Pacific Gas and Electric Company

Yvonne J. Meeks
Site Remediation - Portfolio Manager
Environmental Affairs

6588 Ontario Road
San Luis Obispo, CA 93405

Mailing Address
4325 South Higuera Street
San Luis Obispo, CA 93401

805.546.5243
Internal: 664-5243
Fax: 805.546.5232
E-mail: YJM1@pge.com

August 29, 2008

Aaron Yue
California Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Kris Doebbler
BLM WO-360D, Building 50
Denver Federal Center
Denver, CO 80225

Subject: Submittal of Final Soil and Sediment Data Usability Assessment Technical Memorandum, PG&E Topock Compressor Station

Dear Mr. Yue and Ms. Doebbler:

Attached is the Final Soil and Sediment Data Usability Assessment Technical Memorandum for the Pacific Gas and Electric Topock Compressor Station. This document was originally submitted on May 30, 2006 and has been modified as directed by letters from the California Department of Toxic Substances Control the United States Department of the Interior, dated June 13, 2008 and May 30, 2008, respectively.

Please contact me at 805/234-2257 with any questions or concerns.

Sincerely,

Yvonne Meeks

Yvonne Meeks
Topock Remediation Project Manager

Cc: Karen Baker/DTSC
Chris Guerre/DTSC

Final Soil and Sediment Data Usability Assessment Technical Memorandum PG&E Topock Compressor Station

DATE: August 29, 2008

This Soil and Sediment Data Usability Assessment (DUA) Technical Memorandum presents the evaluation of existing soil and sediment data used to support the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI)/Comprehensive Environmental Response, Cleanup, and Liability Act (CERCLA) Remedial Investigation (RI) at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station. The purpose of the evaluation is to provide supporting information to the RFI/RI regarding the ability to use the existing soil and sediment data for site evaluation and closure decisions.

This document was originally submitted to the California Department of Toxic Substances Control (DTSC) and the United States Department of the Interior (DOI) on May 30, 2006 (CH2M HILL, 2006a). Comments to the original DUA Technical Memorandum were documented and responded to in a memorandum dated November 7, 2007 (CH2M HILL, 2007a). The DTSC and DOI letters dated June 13, 2008 (DTSC, 2008) and May 30, 2008 (DOI, 2008), respectively, provided direction to revise this document.

The DTSC presented requirements for the preparation of a Data Quality Assessment Technical Memorandum to PG&E in a letter dated March 17, 2006 (DTSC, 2006). The DTSC requested that PG&E prepare a data quality assessment consistent with "the five steps, identified in the Environmental Protection Agency guidance that is typically used by a statistician when analyzing a data set for the first time." However, strict application of the data quality assessment guidance as presented in the DTSC letter and referenced United States Environmental Protection Agency (USEPA) guidance is not practical given the status of the data set. The data quality assessment guidance is based on development of a statistical hypothesis and statistical hypothesis testing. At this time, data quality objectives (DQOs) for the RFI/RI sites that have not been closed have not been completed. Consequently, there is no appropriate basis, such as established cleanup goals (decision criteria), for selecting appropriate statistical tests.

For this data set, the data quality assessment process is best applied as a data usability assessment (DUA), resulting in assignment of usability codes to the analytical results. The DUA is based on generally-accepted data quality indicators rather than site-specific DQOs. For the purposes of the usability assessment, the following generalized data quality categories are proposed:

1. Category 1: Sufficient documentation available to demonstrate that the data meet all probable end use objectives including risk assessment, site characterization, site closure, and informational purposes. The data may be used with confidence for all purposes.

2. Category 2: Incomplete documentation available. The data may be used for site characterization, screening, or informational purposes; however, the quantitative results should not be used for future critical decision-making purposes.

3. Category 3: Insufficient documentation available. The data may be used for screening or informational purposes only (qualitatively); however the quantitative results should not be used for future critical decision-making purposes.

Though categorized separately, there would be additional data considered not to be acceptable for any project purposes due to significant quality and/or applicability deficiencies. These data would be rejected and removed from further consideration in the RFI/RI.

The DUA presented in this memorandum satisfies DTSC's requirement for a data set defined in terms of general usability criteria. This DUA addresses all six items required by DTSC's letter dated March 17, 2006. These requirements are:

1. An assessment of the data following the National Functional Guidelines to the extent possible because of the differences in quality control (QC) documentation between the data sources, including a discussion of precision, accuracy, representativeness, completeness and comparability (PARCC).

2. A discussion of method sensitivity, comparing analytical reporting limits with decision criteria.

3. Segregation of the data into various usability categories, identifying those data that may be used to support risk assessments, those data that may used in site characterization, and those data that may used for screening or information purposes only.

4. A discussion of the data set that will be used to support risk assessments.

5. Identification of data considered unacceptable for supporting risk-based decisions.

6. Decision logic showing how the various data sets can be used.

This DUA evaluates the laboratory quality information associated with the existing soil and sediment data. The results of this DUA will be used to address agency concerns regarding the closure activities at certain Solid Waste Management Units (SWMUs) in the lower yard of the Topock Compressor Station between 1988 and 1993, as well as during planning for additional data collection at SWMUs, Areas of Concern (AOCs), and other undesignated units proposed to be carried forward in the RCRA corrective action process. For those SWMUs, AOCs, and other undesignated areas proposed to be carried forward in the RCRA corrective action process, a comprehensive data-gap evaluation is being performed in conjunction with the development of the RFI/RI DQOs and presented in soil sampling work plans (CH2M HILL, 2006b, 2007b) and other future RFI/RI planning documents.

1.0 Existing Soil and Sediment Data

The *RCRA Facility Investigation/Remedial Investigation Report, PG&E Topock Compressor Station, Needles California* (CH2M HILL, 2005) identified the various SWMUs, AOCs, and other undesignated areas at the Topock Compressor Station, and provided conclusions and

recommendations regarding the SWMUs, AOCs, and other undesignated areas that are closed or proposed for closure, and those that are proposed to be carried forward in the RCRA corrective action process.[1] As presented in the 2005 RFI/RI, soil and sediment data were collected between 1988 and 2003 to support the conclusions and recommendations.[2] Soil and sediment data for the RFI/RI were obtained from the following reports:

- *Bat Cave Wash Soil Investigations, Topock Compressor Station,* Brown and Caldwell, October 1988.
- *Phases 1 and 2 Closure Certification Report, Hazardous Waste Management Facilities, Topock Compressor Station,* Mittelhauser Corporation, June 1990.
- *Closure Activity Report, Oil Water Separator System, Topock Compressor Station,* Mittelhauser Corporation, July 1990.
- *Analytical Data Report, Sediment and Sand Samples, Phase 3, Evaporation Ponds, Closure of Hazardous Waste Facilities,* Mittelhauser Corporation, Revision 1, 1992.
- *Report, Site Investigation, Project 62793, PG&E Compressor Facility,* Environmental Profiles, September 1993.
- *Evaporation Pond Closure Report, Pacific Gas and Electric Company, Topock Gas Compressor Station,* Allwaste Transportation and Disposal for Trident Environmental, December 1993.
- *Soil Investigation Report, Pacific Gas and Electric Company, Topock Gas Compressor Station,* Alisto Engineering Group, August 1994.
- *Scrubber Oil Sump Closure Certification Report, PG&E Topock Gas Compressor Station,* Trident Environmental and Engineering, August 1996.
- *RCRA Facility Investigation Report, Bat Cave Wash Area, Pacific Gas and Electric Company, Topock Compressor Station,* Ecology and Environment (E&E), February 2004.

Table 1-1 presents a summary of the number of samples and sample types associated with the reports listed above. Data collection occurred, and original laboratory analytical reports are available for, soil samples collected in 1988 through 1990, October 1993, June 1994, and 1997 to 2003. These reports represent data from the following laboratories:

- TMA-Arli, Monrovia, California
- Applied Chemistry and Physics (APCL), Chino, California
- E&E, Analytical Services Center
- SCS Analytical Laboratory (Aroclors only)
- Twining Laboratories, Inc.
- Superior Precision Analytical, Inc.
- Enseco-CRL, Inc.
- Truesdail Laboratories, Inc.

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[1] The final identification of the SWMUs, AOCs, and undesignated areas at the Topock Compressor Station is documented in the *Revised Final RCRA Facility Investigation and Remedial Investigation Report, Volume 1, Site Background and History.* (CH2M HILL, 2007c)

[2] Soil and sediment data collected between 1988 and 2003 are also presented in soil sampling work plans for the RFI/RI (CH2M HILL, 2006b, 2007b).

- BC Laboratories

In addition, CRL Environmental, BC Laboratories, and Superior Precision Analytical analyzed split samples. All of the primary laboratories listed above, with the exception of SCS Analytical Laboratory and Twining Laboratories, Inc., were either described as being certified by the State of California Department of Health Services (DOHS), or the DOHS Certificate number was included on the laboratory hardcopy report. The certification status for SCS Analytical Laboratory and Twining Laboratories, Inc. was not documented.

2.0 Approach

The evaluation of the soil and sediment data set is based on Chapter 3 of *Guidance for Quality Assurance Project Plans* (USEPA 2002), which provides the following approach:

- Identify existing data sources: as discussed in the previous portions of this memorandum, the sources of soil and sediment data have been identified.
- Determine data needs: the potential data end-use objectives of the RFI/RI have not been finalized, but may include one or more of the following: risk assessment, nature and extent determination, remedial alternatives evaluation, and site closure.
- Evaluate existing data relative to the project's data quality specifications: the evaluation of the soil and sediment data was undertaken in two steps:
  1) An evaluation of the soil and sediment data in terms of available QC documentation. In addition, the level of data review and/or validation performed was determined.
  2) A review of the available QC results.

Table 2-1 presents a summary of the sampling dates, laboratory performing the analyses, certification status, available quality control analyses and the recommended data usability categories based on the findings of this data evaluation.

The soil and sediment data were evaluated based on the analysis of quality control and quality assurance samples that included the following:

- Blanks
- Spiked blanks or samples
- Laboratory duplicates
- Field duplicates
- Equipment and trip blanks
- Split samples

Following the first step of the evaluation, the available QC results were reviewed in terms of the PARCC parameters and method sensitivity. This second step in the evaluation included review and assessment of the associated QC results in terms of the following quantitative parameters:

- Precision: a measure of the degree of agreement among individual measurements obtained under similar conditions. Precision is a measure of the variability associated with analysis or both sampling and analysis. Analytical precision was estimated based

on the results of laboratory sample duplicates or spiked sample duplicates. Analytical and sampling precision were estimated based on the results of field duplicates, if data were available.

- Accuracy: the degree of agreement between a measured value and the "true" or expected value. Accuracy was estimated in terms of percent recoveries from spiked samples, including laboratory control samples (blank spikes) or matrix spikes. While target analyte recoveries from laboratory control samples provide information on method performance using a pristine matrix, matrix spike samples provide information on method performance in the presence of potential matrix interference.

The quantitative criteria used in this second step of the evaluation are summarized in Table 2-2.

Additional information on accuracy and precision was provided by the analysis of interlaboratory split sample analyses. Split sample results provide valuable information on the reliability of the primary sample results. Good agreement between split samples strongly implies that the reported results are a good approximation to the true result. However, poor agreement does not necessarily indicate a problem with the primary laboratory result. Rather, poor agreement between soil and sediment split samples may be the result of sample non-homogeneity or other inherent variability not specifically related to the analytical or sampling systems.

The data sets as a whole were also evaluated in terms of the following qualitative parameters:

- Representativeness is the degree to which sample data accurately reflect the characteristics of a population of samples. It is achieved through a well-designed sampling program and by using standardized sampling strategies and techniques and analytical procedures.

- Comparability is the confidence with which one data set can be compared to another. It is achieved by maintaining standard techniques and procedures for collecting and analyzing samples and reporting the analytical results in standard units.

The PARCC parameter completeness – the measure of the amount of valid data obtained from the analytical measurement system – is not addressed quantitatively in this evaluation. Rather, completeness for the soil RFI/RI data set for individual SWMUs, AOCs and other undesignated areas is presented in closure reports or will be presented as part of the final soil RFI/RI.

The current requirements for PARCC parameters in the PG&E Topock Program *Quality Assurance Project Plan* [QAPP] (CH2M HILL 2004) and the QAPP Addendum (CH2M HILL 2006) were used as a reference point to evaluate the quantitative QC results for the existing soil and sediment data. While it is recognized that there have been numerous changes and improvements to analytical instrumentation and methods over the time period from 1988 to the present, for the purposes of this evaluation, a performance-based approach was adopted, that is, data are considered acceptable if the associated QC results are in general conformance with the current program. Where significant deficiencies were noted, these data quality issues are discussed.

This technical memorandum includes a discussion of overall sensitivity and a discussion of the evaluation of the data included in each of the investigation reports listed previously to support the quality and usability summary.

3.0 Evaluation of PARCC Parameters

This section provides an overall description of the precision, accuracy, representativeness, and comparability of the data sets. Information pertaining to specific data sets is presented in Attachment A.

3.1 Precision and Accuracy

The majority of the results were associated with at some least some analytical precision and accuracy information. Based on this evaluation, the majority of the specific quality control results met the requirements of the current QAPP Addendum (CH2M HILL 2006).

The notable data quality issues identified included poor matrix spike recoveries for silver and thallium associated with the Phases 1 and 2 Closure Report (Mittelhauser 1990a) and very poor surrogate recoveries associated with Aroclor results (Environmental Profiles 1993). The sample quantitation limits (i.e., non-detects) were rejected for the affected analytes in the samples included in these data sets and will be removed from further consideration in the RFI/RI.

3.2 Representativeness

Based on review of the investigation reports, the soil and sediment samples were collected under appropriate chain-of-custody procedures and were analyzed using methods equivalent to the currently promulgated methods. As evidenced by the lack of precision observed with some of the laboratory duplicates and inter-laboratory split samples, sample heterogeneity and potential matrix interferences may have been present, influencing the representativeness of specific analyte data at some locations.

3.3 Comparability

In general, comparability of the data is supported by the use of certified laboratories and equivalent analytical methodologies. Based on the evaluation of sensitivity in Section 5.0, data were reported with consistent units, and reporting limits were equivalent to those currently required by the QAPP Addendum (CH2M HILL 2006).

4.0 Data Use Categories and Decision Logic

As stated earlier, three data use categories were identified for the RFI/RI soil data set, based on the potential uses of the data. The three categories are defined as:

- Category 1: Sufficient documentation available to demonstrate that the data meet all probable end use objectives including risk assessment, site characterization, site closure, and informational purposes. The data may be used with confidence for all purposes.

- Category 2: Incomplete documentation available. The data may be used for site characterization, screening, or informational purposes; however, the quantitative results should not be used for future critical decision-making purposes.
- Category 3: Insufficient documentation available. The data may be used for screening or informational purposes only (i.e. qualitatively); however the quantitative results should not be used for future critical decision making purposes.

The decision logic for use of the various data follows the data category designations. The logic is as follows:

1. Are the data Category 1 data? If yes, the data may be used for risk assessment, site characterization (extent of contamination), data gaps analysis, site closure, and other site screening and informational purposes.
2. If the data are not Category 1, do they meet the requirements of Category 2? If so, the data can be used for site characterization (extent of contamination), data gaps analysis, and other site screening and informational purposes.
3. If the data are not Category 2, they are considered Category 3. The data in Category 3 can be used only for informational purposes. For example, these data could be used when considering the placement of additional sampling locations at a given site.

5.0 Sensitivity

Tables 5-1 and 5-2 present the reporting limits from the soil and sediment data set compared to the reporting limits presented in the QAPP (CH2M HILL 2004) and the QAPP Addendum (CH2M HILL 2006). Based on this comparison, the majority of the soil and sediment data reporting limits are approximately equivalent to the current program requirements.

In addition, the reporting limits from the soil and sediment data set were compared with human health comparison values (based on residential land use) included in the RFI/RI Report (CH2M HILL 2005). With the exception of the Aroclor and some semivolatile organic compounds (benzo(a)pyrene, dibenz(a,h)anthracene, bis(2-ethylhexyl)phthalate, hexachlorobenzene) reporting limits, all of the reporting limits are below the residential comparison values. Reporting limits were also compared to analyte specific ecological comparison values included in the RFI/RI (CH2M HILL 2005). All of the reporting levels met these comparison values, with the exception of the molybdenum reporting limit from the Evaporation Pond Closure Report (Allwaste Transportation 1993).

Comparisons to current QAPP reporting limits, residential PRGs, and ecological comparison values suggest that the soil and sediment reporting limits are sufficiently sensitive (in the absence of dilutions) to provide usable data.

6.0 Data Set Classification

Based on the data quality evaluation (Attachment A), the nine data sets were assigned into one of the three categories described in Section 4.0.

One data set—the data associated with the 2004 Draft RFI (E&E 2004)—is considered to be Category 1 data. The results from the 2004 Draft RFI are presented in complete summary data packages and contain all relevant accuracy and precision results. Further, the 2004 Draft RFI results have undergone some level of data review and validation resulting in systematically applied data flags. The original flags applied by E&E based on review and validation of the results are retained in the overall RFI/RI database.

The data sets from Mittelhauser (1990a, 1992), are considered to be Category 2 data sets. The data contained in these data sets will be updated with the appropriate data usability category in the RFI/RI database to indicate that some uncertainty is associated with these data. Based on the uncertainty associated with these data, use of these data is limited to future site characterization, screening, or informational purposes only.

The data sets from Brown and Caldwell (1988), Mittelhauser (1990b), Environmental Profiles (1993), Allwaste (1993), Alisto (1994), and Trident (1996) were assigned to Category 3. These results were not accompanied by sufficient QC results to determine the level of uncertainty associated with these data, and use of these data is for future screening or informational purposes only.

7.0 Summary and Evaluation

This DUA addresses the overall data quality and usability of the soil and sediment data collected between 1988 and 2003 to support the RFI/RI at the Topock Compressor Station, taking into account the available quality control information. The results of this evaluation will be used:

- To support the conclusions of the RFI/RI as they relate to identification of SWMUs, AOCs, and other undesignated units previously closed or recommended for closure.
- During planning activities for additional soil and sediment data collection at SWMUs, AOCs, and other undesignated units recommended to be carried forward in the RCRA corrective action process.

With the exception of specific deficiencies discussed in this memorandum, there are no significant negative findings that would prevent use of these data to support the RFI/RI. The majority of the data collected to date are suitable for use in supporting project objectives including risk assessment, site characterization, site closure, and informational purposes. The Category 1 data can be used for all purposes with confidence. The Category 2 data may be used to support future site characterization, screening, and informational purposes.

8.0 References

Alisto Engineering Group. 1994. Soil Investigation Report, Pacific Gas and Electric Company, Topock Gas Compressor Station. August 29.

Allwaste Transportation and Disposal for Trident Environmental. 1993. *Evaporation Pond Closure Report, Pacific Gas and Electric Company, Topock Gas Compressor Station.* December.

Brown and Caldwell. 1988. *Bat Cave Wash Soil Investigations,* Topock Compressor Station. October.

California Department of Toxic Substances Control (DTSC). 2006. Letter to Yvonne Meeks/PG&E. "Requirement for the Preparation of a Data Quality Assessment Technical Memorandum, Pacific Gas and Electric Company Topock Compressor Station." March 17.

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CH2M HILL. 2004. *PG&E Program Quality Assurance Project Plan,* Internal Report. November.

_____. 2005. *RCRA Facility Investigation and Remedial Investigation Report.* February.

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_____. 2006a. *Soil and Sediment Data Usability Assessment Technical Memorandum, PG&E Topock Compressor Station, Needles, California.* May 30.

_____. 2006b. *Draft RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan, Part A, PG&E Topock Compressor Station, Needles, California.* November.

_____. 2007a. *Responses to DTSC/DOI Comments on Soil and Sediment Data Usability Assessment Technical Memorandum, PG&E Topock Compressor Station, Needles, California.* November 7.

_____. 2007b. *Draft RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan, Part B, PG&E Topock Compressor Station, Needles, California.* December.

_____. 2007c. *Revised Final RCRA Facility Investigation and Remedial Investigation Report, Volume 1 - Site Background and History, PG&E Topock Compressor Station, Needles, California.* August.

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Mittelhauser Corporation. 1990a. *Phases 1 and 2 Closure Certification Report Hazardous Waste Management Facilities, Topock Compressor Station, Needles, California.* June.

_____. 1990b. *Closure Activity Report, Oil Water Separator System, Topock Compressor Station, Needles, California.* July.

_____. 1992. *Analytical Data Report, Sediment and Sand Samples, Phase 3, Evaporation Ponds, Closure of Hazardous Waste Facilities, Revision 1.*

Trident Environmental and Engineering. 1996. *Scrubber Oil Sump Closure Certification Report, PG&E Topock Gas Compressor Station.* August.

United States Environmental Protection Agency (USEPA). 2002. *Guidance for Quality Assurance Project Plans* EPA QA/G-5, EPA/240/R-02/009, Final.

United States Department of the Interior (DOI). 2008. Letter to Yvonne Meeks/PG&E. "PG&E Topock Compressor Station Remediation Site - DOI Final Comments on the November 7, 2007 Responses to Agency Comments on Soil and Sediment Data Usability Assessment Technical Memorandum." May 30.

Tables

TABLE 1-1
Summary of Soil and Sediment Samples
Topock Compressor Station

Event Title	SWMU, AOC, Other Undesignated Area	Sampling Dates	Primary Sample	Duplicates/Split samples
Bat Cave Wash Soil Investigations (Brown and Caldwell 1988)	Background Soil, SMWU 1/AOC 1	6/24/1988	10	1
Phases 1 and 2 Closure Certification Report (Mittelhauser 1990a)	SWMUs 5-9, AOC 13	9/1988-3/1990	65	8
Closure Activity Report, Oil Water Separator (Mittelhauser 1990b)	Unit 4.4	6/1994-11/1999	5	0
Analytical Data Report, Sediment and Sand Samples, Phase 3 (Mittelhauser 1992)	Background Soil, SWMU 10	4/1990-12/1991	106	4
Report, Site Investigation, Project 62793 (Environmental Profiles 1993)	AOC 13	7/1/1993	25	0
Soil Investigation Report (Alisto 1994)	AOC 13	6/1/1994	52	0
Evaporation Pond Closure Report (Allwaste 1993)	SWMU 10	9/1993-10/1993	88	5
Scrubber Oil Sump Closure Certification Report (Trident 1996)	AOC 13	5/1996 to 7/1996	16	0
RCRA Facility Investigation Report, Ecology and Environment (E&E 2004)	SWMU 1/AOC 1, SWMU 2/AOC 2, AOC 4, AOC 5, AOC 6, AOC 9, AOC 10, AOC 13, Debris Ravine, Railroad Debris Site, Auxiliary Jacket Water Cooling Pump	6/1997-3/2003	259	12

TABLE 2-1
Summary of Quality Control Associated with Soil and Sediment Samples and Recommended Usability Category

Event Title	Sampling Dates	Primary Laboratory	Primary Laboratory Certification (California)	Split Sample Laboratory	Associated Quality Control							Recommended Usability Category
					Blanks	Laboratory Control Samples	Laboratory Duplicates	Matrix Spikes	Matrix Spike Duplicates	Interlaboratory Split Samples	Formal Data Review/Validation/Flagging	
Bat Cave Wash Soil Investigations, Brown and Caldwell[1]	1988	Twining	Unknown	NA	No	No	Yes	No	No	No	No	Category 3
Phases 1 and 2 Closure Certification Report, Mittelhauser[2]	8/1988 to 3/1990	TMA/Arli	Yes	CRL	No	Yes	Yes	Yes	No	Yes	No	Category 2
Closure Activity report, Oil Water Separator, Mittelhauser[3]	11/1989	TMA/Arli and Enseco CRL	Yes	NA	No	No	No	No	No	No	No	Category 3
Analytical Data Report, Sediment and Sand Samples, Phase 3, Mittelhauser[4]	4/1190 to 12/1991	Enseco-CRL	Yes	BC	Yes	Yes	No	Yes	Yes	Yes	No	Category 2

TABLE 2-1
Summary of Quality Control Associated with Soil and Sediment Samples and Recommended Usability Category

Event Title	Sampling Dates	Primary Laboratory	Primary Laboratory Certification (California)	Split Sample Laboratory	Associated Quality Control							Recommended Usability Category
					Blanks	Laboratory Control Samples	Laboratory Duplicates	Matrix Spikes	Matrix Spike Duplicates	Interlaboratory Split Samples	Formal Data Review/Validation/Flagging	
Report, Site Investigation, Project 62793, Environmental Profiles[5]	6/1993	SCS Environmental Laboratory	Unknown	NA	No	No	No	Yes	Yes	No	No	Category 3
Soil Investigation Report[6]	6/1994	APCL	Yes	NA	No	No	No	No	No	No	No	Category 3
Evaporation Pond Closure Report, Allwaste[7]	10/1993	Twining	Yes	Superior Precision	No	No	No	No	No	Yes	No	Category 3
Scrubber Oil Sump Closure Certification Report, Trident[8]	5/1996 to 7/1996	BC Laboratories	Yes	NA	No	No	No	No	No	No	No	Category 3

TABLE 2-1
Summary of Quality Control Associated with Soil and Sediment Samples and Recommended Usability Category

Event Title	Sampling Dates	Primary Laboratory	Primary Laboratory Certification (California)	Split Sample Laboratory	Associated Quality Control							Recommended Usability Category
					Blanks	Laboratory Control Samples	Laboratory Duplicates	Matrix Spikes	Matrix Spike Duplicates	Interlaboratory Split Samples	Formal Data Review/Validation/Flagging	
RCRA Facility Investigation Report, Ecology and Environment (E&E)[9]	7/97 to 3/2003	APCL	Yes	Multiple laboratories used	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Category 1
		E&E	Yes									

Notes:
TMA = Thermoanalytical
APCL = Applied Physics and Chemistry

[1]*Bat Cave Wash Soil Investigations, Topock Compressor Station,* Brown and Caldwell, October 1988.

[2]*Phases 1 and 2 Closure Certification Report, Hazardous Waste Management Facilities, Topock Compressor Station,* Mittelhauser Corporation, June 1990.

[3]*Closure Activity Report, Oil Water Separator System, Topock Compressor Station,* Mittelhauser Corporation, July 1990.

[4]*Analytical Data Report, Sediment and Sand Samples, Phase 3, Evaporation Ponds, Closure of Hazardous Waste Facilities,* Mittelhauser Corporation, Revision 1, 1992.

[5]*Report, Site Investigation, Project 62793, PG&E Compressor Facility,* Environmental Profiles, September 1993.

[6]*Soil Investigation Report, Pacific Gas and Electric Company, Topock Gas Compressor Station,* Alisto Engineering Group, August 1994.

[7]*Evaporation Pond Closure Report, Pacific Gas and Electric Company, Topock Gas Compressor Station,* Allwaste Transportation and Disposal for Trident Environmental, December 1993.

[8]*Scrubber Oil Sump Closure Certification Report, PG&E Topock Gas Compressor Station,* Trident Environmental and Engineering, August 1996.

[9]*RCRA Facility Investigation Report, Bat Cave Wash Area, Pacific Gas and Electric Company, Topock Compressor Station,* Ecology and Environment (E&E), February 2004.

TABLE 2-2
Summary of Evaluation Criteria and Procedures

Quality Control Sample	Acceptance Criteria	Evaluation Procedure
Blanks	No target analytes above reporting limit	Review available results, note if blanks contaminated
Laboratory Control Sample Recovery	ICP Metals (6010)/AAS Metals (7000 series): 80-120 percent recovery Mercury: 75-125 percent recovery Hexavalent Chromium (7196, 7197): 80-120 percent recovery	Results may have negative bias if LCS recovery is below the lower acceptance criterion; no expected effect for LCS recoveries greater than upper acceptance criterion
Matrix Spike and Spike Duplicate Samples	ICP Metals (6010)/AAS Metals (7000 series): 75-125 percent recovery Chrome VI (7196, 7197): 80-120 percent recovery	Results may have negative bias if both MS and MSD recoveries are below the lower acceptance criterion; no expected effect for MS/MSD recoveries greater than upper acceptance criterion unless severe deviations noted; in those cases a high bias may be present.
Duplicates	<=20 percent RPD	Calculate RPD when analytes detected in both samples; consider duplicate results to agree when both results are below the reporting limit; evaluate cases where analyte detected in only one sample in the duplicate pair.
Interlaboratory Split Samples	<=30 percent RPD	

Notes:
ICP = Inductively Coupled Plasma
AAS = Atomic Absorption Spectroscopy
RPD = Relative Percent Difference

ts Compared to Current Topock Requirements and the Topock RFI Comparison Values (All measurements in mg/kg)

s[1]	Residential PRG[2]	Ecological Comparison Values[3]	Bat Cave Wash Soil Investigations, Brown and Caldwell[4]	Phase 1 and 2 Certification Report, Mittelhauser[5]	Analytical Data Report, Sediment and Sand Samples, Phase 3, Mittelhauser[6]	Report, Site Investigation, Environmental Profiles[7]	Evaporation Pond Closure Report, Allwaste[8]	Soil Investigation Report, Alisto[9]	Scrubber Oil Sump Closure Certification Report, Trident[10]	RCRA Facility Investigation Report, Ecology & Environment[11]
	31	80	--	0.3	6	--	0.5	--	--	--
	5,400	170	--	1	1	--	0.5	--	--	--
	150	30	--	1	0.3	--	0.1	--	--	--
	37	20	--	0.5	0.5	--	1	--	--	--
	210	NE	1	3	1	--	1	--	--	0.5
	900	30	--	3	1	--	5	--	--	--
	3,100	40	--	3	2	--	5	--	--	0.5
	150	400	--	1	1	--	5	4	--	--
	390	2	--	1	2	--	20	--	--	--
	1,600	60	--	3	4	--	5	--	--	2
	390	NE	--	1	1	--	1	--	--	--
	5.2	NE	--	5/1	2.5	--	0.5	--	--	--
	7.8	50	--	1	1	--	5	--	--	--
	23,000	150	--	3/0.1	2	--	5	--	--	0.2
	0.62	20	--	0.3	0.5	--	0.2	--	--	--
	23	50	--	0.002	0.02	--		--	--	--
	390	1	--	0.5	0.5	--	0.3	--	--	--
	30	20	0.5	0.01	0.2	--	0.1	--	--	0.5
	NE	NE	--	8*	--	--	--	10	--	--
	NE	NE	--	--	--	10	--	--	200	--
	0.22	NE	--	--	--	1	--	--	--	--

its Compared to Current Topock Requirements and the Topock RFI Comparison Values (All measurements in mg/kg)

ts[1]	Residential PRG[2]	Ecological Comparison Values[3]	Bat Cave Wash Soil Investigations, Brown and Caldwell[4]	Phase 1 and 2 Certification Report, Mittelhauser[5]	Analytical Data Report, Sediment and Sand Samples, Phase 3, Mittelhauser[6]	Report, Site Investigation, Environmental Profiles[7]	Evaporation Pond Closure Report, Allwaste[8]	Soil Investigation Report, Alisto[9]	Scrubber Oil Sump Closure Certification Report, Trident[10]	RCRA Facility Investigation Report, Ecology & Environment[11]

Activity Report, Oil Water Separator System, Topick Compressor Station, Mittelhauser Corporation, July 1990.

for the subject investigation
rbons
rocarbons

No. 3 Closure Planning-Baseline Soil Sampling Work Plan, Attachment B, QAPP Addendum February 2006 and CH2M HILL PG&E Program Quality Assurance Project Plan, Internal Report,

s (PRG), USEPA Region 9, 2004. www.epa.gov/region09/waste/sfund.prg. October.

W. Suter II and A.C. Wooten. 1997. *Toxicological Benchmarks for Screening Contaminants for Effects on Terrestrial Plants: 1997 Revision*. ES/ER/TM-85/R3. Prepared for the U.S. Department ntal Management by Lockheed Martin Energy Systems, Inc.

ions, Topock Compressor Station, Brown and Caldwell, October 1988.

ication Report, Hazardous Waste Management Facilities, Topock Compressor Station, Mittelhauser Corporation, June 1990.

ent and Sand Samples, Phase 3, Evaporation Ponds, Closure of Hazardous Waste Facilities, Mittelhauser Corporation, Revision 1, 1992.

ject 62793, PG&E Compressor Facility, Environmental Profiles, September 1993.

port, Pacific Gas and Electric Company, Topock Gas Compressor Station, Allwaste Transportation and Disposal for Trident Environmental, December 1993.

fic Gas and Electric Company, Topock Gas Compressor Station, Alisto Engineering Group, August 1994.

ertification Report, PG&E Topock Gas Compressor Station, Trident Environmental and Engineering, August 1996.

eport, Bat Cave Wash Area, Pacific Gas and Electric Company, Topock Compressor Station, Ecology and Environment (E&E), February 2004.

TABLE 5-2
Soil and Sediment Semivolatile Reporting Limits Compared to Current Topock Requirements and the Topock RFI Comparison Values (all measurements in mg/kg)

Analyte	Current Topock Reporting Limit Requirements[1]	Residential PRG[2]	Ecological Comparison Values[3]	RCRA Facility Investigation, Ecology & Environment Reporting Limits[4]
Acenapthene	0.33	3700	NE	0.33
Acenaphthylene	0.33	2700	NE	0.33
Anthracene	0.33	2200	NE	0.33
Benzo(a)anthracene	0.33	0.62	12	0.33
Benzo(k)fluoranthene	0.33	0.38	12	0.33
Benzo(a)pyrene	0.33	0.062	12	0.33
Benzo(b)fluoranthene	0.33	0.62	12	0.33
Benzo(g,h,i)perylene	0.33	2300	NE	0.33
Chysene	0.33	3.8	12	0.33
Dibenz(a,h)anthracene	0.33	0.062	12	0.33
Fluoranthene	0.33	2300	NE	0.33
Fluorene	0.33	2700	NE	0.33
Indeno(1,2,3-cd)pyrene	0.33	0.62	12	0.33
2-Methylnaphthlene	0.33	1400	NE	0.33
Naphthlene	0.33	1.7	NE	0.33
Phenanthrene	0.33	2700	NE	0.33
Pyrene	0.33	2300	NE	0.33
1,2,4-Trichlorobenzene	0.33	62	NE	0.33
1,2-Dichlorobenzene	0.33	600	NE	0.33
1,3-Dichlorobenzene	0.33	530	NE	0.33
1,4-Dichlorobenzene	0.33	3.4	NE	0.33
2,2-oxybis(1-chloro)propane	0.33	NE	NE	0.33
2,4,5-Trichlorophenol	1.6	6100	NE	1.6
2,4,6-Trichlorophenol	0.33	6.9	NE	0.33
2,4-Dichlorophenol	0.33	180	NE	0.33

TABLE 5-2
Soil and Sediment Semivolatile Reporting Limits Compared to Current Topock Requirements and the Topock RFI Comparison Values (all measurements in mg/kg)

Analyte	Current Topock Reporting Limit Requirements[1]	Residential PRG[2]	Ecological Comparison Values[3]	RCRA Facility Investigation, Ecology & Environment Reporting Limits[4]
2,4-Dimethylphenol	0.33	1200	NE	0.33
2,4-Dinitrophenol	1.6	120	NE	1.6
2,4-Dinitrotoluene	0.33	120	NE	0.33
2,6-Dinitrotoluene	0.33	61	NE	0.33
2-Chloronaphthlene	0.33	4900	NE	0.33
2-Chlorophenol	0.33	63	NE	0.33
2-Methylphenol	0.33	3100	NE	0.33
2-Nitroaniline	1.6	180	NE	1.6
2-Nitrophenol	0.33	NE	NE	0.33
3,3-Dichlorobenzidine	0.67	1.1	NE	0.67
3-Nitroaniline	1.6	18	NE	1.6
4,6-Dinitro2-methylphenol	1.6	6.1	NE	1.6
4-Bromophenyl ether	0.33	NE	NE	0.33
4-Chloro-3-methylphenol	0.33	NE	NE	0.33
4-Chloroaniline	0.33	240	NE	0.33
4-Chlorophenylphenyl ether	0.33	NE	NE	0.33
4-Methylphenol	0.33	310	NE	0.33
4-Nitroaniline	1.6	23	NE	1.6
4-Nitrophenol	1.6	NE	NE	1.6
Benzoic Acid	1.6	100,000	NE	1.6
Benzyl Alcohol	0.33	18,000	NE	0.33
Bis(2-Chloroethoxy)methane	0.33	NE	NE	0.33
Bis(2-Ethylhexyl)phthalate	0.33	35	NE	0.33
Bis(2-chlorethyl)ether	0.33	0.22	NE	0.33
Benzylbutyl phthalate	0.33	12000	NE	0.33

TABLE 5-2
Soil and Sediment Semivolatile Reporting Limits Compared to Current Topock Requirements and the Topock RFI Comparison Values (all measurements in mg/kg)

Analyte	Current Topock Reporting Limit Requirements[1]	Residential PRG[2]	Ecological Comparison Values[3]	RCRA Facility Investigation, Ecology & Environment Reporting Limits[4]
Dibenzofuran	0.33	150	NE	0.33
Di-n-butyl phthalate	0.33	6100	NE	0.33
Diethyl phthalate	0.33	49000	NE	0.33
Dimethyl phthalate	0.33	100000	NE	0.33
Di-n-octyl phthalate	0.33	2400	NE	0.33
Hexachlorobenzene	0.33	0.3	NE	0.33
Hexachlorobutadiene	0.33	6.2	NE	0.33
Hexachlorocyclopentadiene	0.33	370	NE	0.33
Hexachloroethane	0.33	35	NE	0.33
Isophorone	0.33	510	NE	0.33
Nitrobenzene	0.33	20	NE	0.33
N-Nitrosodiphenylamine	0.33	99	NE	0.33
Pentachlorophenol	1.6	3	NE	1.6
Phenol	0.33	18000	NE	0.33

Notes:

**Nominal reporting limit without moisture correction

NE: Not established

[1]Reporting Limits from PG&E Program Quality Assurance Project Plan, November 2004. Soil reporting limits for semivolatile compounds not contained in the February 2006 QAPP Addendum.

[2]Preliminary Remediation Goals (PRG), USEPA Region 9, 2004. www.epa.gov/region09/waste/sfund.prg. October.

[3]Efroymson, R.A., M.E. Will, G.W. Suter II and A.C. Wooten. 1997. *Toxicological Benchmarks for Screening Contaminants for Effects on Terrestrial Plants: 1997 Revision.* ES/ER/TM-85/R3. Prepared for the U.S. Department of Energy, Office of Environmental Management by Lockheed Martin Energy Systems, Inc.

[4]Ecology and Environment, Inc. 2004. *Draft RCRA Facility Investigation (RFI), Bat Cave Wash Area*, Pacific Gas and Electric Company's Topock Compressor Station, Needles, California.

Attachment A
Evaluation of Soil and Sediment Results

Attachment A: Evaluation of Soil and Sediment Results

The evaluation of the quality control results associated with the soil and sediment analyses is presented for each of the source documents in the following sections. The evaluation varied in scope, depending on the level of quality control (QC) data included with the respective source document. The quality control information in some source documents was limited or absent. The evaluation of the reports is presented in chronological order.

A.1 Evaluation of QC Results Contained in *Bat Cave Wash Soil Investigations, Topock Compressor Station*, Brown and Caldwell, October 1988

Table A-1 summarizes the number of samples and types of analyses performed for this investigation. Samples were collected on June 23, 1998 and analyzed for total chromium (United States Environmental Protection Agency [USEPA] Method 6010) and hexavalent chromium (USEPA Method 7197) by Twining Laboratories, Inc. The report provided no indication whether Twining Laboratories was certified by the California Department of Health Services (DOHS) or any other agency. While this report does not discuss the certification of Twining Laboratory, a more recent study at the site with analytical services provided by Twining Laboratory documents the laboratory's certification (see Section A.4).

These results were presented in a laboratory report with minimal QC information, limited to information for laboratory and field duplicates.

- Laboratory Duplicates: Table A-2 presents the comparison of laboratory duplicate results. The laboratory duplicate analyses were performed to verify that analytical interferences were not present. The relative percent differences (RPD) between the laboratory duplicates and field duplicates were less than 20 percent RPD criterion except for the S-7 replicate pair. The RPD for the pair of hexavalent chromium results was 98 percent RPD, indicating the possibility of analytical interference.
- Field Duplicates: Table A-2 also presents the results of the field duplicate analyses for the samples collected at location S-4. The RPD between the total chromium field duplicate pair was below the 20 percent RPD criterion and the field duplicate results for hexavalent chromium were both non-detect, indicating good field duplicate agreement.

The results of the laboratory duplicate analyses were acceptable with the exception of the hexavalent chromium result discussed above. This result is flagged as estimated based on poor precision because of the possible interferences noted in the Brown and Caldwell report (Brown and Caldwell 1988). The remaining results are considered of limited usability due to the lack of supporting quality control results. This data set has been classified as Category 3.

A.2 Evaluation of QC Results Contained in *Phases 1 and 2 Closure Certification Report Hazardous Waste Management Facilities*, Mittelhauser Corporation, June 1990

The number of samples and types of analyses for this investigation are presented in Table A-3. The primary laboratory was TMA/Arli located in Monrovia, California. The laboratory reports indicate that the laboratory was certified by the DOHS, Certification Number 121. The QC sample results provided in this report included laboratory control samples (LCSs), matrix spikes, sample duplicates, and interlaboratory split samples. There were no method blanks included in the laboratory reports. The report does not specifically identify the duplicate sample results as field duplicates. Therefore, for the purposes of evaluating the data, all duplicate analyses are considered laboratory duplicates.

- Laboratory Control Samples: LCS results were provided for the analyses associated with samples collected on the following dates: December 5, 1988, December 9, 1988, February 8, 1989, and November 15, 1989. The recoveries were all within the acceptance criteria.
- Matrix Spike Samples: Matrix spike samples data were supplied for the following parent samples PH1 (12/5/1989), EDB-2 and EDB5 (12/9/1988), PPT4 (2/8/1989), PC1 (11/14/1989), PF6 (11/18/1989), and PA3 (11/19/1989). Table A-4 summarizes the matrix spike recoveries that did not meet the 75-125 percent recovery acceptance criteria described as follows:
  - December 5, 1988, PH1: The recoveries for the following analytes did not meet the 75-125 percent acceptance criteria: silver, 13 percent; selenium 45 percent; and thallium, 4 percent. Antimony was recovered at 138 percent, and cadmium was recovered at 128 percent (above the 125 percent upper control limit).
  - December 9, 1988, PH1: The recoveries for the following analytes did not meet the 75-125 percent acceptance criteria: silver, 3 percent; selenium 52 percent; and molybdenum, 65 percent. Arsenic was recovered at 140 percent (above the 125 percent upper control limit).
  - February 8, 1989, PPT-4: The recoveries silver, 20 percent; selenium, 45 percent; and antimony 36 percent did not meet the 75 percent acceptance criterion. Mercury was recovered at 136 percent (above the 125 percent upper control limit).
  - November 14, 1989, PC1 (1'): The recovery of selenium was 66 percent, below the 75 percent lower control criterion.
  - November 19, 1989. PA-3: The recovery for antimony was 51 percent, for silver 11 percent, for thallium 68 percent, and for selenium 53 percent.
- Laboratory Duplicates: Laboratory duplicate analyses were performed to verify that analytical interferences were not present. The RPDs between the laboratory duplicates are presented in Table A-5. The average RPD was 19, the minimum RPD was 0, and the maximum RPD was 92. Only 17 out of 133 RPDs calculated between laboratory duplicate pair results were outside the acceptance criterion. The results of the laboratory duplicates indicate acceptable overall precision.

- Split Samples: Table A-6 summarizes the split sample results. The average RPD was 64, exceeding the 30 percent interlaboratory precision criterion, the minimum RPD was 1.2, and the maximum RPD 148. Sixty-three out of 145 pairs of results did not meet the acceptance criterion. The results of the split sample analyses indicate no significant accuracy and precision problems. Approximately 56 percent of the split sample pairs of results did not meet the 30 percent acceptance criterion; it is likely that the differences in the results represent random variability arising from the soil matrix and from interlaboratory analyses and not any systematic bias in either data set. The result of the split samples are considered to demonstrate acceptable accuracy and precision for this data set.

Based on the review of the available QC results, the data for all analytes, with the exception of silver, are considered usable to support the RFI/RI. However, very low recoveries were repeatedly obtained for silver. False negatives may exist, and positive results may have a very low bias. Silver in the samples associated with the low recoveries will be flagged as rejected. With the exception of the silver data, these data are classified as Category 2.

A.3 Evaluation of QC Results Contained in *Closure Activity Report, Oil Water Separator System, Topock Compressor Station*, Mittelhauser Corporation, July 1990

The number of samples, sample collection date, and types of analyses for this investigation are presented in Table A-7. There are no QC results provided with these data, and there is no documentation of QC activities included in this report. For these reasons, these data are classified as Category 3.

A.4 Evaluation of QC Results Contained in *Analytical Data Report, Sediment and Sand Samples, Phase 3, Evaporation Ponds, Closure of Hazardous Waste Facilities, Revision 1*, Mittelhauser Corporation, February 1992

The number of samples and type of analyses performed for this investigation are presented in Table A-8. The primary laboratory for the Phase 3 sample analyses was Enseco-CRL located in Garden Grove, California. The laboratory reports indicate that the laboratory was certified by the DOHS, Certification Number 157. The QC sample results included method blanks, LCSs, matrix spikes, laboratory duplicates, and interlaboratory split samples.

- Method Blanks: Method blank results were included with each sample report. There were no target analytes reported in any of the blanks.
- Laboratory Control Samples: All of the LCS results were within acceptance criteria for the analyses associated with samples collected on August 28, 1990 and August 29, 1990. The recoveries for selenium, arsenic and thallium were below the 80 percent lower control limit in the LCSs associated with samples collected on April 17, 1990.
- Matrix Spike/Spike Duplicate (MS/MSD) Samples: Matrix spike and matrix spike duplicate samples were analyzed using samples B-1-1, B-3-2, and B-3-6 as parent samples. Table A-9 summarizes the matrix spike recoveries outside the acceptance criteria. The recoveries listed in Table A-9 are only slightly below the indicated acceptance criteria and do not negatively impact data usability.

- Laboratory Duplicates: The laboratory analyzed MS/MSD samples to evaluate precision in lieu of laboratory duplicate samples. All MS/MSD RPD results were within the acceptance criteria of below the 20 percent RPD.
- Split Samples: Table A-10 summarizes the split sample results. The average RPD was 52 percent above the 30 percent upper control limit, the minimum RPD was 0, and the maximum RPD was 188. The interlaboratory reproducibility for the split sample results was acceptable in most cases. Seventy percent of the results were in agreement. However, large differences between the results, especially for fluoride, were observed, indicating a possible systematic bias in some of the analyte results.

The results of the available QC analyses support the use of the data, although some QC results were outside acceptance criteria. The accuracy of the results as represented by the MS/MSD samples is adequate; however, the precision between interlaboratory duplicates was poor for some analytes, indicating a high degree of matrix variability, analytical interferences, non-representative sampling techniques, or other undetermined sources of error. For these reasons, the results for the analytes that exhibited poor analytical precision are estimated, and data flags are added to the results.

Enseco-CRL indicated in the laboratory narrative that the data were reported on an "as received basis," and no percent-moisture was determined and no dry-weight correction applied. Based on the forgoing, the comparability of these results to other data sets may be reduced. Also, it should be noted that Enseco-CRL reported trivalent instead of total chromium. Because the amount of trivalent chromium generally exceeds the hexavalent chromium by a large amount, there is no significant effect on data comparability. These data are classified as Category 2.

A.5 Evaluation of QC Results Contained in *Report, Site Investigation, Project 62793, PG&E Compressor Facility*, Environmental Profiles, Inc. September 1993

The number of samples, sample collection dates, and types of analyses performed for this investigation are presented in Table A-11. The primary laboratory was SCS Analytical Laboratory located in Long Beach, California. It is unknown if the laboratory was certified by the DOHS. Based on the following discussion, these data are considered usable for information only and therefore the certification status of the laboratory is not a significant factor in the evaluation of these results.

Samples were analyzed for total recoverable petroleum hydrocarbons (TRPH) by USEPA Method 418.1 and polychlorinated biphenyls (PCBs) by USEPA Method 8080. The analytical results were evaluated based on the available QC sample results included in the laboratory reports. These QC sample results included matrix spikes, matrix spike duplicates, and surrogate spikes (USEPA Method 8080).

- Matrix Spike/Spike Duplicate Samples: MS/MSDs were submitted for both the TRPH and PCB analyses. The recoveries for TRPH and for Aroclor-1242 (used as the spiking compound for USEPA Method 8080) were within acceptance criteria.
- Surrogates: For USEPA Method 8080, two surrogates are used: tetra-chloro-meta xylene (TCMX) and dibutylchorandate. Out of the 15 samples analyzed for PCBs, the

dibutylchorandate recovery was 0 percent in 10 of the samples and 1 percent in an eleventh. Recoveries for a second surrogate, TCMX, were also reported; the use of a second surrogate is not required by the Program Quality Assurance Project Plan (CH2M HILL 2004). The recoveries for TCMX were between 44 and 67 percent; all of the surrogate results are summarized in Table A-12.

The use of the PCB data is limited due to poor surrogate recovery results. The TRPH results were submitted with no supporting QC information. The TRPH method is non-specific and, as such, the concentrations provide an uncharacterized indication of the presence of hydrocarbons. It is recommended that these data be used for information only. These data are classified as Category 3.

A.6 Evaluation of QC Results Contained in *Pond Closure Report, Pacific Gas and Electric Company, Topock Gas Compressor Station*, Allwaste Transportation and Remediation for Trident Environmental *Evaporation*, December 1993

The number of samples and types of analyses performed for this investigation are presented in Table A-13. The primary laboratory was Twining Laboratories, Inc.'s corporate office located in Fresno. Analyses were also performed by laboratories located in Modesto, Visalia, and Bakersfield, California. The location where the analyses were performed is not identified on the laboratory reports. The laboratory reports indicate that the laboratory was certified by the DOHS, Certification Number 1371

The analytical results were evaluated based on the available quality control sample results included in the laboratory reports. These QC sample results consisted of interlaboratory split samples only; there were no blanks, LCSs, or MS/MSD samples included in this report.

Table A-14 summarizes the split sample results. Quality assurance split samples were received by the primary Twining laboratory, homogenized, and then a split sample was shipped Superior Precision Analytical, Inc. located in Martinez, California. This data set does not include supporting intralaboratory quality control analyses for the primary samples. However, the results of the split samples indicate that the data are sufficiently precise and accurate to support the project objectives. These data are classified as Category 3.[3]

A.7 Evaluation of QC Results Contained in *Soil Investigation Report, Pacific Gas and Electric Company, Topock Gas Compressor Station*, Alisto Engineering Group, August 29, 1994

The number of samples, sample collection date, and type of analyses performed for this investigation are presented in Table A-15. There are no QC results or discussion of QC activities associated with these data. The data are classified as Category 3.

[3] As documented in DTSC's November 7, 2007 letter, the closed evaporation ponds are not being reconsidered under corrective action; therefore these data are of little significance to the current project (DTSC 2007)

A.8 Evaluation of QC Results Contained in *Scrubber Oil Sump Closure Certification Report PG&E Topock Gas Compressor Station*, Trident Environmental and Engineering, August 26, 1996

The number of samples and types of analyses for this investigation are presented in Table A-16. There were no QC results reported with these data. The report did contain a Soil Sampling Quality Assurance Plan, which included requirements for analysis of laboratory splits at a 10 percent frequency, laboratory certification by DOHS, participation in interlaboratory performance evaluation sample analysis programs, and interlaboratory analysis of blind performance evaluation samples. There was no documentation provided in the report that these activities had occurred. These data are classified as Category 3.

A.9 Evaluation of QC Results Contained in *RCRA Facility Investigation Report, Bat Cave Wash Area, Pacific Gas and Electric Company, Topock Compressor Station*, Ecology and Environment, February 2004

The number of samples, sample collection date, and types of analyses performed for this investigation are summarized in Table A-17 for soils and in Table A-18 for sediments. Attachment B to this Technical Memorandum is the data assessment for analytical data collected to support the Topock RFI, originally published as *Data Review and Results of the Draft RCRA Facility Investigation (RFI) Report, Bat Cave Wash Area, dated February 2004* (E&E 2004). Attachment B presents the results of the Ecology and Environment (E&E) analytical data review conducted for the Topock RFI (E&E 2004) that included surface water, groundwater, characterization soil/sediment, and background soil results. The data review contains a narrative description of the project data quality objectives, the findings of the data review and validation performed, and an evaluation of the data usability. These findings indicate that there were no significant QC issues that would affect data usability. Although individual data review and/or validation reports were not included, E&E states that, for the constituents of concern (COCs), 10 percent of the data under went full validation, and the remaining 90 percent underwent limited review, that is review of the QC results without inspection of the raw data.

The laboratory reports provided by E&E were reviewed and appear to support the statements contained in Attachment B. The findings of the E&E data quality assessment are considered sufficient to demonstrate the usability of the data and these findings are summarized in this section.

The primary laboratory was APCL (DOHS Certificate Number 1431). APCL was audited by Alisto in 1996. E&E Analytical Services Center was also used and was certified by DOHS (certificate number 1766) and the National Environmental Laboratory Accreditation Program (identification number 10486). For both laboratories, at a minimum, complete summary data packages are available that include QC results. In many cases, full data packages are available, including calibration records, bench sheets, and raw data.

Attachment B documents the following QC activities:

- All results for COCs were reviewed with respect to conformance with method and project requirements.

- For non-COCs, 10 percent of the results were reviewed with respect to conformance with method and project requirements.
- E&E concluded that all data used in the RFI report are of acceptable quality, and the project completeness objectives were met.
- Data not meeting the acceptance criteria for accuracy and precision were flagged as estimated, and these flags are retained in the current project RFI/RI database.

Twelve co-located duplicate soil samples were collected. Table A-18 presents the results and the RPD calculated between the results from co-located samples. Out of a total of 108 results, 29 RPDs exceeded the less than 20 percent criterion. Where one or both of the results were reported below the reporting limit, the RPD was not calculated or counted as part of this analysis. Considering the non-homogeneous nature of the soil matrix, these co-located sample results indicate adequate field and laboratory precision for these samples. This further supports E&E's conclusion that the analytical results meet the RFI project data quality objectives. The data collected by E&E are classified as Category 1.

TABLE A-1

Sample Summary, Bat Cave Wash Soil Investigation, Brown and Caldwell

Sample Collection Date*	Laboratory	Sample Location	Total Chromium		Hexavalent	
			Run 1	Run 2**	Run 1	Run 2**
24-Jun-88	Twining	BG-1	x	--	x	--
24-Jun-88	Twining	BG-2	x	--	x	--
24-Jun-88	Twining	PB-1	x	--	x	--
24-Jun-88	Twining	PB-2	x	x	x	x
24-Jun-88	Twining	PB-2 Dup	--	x	--	x
24-Jun-88	Twining	PB-3	x	x	x	x
24-Jun-88	Twining	PB-4	x	--	x	--
24-Jun-88	Twining	DS-1	x	x	x	x
24-Jun-88	Twining	DS-2	x	--	x	--
24-Jun-88	Twining	DS-3	x	--	x	--
24-Jun-88	Twining	DS-4	x	--	x	--
		Total	10	4	10	4

x: Analyte analyzed

--: Analyte not analyzed

*Sample collection date not provided, samples received at laboratory 6/24/1988.

**Confirmation analyses performed on several samples.

Source: *Bat Cave Wash Soil Investigations*, Topock Compressor Station. Brown and Caldwell. October 1988.

TABLE A-2
Summary of Laboratory and Field Duplicates, Bat Cave Wash Investigation Brown and Caldwell

Sample Identification	Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Duplicate Sample Result (mg/kg)	Relative Percent Difference RPD<=20
Laboratory Duplicates					
S-4	PB-2	Total Chromium	38	38	0
		Hexavalent Chromium	<0.5	<0.5	NA
S-5	PB-3	Total Chromium	270	220	Agree
		Hexavalent Chromium	7.1	6.5	Agree
S-7	DS-1	Total Chromium	80	79	Agree
		Hexavalent Chromium	6.8	2.3	98
Field Duplicate					
S-4	PB-2	Total Chromium	38	37	Agree
		Hexavalent Chromium	<0.5	<0.5	NA

Note:
mg/kg = milligram per kilogram
NA = not applicable

Source: Brown and Caldwell. 1988. Bat Cave Wash Soil Investigations, Topock Compressor Station. October.

TABLE A-3
Sample Summary, Phases 1 and 2 Closure Certification Report, Mittelhauser

Sample Collection Date	Laboratory	Sample Location	Sb	Ba	Be	Cd	Cr	Co	Cu	Pb	Mo	Ni	Ag	Tl	V	Zn	As	Hg	Se	EC	F	CrVI	pH	TPH
08-Sep-88	TMA/ARLI	BGCS-1,1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-1,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-1,3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-2,1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-2,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-2,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	CRL	BGCS-2,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-2,3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-3,1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-3,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	CRL	BGCS-3,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-3,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-3,3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-4,1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-4,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-4,3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-5,1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-5,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-5,3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-6,1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-6,2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
08-Sep-88	TMA/ARLI	BGCS-6,3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
15-Nov-89	TMA	CRT-4 (0.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
15-Nov-89	CRL	CRT-4 (0.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
15-Nov-89	TMA	CRT-4 (1')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
15-Nov-89	TMA	CRT-4 (1.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	EDB-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	EDB-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	EDB-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
20-Mar-90	Enseco	Oil Pad	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	x
19-Nov-89	TMA	PA-3 (1')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
19-Nov-89	TMA	PA-3 (1')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
14-Nov-89	CRL	PC-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
18-Nov-89	TMA	PF-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
18-Nov-89	CRL	PF-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
18-Nov-89	TMA	PF-8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
20-Mar-90	Enseco	PF-8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
15-Nov-89	TMA/ARLI	PG-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
15-Nov-89	TMA/ARLI	PG-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	x	--

TABLE A-3
Sample Summary, Phases 1 and 2 Closure Certification Report, Mittelhauser

Sample Collection Date	Laboratory	Sample Location	Sb	Ba	Be	Cd	Cr	Co	Cu	Pb	Mo	Ni	Ag	Tl	V	Zn	As	Hg	Se	EC	F	CrVI	pH	TPH
05-Dec-88	TMA	PH1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
05-Dec-88	TMA	PH1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
20-Nov-89	TMA	PH-10	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
20-Mar-90	Enseco	PH-10/PT-3	--	--	x	x	--	--	x	--	--	--	--	--	--	x	--	--	--	--	--	--	--	--
21-Nov-89	TMA	PH-11	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
21-Nov-89	TMA	PH-12	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
21-Nov-89	TMA	PH-13	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
05-Dec-88	TMA	PH-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
20-Mar-90	Enseco	PH-2	--	--	--	--	x	--	--	x	--	--	--	--	--	x	--	--	--	--	--	x	--	--
14-Nov-89	TMA	PH-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
20-Mar-90	Enseco	PH-3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	x	--	--
14-Nov-89	TMA	PH-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
14-Nov-89	TMA	PH-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
14-Nov-89	TMA	PH-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	--	--	--	--
18-Nov-89	TMA	PH-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
20-Mar-90	Enseco	PH-6	--	--	--	--	x	--	--	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18-Nov-89	TMA	PH-7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
18-Nov-89	CRL	PH-7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
18-Nov-89	TMA	PH-8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
20-Nov-89	TMA	PH-9	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
06-Dec-88	TMA	PPT-4 (0.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	CRL	PPT-4 (0.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	PPT-4 (1')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	PPT-4 (1.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
08-Feb-89	TMA	PPT-4 (2')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
08-Feb-89	TMA	PPT-4 (2')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
08-Feb-89	TMA	PPT-4 (3')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
08-Dec-88	TMA	PT-3 (0.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	PT-3 (0.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
08-Dec-88	TMA	PT-3 (1')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
08-Dec-88	TMA	PT-3 (1.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
08-Feb-89	TMA	PT-3 (2')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
08-Feb-89	TMA	PT-3 (4")	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	PT-4 (0.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	CRL	PT-4 (1')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	PT-4 (1')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	PT-4 (1.5')	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
15-Nov-89	TMA	TS-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
05-Dec-88	TMA	WDB-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--

TABLE A-3
Sample Summary, Phases 1 and 2 Closure Certification Report, Mittelhauser

Sample Collection Date	Laboratory	Sample Location	Sb	Ba	Be	Cd	Cr	Co	Cu	Pb	Mo	Ni	Ag	Tl	V	Zn	As	Hg	Se	EC	F	CrVI	pH	TPH
09-Dec-88	TMA	WDB-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	CRL	WDB-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
09-Dec-88	TMA	WDB-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	--
		Total samples	65	65	66	66	67	65	66	67	65	65	65	65	65	67	65	65	64	18	64	66	64	1

Notes:
x: Analyte analyzed
--: Analyte not analyzed
Ag: Silver
As: Arsenic
Ba: Barium
Be: Beryllium
Cd: Cadmium
Co: Cobalt
Cr: Chromium
Cu: Copper
EC: Conductivity
F: Fluoride
Hg: Mercury
Mo: Molybdenum
Ni: Nickel
Pb: Lead
Sb: Antimony
Se: Selenium
Tl: Thallium
V: Vanadium
Zn: Zinc
TPH: Total Petroleum Hydrocarbons by Method 8015

Source: Mittelhauser Corporation. 1990a. *Phases 1 and 2 Closure Certification Report Hazardous Waste Management Facilities, Topock Compressor Station, Needles, California*. June.

TABLE A-4
Summary of Matrix Spike Recoveries Outliers, Mittelhauser Phases 1 and 2

Area	Sample Location	Analyte	Matrix Spike Percent Recovery
Piping	PA-3 (1')	Antimony	51
Piping	PA-3 (1')	Silver	11
Piping	PA-3 (1')	Thallium	68
Piping	PA-3 (1')	Selenium	53
Drying Beds	EDB-5	Molybdenum	65
Drying Beds	EDB-5	Silver	3
Drying Beds	EDB-5	Arsenic	140
Drying Beds	EDB-5	Selenium	52
Piping	PC-1 (1')	Selenium	66
Piping	PH-1	Antimony	138
Piping	PH-1	Cadmium	128
Piping	PH-1	Silver	13
Piping	PH-1	Thallium	4
Piping	PH-1	Selenium	45
Chromate Reduction	PPT-4	Antimony	36
Chromate Reduction	PPT-4	Molybdenum	59
Chromate Reduction	PPT-4	Silver	20
Chromate Reduction	PPT-4	Mercury	136
Chromate Reduction	PPT-4	Selenium	45
		Acceptance Criteria	75-125

Source: Mittelhauser Corporation. 1990a. *Phases 1 and 2 Closure Certification Report Hazardous Waste Management Facilities, Topock Compressor Station, Needles, California*. June.

TABLE A-5
Summary of Laboratory Duplicate Results Mittelhauser, Phases 1 and 2

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Laboratory Duplicate Sample Result (mg/kg)	Relative Percent Difference (<=20)
BGCS-1,2	Antimony	<0.3	<0.3	NA
BGCS-1,2	Arsenic	3.1	3.37	Agree
BGCS-1,2	Barium	180	190	Agree
BGCS-1,2	Beryllium	<1	<1	NA
BGCS-1,2	Cadmium	<0.5	<0.5	NA
BGCS-1,2	Chromium	9	11	Agree
BGCS-1,2	Cobalt	8	9	Agree
BGCS-1,2	Copper	<3	<3	NA
BGCS-1,2	Lead	5	5	Agree
BGCS-1,2	Mercury	0.039	0.051	Agree
BGCS-1,2	Molybdenum	<1	<1	NA
BGCS-1,2	Nickel	12	16	Agree
BGCS-1,2	Selenium	<0.5	<0.5	NA
BGCS-1,2	Silver	<1	<1	NA
BGCS-1,2	Thallium	<5	<5	NA
BGCS-1,2	Vanadium	25	29	Agree
BGCS-1,2	Zinc	41	47	Agree
BGCS-1,2	pH	8.55	8.64	Agree
PPT-4 (2')	Antimony	<0.3	<0.3	NA
PPT-4 (2')	Barium	65	65	Agree
PPT-4 (2')	Beryllium	<1	<1	NA
PPT-4 (2')	Cadmium	<0.5	<0.5	NA
PPT-4 (2')	Chromium	32	29	Agree
PPT-4 (2')	Cobalt	13	9	36
PPT-4 (2')	Copper	19	15	24
PPT-4 (2')	Lead	5	4	22
PPT-4 (2')	Molybdenum	<1	<1	NA
PPT-4 (2')	Nickel	33	26	24
PPT-4 (2')	Silver	<1	<1	NA
PPT-4 (2')	Thallium	<5	<5	NA
PPT-4 (2')	Vanadium	41	32	25
PPT-4 (2')	Zinc	44	36	Agree
PPT-4 (2')	Arsenic	1.1	1.2	Agree
PPT-4 (2')	Mercury	0.02	0.027	Agree
PPT-4 (2')	Selenium	<0.5	<0.5	NA
PPT-4 (2')	Fluoride	636	664	Agree
PPT-4 (2')	Hexavalent Chromium	<1	<1	NA
PPT-4 (2')	pH	8.68	8.74	Agree
PH1	Antimony	<0.3	<0.3	NA
PH1	Arsenic	3.19	2.48	25
PH1	Barium	170	180	Agree
PH1	Beryllium	<1	<1	NA
PH1	Cadmium	<0.5	<0.5	NA
PH1	Chromium	23	22	Agree
PH1	Cobalt	5.1	5.1	Agree
PH1	Copper	<3	<3	NA
PH1	Lead	10	20	Agree
PH1	Mercury	0.061	0.043	35
PH1	Molybdenum	<1	<1	NA
PH1	Nickel	8.5	6.8	22
PH1	Selenium	<0.5	<0.5	NA
PH1	Silver	<1	<1	NA
PH1	Thallium	<5	<5	NA

TABLE A-5
Summary of Laboratory Duplicate Results Mittelhauser, Phases 1 and 2

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Laboratory Duplicate Sample Result (mg/kg)	Relative Percent Difference (<=20)
PH1	Vanadium	13	15	Agree
PH1	Zinc	30	33	Agree
PH1	Fluoride	498	502	Agree
PH1	Hexavalent Chromium	<1	<1	NA
PH1	pH	8.57	8.4	Agree
PF-6	EC	265	263	Agree
PF-6	Fluoride	355	334	Agree
PF-6	Hexavalent Chromium	<1	<1	NA
PH-5	Antimony	<0.3	<0.3	NA
PH-5	Arsenic	2.7	2.7	Agree
PH-5	Barium	216	201	Agree
PH-5	Beryllium	<1	<1	NA
PH-5	Cadmium	<0.5	<0.5	NA
PH-5	Chromium	12	11	Agree
PH-5	Cobalt	7	4	55
PH-5	Copper	5	5	Agree
PH-5	Lead	6	5	Agree
PH-5	Mercury	0.172	0.172	Agree
PH-5	Molybdenum	<1	15	NA
PH-5	Nickel	11	9	Agree
PH-5	Selenium	<0.5	<0.5	NA
PH-5	Silver	<1	<1	NA
PH-5	Thallium	<5	<5	NA
PH-5	Vanadium	13	8	48
PH-5	Zinc	29	29	Agree
EDB-5	Antimony	<0.3	<0.3	NA
EDB-5	Barium	110	120	Agree
EDB-5	Beryllium	<1	<1	NA
EDB-5	Cadmium	<0.5	<0.5	NA
EDB-5	Chromium	37	47	Agree
EDB-5	Cobalt	8.2	8.3	Agree
EDB-5	Copper	3.8	1.8	71
EDB-5	Lead	4.4	2.8	44
EDB-5	Molybdenum	<1	<1	NA
EDB-5	Nickel	9.3	9.1	Agree
EDB-5	Silver	<1	<1	NA
EDB-5	Thallium	<5	<5	NA
EDB-5	Vanadium	24	29	Agree
EDB-5	Zinc	53	56	Agree
EDB-5	Arsenic	1.21	1.14	Agree
EDB-5	Mercury	0.016	0.03.	NA
EDB-5	Selenium	<0.5	<0.5	NA
EDB-5	Fluoride	791	621	24
PA-3	Antimony	<0.3	<0.3	NA
PA-3	Barium	168	169	Agree
PA-3	Beryllium	<1	<1	NA
PA-3	Cadmium	<0.5	<0.5	NA
PA-3	Chromium	45	49	Agree
PA-3	Cobalt	<3	<3	NA
PA-3	Copper	7	8	Agree
PA-3	Lead	14.8	12.4	Agree
PA-3	Molybdenum	<1	<1	NA
PA-3	Nickel	14	12	Agree

TABLE A-5
Summary of Laboratory Duplicate Results Mittelhauser, Phases 1 and 2

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Laboratory Duplicate Sample Result (mg/kg)	Relative Percent Difference (<=20)
PA-3	Silver	<1	<1	NA
PA-3	Thallium	<5	<5	NA
PA-3	Vanadium	24	25	Agree
PA-3	Zinc	87	91	Agree
PA-3	Arsenic	2.3	2.6	Agree
PA-3	Mercury	0.058	0.036	47
PA-3	Selenium	<0.5	<0.5	NA
PG-2	Antimony	<0.3	<0.3	NA
PG-2	Arsenic	2.18	3	Agree
PG-2	Barium	152	219	Agree
PG-2	Beryllium	<1	<1	NA
PG-2	Cadmium	<0.5	<0.5	NA
PG-2	Chromium	24.7	26	Agree
PG-2	Cobalt	<3	<3	NA
PG-2	Copper	3.3	9	Agree
PG-2	Lead	10.6	4.1	88
PG-2	Mercury	0.026	<0.002	NA
PG-2	Molybdenum	<1	<1	NA
PG-2	Nickel	9.6	8	Agree
PG-2	Selenium	<0.5	<0.5	NA
PG-2	Silver	4.4	<1	NA
PG-2	Thallium	<5	<5	NA
PG-2	Vanadium	<1	7	NA
PG-2	Zinc	92	45	69
PG-2	EC	430	383	Agree
PG-2	Fluoride	890	686	26
PG-2	Hexavalent Chromium	<1	<1	NA

mg/kg = milligram per kilogram
NA = not applicable

Source: Mittelhauser Corporation. 1990a. *Phases 1 and 2 Closure Certification Report Hazardous Waste Management Facilities, Topock Compressor Station, Needles, California*. June.

TABLE A-6
Summary of Interlaboratory Splits, Mittelhauser, Phases 1 and 2

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Split Sample Sample Result (mg/kg)	Relative Percent Difference <=30
BGCS-2,2	Antimony	<0.3	<1	NA
BGCS-2,2	Arsenic	3.6	3.3	Agree
BGCS-2,2	Barium	270	140	63
BGCS-2,2	Beryllium	<1	<0.2	NA
BGCS-2,2	Cadmium	<0.5	14	NA
BGCS-2,2	Chromium	15	26	54
BGCS-2,2	Cobalt	6	5.1	Agree
BGCS-2,2	Copper	26	11	81
BGCS-2,2	Lead	<1	8.4	NA
BGCS-2,2	Mercury	0.034	<0.02	NA
BGCS-2,2	Molybdenum	<1	2.1	NA
BGCS-2,2	Nickel	11	18	48
BGCS-2,2	Selenium	<0.5	0.14	NA
BGCS-2,2	Silver	<1	<0.2	NA
BGCS-2,2	Thallium	<5	<0.3	NA
BGCS-2,2	Vanadium	22	23	Agree
BGCS-2,2	Zinc	54	30	57
BGCS-2,2	Conductivity	108	435	120
BGCS-2,2	Fluoride	595	870	38
BGCS-2,2	Hexavalent Chromium	<1	<1	NA
BGCS-2,2	pH	8.8	7.5	Agree
BGCS-2,2	Oil and Grease	25	<10	NA
PPT-4 (6")	Antimony	<0.3	<1	NA
PPT-4 (6")	Barium	81	12	148
PPT-4 (6")	Beryllium	<1	0.12	NA
PPT-4 (6")	Cadmium	0.6	0.21	96
PPT-4 (6")	Chromium	31	13	82
PPT-4 (6")	Cobalt	12	2	143
PPT-4 (6")	Copper	12	6.3	62
PPT-4 (6")	Lead	29	4.7	144
PPT-4 (6")	Molybdenum	<1	0.11	NA
PPT-4 (6")	Nickel	25	7.1	112
PPT-4 (6")	Silver	<1	<0.2	NA
PPT-4 (6")	Thallium	<5	<0.3	NA
PPT-4 (6")	Vanadium	37	8	129
PPT-4 (6")	Zinc	76	14	138
PPT-4 (6")	Arsenic	1.17	1.2	Agree
PPT-4 (6")	Mercury	0.006	0.003	67
PPT-4 (6")	Selenium	<0.5	<0.5	NA
PPT-4 (6")	Fluoride	801	170	130
PPT-4 (6")	Hexavalent Chromium	<1	<1	NA
PPT-4 (6")	pH	9.64	9.92	Agree
PT-4 (12")	Antimony	<0.3	0.5	NA
PT-4 (12")	Barium	99	19	136
PT-4 (12")	Beryllium	<1	0.12	NA
PT-4 (12")	Cadmium	0.7	0.19	115
PT-4 (12")	Chromium	18	8.6	71
PT-4 (12")	Cobalt	6.4	2	105

TABLE A-6
Summary of Interlaboratory Splits, Mittelhauser, Phases 1 and 2

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Split Sample Sample Result (mg/kg)	Relative Percent Difference <=30
PT-4 (12")	Copper	<	5.7	NA
PT-4 (12")	Lead	1.8	2.5	33
PT-4 (12")	Molybdenum	<1	0.16	NA
PT-4 (12")	Nickel	17	7.1	82
PT-4 (12")	Silver	<1	<0.2	NA
PT-4 (12")	Thallium	<5	<0.3	NA
PT-4 (12")	Vanadium	27	7.9	109
PT-4 (12")	Zinc	26	11	81
PT-4 (12")	Arsenic	1.84	1.1	50
PT-4 (12")	Mercury	0.023	<0.02	NA
PT-4 (12")	Selenium	<0.5	<0.5	NA
PT-4 (12")	Fluoride	669	190	112
PT-4 (12")	Hexavalent Chromium	<1	<1	NA
PT-4 (12")	pH	9.86	10.18	Agree
WDB-08	Antimony	<0.3	0.3	NA
WDB-08	Arsenic	1.84	1.3	34
WDB-08	Barium	210	78	92
WDB-08	Beryllium	<1	<1	NA
WDB-08	Cadmium	0.5	<0.2	NA
WDB-08	Chromium	30	18	50
WDB-08	Cobalt	8.3	23	94
WDB-08	Copper	3.1	8.1	89
WDB-08	Lead	5.2	4	Agree
WDB-08	Mercury	0.012	0.019	45
WDB-08	Molybdenum	<1	0.11	NA
WDB-08	Nickel	11	6.5	51
WDB-08	Selenium	<0.5	<0.5	NA
WDB-08	Silver	<1	<0.2	NA
WDB-08	Thallium	<5	<0.3	NA
WDB-08	Vanadium	20	8.1	85
WDB-08	Zinc	100	93	Agree
WDB-08	Fluoride	310	130	82
WDB-08	Hexavalent Chromium	<1	<1	NA
WDB-08	pH	10.21	10.35	Agree
CRT-4 (6")	Antimony	<0.3	<1	NA
CRT-4 (6")	Barium	165	56	99
CRT-4 (6")	Beryllium	<1	0.1	NA
CRT-4 (6")	Cadmium	<0.5	0.2	NA
CRT-4 (6")	Chromium	120	43	94
CRT-4 (6")	Cobalt	10	3	108
CRT-4 (6")	Copper	14	8.3	51
CRT-4 (6")	Lead	6	1.9	104
CRT-4 (6")	Molybdenum	<1	<1	NA
CRT-4 (6")	Nickel	19	8.1	80
CRT-4 (6")	Silver	<1	<0.2	NA
CRT-4 (6")	Thallium	<5	<0.3	NA
CRT-4 (6")	Vanadium	25	14	56
CRT-4 (6")	Zinc	96	59	48

TABLE A-6
Summary of Interlaboratory Splits, Mittelhauser, Phases 1 and 2

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Split Sample Sample Result (mg/kg)	Relative Percent Difference <=30
CRT-4 (6")	Arsenic	4.3	1.9	77
CRT-4 (6")	Mercury	<0.002	<0.02	NA
CRT-4 (6")	Selenium	<0.5	<0.5	NA
CRT-4 (6")	Conductivity	170	380	76
CRT-4 (6")	Fluoride	380	650	52
CRT-4 (6")	Hexavalent Chromium	1	<1	NA
CRT-4 (6")	pH	8.42	10.01	Agree
PF-6 (12")	Antimony	<0.3	<1	NA
PF-6 (12")	Barium	80	47	52
PF-6 (12")	Beryllium	<1	0.12	NA
PF-6 (12")	Cadmium	<0.5	0.11	NA
PF-6 (12")	Chromium	22	26	Agree
PF-6 (12")	Cobalt	<3	1.8	NA
PF-6 (12")	Copper	3	6.7	76
PF-6 (12")	Lead	28.5	16	56
PF-6 (12")	Molybdenum	<1	<1	NA
PF-6 (12")	Nickel	8	5.4	39
PF-6 (12")	Silver	<1	<0.2	NA
PF-6 (12")	Thallium	<5	<0.3	NA
PF-6 (12")	Vanadium	8	7.3	Agree
PF-6 (12")	Zinc	51	26	65
PF-6 (12")	Arsenic	1.7	2	Agree
PF-6 (12")	Mercury	<0.002	<0.02	NA
PF-6 (12")	Selenium	<0.5	<0.5	NA
PF-6 (12")	Conductivity	265	980	115
PF-6 (12")	Fluoride	355	380	Agree
PF-6 (12")	Hexavalent Chromium	<1	<1	NA
PF-6 (12")	pH	8.59	8.69	Agree
PH-7 (5')	Antimony	<0.3	<1	NA
PH-7 (5')	Barium	149	79	61
PH-7 (5')	Beryllium	<1	0.2	NA
PH-7 (5')	Cadmium	<0.5	0.19	NA
PH-7 (5')	Chromium	52	27	63
PH-7 (5')	Cobalt	7	3.3	72
PH-7 (5')	Copper	10	11	Agree
PH-7 (5')	Lead	9.6	2.2	125
PH-7 (5')	Molybdenum	<1	<1	NA
PH-7 (5')	Nickel	25	12	70
PH-7 (5')	Silver	<1	<0.2	NA
PH-7 (5')	Thallium	<5	<0.3	NA
PH-7 (5')	Vanadium	23	14	49
PH-7 (5')	Zinc	118	34	111
PH-7 (5')	Arsenic	1.7	1.4	Agree
PH-7 (5')	Mercury	0.034	0.02	52
PH-7 (5')	Selenium	<0.5	<0.5	NA
PH-7 (5')	Conductivity	380	810	72
PH-7 (5')	Fluoride	640	650	Agree
PH-7 (5')	Hexavalent Chromium	<1	<1	NA

TABLE A-6
Summary of Interlaboratory Splits, Mittelhauser, Phases 1 and 2

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Split Sample Sample Result (mg/kg)	Relative Percent Difference <=30
PH-7 (5')	pH	9.6	10.26	Agree

mg/kg = milligram per kilogram
NA = not applicable

Source: Mittelhauser Corporation. 1990a. *Phases 1 and 2 Closure Certification Report Hazardous Waste Management Facilities, Topock Compressor Station, Needles, California* . June.

TABLE A-7
Sample Summary, Closure Activity Report, Oil-Water Separator System, Mittelhauser

Sample Collection Date	Laboratory	Sample Location	8015MS Fuels-Total Hydrocarbons
16-Nov-99	TMA	OWSS-PAD	x
17-Nov-99	TMA	PI-1	x
17-Nov-89	TMA	OWSS	x
17-Nov-89	TMA	PI-1	x
14-Jun-94	Enseco-CRL	TC-13-5	x
	Total		5

x: Analyte analyzed

Source: Mittelhauser, 1990. *Closure Activity Report, Oil Water Separator System, Topock Compressor Station, Needles, California*. July.

TABLE A-8

Sample Summary, Analytical Data Report, Sediment and Sand Samples, Mittelhauser, Phase 3

Sample Collection Date	Laboratory	Sample Location	Sb	Ba	Be	Cd	Cr	Co	Cu	Pb	Mo	Ni	Ag	Tl	V	Zn	As	Hg	Se	F	CrVI	pH
28-Aug-90	Enseco-CRL	B-1-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-1-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-1-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-1-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-1-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	BC	B-1-5D	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-1-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-1-7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-2-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-2-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-2-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-2-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-2-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-2-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	BC	B-2-6D	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-2-7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-2-8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-3-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-3-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-3-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-3-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-3-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-3-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-3-7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-4-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-4-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-4-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-4-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	BC	B-4-4D	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-4-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-4-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	BC	B-4-6D	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-4-7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28-Aug-90	Enseco-CRL	B-4-8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P1-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P1-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P1-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

TABLE A-8

Sample Summary, Analytical Data Report, Sediment and Sand Samples, Mittelhauser, Phase 3

Sample Collection Date	Laboratory	Sample Location	Sb	Ba	Be	Cd	Cr	Co	Cu	Pb	Mo	Ni	Ag	Tl	V	Zn	As	Hg	Se	F	CrVI	pH
17-Apr-90	Enseco	P1-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P1-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P1-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P1-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P1-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P2-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P2-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P2-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P2-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P2-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P2-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P2-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P2-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P2-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P2-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
08-Oct-91	TLI	P2-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P3-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P3-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P3-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P3-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P3-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P3-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P3-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P3-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x'
19-Dec-91	TLI	P3-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P3-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	BC	P4-1D	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P4-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P4-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P4-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P4-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Apr-90	Enseco	P4-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P4-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P4-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

TABLE A-8

Sample Summary, Analytical Data Report, Sediment and Sand Samples, Mittelhauser, Phase 3

Sample Collection Date	Laboratory	Sample Location	Sb	Ba	Be	Cd	Cr	Co	Cu	Pb	Mo	Ni	Ag	Tl	V	Zn	As	Hg	Se	F	CrVI	pH
19-Dec-91	TLI	P4-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P4-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P4-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P4-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P4-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P4-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29-Aug-90	Enseco-CRL	P4-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19-Dec-91	TLI	P4-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
		Total	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104

Notes:

x: Sample analyzed for analyte

Ag: Silver

As: Arsenic

Ba: Barium

Be: Beryllium

Cd: Cadmium

Co: Cobalt

Cr: Chromium

Cu: Copper

F: Fluoride

Hg: Mercury

Mo: Molybdenum

Ni: Nickel

Pb: Lead

Sb: Antimony

Se: Selenium

Tl: Thallium

V: Vanadium

Zn: Zinc

Source: Mittelhauser, 1992. *Analytical Data Report, Sediment and Sand Samples, Phase 3, Evaporation Ponds, Closure of Hazardous Waste Facilities, Revision 1.*

TABLE A-9
Summary of Matrix Spike/Matrix Spike Dupicate Outliers, Mittelhauser Phase 3

Sample Location	Target Analyte	Matrix Spike Percent Recovery	Matrix Spike Duplicate Percent Recovery	Acceptance Criteria
P2-1	Hexavalent Chromium	74	70	80-120
B-1-1	Cadmium	76	73	
B-1-1	Chromium	73	69	
B-1-1	Nickel	73	70	
B-1-1	Lead	74	70	
B-1-1	Antimony	64	67	
B-3-2	Silver	70	69	
B-3-2	Arsenic	71	71	
B-3-2	Cadmium	66	67	
B-3-2	Chromium	73	68	75-125
B-3-2	Cobalt	60	68	
B-3-2	Molybdenum	73	72	
B-3-2	Nickel	68	68	
B-3-2	Lead	64	64	
B-3-2	Antimony	72	67	
B-3-2	Thallium	73	73	
B-3-2	Zinc	70	71	
B-3-6	Arsenic	72	64	

Source: Mittelhauser, 1992. *Analytical Data Report, Sediment and Sand Samples, Phase 3, Evaporation Ponds, Closure of Hazardous Waste Facilities, Revision 1.*

TABLE A-10
Summary of Interlaboratory Split Samples, Mittelhauser, Phase 3

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Split Sample Sample Result (mg/kg)	Relative Percent Difference
P1-6 (0.25')	Antimony	<6	<5	NA
P1-6 (0.25')	Arsenic	2.3	2.61	Agree
P1-6 (0.25')	Barium	22	97.3	126
P1-6 (0.25')	Beryllium	<0.3	<0.5	NA
P1-6 (0.25')	Cadmium	<0.5	<0.5	NA
P1-6 (0.25')	Chrome	190	150	Agree
P1-6 (0.25')	Cobalt	1	<2.5	NA
P1-6 (0.25')	Copper	5	10.3	69
P1-6 (0.25')	Lead	1.5	2.92	64
P1-6 (0.25')	Mercury	<0.1	<0.1	NA
P1-6 (0.25')	Molybdenum	<2	<2.5	NA
P1-6 (0.25')	Nickel	<4	14.5	NA
P1-6 (0.25')	Selenium	<0.5	<0.5	NA
P1-6 (0.25')	Silver	<1	<0.5	NA
P1-6 (0.25')	Thallium	<2.5	<5	NA
P1-6 (0.25')	Vanadium	5.7	11.5	67
P1-6 (0.25')	Zinc	150	136	Agree
P1-6 (0.25')	Fluoride	600	19.2	188
P1-6 (0.25')	Hexavalent Chromium	1.4	<1	NA
P1-6 (0.25')	pH	7.79	7.98	Agree
P1-6 (0.25')	Electical Conductivity	4900	10497	73
P4-2 (0')	Antimony	<6	<5	NA
P4-2 (0')	Arsenic	2.5	3.49	33
P4-2 (0')	Barium	26	115	126
P4-2 (0')	Beryllium	<0.3	<0.5	NA
P4-2 (0')	Cadmium	<0.5	<0.5	NA
P4-2 (0')	Chrome	23	34.8	41
P4-2 (0')	Cobalt	1.6	<2.5	NA
P4-2 (0')	Copper	3.9	5.47	34
P4-2 (0')	Lead	1.1	5.34	132
P4-2 (0')	Mercury	<0.1	<0.1	NA
P4-2 (0')	Molybdenum	11	20	58
P4-2 (0')	Nickel	<4	4.34	NA
P4-2 (0')	Selenium	<0.3	<0.5	NA
P4-2 (0')	Silver	<1	<0.5	NA
P4-2 (0')	Thallium	<2.5	<5	NA
P4-2 (0')	Vanadium	9.6	17	56
P4-2 (0')	Zinc	21	30	35
P4-2 (0')	Fluoride	600	39.7	175
P4-2 (0')	Hexavalent Chromium	<.2	<1	NA
P4-2 (0')	pH	8.31	8.2	Agree
P4-2 (0')	Electical Conductivity	37200	57252	42
B-1	Antimony	<6	<7.0	NA
B-1	Arsenic	36	4.15	159
B-1	Barium	79.8	91.9	Agree
B-1	Beryllium	<0.2	<0.7	NA
B-1	Cadmium	<0.5	<0.7	NA

TABLE A-10
Summary of Interlaboratory Split Samples, Mittelhauser, Phase 3

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Split Sample Sample Result (mg/kg)	Relative Percent Difference
B-1	Chrome	2.4	12.7	136
B-1	Cobalt	2	<3.5	NA
B-1	Copper	4.5	10.3	78
B-1	Lead	<5	3.75	NA
B-1	Mercury	<0.1	<0.15	NA
B-1	Molybdenum	<2	<3.5	NA
B-1	Nickel	<4	38.6	NA
B-1	Selenium	<0.5	<0.7	NA
B-1	Silver	<1	<0.7	NA
B-1	Thallium	<50	<0.7	NA
B-1	Vanadium	6.7	14	71
B-1	Zinc	10.3	19.6	62
B-1	Fluoride	130	127	Agree
B-1	Hexavalent Chromium	<0.2	<1	NA
B-1	pH	9.2	9.37	Agree
B-2	Antimony	<6	<7.0	NA
B-2	Arsenic	1.2	2.23	60
B-2	Barium	58.9	78.2	Agree
B-2	Beryllium	<0.2	<0.7	NA
B-2	Cadmium	<0.5	<0.7	NA
B-2	Chrome	2.1	6.5	102
B-2	Cobalt	1.7	<3.5	NA
B-2	Copper	2.8	8.79	103
B-2	Lead	<5	<3.5	NA
B-2	Mercury	<0.1	<0.15	NA
B-2	Molybdenum	<2	<3.5	NA
B-2	Nickel	<4	5.7	NA
B-2	Selenium	<0.5	<0.7	NA
B-2	Silver	<1	<0.7	NA
B-2	Thallium	<50	<0.7	NA
B-2	Vanadium	6.7	11.4	52
B-2	Zinc	9.7	21.9	77
B-2	Fluoride	87	104	Agree
B-2	Hexavalent Chromium	<0.2	<1	NA
B-2	pH	9.5	8.71	Agree
B-4	Antimony	<6	<7.0	NA
B-4	Arsenic	1.2	2.05	52
B-4	Barium	90.8	95.7	Agree
B-4	Beryllium	<0.2	<0.7	NA
B-4	Cadmium	<0.5	<0.7	NA
B-4	Chrome	8.3	13.6	48
B-4	Cobalt	3.5	3.61	Agree
B-4	Copper	10.1	12.9	Agree
B-4	Lead	<5	<3.5	NA
B-4	Mercury	<0.1	<0.15	NA
B-4	Molybdenum	<2	<3.5	NA
B-4	Nickel	6.5	7.81	Agree

TABLE A-10
Summary of Interlaboratory Split Samples, Mittelhauser, Phase 3

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Split Sample Sample Result (mg/kg)	Relative Percent Difference
B-4	Selenium	<0.5	<0.7	NA
B-4	Silver	<1	<0.7	NA
B-4	Thallium	<50	<0.7	NA
B-4	Vanadium	15.4	36.7	82
B-4	Zinc	22.1	35.7	47
B-4	Fluoride	210	296	34
B-4	Hexavalent Chromium	<0.2	<1	NA
B-4	pH	9.1	8.9	Agree
B-4	Antimony	<6	<7.0	NA
B-4	Arsenic	1.2	2.5	70
B-4	Barium	119	216	58
B-4	Beryllium	<0.2	<0.7	NA
B-4	Cadmium	<0.5	<0.7	NA
B-4	Chrome	4.3	11.7	93
B-4	Cobalt	2.5	<3.5	NA
B-4	Copper	4.5	10.1	77
B-4	Lead	<5	<3.5	NA
B-4	Mercury	<0.1	<0.15	NA
B-4	Molybdenum	<2	<3.5	NA
B-4	Nickel	4.3	5.84	30
B-4	Selenium	<0.5	<0.7	NA
B-4	Silver	<1	<0.7	NA
B-4	Thallium	<50	<0.7	NA
B-4	Vanadium	9.6	25.1	89
B-4	Zinc	14.9	21.3	35
B-4	Fluoride	160	196	Agree
B-4	Hexavalent Chromium	<0.2	<1	NA
B-4	pH	8.9	8.86	Agree
P4-1 (0')	Antimony	<30	<10	NA
P4-1 (0')	Arsenic	9.4	9.3	Agree
P4-1 (0')	Barium	133	10.9	170
P4-1 (0')	Beryllium	<1	<1	NA
P4-1 (0')	Cadmium	<2.5	<1	NA
P4-1 (0')	Chrome	742	356	70
P4-1 (0')	Cobalt	<5	<5	NA
P4-1 (0')	Copper	36.9	29.7	Agree
P4-1 (0')	Lead	<25	<5	NA
P4-1 (0')	Mercury	<0.1	<0.2	NA
P4-1 (0')	Molybdenum	115	112	Agree
P4-1 (0')	Nickel	<20	5.88	NA
P4-1 (0')	Selenium	<0.5	1	NA
P4-1 (0')	Silver	<5	<1	NA
P4-1 (0')	Thallium	<250	<10	NA
P4-1 (0')	Vanadium	31.2	30.9	Agree
P4-1 (0')	Zinc	324	250	Agree
P4-1 (0')	Fluoride	4300	3230	Agree
P4-1 (0')	Hexavalent Chromium	<0.2	<1	NA

TABLE A-10

Summary of Interlaboratory Split Samples, Mittelhauser, Phase 3

Sample Location	Target Analyte	Primary Sample Result (mg/kg)	Split Sample Sample Result (mg/kg)	Relative Percent Difference
P4-1 (0')	pH	7.89	7.89	Agree
P4-1 (1')	Antimony	<6	<7.0	NA
P4-1 (1')	Arsenic	2.1	3.18	41
P4-1 (1')	Barium	101	140	32
P4-1 (1')	Beryllium	<0.2	<0.7	NA
P4-1 (1')	Cadmium	<0.5	<0.7	NA
P4-1 (1')	Chrome	7	15.7	77
P4-1 (1')	Cobalt	2.2	<3.5	NA
P4-1 (1')	Copper	4.6	9.29	68
P4-1 (1')	Lead	<5	<3.5	NA
P4-1 (1')	Mercury	<0.1	<0.15	NA
P4-1 (1')	Molybdenum	4.7	5.96	Agree
P4-1 (1')	Nickel	4.9	6.8	32
P4-1 (1')	Selenium	<0.5	<0.7	NA
P4-1 (1')	Silver	1	<0.7	NA
P4-1 (1')	Thallium	<50	<0.7	NA
P4-1 (1')	Vanadium	13.8	27.4	66
P4-1 (1')	Zinc	16.2	32.4	67
P4-1 (1')	Fluoride	330	402	Agree
P4-1 (1')	Hexavalent Chromium	<0.2	<1	NA
P4-1 (1')	pH	8.9	5.6	46

mg/kg = milligram per kilogram

NA = not applicable

Source: Mittelhauser, 1992. *Analytical Data Report, Sediment and Sand Samples, Phase 3, Evaporation Ponds, Closure of Hazardous Waste Facilities, Revision 1.*

TABLE A-11

Sample Summary, Report, Site Investigation, Environmental Profiles

Sample Collection Date	Laboratory	Sample Location	Aroclors	TRPH
21-Jul-93	SCS Analytical Lab	64/24	x	x
21-Jul-93	SCS Analytical Lab	64/10	x	x
21-Jul-93	SCS Analytical Lab	63/12	x	x
21-Jul-93	SCS Analytical Lab	62/20	x	x
21-Jul-93	SCS Analytical Lab	61/12	x	x
21-Jul-93	SCS Analytical Lab	20/24	x	x
21-Jul-93	SCS Analytical Lab	19/24	x	x
21-Jul-93	SCS Analytical Lab	18/16	x	x
21-Jul-93	SCS Analytical Lab	17/20	x	x
21-Jul-93	SCS Analytical Lab	16/18	x	x
21-Jul-93	SCS Analytical Lab	15/18	x	x
21-Jul-93	SCS Analytical Lab	14/18	x	x
21-Jul-93	SCS Analytical Lab	6/12	x	x
21-Jul-93	SCS Analytical Lab	1/20	x	x
21-Jul-93	SCS Analytical Lab	3/20	--	x
21-Jul-93	SCS Analytical Lab	13/18	x	x
21-Jul-93	SCS Analytical Lab	5/28	--	x
21-Jul-93	SCS Analytical Lab	2/12	x	x
21-Jul-93	SCS Analytical Lab	7/18	--	x
21-Jul-93	SCS Analytical Lab	8/18	--	x
21-Jul-93	SCS Analytical Lab	9/18	x	x
21-Jul-93	SCS Analytical Lab	10/12	--	x
21-Jul-93	SCS Analytical Lab	11/30	x	x
21-Jul-93	SCS Analytical Lab	12/18	x	x
21-Jul-93	SCS Analytical Lab	4/16	--	x
		Total	19	25

Notes:
x: Analyte analyzed
--: Analyte not analyzed
TRPH: Total Recoverable Petroleum Hydrocarbons

Source: Environmental Profiles. 1993. *Report, Site Investigation, Project 62793, PG&E Compressor Facility*. September.

TABLE A-12

Summary of Surrogate Recoveries, Environmental Profiles

Laboratory Identification	Sample Identification	TCMX (percent recovery)	DBC (percent recovery)
0549-0	1/20	58	104
0549-0	1/20	59	64
0549-1	2/12	58	53
0549-1	2/12	51	0
0549-2	3/20	67	0
0549-3	4/16	60	0
0549-4	5/28	56	125
0549-5	6/12	60	1
0549-5	6/12	53	0
0549-6	7/18	62	0
0549-7	8/18	45	0
0549-8	9/18	52	0
0549-8	9/18	44	0
0549-9	10/12	45	0
0549-10	11/30	45	0
		Acceptance Criteria	25-143

TCMX = Tetrachloro-meta-xylene

DBC = Dibutylchlorendate

Source: Environmental Profiles. 1993. *Report, Site Investigation, Project 62793, PG&E Compressor Facility*. September.

TABLE A-13
Sample Summary, Evaporation Pond Closure Report, Allwaste

Sample Date	Laboratory	SampleLocation	CAM 17 Metals	CrVI	F	pH	EC	TRPH	PCB	VOCs	SVOCs
14-Oct-93	TWINING	P1-1	x	x	x	x	x	--	--	--	--
14-Oct-93	TWINING	P1-1	x	x	x	x	x	--	--	--	--
14-Oct-93	TWINING	P1-1	x	x	x	x	x	--	--	--	--
14-Oct-93	TWINING	P1-2	x	x	x	x	x	--	--	--	--
14-Oct-93	TWINING	P1-2	x	x	x	x	x	--	--	--	--
14-Oct-93	TWINING	P1-2	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-3	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-3	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-3	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-4	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-4	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-4	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-5	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-5	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-6	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-6	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-6	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-7	x	x	x	x	x	--	--	--	--
15-Oct-93	TWINING	P1-7	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-1	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-1	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-1	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-2	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-2	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-2	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-3	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-3	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-3	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-4	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-4	x	x	x	x	x	--	--	--	--
12-Oct-93	TWINING	P2-4	x	x	x	x	x	--	--	--	--
13-Oct-93	TWINING	P2-5	x	x	x	x	x	--	--	--	--
13-Oct-93	TWINING	P2-5	x	x	x	x	x	--	--	--	--
13-Oct-93	TWINING	P2-5	x	x	x	x	x	--	--	--	--
13-Oct-93	TWINING	P2-6	x	x	x	x	x	--	--	--	--
13-Oct-93	TWINING	P2-6	x	x	x	x	x	--	--	--	--
13-Oct-93	TWINING	P2-7	x	x	x	x	x	--	--	--	--
13-Oct-93	TWINING	P2-7	x	x	x	x	x	--	--	--	--

TABLE A-13
Sample Summary, Evaporation Pond Closure Report, Allwaste

Sample Date	Laboratory	SampleLocation	CAM 17 Metals	CrVI	F	pH	EC	TRPH	PCB	VOCs	SVOCs
13-Oct-93	TWINING	P2-7	x	x	x	x	x	--	--	--	--
27-Sep-93	TWINING	P2-OIL	--	--	--	--	--	x	x	x	x
18-Oct-93	TWINING	P3-1	x	x	x	x	x	--	--	--	--
18-Oct-93	TWINING	P3-1	x	x	x	x	x	--	--	--	--
18-Oct-93	TWINING	P3-2	x	x	x	x	x	--	--	--	--
18-Oct-93	TWINING	P3-2	x	x	x	x	x	--	--	--	--
18-Oct-93	TWINING	P3-3	x	x	x	x	x	--	--	--	--
18-Oct-93	TWINING	P3-3	x	x	x	x	x	--	--	--	--
18-Oct-93	TWINING	P3-3	x	x	x	x	x	--	--	--	--
19-Oct-93	TWINING	P3-4	x	x	x	x	x	--	--	--	--
19-Oct-93	TWINING	P3-4	x	x	x	x	x	--	--	--	--
19-Oct-93	TWINING	P3-4	x	x	x	x	x	--	--	--	--
19-Oct-93	TWINING	P3-5	x	x	x	x	x	--	--	--	--
19-Oct-93	TWINING	P3-5	x	x	x	x	x	--	--	--	--
19-Oct-93	TWINING	P3-5	x	x	x	x	x	--	--	--	--
20-Oct-93	TWINING	P4-1	x	x	x	x	x	--	--	--	--
20-Oct-93	TWINING	P4-1	x	x	x	x	x	--	--	--	--
20-Oct-93	TWINING	P4-2	x	x	x	x	x	--	--	--	--
20-Oct-93	TWINING	P4-2	x	x	x	x	x	--	--	--	--
27-Sep-93	TWINING	P4-3	--	--	--	--	--	--	--	--	--
20-Oct-93	TWINING	P4-3	x	x	x	x	x	--	--	--	--
20-Oct-93	TWINING	P4-3	x	x	x	x	x	--	--	--	--
27-Sep-93	TWINING	P4-4	--	--	--	--	--	--	--	--	--
20-Oct-93	TWINING	P4-4	x	x	x	x	x	--	--	--	--
20-Oct-93	TWINING	P4-4	x	x	x	x	x	--	--	--	--
20-Oct-93	TWINING	P4-4	x	x	x	x	x	--	--	--	--
21-Oct-93	TWINING	P4-5	x	x	x	x	x	--	--	--	--
21-Oct-93	TWINING	P4-5	x	x	x	x	x	--	--	--	--
21-Oct-93	TWINING	P4-5	x	x	x	x	x	--	--	--	--
27-Sep-93	TWINING	P4-6	--	--	--	--	--	--	--	--	--
21-Oct-93	TWINING	P4-6	x	x	x	x	x	--	--	--	--
21-Oct-93	TWINING	P4-6	x	x	x	x	x	--	--	--	--
		Total	88	88	88	88	88	1	1	1	1

Notes:
x: Analyte analyzed
--: Analyte not analyzed

Source: Allwaste Transportation and Disposal for Trident Environmental. 1993. *Evaporation Pond Closure Report, Pacific Gas and Electric Company, Topock Gas Compressor Station*. December.

TABLE A-13

Sample Summary, Evaporation Pond Closure Report, Allwaste

Sample Date	Laboratory	SampleLocation	CAM 17 Metals	CrVI	F	pH	EC	TRPH	PCB	VOCs	SVOCs

CAM 17 Metals: California Assessment Manual analyte list.
CrVI: Hexavalent chromium
F: Fluoride
EC: electrical conductivity
TRPH: total recoverable petroleum hydrocarbons
PCB: polychlorinated biphenyls
VOCs: volatile organic compounds
SVOCs: semivolatile organic compounds

TABLE A-14
Summary of Interlabotatory Splits, Allwaste

Sample Location	Analyte	Primary Results (mg/kg)	Split Sample Results (mg/kg)	RPD
P1-5/2.0-2.5, P1-5/2.5-3.0	Selenium	NR	<5	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Arsenic	2.4	2	Agree
P1-5/2.0-2.5, P1-5/2.5-3.0	Barium	88	52	51
P1-5/2.0-2.5, P1-5/2.5-3.0	Beryllium	0.1	<0.5	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Cadmium	<1	<0.5	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Chrome	29	12	83
P1-5/2.0-2.5, P1-5/2.5-3.0	Cobalt	<5	5	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Copper	<5	5	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Lead	7	<5	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Mercury	<1	<0.05	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Molybdenum	NR	<5	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Nickel	7	7	Agree
P1-5/2.0-2.5, P1-5/2.5-3.0	Selenium	<0.3	<1	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Silver	<1	<5	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Thallium	<0.5	<5	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Vanadium	15	22	38
P1-5/2.0-2.5, P1-5/2.5-3.0	Zinc	21	22	Agree
P1-5/2.0-2.5, P1-5/2.5-3.0	Hexavalent Chromium	<0.1	<0.1	NA
P1-5/2.0-2.5, P1-5/2.5-3.0	Fluoride	4.3	110	185
P1-7/0-0.5, P1-7/0.5-1.0	Selenium	NR	<5	NA
P1-7/0-0.5, P1-7/0.5-1.0	Arsenic	3.3	3	Agree
P1-7/0-0.5, P1-7/0.5-1.0	Barium	220	210	Agree
P1-7/0-0.5, P1-7/0.5-1.0	Beryllium	0.1	<0.5	NA
P1-7/0-0.5, P1-7/0.5-1.0	Cadmium	<1	<0.5	NA
P1-7/0-0.5, P1-7/0.5-1.0	Chrome	10	11	Agree
P1-7/0-0.5, P1-7/0.5-1.0	Cobalt	<5	5	NA
P1-7/0-0.5, P1-7/0.5-1.0	Copper	<5	7	NA
P1-7/0-0.5, P1-7/0.5-1.0	Lead	7	<5	NA
P1-7/0-0.5, P1-7/0.5-1.0	Mercury	<0.1	<0.05	NA
P1-7/0-0.5, P1-7/0.5-1.0	Molybdenum	NR	<5	NA
P1-7/0-0.5, P1-7/0.5-1.0	Nickel	7	7	Agree
P1-7/0-0.5, P1-7/0.5-1.0	Selenium	0.3	<0.1	NA
P1-7/0-0.5, P1-7/0.5-1.0	Silver	<1	<0.5	NA
P1-7/0-0.5, P1-7/0.5-1.0	Thallium	<0.5	<0.5	NA
P1-7/0-0.5, P1-7/0.5-1.0	Vanadium	14	23	49
P1-7/0-0.5, P1-7/0.5-1.0	Zinc	21	27	Agree
P1-7/0-0.5, P1-7/0.5-1.0	Hexavalent Chromium	<0.1	<0.1	NA
P1-7/0-0.5, P1-7/0.5-1.0	Fluoride	1.7	80	192
P2-6/2.0-2.5, P2-6/2.5-3.0	Selenium	NR	<5	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Arsenic	3.3	<1	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Barium	130	100	Agree
P2-6/2.0-2.5, P2-6/2.5-3.0	Beryllium	<0.1	<0.5	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Cadmium	<1	<0.5	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Chrome	22	15	38
P2-6/2.0-2.5, P2-6/2.5-3.0	Cobalt	6	9	40
P2-6/2.0-2.5, P2-6/2.5-3.0	Copper	<5	19	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Lead	5	<5	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Mercury	<0.1	<0.05	NA

TABLE A-14
Summary of Interlabotatory Splits, Allwaste

Sample Location	Analyte	Primary Results (mg/kg)	Split Sample Results (mg/kg)	RPD
P2-6/2.0-2.5, P2-6/2.5-3.0	Molybdenum	NR	<5	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Nickel	10	8	Agree
P2-6/2.0-2.5, P2-6/2.5-3.0	Selenium	0.4	<01	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Silver	<1	<5	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Thallium	<0.5	<5	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Vanadium	22	27	Agree
P2-6/2.0-2.5, P2-6/2.5-3.0	Zinc	35	36	Agree
P2-6/2.0-2.5, P2-6/2.5-3.0	Hexavalent Chromium	<0.1	<0.1	NA
P2-6/2.0-2.5, P2-6/2.5-3.0	Fluoride	1.4	110	195
P3-1, 0-0.5, P3-1, 0.5-1.0	Selenium	NR	<5	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Arsenic	2.9	2	37
P3-1, 0-0.5, P3-1, 0.5-1.0	Barium	92	84	Agree
P3-1, 0-0.5, P3-1, 0.5-1.0	Beryllium	<0.1	<0.5	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Cadmium	<1	<0.5	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Chrome	11	11	Agree
P3-1, 0-0.5, P3-1, 0.5-1.0	Cobalt	<5	<5	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Copper	6	5	Agree
P3-1, 0-0.5, P3-1, 0.5-1.0	Lead	9	<5	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Mercury	<0.1	<0.05	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Molybdenum	NR	<5	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Nickel	6	6	Agree
P3-1, 0-0.5, P3-1, 0.5-1.0	Selenium	1.3	<1	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Silver	<1	<5	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Thallium	<0.5	<5	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Vanadium	19	23	Agree
P3-1, 0-0.5, P3-1, 0.5-1.0	Zinc	19	21	Agree
P3-1, 0-0.5, P3-1, 0.5-1.0	Hexavalent Chromium	<0.1	<0.1	NA
P3-1, 0-0.5, P3-1, 0.5-1.0	Fluoride	1.4	80	193
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Selenium	NR	<5	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Arsenic	1.9	<1	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Barium	93	80	Agree
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Beryllium	<0.1	<0.5	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Cadmium	<1	<0.5	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Chrome	25	17	38
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Cobalt	7	8	Agree
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Copper	10	8	Agree
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Lead	9	<5	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Mercury	<0.1	<0.05	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Molybdenum	NR	<5	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Nickel	10	10	Agree
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Selenium	0.5	<1	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Silver	<1	<5	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Thallium	<0.5	<5	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Vanadium	34	37	Agree
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Zinc	39	35	Agree
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Hexavalent Chromium	<0.1	<0.1	NA
P3-2, 2.0-2.5, P3-2, 2.5-3.0	Fluoride	1.6	80	192

mg/kg = milligram per kilogram

TABLE A-14

Summary of Interlabotatory Splits, Allwaste

Sample Location	Analyte	Primary Results (mg/kg)	Split Sample Results (mg/kg)	RPD

NA = not applicable

NR = not reported

RPD = Relative Percent Difference

Source: Allwaste Transportation and Disposal for Trident Environmental. 1993. *Evaporation Pond Closure Report, Pacific Gas and Electric Company, Topock Gas Compressor Station* . December.

TABLE A-15
Sample Summary Soil Investigation Report, Alisto

Sample Collection Date	Laboratory	Sample Location	Modified Luft 8015	Lead
14-Jun-94	APCL	TC-10-3	x	--
14-Jun-94	APCL	TC-1-1	x	x
14-Jun-94	APCL	TC-11-5	x	--
14-Jun-94	APCL	TC-12-25	x	x
14-Jun-94	APCL	TC-13-5	x	x
14-Jun-94	APCL	TC-14-5	x	x
14-Jun-94	APCL	TC-15-4.5	x	x
14-Jun-94	APCL	TC-16-2.5	x	--
14-Jun-94	APCL	TC-17-2.5	x	x
14-Jun-94	APCL	TC-17-8	x	--
14-Jun-94	APCL	TC-18-2.5	x	x
14-Jun-94	APCL	TC-18-7.5	x	--
14-Jun-94	APCL	TC-19-13	x	--
14-Jun-94	APCL	TC-19-3	x	x
14-Jun-94	APCL	TC-20-2.5	x	--
14-Jun-94	APCL	TC-21-10	x	--
14-Jun-94	APCL	TC-21-2.5	x	x
14-Jun-94	APCL	TC-21-5	x	--
14-Jun-94	APCL	TC-22-4.5	x	x
14-Jun-94	APCL	TC-2-3	x	x
14-Jun-94	APCL	TC-23-5	x	x
14-Jun-94	APCL	TC-24-2.5	x	x
14-Jun-94	APCL	TC-25-9.5	x	--
14-Jun-94	APCL	TC-26-2.5	x	--
14-Jun-94	APCL	TC-3-2.5	x	x
14-Jun-94	APCL	TC-4-0	x	x
14-Jun-94	APCL	TC-4-3	x	--
14-Jun-94	APCL	TC-5-2.5	x	--
14-Jun-94	APCL	TC-6-2.5	x	x
14-Jun-94	APCL	TC-6-6.5	x	--
14-Jun-94	APCL	TC-7-2.5	x	x
14-Jun-94	APCL	TC-7-8	x	--
14-Jun-94	APCL	TC-8-3.5	x	--
14-Jun-94	APCL	TC-9-2.5	x	x
13-Jun-94	APCL	TG-1-0	x	x
13-Jun-94	APCL	TG-10-2	x	--
13-Jun-94	APCL	TG-11-2	x	x
13-Jun-94	APCL	TG-12-0.5	x	--
13-Jun-94	APCL	TG-13-1.5	x	x
13-Jun-94	APCL	TG-14-2	x	x
13-Jun-94	APCL	TG-15-3	x	x
13-Jun-94	APCL	TG-17-1.5	x	--
13-Jun-94	APCL	TG-18-3	x	--
13-Jun-94	APCL	TG-2-0	x	--
13-Jun-94	APCL	TG-3-0	x	--
13-Jun-94	APCL	TG-3-2	x	--
13-Jun-94	APCL	TG-4-0	x	x
13-Jun-94	APCL	TG-5-2.5	x	--
13-Jun-94	APCL	TG-6-2.5	x	x
13-Jun-94	APCL	TG-7-1	x	--
13-Jun-94	APCL	TG-8-2	x	--
13-Jun-94	APCL	TG-9-2.5	x	x
		Total	**52**	**26**

LUFT: Leaking Underground Fuel Tank
x: Analyte analyzed
--: Analyte not analyzed

Source: Alisto Engineering Group, Soil Investigation Report, Pacific Gas and Electric Company, Topock Gas Compressor Station, August 1994

TABLE A-16
Sample Summary, Scrubber Oil Sump Closure Certification Report, Trident

Sample Collection Date	Laboratory	Sample Location	TRPH
05-Jun-96	BC Laboratories	SW_bottom_JUN96	x
21-May-96	BC Laboratories	SW_bottom	x
05-Jun-96	BC Laboratories	SE_bottom_JUN96	x
21-May-96	BC Laboratories	SE_bottom	x
05-Jun-96	BC Laboratories	NW_bottom_JUN96	x
21-May-96	BC Laboratories	NW_bottom	x
05-Sep-96	BC Laboratories	NE_bottom_JUN96	x
5/21/0996	BC Laboratories	NE_bottom	x
24-Jul-96	BC Laboratories	SS-NW-10	x
24-Jul-96	BC Laboratories	SS-N-10.4	x
24-Jul-96	BC Laboratories	SS-NE-10	x
24-Jul-96	BC Laboratories	SS-NE-10.5	x
24-Jul-96	BC Laboratories	SS-SE-10.5	x
24-Jul-96	BC Laboratories	SS-SE-10.8	x
24-Jul-96	BC Laboratories	SS-S-11	x
24-Jul-96	BC Laboratories	SS-SW-COMP	x
		Total	16

x: Analyte analyzed
TRPH: Total Recoverable Petroleum Hydrocarbons

Source: Trident Environmental and Engineering. 1996. *Scrubber Oil Sump Closure Certification Report, PG&E Topock Gas Compressor Station.* August.

Sample Location	Cr(VI)	Cr(T)	Cu	Ni	Zn	pH	Eh	CEC	P	Ba	Pb	Mn	Mn (x)	Mo	V	S-	SO4
SSB-1-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-1-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-1-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-1-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
SSB-2-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-2-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-2-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-2-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
SSB-3-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-3-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-3-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-3-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
SSB-4-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-4-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-4-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-4-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
SSB-5-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-5-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-5-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-5-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
SSB-6-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-6-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-6-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-6-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
SSB-7-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-7-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-7-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-7-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
SSB-8-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-8-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-8-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-8-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
SSB-8-10CL	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-9-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-9-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-9-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
SSB-9-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
XMW-9-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
XMW-9-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
XMW-9-10CL	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
XMW-9-30	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
XMW-9-50	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
XMW-9-70	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Total	43	43	43	43	43	43	13	2	13	13	13	13	13	13	13	13	13
s																	
MW-9-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-9-3.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-9-3.5CL	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-9-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-9-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
MW-9-20	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-9-30	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
MW-9-40	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-9-50	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
MW-9-60	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-9-70	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--

Sample Location	Cr(VI)	Cr(T)	Cu	Ni	Zn	pH	Eh	CEC	P	Ba	Pb	Mn	Mn (x)	Mo	V	S-	SO4
MW-9-87	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-9-87CL	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-10-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-10-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-10-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-10-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
MW-10-20	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-10-25	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-10-30	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-10-35	--	--	--	--	--	--	x	--	x	x	x	x	x	x	x	x	x
MW-10-40	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-10-50	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-10-60	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-10-70	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
MW-10-75	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-10-75CL	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-10-82	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-11-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-11-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-11-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-11-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
MW-11-20	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-11-30	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
MW-11-40	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-11-50	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-11-60	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-11-60CL	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-11-69	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-12-15	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-12-20	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-12-24	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-12-35	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-13-10	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-13-20	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-13-25	--	--	--	--	--	--	x	x	x	x	x	x	x	x	x	x	x
MW-13-30	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-13-40	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-13-40CL	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-14-30	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-14-60	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-14-90	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-15-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-15-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-15-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-15-10	x	x	x	x	x	x	x	--	x	x	x	x	x	x	x	x	x
MW-15-70	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-15-100	x	x	x	x	x	x	--	x	--	--	--	--	--	--	--	--	--
MW-15-140	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-15-200	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-16-207	x	x	x	x	x	x	x	--	--	--	--	--	x	--	--	x	--
MW-17-139	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	x
MW-17-CL	x	x	x	x	x	x	x	x	x	x	x	x	--	x	x	x	x
MW-18-100	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-19-61	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-20/70-62	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-20/130-61.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-20/130-61.5CL	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--

Sample Location	Cr(VI)	Cr(T)	Cu	Ni	Zn	pH	Eh	CEC	P	Ba	Pb	Mn	Mn (x)	Mo	V	S-	SO4
MW-20/130-71.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-20/130-81.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-20/130-91.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-20/130-101.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-20/130-111.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-20/130-121.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-20/130-131.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-20/130-131.5CL	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
MW-21-51	x	x	x	x	x	x	x	--	--	--	--	x	--	--	--	x	--
MW-22-4	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-23-Comp	x	x	x	x	x	x	x	--	--	--	--	x	--	--	--	x	--
MW-24A-30	x	x	x	x	x	x	x	--	x	x	x	x	--	x	x	x	x
MW-24A-60	x	x	x	x	x	x	x	--	x	x	x	x	--	x	x	x	x
MW-24A-90	x	x	x	x	x	x	x	--	x	x	x	x	--	x	x	x	x
MW-24A-124	x	x	x	x	x	x	x	--	x	x	x	x	--	x	x	x	x
MW-24B-200**	x	x	x	x	x	x	x	--	x	x	x	x	--	x	x	x	x
MW-24B-CI	x	x	x	x	x	x	x	--	x	x	x	x	--	x	x	x	x
MW-24BR-390grab	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-24BR-430grab	x	x	x	x	x	x	x	--	--	--	--	--	x	--	--	--	--
MW-25-20	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-25-40	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-25-60	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-25-80	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-25-96	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-26-59	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-27-10	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-28-15	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-28-15CL	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-29-32	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-30-25	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
MW-31-42.5	x	x	x	x	x	x	x	--	--	--	--	x	x	--	--	x	--
B-25 Comp	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
Total	98	98	98	98	98	98	47	21	26	26	26	45	37	26	26	46	26
g																	
JP-1-S	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-1-3	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-1-4.5	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-2-S	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-2-3	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-3-S	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-4-S	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-5-S	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-6-S	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-7-S	x	x	--	--	x	--	--	--	--	--	x	x	--	--	--	--	--
JP-8-S	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
JP-8-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
JP-9-S	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
JP-9-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
JP-10-S	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
JP-10-2	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
JP-10-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
Total	17	17	7	7	17	7	0	0	0	0	10	10	0	0	0	0	0
PS-1-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-1-1	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-2-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--

Sample Location	Cr(VI)	Cr(T)	Cu	Ni	Zn	pH	Eh	CEC	P	Ba	Pb	Mn	Mn (x)	Mo	V	S-	SO4
PS-2-3	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-3-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-3-3	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-4-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-5-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-6-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-7-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
Total	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0
PS-8-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-8-3	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-9-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-10-0	x	x	x	x	x	--	--	--	--	--	--	x	--	--	--	--	x
PS-11-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-12-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
Total	6	6	6	6	6	0	0	0	0	0	0	1	0	0	0	0	1
PS-13-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-13-3	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-14-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-15-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-16-0	x	x	x	x	x	--	--	--	--	--	--	x	--	--	--	--	x
Total	5	5	5	5	5	0	0	0	0	0	0	1	0	0	0	0	1
PS-17-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-17-3	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-18-0	x	x	x	x	x	--	--	--	--	--	--	x	--	--	--	--	x
PS-19-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-20-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
Total	5	5	5	5	5	0	0	0	0	0	0	1	0	0	0	0	1
PS-21-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-21-2	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
PS-22-0	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
Total	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0
BG-1	x	x	x	x	x	--	--	--	--	--	--	x	--	--	--	--	x
BG-2	x	x	x	x	x	--	--	--	--	--	--	x	--	--	--	--	x
BG-3	x	x	x	x	x	--	--	--	--	--	--	x	--	--	--	--	x
Total	3	3	3	3	3	0	0	0	0	0	0	3	0	0	0	0	3
DR-1-S	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-1-D	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-2-S	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-3-S	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-3-D	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-4-S	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-5-S	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-5-D	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-6-S	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-6-D	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-7-S	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
DR-7-D	x	x	x	x	x	--	--	--	--	x	x	--	--	x	x	--	--
Total	12	12	12	12	12	0	0	0	0	12	12	0	0	12	12	0	0
WP-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-2A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--

Sample Location	Cr(VI)	Cr(T)	Cu	Ni	Zn	pH	Eh	CEC	P	Ba	Pb	Mn	Mn (x)	Mo	V	S-	SO4
WP-3-.5A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-3-2A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-4A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-5-0A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-5-1A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-5-2A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-5-3A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-5-4A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-6-0A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-6-1A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-6-2A	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
T-1-BK	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
T-1-S	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
T-2-BK	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
T-2-S	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
T-3-B	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
P-1-B	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
P-1-W	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
P-2-WP	x	x	x	x	x	x	--	--	--	--	--	X	--	--	--	--	X
P-2-B	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
Bank -WP	x	x	x	x	x	x	--	--	--	--	--	X	--	--	--	--	X
Bank - b	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
WP-Bank1	x	x	x	x	x	x	--	--	--	--	--	X	--	--	--	--	X
WP-Bank2	x	x	x	x	x	x	--	--	--	--	--	X	--	--	--	--	X
WP-Floor	x	x	x	x	x	x	--	--	--	--	--	X	--	--	--	--	X
Bin-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
Total	**28**	**28**	**28**	**28**	**28**	**28**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**5**
GS-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
GS-2	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S1-20-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	X
S2-6-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S2-6-5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S2-62-2	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S2-62-3	--	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
S2-62-4	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S2-130-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S3-15-2	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S3-15-4	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S3-72-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S3-72-2	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S3-120-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S4-4-4	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	X
S4-4-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S4-55-5	--	x	--	--	x	--	--	--	--	--	--	--	--	--	--	--	--
S4-95-2	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S4-95-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S4-160-2	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
S8-23-3	--	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--
S8-30-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-2	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-4	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-7	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--

Sample Location	Cr(VI)	Cr(T)	Cu	Ni	Zn	pH	Eh	CEC	P	Ba	Pb	Mn	Mn (x)	Mo	V	S-	SO4
RR-8	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-9	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-10	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-11	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
RR-12	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--
Total	31	34	33	33	34	31	0	0	0	0	0	0	0	0	0	0	2

e, based on E&E RFI Report

RCRA Facility Investigation Report, Bat Cave Wash Area, Pacific Gas and Electric Company, Topock Compressor Station. February.

ple	Cr(T)	Cr(VI)	Cu	Ni	Zn	pH	Sb	As	Ba	Be	Cd	Co	Pb	Hg	Mo	Se	Ag	Tl	V	F
1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	--
-1	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-2	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
9	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
10	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
11	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
27	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	x
-10	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-20	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	x
-10	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	x
-3	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	x
20	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
30	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	x
	27	27	27	27	27	27	10	10	10	10	10	10	10	10	10	10	10	10	10	
.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
.5	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9	x	x	x	x	x	x	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ole	Cr(T)	Cr(VI)	Cu	Ni	Zn	pH	Sb	As	Ba	Be	Cd	Co	Pb	Hg	Mo	Se	Ag	Tl	V	F

A Facility Investigation Report, Bat Cave Wash Area, Pacific Gas and Electric Company, Topock Compressor Station. February.

Attachment B
Data Review Process and Results

APPENDIX A
Data Review Process and Results
Topock RFI

1. DATA REVIEW PROCESS

1.1 Basis For Review

The analytical data generated for the Topock RFI was reviewed to ensure accuracy, high quality, and sufficient data usability to support the findings and conclusions. The purpose of the data review was to verify that the quality control indicators met the requirements specified in the following documents:

- RFI Work Plan (Alisto 1997a)
- Subcontract statement of work (SOW) prepared by Alisto (Alisto 1997b) and Ecology and Environment, Inc. (E & E 1998)
- Applied P&Ch Laboratory (APCL's) quality assurance program plan (QAPP) (Alisto 1997a)
- APCL's standard operating procedures (SOPs)

A summary of the quality control (QC) criteria is provided in Tables A-1 (soils), A-2 (water), and A-3 (QC parameters). Corrective actions were documented in Data Concern and Resolution Forms prepared by E & E. The data were reviewed and evaluated for overall precision, accuracy, representativeness, completeness, and comparability. Different levels of review were conducted based on the test performed for constituents of concern (COCs) or other contaminants. The levels and types of reviews that were performed are the following:

- For all the COCs, 100 percent of the raw data packages were reviewed in depth and the results were validated based on criteria defined in the above documents and on the reviewer□s professional judgment.

- For the other parameters, 10 percent of the sample data packages were reviewed for obvious discrepancies and compliance with QC criteria, to identify obvious analytical problems.

1.2 Quality Control Measures

An abbreviated review of the data packages (i.e., 10 percent of the samples) was performed for the other parameters. The following QC measures and checks were reviewed to perform the in-depth data validation of the COCs:

- Chain-of-custody tracking and completeness
- Sample integrity and preservation
- Sample holding time
- RFI Laboratory QC Summary Forms, Part 1 and 2
- Data package completeness
- All calculations verified and checked
- Analytical method SOP compliance
- Instrument calibration (initial and continuing)
- Laboratory control standards (internal and external standards)
- Blank sample assessment
- Spike sample assessment
- Field and laboratory duplicate assessment
- Practical quantitation limits (PQLs) and units
- Annual method detection limits (MDL); i.e., contract required detection limits
- QC check frequency
- Internal peer review and management approvals
- Evaluate and assess laboratory problems documented in the Case Narrative

1.3 Data Review Results and Conclusions

Overall, the data reported in this RFI are of acceptable quality and the completeness objectives have been accomplished. Data that did not meet all of the established QC criteria were annotated with the qualifier, "J—Estimated." Such qualified data may underestimate the actual

nvironmental concentration (i.e., a negative bias). When the concentrations were below the PQL but greater than the MDL, the data are of unknown quality and have greater uncertainty than non-notated data. The data may be qualified because of the following analytical uncertainties:

- The precision and accuracy limits did not meet the lower limit due to matrix interferences
- The result was below the PQL, but greater than the MDL
- The analysis exceeded the sample holding time

n summary, data that did not meet every QC criteria were qualified with a "J—Estimated" designation. These data are considered useable, but uncertain, especially at very low oncentrations.

2. QUALITY CONTROL RESULTS

2.1 Data Quality Measurement Requirements

Table A-3 presents the QC criteria and frequency of testing for precision, accuracy, representativeness, completeness, and comparability. Field and laboratory QC check samples were analyzed with the environmental samples to monitor the overall quality of data generated. Laboratory QA/QC results were tabulated in each data package, which is archived in the project file. All laboratory QC measurements were within the limits listed in Table A-3, except for those samples qualified as "J—Estimated," discussed above.

2.2 Field Duplicate QC Sample Results

The groundwater field duplicate samples collected for the COCs between 1997 to 1999 are plotted in Figures A-1 and A-1b for total chromium and hexavalent chromium (Table A-4 lists the duplicates for all parameters). Two out of 33 samples exceeded the precision limit of 25 relative percent difference (RPD) for total chromium (see Figure A-1a), and 3 out of 33 exceeded the RPD limit for hexavalent chromium (see Figure A-1b). Field precision and reproducibility are acceptable to support the data in this RFI report. All field duplicate samples for surface waters were within the limits; all concentrations were non-detected for the COCs.

3. PERFORMANCE AND SYSTEM AUDITS

Overview

To monitor and evaluate the performance of field and laboratory personnel conducting sampling and testing activities, both performance and system audits were performed during this investigation. The objectives of these audits were to monitor compliance with the QA/QC field and laboratory procedures and implement corrective actions, if necessary, and to ensure that procedures comply with the objectives of the project QA plan. Field audits of Alisto field procedures were performed by the Department of Toxic Substances Control (DTSC) and E & E. Field split samples were collected several times and analyzed by DTSC and by a secondary laboratory to monitor the quality of primary lab (APCL) data. Laboratory audits of APCL were also performed to ensure compliance with the QAPP for this project. Intra-laboratory comparisons of APCL and the secondary laboratory were also performed to monitor the overall quality of APCL data by analyzing performance evaluation standards.

3.1 Laboratory Audit Results

The primary laboratory, APCL, was audited by Alisto on November 6, 1996. The audit results indicated that APCL was complying with their internal SOPs and QAPP. The SOW (Alisto 1997b) for APCL, which specified the analytical QC and reporting requirements, was implemented. A supplemental SOW (E & E 1998) for APCL was implemented to continue the contracting services for soil and water sample analysis for the RFI.

3.2 Intra-Laboratory Comparisons and Split Sample Results

A secondary laboratory, American Environmental Network (AEN), was directed to perform an intra-laboratory comparison of 20 known standards and field split samples for the COCs in July 1997. The results were within acceptable levels for hexavalent chromium, as shown in Figure A-2, and for total chromium, as shown in Figure A-3 (Table A-5 summarizes the results for all the COCs). The average RPD for hexavalent chromium and total chromium was less than 10 percent for all standards and field split samples.

The DTSC also performed an independent check of groundwater samples that were split with APCL; the results were within acceptable levels. Additionally, the DTSC performed a study of holding times for hexavalent chromium in water to determine if there was a significant change in concentration after the 24-hour holding time requirement specified by the U.S. Environmental Protection Agency (EPA). The results indicated that the concentration of hexavalent chromium from the study area did not change significantly, even up to 5 days after sample collection. Nevertheless, all analyses performed for this RFI were carried out within 24 hours, as specified by the analytical method.

Another intra-laboratory comparison of the COCs between APCL and a secondary laboratory (ChromaLabs) was performed in May 1999; the results were within acceptable levels. Each laboratory prepared known standards and exchanged them with the other laboratory for analysis. Figure A-4 shows the hexavalent chromium results and Figure A-5 shows the total chromium results (Table A-6 summarizes the results).

Groundwater samples were also split between APCL, ChromaLabs, and the DTSC laboratory in June 1999. Figures A-6 (hexavalent chromium) and A-7 (total chromium) show that the results were within acceptable limits, except for three samples for hexavalent chromium. The anomaly was probably due to the high concentrations of hexavalent chromium and interferences from total dissolved solids (conductivities greater than 5,000 micro mhos per centimeter [µS/cm]). Table A-7 summarizes the results. Because of this discrepancy, groundwater split samples were collected again in July 1999. The results improved to acceptable limits for hexavalent chromium, except for one sample (see Table A-8 and Figures A-8 and A-9). This demonstrates that high total dissolved solids may interfere with the reproducibility of hexavalent chromium.

TABLE A-1
Soil Analysis
Topock RFI

Parameter	Analysis	Test Method	CRDL (MDL) mg/kg	PQL (mg/kg, dry wt.)
COCs	Total chromium	EPA 200.7/6010	0.054	0.5
	Hexavalent chromium	EPA 7196A	0.027	0.5
	Copper	EPA 200.7/6010	0.16	0.5
	Nickel	EPA 200.7/6010	0.38	2.0
	Zinc	EPA 200.7/6010	0.12	0.2
	pH	EPA 9040	0.01	0.01
Geotechnical	Bulk density	ASTM D2937/D2216	NA	NA
	Sieve analysis	ASTM D422-63 (1990)	NA	NA
	Porosity	ASTM D854 (a)	NA	NA
	Constant head perm.	ASTM D2434-68 (1994)	NA	NA
General Chemistry	Sulfide	EPA 376.2	0.5	4
	Total organic carbon	Walkley/Black	100	100
	Eh	ASTM D1498	1	1
	Extractable Fe (II)	(b)	100	100
	Sulfate	EPA 375.4	4	10
	Phosphorus	EPA 365.2	0.1	0.1
	Cation exchange cap.	EPA 9080/9081	0.02	0.1
	Batch adsorption test	ASTM 4319	na	na
Metals	Manganese	EPA 200.7/6010 and (c)	0.051	0.5
	Total iron	EPA 200.7/6010	0.27	1
	Barium	EPA 200.7/6010	0.13	1
	Lead	EPA 200.7/6010	0.047	0.2
	Vanadium	EPA 200.7/6010	0.092	0.5
	Molybdenum	EPA 200.7/6010	0.027	0.2
Other tests	Chloride	EPA 325.3/9252	1	5
	Carbonate/bicarbonate	SM 2320B	0.01	0.01
	Calcium	EPA 200.7/6010	1	5
	Magnesium	EPA 200.7/6010	1	5
	Potassium	EPA 200.7/6010	1	5
	Sodium	EPA 200.7/6010	1	5
	Nitrogen as nitrate	EPA 353.3	1.4	5
	Phosphorus as ortho-P	EPA 365.2	0.04	0.1
	Percent moisture	ASTM D2216-92	0.12	0.5

ABBREVIATIONS:

(a) ASTM D854 (Specific Gravity Test) was used to calculate porosity
(b) Oxalate extraction (Phillips and Lovely 1987) method to be run if total iron is detected
(c) Hydroxylamine hydrochloride extraction (Palmer & Puls 1994)
COC Constituents of concern
CRDL Contractor Required Detection Limit (i.e., method detection limit)
MDLs Method Detection Limit
mg/kg Milligram per kilogram
NA Not applicable
PQL Practical quantitation limit

TABLE A-2
Groundwater Analyses
Topock RFI

Parameter	Analysis	Test Method	CRDL (MDL) mg/L	PQL (mg/L)
COCs	Total chromium	EPA 200.7/6010	0.01	0.02
	Hexavalent chromium	EPA 7196A	0.01	0.01
	Copper	EPA 200.7/6010	0.003	0.01
	Nickel	EPA 200.7/6010	0.008	0.025
	Zinc	EPA 200.7/6010	0.003	0.005
	pH	EPA 9040	0.01	0.01
	Electrical conductivity	EPA 120.1/9050	1	1
General Chemistry	Ammonia	EPA 350.2	0.07	0.2
	Carbonate/bicarbonate	SM 2320B	0.6	2
	Chloride	EPA 325.3/9252	0.8	1
	Eh	ASTM D1498	1	1
	Fluoride	EPA 340.2	0.046	0.1
	Nitrogen as nitrate	EPA 353.3	0.48	1
	Nitrogen as nitrite	EPA 353.3	0.004	0.02
	Phosphorus	EPA 365.2	0.018	0.1
	Sulfide	EPA 376.2	0.11	0.2
	Sulfate	EPA 375.4	0.7	2
Metals	Barium	EPA 200.7/6010	0.003	0.01
	Calcium	EPA 200.7/6010	0.11	0.2
	Total iron	EPA 200.7/6010	0.007	0.05
	Ferrous iron	ASTM 3500FeD	0.01	0.01
	Total lead	EPA 200.7/6010	0.001	0.005
	Magnesium	EPA 200.7/6010	0.051	0.1
	Manganese	EPA 200.7/6010	0.005	0.005
	Molybdenum	EPA 200.7/6010	0.005	0.005
	Potassium	EPA 200.7/6010	0.19	0.4
	Sodium	EPA 200.7/6010	0.82	2
	Vanadium	EPA 200.7/6010	0.005	0.01
Other tests	Dissolved oxygen	EPA 360.1	0.05	0.2
	Total dissolved solids	EPA 160.1	3	10
	Total organic carbon	EPA 415.1	0.4	1

ABBREVIATIONS:
COC Constituents of concern
CRDL Contractor Required Detection Limit (i.e., MDL)
MDL Method detection limit
mg/L Milligram per liter
PQL Practical quantitation limit

TABLE A-3
Summary of Data Quality Indicator Objectives
Topock RFI

ANALYTE	%R	RPD	FIELD/ TRIP BLANKS	FIELD/TRIP BLANKS FREQUENCY	MS/MSD FREQUENCY	METHOD BLANK AND FIELD DUPLICATE FREQUENCY
SOIL						
Total chromium	75-125	25	NA	NA	NA	1 per 10
Hexavalent chromium	85-115	15	NA	NA	NA	1 per 10
Copper	75-125	25	NA	NA	NA	1 per 10
Nickel	75-125	25	NA	NA	NA	1 per 10
Zinc	75-125	25	NA	NA	NA	1 per 10
pH	NA	NA	NA	NA	NA	1 per 10
WATER						
Total chromium	75-125	25	<PQL	1 each per day	1 per 20	1 per 10
Hexavalent chromium	85-115	15	<PQL	1 each per day	1 per 10	1 per 10
Copper	75-125	25	<PQL	1 each per day	1 per 20	1 per 10
Nickel	75-125	25	<PQL	1 each per day	1 per 20	1 per 10
Zinc	75-125	25	<PQL	1 each per day	1 per 20	1 per 10
pH	NA	NA	<PQL	1 each per day	1 per 20	1 per 10
Electrical conductivity	NA	NA	<PQL	1 each per day	1 per 20	1 per 10

ABBREVIATIONS:

PQL Practical quantitation limit
MS/MSD Matrix spike/matrix spike duplicate in the laboratory
% R Percent recovery for LCS and MS/MSD
RPD Relative percent difference for MS/MSD, LCS/LCSD, laboratory replicate of samples, and all field duplicate samples
NA Not applicable
LCS Laboratory control standard

TABLE A-4
Groundwater Field Duplicates
Topock RFI

DRAFT

		ANALYTE (mg/L)						
		Cr(T)	Cr(VI)	Cu	Ni	Zn	Conductivity	pH
	PQL	0.02	0.01	0.01	0.025	0.005	1.0	0.01
	LIMIT	25	15	25	25	25	NA	NA
MW-3	Jul-97	1.2	--	--	--	--	1,340	7.04
MW-2(3D)		0.5	--	--	--	--	1,340	7.01
RPD		82					0	0
MW-3	Sep-97	0.02	0.01	ND	0.042	0.06	1,270	8.18
MW-3D		0.016	0.01	ND	0.024	0.016	1,320	8.14
RPD		22	0	0	55	116	4	0
MW-3	Feb-98	0.016	ND	ND	0.023	ND	1,300	8.09
MW-2(3D)		0.017	0.01	0.0044(j)	0.024	ND	1,310	8.11
RPD		6	0	0	4	0	1	0
MW-3	Jun-98	0.014	0.01	ND	0.030	0.021	1,320	8.07
MW-2(3D)		0.014	0.01	ND	0.031	0.005	1,310	7.99
RPD		0	0	0	3	119	1	1
MW-9	Jul-97	0.29	0.344	0.011	ND	0.018	3,060	7.52
MW-9D		0.28	0.296	0.01	ND	0.025	2,910	7.31
RPD		4	15	10	0	33	5	3
MW-10	Jul-97	1.1	0.992	0.018	0.011	0.031	2,440	7.54
MW-10D		1.2	1.24	0.026	0.015	0.055	2,440	7.66
RPD		9	22	36	31	56	0	2
MW-12	Jul-97	0.35	0.391	0.0083	ND	0.0077	2,770	8.06
MW-12D (F)		0.34	0.385	0.0065	ND	0.016	2,740	8.25
RPD		3	2	24	0	70	1	2
MW-12	Sep-99	0.47	0.43	0.0034(j)	ND	0.0096	5,050	8.11
MW-12D		0.47	0.414	ND	ND	0.0094	5,030	8.11
RPD		0	4	0	0	2	0	0
MW-13	Jun-98	0.018	0.02	ND	0.0098	ND	2,090	7.4
MW-13D		0.016	0.01	0.0031	0.0095	ND	2,070	7.07
RPD		12	67	0	3	0	1	5
MW-15	Jul-97	0.023	ND	0.016	0.012	0.048	1,210	7.47
MW-15D		0.023	ND	0.019	0.01	0.04	1,100	7.2
RPD		0	0	17	18	18	10	4
MW-18	Sep-99	0.031	0.026	ND	ND	0.039	1,480	7.60
MW-18D		0.031	0.025	ND	ND	0.037	1,470	7.58
RPD		0	4	0	0	5	1	0

TABLE A-4
Groundwater Field Duplicates
Topock RFI

DRAFT

		ANALYTE (mg/L)						
		Cr(T)	Cr(VI)	Cu	Ni	Zn	Conductivity	pH
	PQL	0.02	0.01	0.01	0.025	0.005	1.0	0.01
	LIMIT	25	15	25	25	25	NA	NA
MW-19	Jun-99	0.73	0.638	ND	ND	0.015	3,460	7.50
MW-19D		0.73	0.649	ND	ND	0.019	3,420	7.69
RPD		0	2	0	0	24	1	3
MW-20/70	Jun-98	12.2	12.6	0.0033(j)	ND	0.012	3,650	7.62
MW-20/70D		11.3	10.7	ND	ND	0.0091	3,610	7.47
RPD		8	16	0	0	27	1	2
MW-20/70	Sep-99	9.2	8.24	ND	ND	0.0297	6,030	7.20
MW-20/70D		10.3	9.03	ND	ND	0.0486	6,150	7.47
RPD		11	9	0	0	48	2	4
MW-20/70	Dec-99	11	10.4	0.0081(j)	0.0019(j)	0.031	3,450	7.49
MW-20/70D		10.9	10.7	0.0046(j)	0.0013(j)	0.029	3,460	7.49
RPD		1	3	0	0	7	0	0
MW-20/100	Sep-99	2.7	2.49	ND	ND	0.0412	9,900	7.63
MW-20/100D		2.7	2.41	ND	ND	0.0506	9,900	7.54
RPD		0	3	0	0	20	0	1
MW-20/100	Dec-99	2.8	2.94	0.0041	ND	0.0061	5,840	7.92
MW-20/100D		2.8	2.78	ND	ND	0.0065	5,800	7.88
RPD		0	6	0	0	6	1	1
MW-20/130	Jun-99	5.2	3.51	<0.1	<0.25	<0.053	18,100	7.51
MW-20/130D		5.3	4.08	<0.1	<0.25	<0.053	17,900	7.55
RPD		2	15	0	0	0	1	1
MW-20/130	Sep-99	5.6	5.08	ND	ND	0.0209	29,000	7.44
MW-20/130D		5.7	5.54	ND	ND	0.0277	29,800	7.37
RPD		2	9	0	0	28	3	1
MW-20/130	Dec-99	5.6	5.51	0.011	ND	0.054	16,300	7.59
MW-20/130D		5.5	4.81	0.0066	ND	0.043	15,800	7.52
RPD		2	14	50	0	23	3	1
MW-22	Jul-99	ND	ND	0.0056	ND	0.016	28,200	6.86
MW-22D		ND	ND	0.0045	ND	0.021	28,100	6.86
RPD		0	0	22	0	27	0	0
MW-24A	Jun-98	3.7	2.93	0.0052(j)	ND	0.032	4,140	7.85
MW-24A D		3.5	2.96	ND	ND	0.026	3.3*	7.92
RPD		6	1	0	0	21	--	1

TABLE A-4
Groundwater Field Duplicates
Topock RFI

DRAFT

		ANALYTE (mg/L)						
		Cr(T)	Cr(VI)	Cu	Ni	Zn	Conductivity	pH
	PQL	0.02	0.01	0.01	0.025	0.005	1.0	0.01
	LIMIT	25	15	25	25	25	NA	NA
MW-24BR	Jun-98	0.38	0.302	ND	ND	ND(j)	17,300	12.45
MW-24BR D		0.15	0.346	ND	ND	0.009(j)	17,200	12.62
RPD		87	14	0	0	0	1	1
MW-26	Jun-99	0.86	0.831	0.006	ND	0.081	3,570	7.56
MW-26D		0.76	0.759	0.0059	ND	0.013	3,690	7.59
RPD		12	9	2	0	145	3	0
MW-27	Sep-99	ND	ND	ND	ND	<0.0053	1,260	7.41
MW-27D		ND	ND	ND	ND	<0.0053	1,470	7.47
RPD		0	0	0	0	0	15	1
MW-27	Dec-99	ND	ND	0.0082	0.0037	0.0087	1,580	7.61
MW-27D		ND	ND	0.0078	ND	0.016	1,150	7.75
RPD		0	0	5	0	59	32	2
PGE-6 1530	Jul-97	2.7	3.1	0.022	0.0015(j)	1.5	3,990	7.09
PGE-6 1530(A)		2.7	3.1	ND	ND	0.025	4,300	7.4
RPD		0	0	0	0	193	7	4
PGE-06	Sep-97	2.0	1.88	0.006	0.014(j)	0.09	3,860	7.67
PGE-06D		2.3	2.33	0.007	ND	0.05	3,830	7.63
RPD		14	21	15	0	57	1	1
PGE-06	Feb-98	0.888	0.862	0.0036	ND (j)	0.013	3,610	7.57
PGE-06D		0.937	0.902	0.0039	ND	0.015	3,630	7.80
RPD		5	5	8	0	14	1	3
PGE-07	Jul-97	4.0	5.09	0.0072	ND	0.15	17,300	7.45
PGE-07D		4.0	4.76	0.012	ND	0.22	14,900	8.69
RPD		0	7	50	0	38	15	15
PGE-07	Sep-97	4.0	4.92	ND	ND	0.045	12,300	7.97
PGE-7D		4.2	4.66	0.006(j)	ND	0.045	12,200	8.06
RPD		5	5	0	0	0	1	1
PGE-08	Feb-98	ND	ND	ND	ND	0.17	20,000	8.19
PGE-8D		ND	ND	ND	ND	0.17	20,000	8.34
RPD		0	0	0	0	0	0	2
PGE-08	Jun-98	ND	ND	ND	ND	ND(j)	18,500	8.82
PGE-8 D		ND	ND	0.0053(j)	ND	0.017(j)	18,100	8.86
RPD		0	0	0	0	0	2	0

KEY:
Boldface numbers indicate that QC criteria were not met.

ABBREVIATIONS:

MW-3	Monitoring Well-3
RPD	Relative percent difference
mg/L	Milligrams per liter
PQL	Practical quantitation limit

TABLE A-5
Intra-Laboratory Testing
Topock RFI
July 1997

DRAFT

Analyte	Test Method	MDL (mg/L)	RPD Limit	Sample No.	APCL Results (mg/L)	AEN Results (mg/L)	RPD
Cr+6	EPA 7196	0.01	15.0	AC-4	0.05	0.05	0.0
				AC-5	0.1	0.09	10.5
				AC-6	0.08	0.08	0.0
				Cr6A	0.02	0.02	0.0
				Cr6B	0.055	0.05	9.5
				Cr6C	0.086	0.08	7.2
				MW-9	0.344	0.30	13.7
				MW-9D	0.296	0.31	4.6
				MW-13	0.02	ND	0.0
				MW-13D	0.01	ND	0.0
					Average RPD		4.6
Cr-total	EPA 6010	0.01	25.0	AC-1	0.5	0.51	2.0
				AC-2	0.2	0.2	0.0
				AC-3	0.4	0.41	2.5
				AM-1	1	1	0.0
				AM-2	0.5	0.52	3.9
				Total Cr A	0.034	0.03	12.5
				Total Cr B	0.11	0.1	9.5
				Total Cr C	1	0.89	11.6
				Mix A	0.057	0.05	13.1
				Mix B	0.45	0.39	14.3
				MW-9	0.29	0.27	7.1
				MW-9D	0.28	0.26	7.4
				MW-13	0.018	ND	0.0
				MW-13D	0.016	ND	0.0
					Average RPD		7.0
Cu	EPA 6010	0.003	25.0	AM-1	0.5	0.48	4.1
				AM-2	0.25	0.24	4.1
				MIX A	0.066	0.06	9.5
				MIX B	0.22	0.2	9.5
				MW-9	0.011	ND	-
				MW-9D	0.01	ND	-
				MW-13	ND	ND	0.0
				MW-13D	0.0031J	ND	-
					Average RPD		6.8
Ni	EPA 6010	0.008	25.0	AM-1	0.8	0.8	0.0
				AM-2	0.4	0.41	2.5
				MIX A	0.091	0.08	12.9
				MIX B	0.57	0.5	13.1
				MW-9	ND	ND	0.0
				MW-9D	ND	ND	0.0
				MW-13	0.0098	ND	-
				MW-13D	0.0095	ND	-
					Average RPD		4.7
Zn	EPA 6010	0.003	25.0	AM-1	0.6	0.6	0.0
				AM-2	0.3	0.31	3.3
				MIX A	0.097	0.09	7.5
				MIX B	0.85	0.8	6.1
				MW-9	0.018	0.011	48.3
				MW-9D	0.025	0.011	77.8
				MW-13	ND	0.008	-
				MW-13D	ND	0.012	-
					Average RPD		23.8

MDL - method detection limit
RPD - relative percent difference

TABLE A-6
Intra-Laboratory Comparison, May 1999
Topock RFI

DRAFT

APCL #5399 Standard	Known Std. (mg/L)	ChromaLab Results (mg/L)	RPD
Cr+6			
A1	0.03	0.03	0.0
B1	3	3.2	6.5
C1	9	10	10.5
Cr-total			
A2	0.05	0.058	14.8
B2	5	5.3	5.8
C2	10	11	9.5
Cu			
D	0.025	0.03	18.2
E	0.02	0.022	9.5
Ni			
D	0.04	0.048	18.2
E	0.035	0.033	5.9
Zn			
D	1.2	1.3	8.0
E	0.95	0.94	1.1

ChromaLab Standard	Known Std. (mg/L)	APCL Results (mg/L)	RPD
Cr+6			
A1 HEX	0.5	0.446	11.4
B2 HEX	0.4	0.367	8.6
C3 HEX	0.3	0.27	10.5
Cr-total			
TOTAL A	10	10.5	4.9
TOTAL B	5	5.2	3.9
TOTAL C	0.5	0.51	2.0
Cu			
MIX A	0.1	0.11	9.5
MIX B	0.05	0.064	24.6
Ni			
MIX A	0.1	0.11	9.5
MIX B	0.05	0.057	13.1
Zn			
MIX A	0.1	0.15	40.0
MIX B	0.05	0.11	75.0

TABLE A-7
Laboratory Comparison of Field Split Samples
Topock RFI, June 8, 1999

DRAF

	APCL							CHROMALAB							DTSC
	Cr+6	Cr	Cu	Ni	Zn	Cond	pH	Cr+6**	Cr	Cu	Ni	Zn	Conduc	pH	Cr+6
MW 20/70	6.78	12.3	0.0035J	ND	0.016	5,160	7.53	14	14	ND	ND	0.042	4,100	7.67	13.2
PGE 20/70 (dupl of MW 20/70)	na	na	na	na	na	na	na	12	13	ND	ND	0.035	4,000	7.87	na
MW 20/100	1.55	1.7	<0.05	<0.13	<0.027	5,860	6.65	1.2	1.7	ND	ND	ND	6,200	7.96	2.64
MW 20/130	3.51	5.2	<0.1	<0.25	<0.053	18,100	7.51	3.9	5.2	ND	ND	0.047	20,000	7.60	5.34
MW 27	ND	ND	0.0089J	ND	0.011	1,210	7.58	ND	ND	ND	ND	0.016	1,200	8.09	ND
MW 28	ND	ND	0.0073J	ND	0.0087	1,620	7.76	ND	ND	ND	ND	0.013	1,700	8.06	ND
MW 29	ND	ND	0.0095J	ND	0.017	2,820	7.38	ND	ND	ND	ND	0.017	3,100	7.76	ND
PQL	0.01	0.02	0.01	0.025	0.005	1	0.01	0.01	0.05	0.005	0.005	0.01	1	0.01	0.005

	RPD Between APCL and CHROMALAB						
	Cr+6	Cr	Cu	Ni	Zn	Cond	pH
MW 20/70	69	13	-	-	90	23	2
MW 20/100	25	0	-	-	-	6	18
MW 20/130	11	0	-	-	-	10	18
MW 27	0	0	-	-	37	1	1
MW 28	0	0	-	-	40	5	4
MW 29	0	0	-	-	0	9	5

	RPD APCL/DTSC	RPD ChromaLab-DTSC
	Cr+6	Cr+6
MW 20/70	64	6
MW 20/100	52	75
MW 20/130	41	31
MW 27	0	0
MW 28	0	0
MW 29	0	0

** CHROMALAB re-analyzed MW 20/70 and its duplicate after the holding time was exceeded because the original analysis (0.05 and ND, respectively) was inconsistent with previous results. The re-analysis, 14 and 12 mg/L, respectively, was reported.

KEY:
Practical quantitation limit (PQL) in mg/L for metals, uS/cm for conductivity, and pH units for pH (filtered samples)

ABBREVIATIONS:

ND	Not detected above PQL
J	Below the PQL but greater than method detection limit
<	Adjusted PQL
mg/L	Milligrams per liter
RPD	Relative percent difference
DTSC	Department of Toxic Substances
APCL	

DRAFT

TABLE A-8
Laboratory Comparison of Field Split Samples
Topock RFI, July 19, 1999

	APCL								CHROMALAB *				
	Cr+6	Cr	Cu	Ni	Zn	Cond	pH		Cr+6	Cr	Cu	Ni	Zn
MW 20/70	12.9	13.2	ND	ND	0.019	4,030	7.43		14	13	ND	ND	0.028
MW 20/100	1.35	1.5	0.0071J	ND	0.23	6,150	7.82		1.2	1.4	ND	ND	0.26
MW 20/130	3.66	4.1	ND	ND	0.078	18,700	7.59		5.3	4.3	ND	ND	0.079
MW 22	ND	ND	0.0056	ND	0.016	28,200	6.86		ND	ND	ND	ND	ND
R 22	ND	ND	.006J	ND	0.013	1,040	8		ND	ND	ND	ND	ND
DUP. MW 22	ND	ND	.0045J	ND	0.021	28,100	6.86		NA	NA	NA	NA	NA
PQL	0.01	0.02	0.01	0.025	0.005	1	0.01		0.01	0.005	0.005	0.005	0.01
	Reletave Percent Difference Between APCL and CHROMALAB												
	Cr+6	Cr	Cu	Ni	Zn								
MW 20/70	8	2	-	-	38								
MW 20/100	12	7	-	-	12								
MW 20/130	37	5	-	-	1								
MW 22	0	0	-	-	-								
R 22	0	0	-	-	-								
DUP. MW 22	-	-	-	-	-								

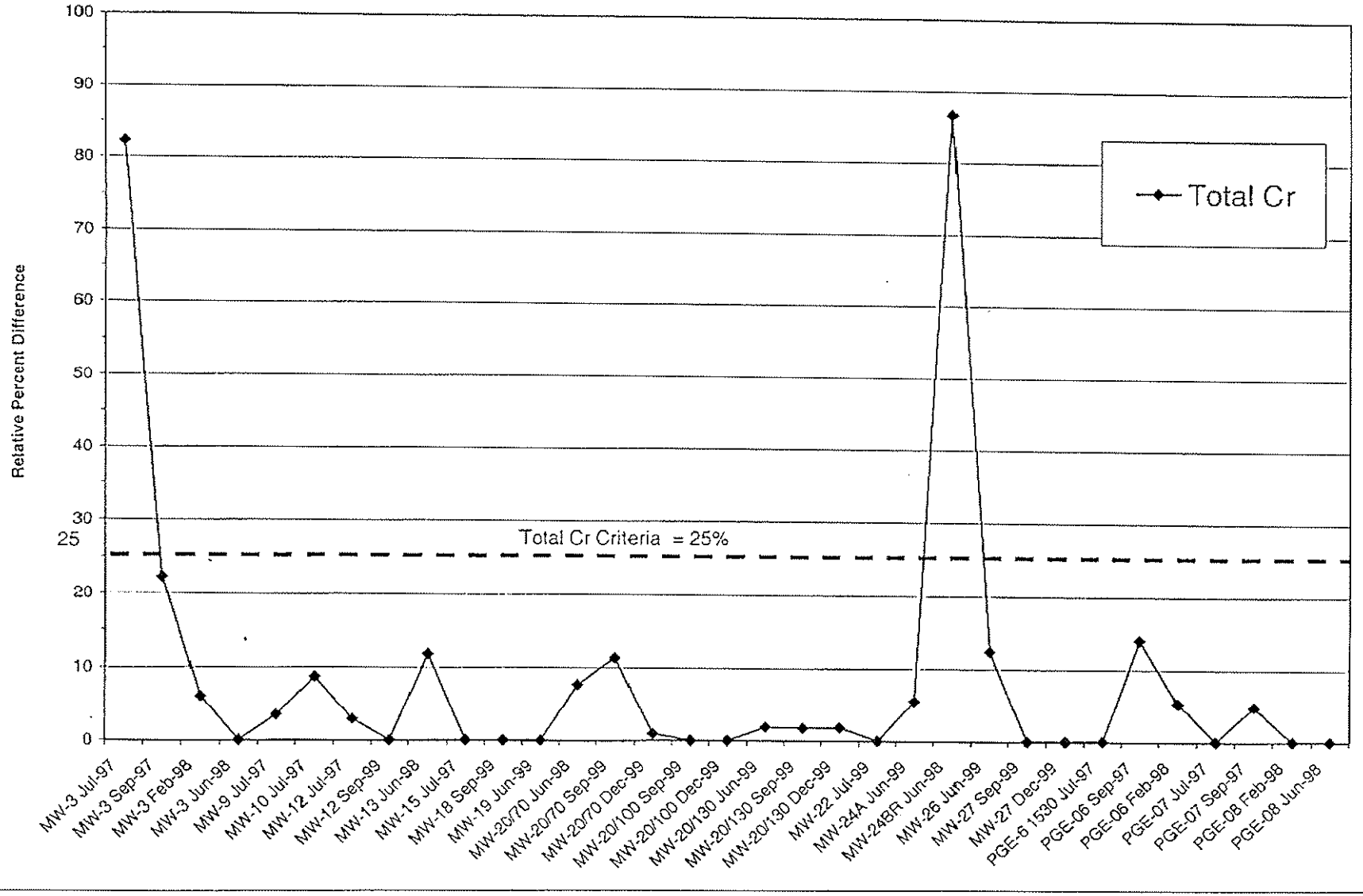
KEY:

Practical quantitation limit (PQL) in mg/L for metals, uS/cm for conductivity, and pH units for pH (filtered samples).

ABBREVIATIONS:

*	conductivity and pH were not analyzed
ND	ND is not detected above PQL
J	J is below the PQL but greater than method detection limit
NA	Not analyzed

FIGURE A-1a TOTAL CHROMIUM IN GROUNDWATER FIELD DUPLICATE SAMPLES



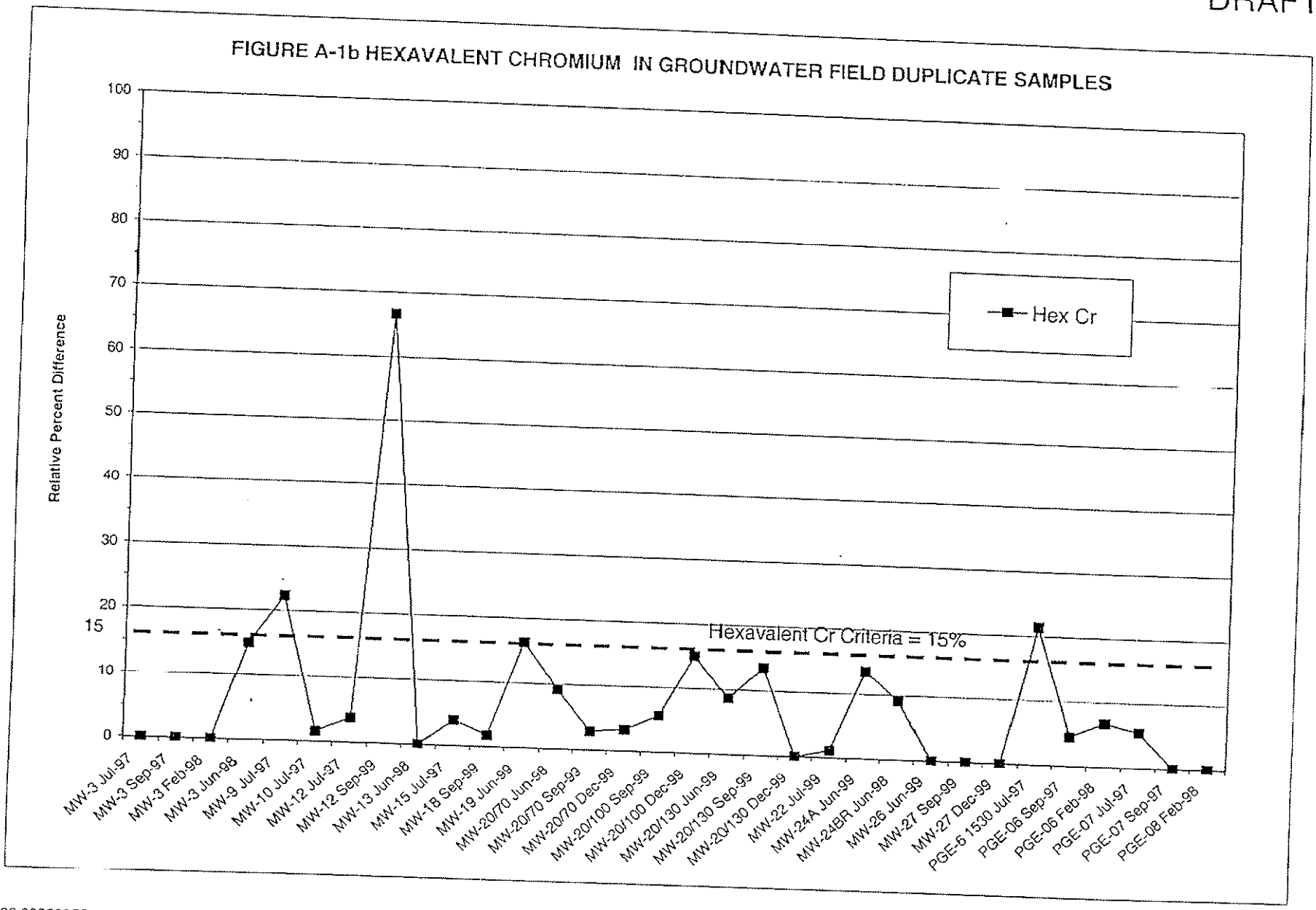


FIGURE A-1b HEXAVALENT CHROMIUM IN GROUNDWATER FIELD DUPLICATE SAMPLES
Relative Percent Difference
100
90
80
70
60
50
40
30
20
15
10
0
Hex Cr
Hexavalent Cr Criteria = 15%
MW-3 Jul-97
MW-3 Sep-97
MW-3 Feb-98
MW-3 Jun-98
MW-9 Jul-97
MW-10 Jul-97
MW-12 Jul-97
MW-12 Sep-99
MW-13 Jun-98
MW-15 Jul-97
MW-18 Sep-99
MW-19 Jun-99
MW-20/70 Jun-98
MW-20/70 Sep-99
MW-20/70 Dec-99
MW-20/100 Sep-99
MW-20/100 Dec-99
MW-20/130 Jun-99
MW-20/130 Sep-99
MW-20/130 Dec-99
MW-22 Jul-99
MW-24A Jun-99
MW-24BR Jun-98
MW-26 Jun-99
MW-27 Sep-99
MW-27 Dec-99
PGE-6 1530 Jul-97
PGE-06 Sep-97
PGE-06 Feb-98
PGE-07 Jul-97
PGE-07 Sep-97
PGE-08 Feb-98

Figure A-2 Intra-Laboratory Comparison of APCL-AEN Laboratories for Hexavalent Chromium, July 1997

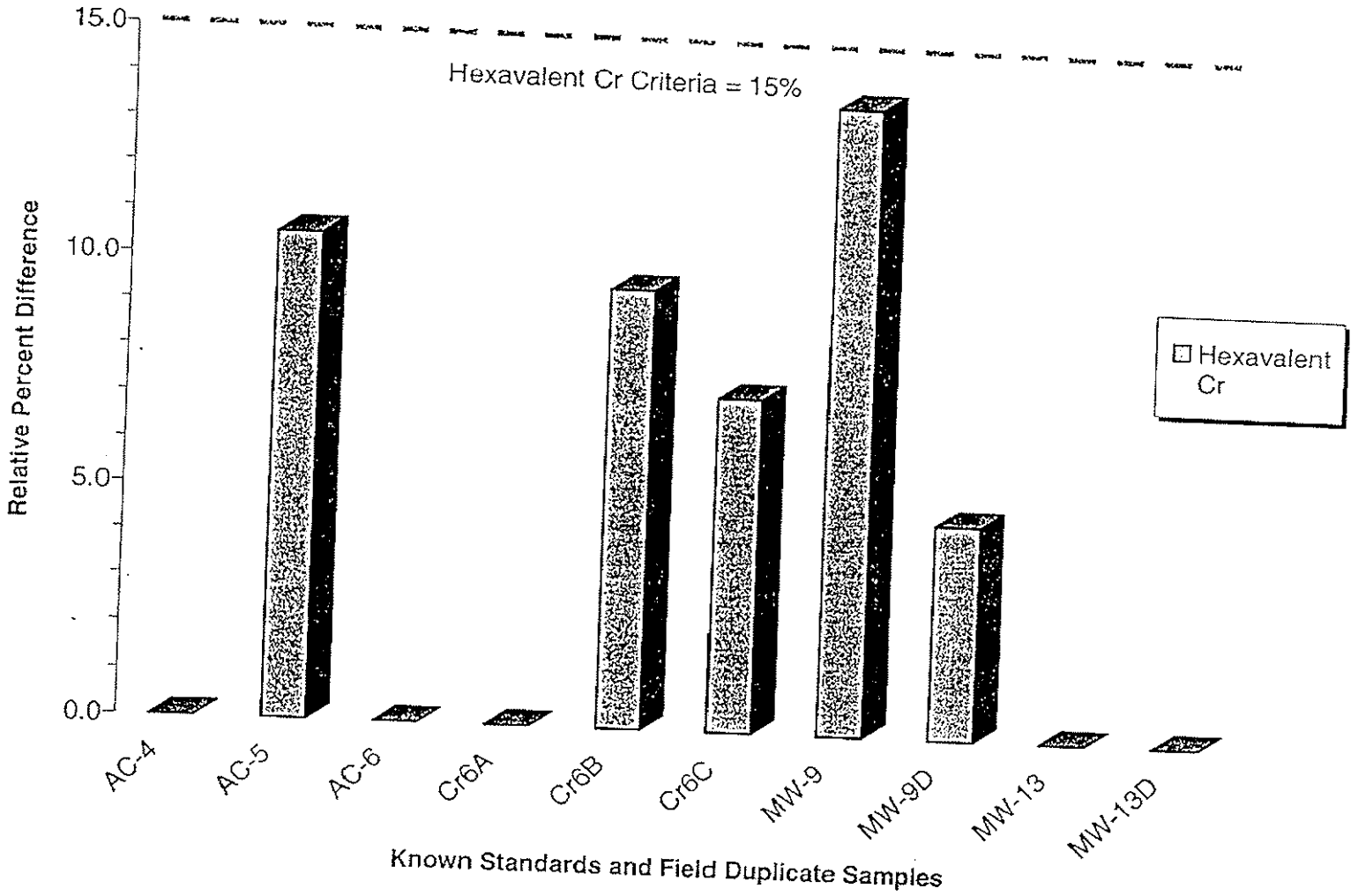


Figure A-3 Intra-Laboratory Comparison of APCL-AEN Laboratories for Total Chromium, July 1997

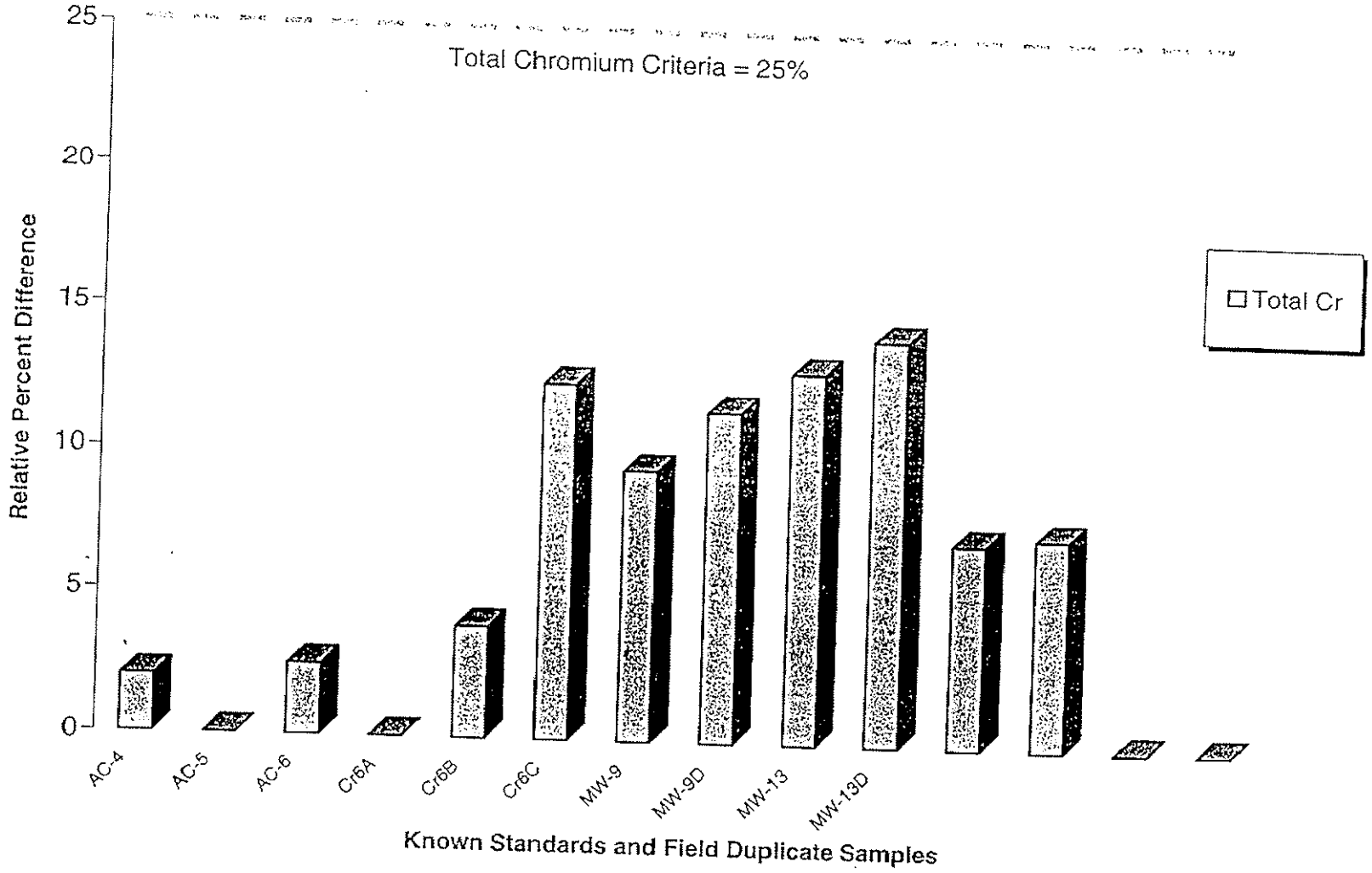


Figure A-4 Intra-Laboratory Comparison of APCL-ChromaLab for Hexavalent Chromium, May 1999

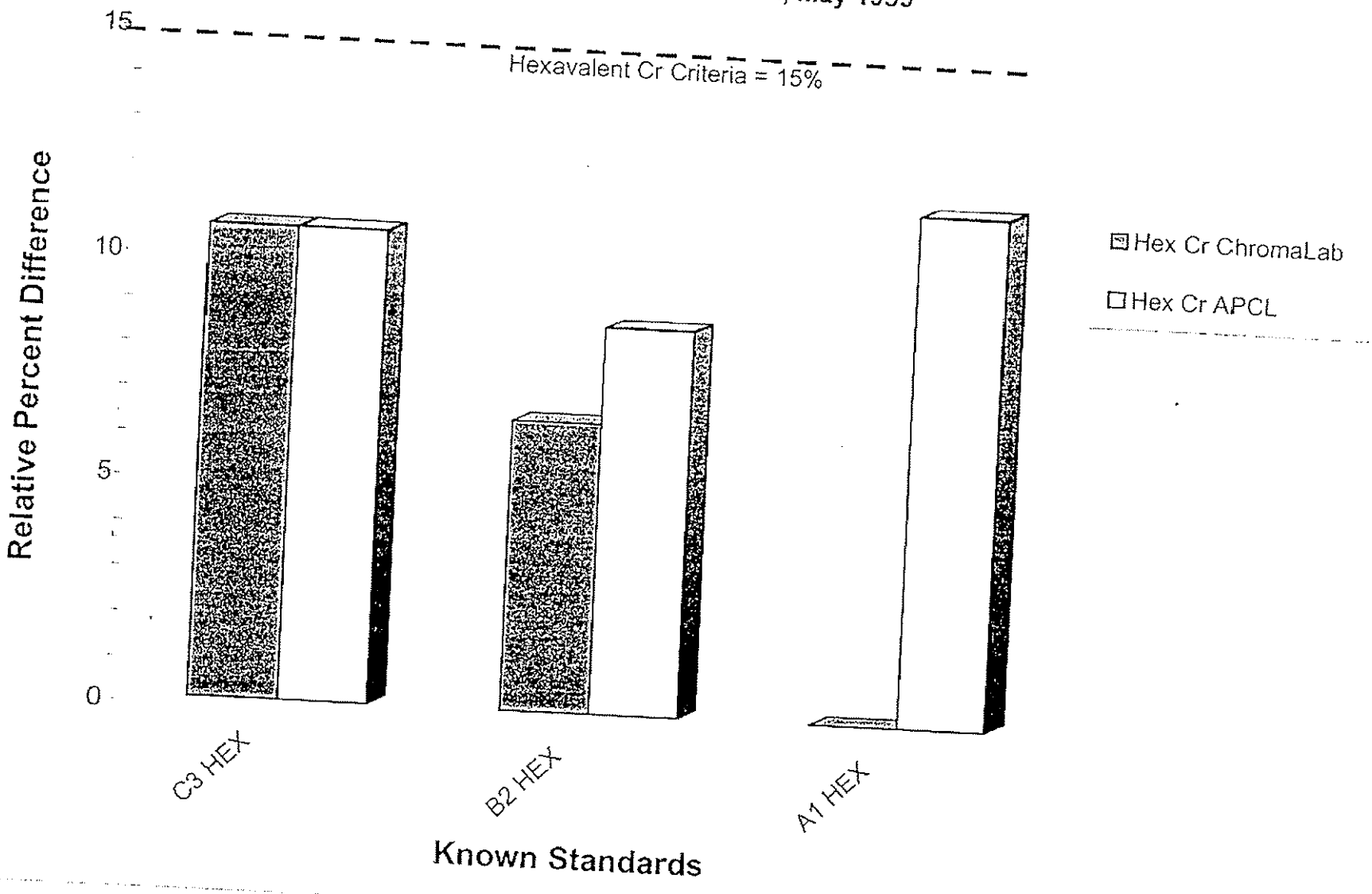


Figure A-5 Intra-Laboratory Comparison of APCL-ChromaLab for Total Chromium, May 1999

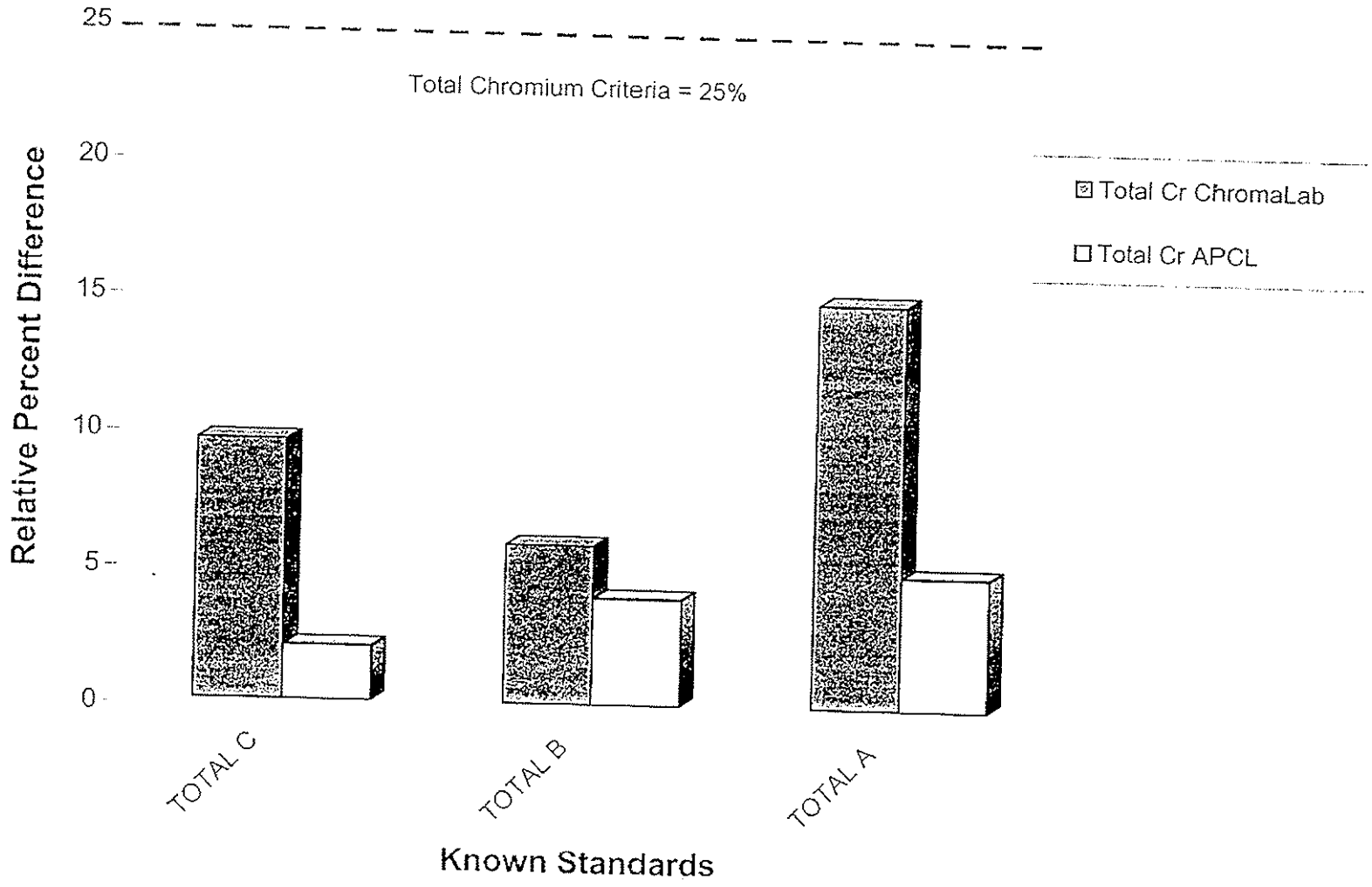


Figure A-6 Field Split Samples for Hexavalent Chromium, June 1999

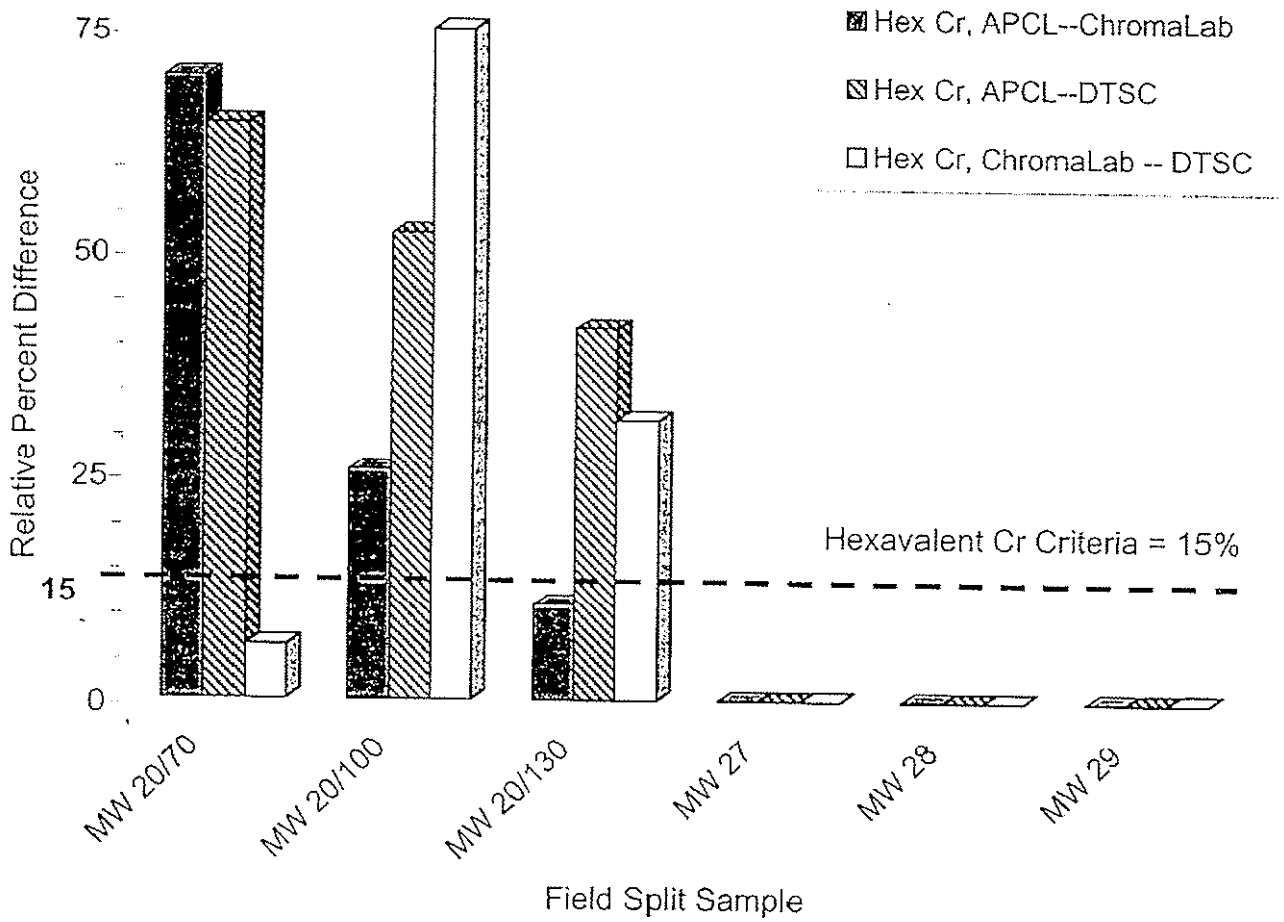


Figure A-7 Field Split Samples for Total Chromium, APCL and ChromaLab, June 1999

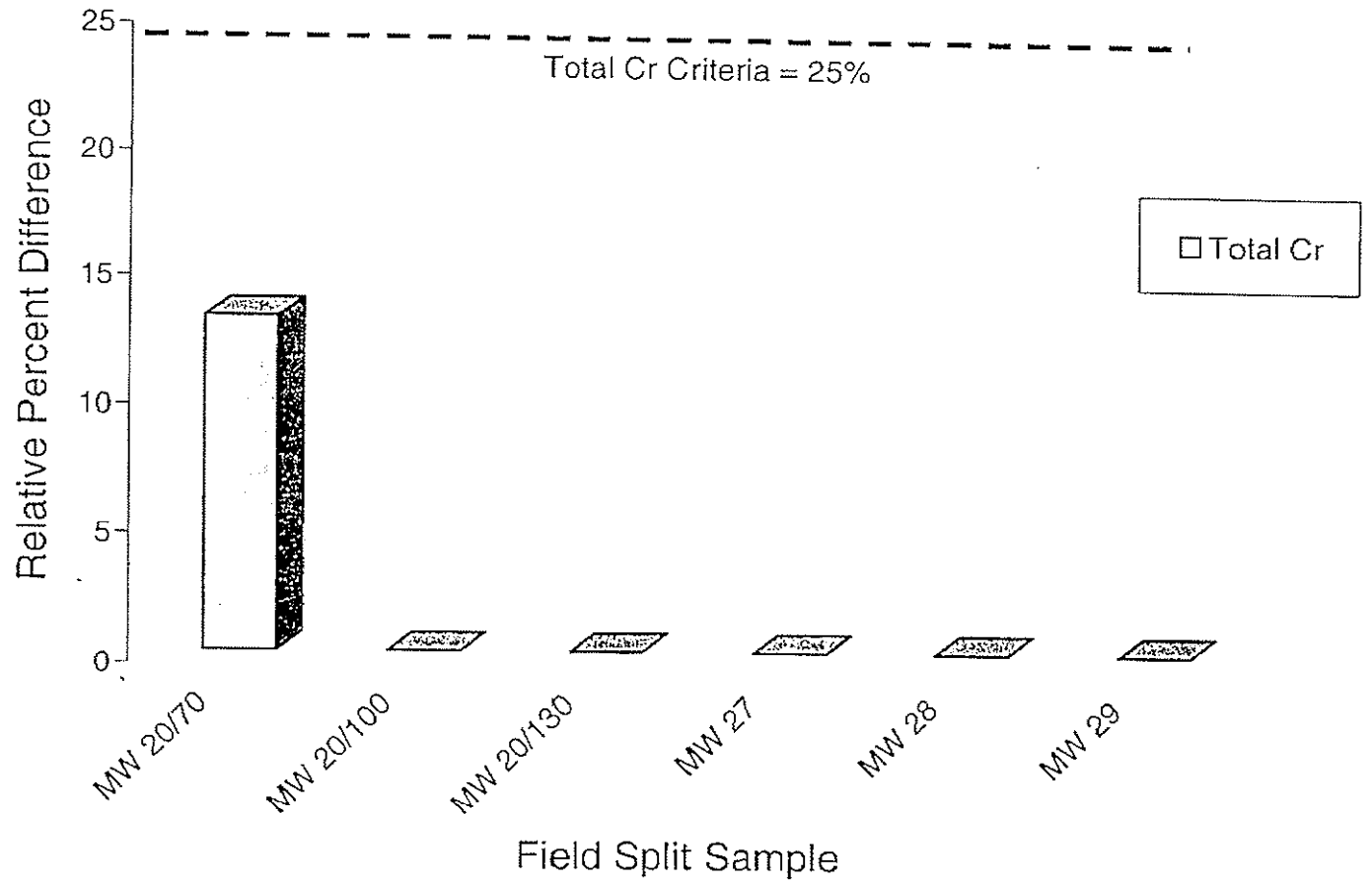
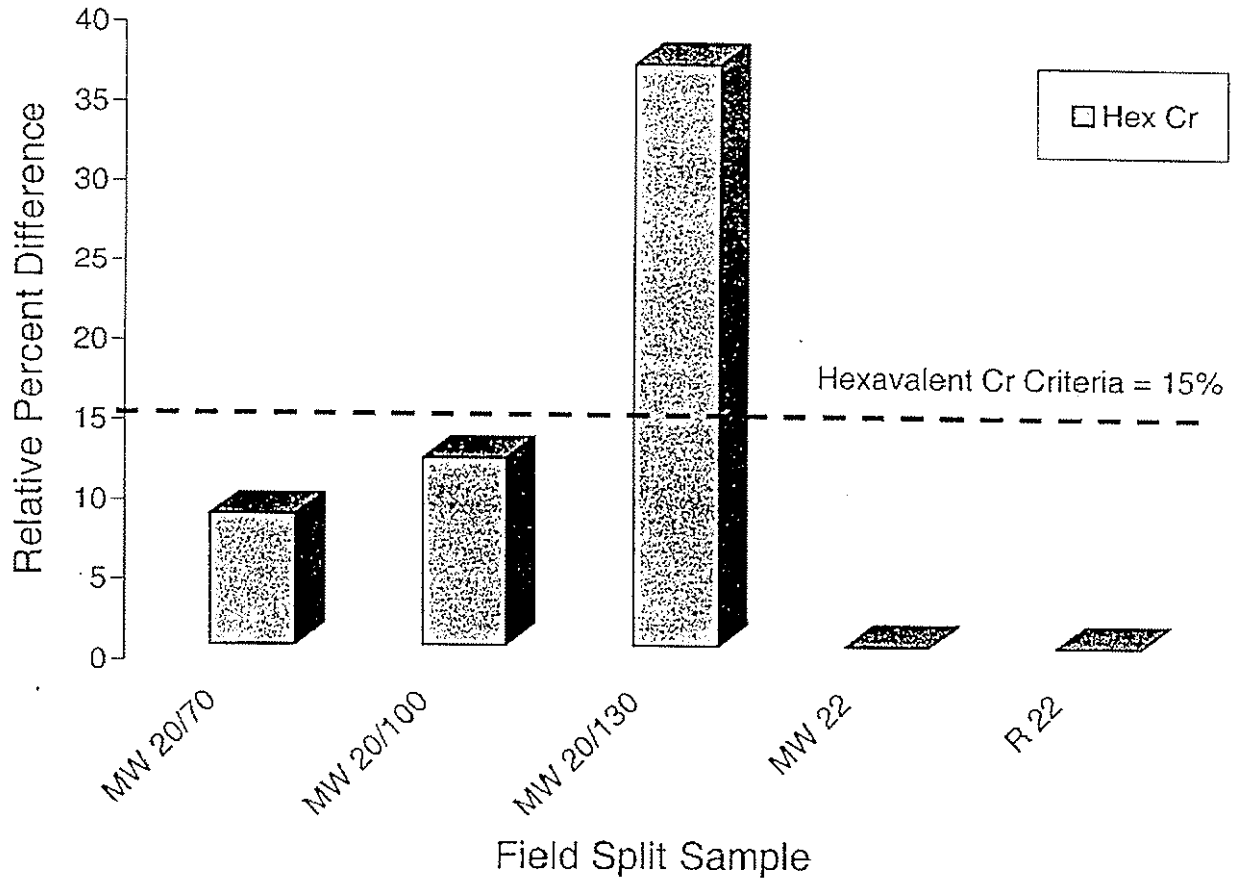


Figure A-8 Field Split Samples for Hexavalent Chromium, APCL and ChromaLab, July 1999



09:000529PD06000501-SF446
7-99Splits Fig A-8, A-9 Chart 1 7-99Splits Fig A-8, A-9 Chart 1 5/8/01 4:54 PM

Figure A-9 Field Split Samples, APCL and ChromaLab for Total Chromium, July 1999