SOM01.1, May 2005; and

X *USEPA Contract Laboratory Program National Functional Guidelines for Guidelines for Suprtfund Organic Methods Data Review*, January 2005.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	Parameter	Acceptable	Comment
1.	Holding Time/Preservation	Yes	
2.	GC/MS Tune/GC Performance	Yes	
3.	Initial Calibration	No	A
4.	Continuing Calibration	No	A, E
5.	Laboratory Blanks	No	D
6.	Field Blanks	No	D
7.	Deuterated Monitoring Compounds	No	B, F
8.	Matrix Spike/Matrix Spike Duplicates	Yes	
9.	Laboratory Control Samples/Duplicates	N/A	
10.	Internal Standards	No	G
11.	Compound Identification	Yes	
12.	Compound Quantitation	Yes	C
13.	System Performance	Yes	
14.	Field Duplicate Sample Analysis	N/A	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. Nondetected results for the following analyte should be qualified as rejected due to very low relative response factors (RRFs) in the initial and continuing calibrations and should be flagged "R".

X 1,4-Dioxane in all samples, all method blanks, and storage blank VHBLK01.

Relative response factors (RRFs) below 0.01 were reported for the analyte listed above in the initial and continuing calibrations (see Table 2). These values are well below the 0.05 validation criterion. Since results are nondetected, false negatives may exist.

The DMC 1,4-dioxane-d8 also had RRFs below the 0.01 validation criterion in the initial calibration and continuing calibrations (see Table 2).

The RRF evaluates instrument sensitivity and is used in the quantitation of target analytes.

B. The nondetected result for the following analyte should be qualified as rejected due to a very low DMC recovery (<20%) and should be flagged AR@.

{Vinyl Chloride-d3}
X Vinyl chloride in sample Y2ET2

A recovery of 3% was reported for the DMC vinyl chloride-d3 in sample Y2ET2, which is well below the QC limit of 65-131%. Since the result is nondetected, false negative may exist. The sample was not reanalyzed.

Surrogates (e.g., deuterated monitoring compounds (DMCs)) are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. All samples are spiked with DMCs prior to purging. DMCs provide information about both the laboratory performance on individual samples and the possible effects of the sample matrix on the analytical results.

C. The following results should be denoted with an AL@ qualifier, qualified as estimated, and flagged AJ@.

X All detected results below the contract required quantitation limits

Results below the contract required quantitation limits (CRQLs) are considered to be qualitatively acceptable, but quantitatively unreliable, due to the uncertainty in analytical precision near the limit of detection.

D. The following results should be qualified as nondetected and estimated due to method blank and equipment blank contamination and should be flagged AU,J@.

X Methylene chloride in all samples and storage blank VHBLK01

X Acetone in sample Y2ET2

X Chloroform in samples Y2ET2 and Y2ET3

Methylene chloride was found in all method blanks and acetone and chloroform were found in equipment blank Y2ET4. Results for the samples listed above are considered nondetected and estimated (U,J) and quantitation limits have been raised according to blank qualification rules presented below.

No positive results are reported unless the concentration of the compound in the sample exceeds 10 times the amount in any associated blank for common laboratory contaminants or 5 times the amount for other compounds. If the sample result is greater than the CRQL, the quantitation limit is raised to the sample result and reported as nondetected. If the sample result is less than the CRQL, the result is reported as nondetected at the CRQL.

A laboratory method blank is laboratory reagent water or baked sand analyzed with all reagents, deuterated monitoring compounds, and internal standards and carried through the same sample preparation and analytical procedures as the field samples. The laboratory method blank is used to determine the level of contamination introduced by the laboratory during analysis.

An equipment blank is clean water that has been collected as a sample using decontaminated sampling equipment. The intent of an equipment blank is to monitor for contamination introduced by the sampling activity, although any laboratory introduced contamination will also be present.

E. Results for the following analytes should be qualified as estimated due to large percent differences (%Ds) in continuing calibrations and should be flagged AJ@.

X Carbon tetrachloride and bromoform in samples Y2ET3, Y2ET3MS, and Y2ET3MSD; method blank VBLK25; and storage blank VHBLK01

%Ds exceeded the ∀30.0% validation criterion for the analytes listed above in the 03/15/06 continuing calibration (see Table 2).

The DMC chloroethane-d also had a %D that exceeded the ∀30.0% validation criterion in the 03/15/06 continuing calibration (see Table 2). Quantitation of the analytes associated with this DMC may have been affected by the high %D (see attached Table 9 from the Functional Guidelines).

The continuing calibration checks the instrument performance daily and produces the relative response factors (RRFs) for target analytes that are used for quantitation.

F. Results for the following analytes should be qualified as estimated due to DMC recoveries outside QC limits and should be flagged AJ@.

{Toluene-d8}

X Trichloroethene, toluene, tetrachloroethene, ethylbenzene, o-xylene, m,p-xylenes, styrene, and isopropylbenzene in sample Y2ET2

{trans-1,3-Dichloropropene-d4}

X cis-1,3-dichloropropene, trans-1,3-dichloropropene, and 1,1,2-trichloroethane in sample Y2ET2

{1,4-Dioxane-d8}

X 1,4-Dioxane in samples Y2ET2, method blank VBLK25, and storage blank VHBLK01

{1,1,2,2-Tetrachloroethane-d2}

X 1,1,2,2-tetrachloroethane and 1,2-dibromo-3-chloropropane in sample Y2ET3MS

The DMC recoveries outside QC limits are shown below.

Sample	DMC	% Recovery	QC Limits

Y2ET2	Vinyl chloride-d3	3	65-131
Y2ES1	Chloroethane-d5	137	71-131
Sample	DMC	% Recovery	QC Limits
Y2ET3MS	1,1-Dichloroethene-d2	112	55-104
Y2ET3MSD	1,1-Dichloroethene-d2	106	55-104
Y2ET2	Toluene-d8	30	77-121
Y2ET2	t-1,3-Dichloropropene-d4	65	73-121
Y2ET3	1,4-Dioxane-d8	40	50-150
VBLK25	1,4-Dioxane-d8	48	50-15
VHBLK01	1,4-Dioxane-d8	48	50-150
Y2ET3MS	1,1,2,2,-Tetrachloroethane-d2	72	73-125

Detected results for affected analytes where DMC recoveries fell below QC limits may be biased low; where results are nondetected, false negatives may exist. For DMC recoveries that exceeded QC limits, only detected results for associated analytes are qualified. Recoveries for DMCs chloroethane-d5 and 1,1-dichloroethene-d2 exceeded QC limits but results were not qualified because they were nondetects. The samples were not reanalyzed.

It should be noted that the result for vinyl chloride in sample Y2ET2 was previously qualified as rejected (see Comment B).

G. Results for the following analytes should be qualified as estimated due to low internal standard areas and should be flagged AJ@.

{1,4-Dichlorobenzene-d4}

X Bromoform, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene, and 1,2,3-trichlorobenzene in samples Y2ER9, Y2ES1, Y2ES3, Y2ES5, and Y2ET2

Internal standard areas outside QC limits are shown below.

Sample	Internal Standard	Area	QC Limits
Y2ER9	1,4-Dichlorobenzene-d_4	7472	7571 - 17667
Y2ES1	1,4-Dichlorobenzene-d_4	6732	7571 - 17667
Y2ES3	1,4-Dichlorobenzene-d_4	7190	7571 - 17667
Y2ES5	1,4-Dichlorobenzene-d_4	6698	7571 - 17667
Y2ET2	1,4-Dichlorobenzene-d_4	7136	7571 - 17667

Detected results and quantitation limits for the affected analytes are considered quantitatively questionable. Where results are nondetected, false negatives may exist. The samples were not reanalyzed.

Internal standards, introduced into every calibration standard, blank, sample, and QC sample, monitor changes in analyte response due to matrix effects and fluctuations in instrument sensitivity throughout the analytical sequence. Internal

standards are used to quantitate the concentration of target analytes and surrogate standards.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR ORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared according to the document, "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2005.

U The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method.

L Indicates results which fall below the Contract Required Quantitation Limit. Results are estimated and are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

J The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL).

NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.

Table 2
Calibration Summary

Case No.: 35104
SDG No.: Y2ES5
Site: Asarco Hayden
Laboratory: A4 Scientific, Inc.
Reviewer: Calvin Tanaka, ESAT/LDC
Date: May 25, 2006

RELATIVE RESPONSE FACTORS (RRF)

	RRF	RRF	RRF	RRF
Analysis date:	3/13/06	3/7/06	3/13/06	3/13/06
Analysis time:	11:32-15:19	10:33-12:40	12:34	22:47
GC/MS I.D.:	C-5973	F-5973	C-5973	C-5973
Analyte	Init.	Init.	Cont.	Cont.
1,4-Dioxane	0.010	0.007	0.009	0.008
1,4-Dioxane-d8	0.010	0.006	0.007	0.008

	RRF	RRF	RRF	RRF
Analysis date:	3/15/06	3/15/06	3/15/06	3/16/06
Analysis time:	08:07	15:26	23:44	08:26
GC/MS I.D.:	C-5973	C-5973	C-5973	C-5973
Analyte	Cont.	Cont.	Cont.	Cont.
1,4-Dioxane	0.006	0.007	0.007	0.007
1,4-Dioxane-d8	0.007	0.008	0.007	0.006

PERCENT DIFFERENCES (%D)

	%D
Analysis Date:	3/15/06
Analysis Time:	23:44
GC/MS I.D.:	C-5973
Analyte	Cont.
Carbon tetrachloride	+39.0
Bromoform	+35.0
Chloroethane-d5	+30.5

- = RRF biased low; + = RRF biased high.

ASSOCIATED SAMPLES AND METHOD BLANKS

Initial 3/13/06:	All samples, method blanks, and storage blank VHBLK01
Cont., 3/13/06 (12:34):	Sample Y2ET4, method blank VBLK17
Cont., 3/13/06 (22:47):	Sample Y2ET4, method blank VBLK17
Cont., 3/15/06 (08:07):	Samples Y2ER9, Y2ES1, Y2ES3, Y2ES5, and Y2ET2, method blank VBLK23
Cont., 3/15/06 (15:26):	Samples Y2ER9, Y2ES1, Y2ES3, Y2ES5, and Y2ET2, method blank VBLK23
Cont., 3/15/06 (23:44):	Samples Y2ET3, Y2ET3MS, and Y2ET3MSD, storage blank VHBLK01, method blank VBLK25
Cont., 3/16/06 (08:26):	Samples Y2ET3, Y2ET3MS, and Y2ET3MSD, storage blank VHBLK01, method blank VBLK25