

**APPENDIX B
DATA VALIDATION FINDINGS AND LABORATORY INFORMATION**

**SOIL BACKGROUND REPORT
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
FINAL**

Prepared for:

The Boeing Company


National Aeronautics and Space Administration

U.S. Department of Energy


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September 2005



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APPENDIX B
DATA VALIDATION FINDINGS AND LABORATORY INFORMATION

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**B-1 ELECTRONIC COPY OF SOIL BACKGROUND LABORATORY
INFORMATION AND VALIDATION REPORTS**

B-2 HML SOIL BACKGROUND MEMORANDUM

ACRONYMS

Boeing	The Boeing Company
Cal-EPA	California Environmental Protection Agency
CCB	continuing calibration blank
DHS	California Department of Health Services
DOE	U.S. Department of Energy
DTSC	Department of Toxic Substances Control
ELAP	Environmental Lab Accreditation Program
FSDF	Former Sodium Disposal Facility
GC/MS	gas chromatography/ mass spectrometry
ICF	ICF Kaiser Engineers
ICP	inductively coupled plasma spectrometry
ICSA	interference check sample A
MDL	method detection limit
MWH	Montgomery Watson Harza
NASA	National Aeronautics and Space Administration
OCDD	octachlorodibenzo-p-dioxin
PARCC	precision, accuracy, representativeness, completeness, comparability
%D	percent difference
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SOP	standard operating procedure
SSFL	Santa Susana Field Laboratory
TIC	tentatively identified compound
USEPA	U.S. Environmental Protection Agency

B.1 INTRODUCTION

This document has been prepared by AMEC Earth and Environmental, Inc. (AMEC) for presentation in the Soil Background Report prepared by MWH Americas, Inc. on behalf of The Boeing Company (Boeing), the National Aeronautics and Space Administration (NASA) and the U.S. Department of Energy (DOE).

The Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the Santa Susana Field Laboratory (SSFL) includes soil, groundwater, surface water, and biota sampling and analysis, as well as passive and active soil gas sampling and analysis following California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control (DTSC) approved work plans (ICF Kaiser Engineers [ICF] 1993a, 1993b, and 1993c; McLaren/Hart 1992, 1993a and 1993b; Ogden 1996, 2000a, and 2000b). Samples are analyzed for a variety of compounds including those analyzed for the soil background data set: metals, dioxins, and general minerals (pH and fluoride). The resulting data is validated by qualified chemists following United States Environmental Protection Agency (USEPA) guidelines as described in the RFI Quality Assurance Plans (QAPPs) and data validation standard operating procedures (SOPs). These data validation procedures are based on USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (1994a) and USEPA National Functional Guidelines for Organic Data Review (1994b).

Soil samples collected to define the background soil data set for the SSFL were collected in accordance with DTSC-approved work plans (ICF 1993b and 1993c; McLaren/Hart 1993b; Ogden 1996, 2000a, and 2000b). As discussed in Section 2 of the Background Soils Report, these samples were collected in six distinct events:

- **Multi-Media Sampling at the Brandeis-Bardin Institute and Santa Monica Mountains Conservancy** - soil sampling conducted by McLaren Hart in 1992-1994 under the Work Plan for Multi-Media Sampling at the Brandeis-Bardin Institute and Santa Monica Mountains Conservancy (McLaren/Hart 1992).

Metals analyses were performed by McLaren/Hart Analytical Laboratory, a California Department of Health Services (DHS)-certified laboratory located in Rancho Cordova, California.

- **FSDF Closure Field Investigation** - soil sampling conducted by ICF in 1995 in support of the Former Sodium Disposal Facility (FSDF) closure activities. Metals and dioxin analyses were performed by Quanterra Environmental Services, a California DHS-certified laboratory located in Knoxville, Tennessee.
- **Metals Sampling for the RFI Work Plan Addendum** - samples collected by Ogden in 1996 under the Metals Sampling and Analysis Plan for the RFI Work Plan Addendum (Ogden 1996). Metals analyses were performed by Ceimic Corporation, a California DHS-certified laboratory located in San Diego, California.
- **Bell Canyon Area Sampling** - samples collected by Ogden in 1998 under the Bell Canyon Residence Soil Sampling Work Plan (Ogden 1998a). Metals and general mineral analyses were performed by Columbia Analytical Services, Inc, a California DHS-certified laboratory located in Canoga Park, California. Dioxin analyses were performed by Alta Analytical, a California DHS-certified laboratory located in El Dorado Hills, California.
- **Additional Sampling for the RFI Standardized Risk Assessment Methodology Work Plan** – DTSC-requested, additional background soil samples collected by Ogden in 2000 under the RFI Work Plan Addendum (Ogden 1996) and RFI Work Plan Addendum Amendment (Ogden 2000b). Metals and general mineral analyses were performed by Calscience Environmental Laboratories, Inc., a California DHS-certified laboratory located in Garden Grove, California. Dioxin analyses were performed by Alta Analytical.
- **April 2005 Metals Supplemental Sampling** - additional samples collected by MWH in 2005 at DTSC-approved locations to supplement the soil metals background data set. All samples were analyzed by Del Mar Analytical, a California DHS-certified laboratory located in Irvine, California.

Field quality control (QC) samples provide a means of evaluating the quality of field sampling procedures, the effectiveness of equipment decontamination procedures, and the potential for introduction of contaminants unrelated to the project. Field QC samples collected during the six background soil sampling events included equipment rinsate samples, field blank samples, and field duplicate samples.

As determination of the background soil data set was not a complete field project, a precision, accuracy, representativeness, completeness, and comparability (PARCC) parameter assessment was not performed.

Data validation results in the following qualifications of analytical results: “U” (non detect), “J” (estimated), “UJ” (estimated non detect), “N” (tentative identification), “NJ” (estimated and tentatively identified), and “R” (rejected). Data with “U,” “J,” “UJ,” “NJ,” or “N” qualifiers and data without qualifiers are usable; data with “R” qualifiers are unusable. Level IV validation includes review of the following items (when applicable): sample management (collection techniques, sample containers, preservation, handling, transport, chain-of-custody, holding times), gas chromatography/mass spectrometry (GC/MS) instrument performance, initial and continuing calibration, method blank results, calibration blank results, laboratory duplicate precision, matrix spike accuracy, matrix spike/matrix spike duplicate precision and accuracy, surrogate results, serial dilution precision, laboratory and field QC sample results, internal standard performance, target compound identification, compound quantification and reported detection limits, tentatively identified compounds (TICs), and a definitive review of the raw data. Level V validation includes review of sample management, blanks, matrix spike samples, surrogates, and laboratory and field QC samples.

Overall, data reviewed for the background soil data set met project quality objectives and were determined usable for decision making as no data were rejected, except for a few metals data collected by McLaren/Hart in 1992. Six antimony, six mercury, and nine selenium results were rejected due to matrix spike recovery outliers. These samples were recollected during the April 2005 sampling event and these results were usable. Some results were qualified as estimated concentrations. These data are usable; therefore all sample data included in the final background data set were deemed usable for risk analysis.

The following sections contain brief summaries of the data validation results for the six background soil sampling events. A more detailed summary of the validation findings is presented in the individual data validation reports attached.

B.2 MULTI-MEDIA SAMPLING AT THE BRANDEIS-BARDIN INSTITUTE AND THE SANTA MONICA MOUNTAINS CONSERVANCY (1992-1994)

All data were validated at a Level V.

B.2.1 METALS

All metals results are considered useable as no data were rejected, except for six antimony, six mercury, and nine selenium results rejected due to matrix spike recovery outliers. Samples were recollected at the locations corresponding to the rejected data. These results are discussed in Section 7.0.

Nine soil samples were analyzed for antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc by EPA SW-846 Methods 6010 and 7471. Some thallium and all arsenic data were qualified as estimated detects and non detects for matrix spike recovery outliers. There were no method blank qualifications.

No field blank or equipment rinsate samples were collected in association with this sampling event; therefore, no assessment could be made with respect to possible contamination due to field decontamination procedures.

B.3 FSDF CLOSURE FIELD INVESTIGATION (1995)

All data were validated at a Level V.

B.3.1 DIOXINS

All dioxin results are considered useable as no data were rejected. Seven soil samples were analyzed for 21 individual dioxin congeners by EPA SW-846 Method 8290. No field duplicate samples were collected during this sampling event.

In one case a sample had multiple analytical results for an individual congener. Based on professional evaluation of the data quality, the data validator accepted the most technically sound result.

A few compounds were qualified as estimated due to surrogate recovery outliers. Several compounds were qualified as non detects due to interference from a coextracted ether compound in the sample matrix. Several compounds were qualified as estimated non detects due to outliers for an identification criterion, the ion abundance ratio. A few results were qualified as estimated detects due to interference from a calibration-related compound. For the most part, these qualifications were related to interference inherent in the method or caused by the soil matrix and were not indicative of laboratory quality control issues. Several dioxin totals and one individual congener were qualified as non detected due to detects in the associated method blank.

No field blank samples were collected in association with this sampling event; therefore, no assessment could be made with respect to possible contamination due to field decontamination procedures.

B.3.2 METALS

All metals results are considered usable as no data were rejected. Seven soil samples were analyzed for antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc by EPA SW-846 Methods 6010 and 7471. No qualifications were applied to the data.

No field blank or equipment rinsate samples were collected in association with this sampling event; therefore, no assessment could be made with respect to possible contamination due to field decontamination procedures.

B.4 METALS SAMPLING FOR THE RFI WORK PLAN ADDENDUM (1996)

All data were validated at a Level V.

B.4.1 METALS

All metals results are considered usable as no data were rejected. Fifteen soil samples were analyzed for aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc by EPA SW-846 Methods 6010 and 7471. Two field duplicate pairs were collected and the results were in good agreement.

All antimony and some cadmium and selenium data were qualified as estimated detects and non detects due to matrix spike recovery outliers. For the most part, these qualifications were related to interference caused by the soil matrix and were not indicative of laboratory quality control issues. Some thallium data were qualified as estimated non detects due to laboratory control sample recovery outliers. A few molybdenum detects were qualified as estimated non detects due to molybdenum detected in the associated laboratory method blanks.

No field blank or equipment rinsate samples were collected in association with this sampling event; therefore, no assessment could be made with respect to possible contamination due to field decontamination procedures.

B.5 BELL CANYON AREA SAMPLING (1998)

All data were validated at a Level V.

B.5.1 DIOXINS

All dioxin results are considered useable as no data were rejected. Seven soil samples were analyzed for 21 individual dioxin congeners by EPA SW-846 Method 1613B. One field duplicate pair was collected during this sampling event and the results were in good agreement.

Two compounds not reported by the laboratory were determined to be present, and were reported as such by the data validator. The compounds were originally reported as detected in the initial analysis by EPA SW-846 Method 1613A.

One equipment rinsate sample and one field blank sample were collected in association with this sampling event. One sample result for OCDD was qualified as an estimated detect for OCDD detected in the field blank.

B.5.2 METALS

All metals results are considered usable as no data were rejected. Seven soil samples were analyzed for aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc by EPA SW-846 Methods 6010 and 7471. One field duplicate pair was collected and the results were in good agreement.

All antimony results were qualified as estimated non detects due to matrix spike recovery outliers. All zinc and some aluminum and barium results were qualified as estimated detects and non detects due to serial dilution percent difference (%D) outliers. For the

most part, these qualifications were related to interference caused by the soil matrix and were not indicative of laboratory quality control issues.

Two equipment rinsate and two field blank samples were collected in association with this sampling event. No data were qualified due to these results.

B.5.3 GENERAL MINERALS

All general minerals results are considered usable as no data were rejected. Seven samples were analyzed for pH by EPA SW-846 Method 9045 and for fluoride by EPA Method 340.2. One field duplicate pair was collected during this sampling event and the results were in good agreement.

Most pH results were qualified as estimated due to analysis exceeding holding times. The holding time for pH is “immediate.” Therefore, exceeded holding times are not uncommon and are not indicative of poor laboratory or field QA/QC procedures.

Two equipment rinsate and two field blank samples were collected in association with this sampling event. No data were qualified due to these results.

B.6 ADDITIONAL SAMPLING FOR THE RFI STANDARDIZED RISK ASSESSMENT METHODOLOGY WORK PLAN (2000)

All dioxins and metals data were validated at a Level V.

B.6.1 DIOXINS

All dioxin results are considered useable as no data were rejected. Three soil samples were analyzed for 21 individual dioxin congeners by EPA SW-846 Method 8290. No field duplicate samples were collected during this sampling event.

A few detected compounds were qualified as estimated non detects due to detects in the associated method blank. A few results were qualified as estimated because the laboratory did not use “J” qualifiers for results reported below the method calibration limit. These required data validation qualifiers, but these qualifications are not indicative of data quality problems.

No field blank or equipment rinsate samples were collected in association with this sampling event; therefore, no assessment could be made with respect to possible contamination due to field decontamination procedures.

B.6.2 METALS

All metals results are considered usable as no data were rejected. Three soil samples were analyzed for aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc by EPA SW-846 Methods 6010B and 7471A. No data were qualified.

One equipment rinsate was collected in association with this sampling event. No data were qualified due to these results.

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B.7 SUPPLEMENTAL METALS SAMPLING (APRIL 2005)

All metals data and a representative portion (10%) of the general minerals (fluoride and pH) data were validated at a Level IV. The remaining general minerals data were validated at a Level V.

B.7.1 METALS

All metals results are considered usable as no data were rejected. Forty soil samples were analyzed for analyzed for aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, sodium, thallium, vanadium, zinc, and zirconium by EPA SW-846 Methods 6020, 6010B, and 7471A. Three field duplicate pairs were collected and the results were in good agreement.

In one case, a sample had multiple analytical results for mercury. Based on professional evaluation of the data quality, the data validator accepted the most technically sound result.

Most lithium results were qualified as estimated due to lithium detected in the inductively coupled plasma (ICP) check solution A (ICSA). Some antimony results were qualified as estimated non detects due to matrix spike recovery outliers. For the most part, these qualifications were related to interference caused by the soil matrix and were not indicative of laboratory quality control issues.

Most zirconium results were qualified as estimated due to laboratory control sample recovery outliers and some thallium results were qualified as estimated detects and non detects due to reporting limit check standard recovery outliers. Most antimony results were qualified as estimated detects and non detects due to reporting limit check standard recovery outliers. These antimony qualifications, coupled with antimony detects in most

continuing calibration blanks (CCBs), potentially indicated poor instrument sensitivity near the instrument detection limit. All antimony results were reviewed by data validators and, when necessary, the antimony method detection limits (MDLs) were raised to the value of the interference in the CCBs. The MDL for one potassium result was also raised due to consistently negative potassium results in the CCBs.

Some antimony, boron, molybdenum, selenium, sodium, and thallium results were qualified as estimated detects and non detects due to detects and negative results in the associated laboratory method blanks and CCBs. No qualifications appeared related to severe laboratory contamination.

One field blank and two equipment rinsate samples were collected in association with this sampling event. Sodium and thallium were detected in one of the equipment rinsate samples, resulting in the estimation of most sodium and some thallium detects.

B.7.2 GENERAL MINERALS

All general minerals results are considered usable as no data were rejected. Forty samples were analyzed for pH by EPA SW-846 Method 9045C and for fluoride by EPA Method 300.0. Two field duplicate pairs were collected during this sampling event and the results were in good agreement.

Most pH results were qualified as estimated due to exceeded holding time; however, as noted in Section 4.2, the pH holding time is “immediate” and exceeded holding times are not indicative of poor laboratory or field QA/QC procedures. Fluoride was detected below the reporting limit in several laboratory method blanks and CCBs, as well as in most site samples. The blank detects resulted in the qualification of most fluoride detects as estimated non detects, at the level of contamination in the samples. As fluoride was detected below the reporting limit in these samples, the final fluoride results are all estimated values below the reporting limit.

One field blank and two equipment rinsate samples were collected in association with this sampling event. No qualifications were required due to these results.

B.8 HAZARDOUS MATERIALS LABORATORY DATA VALIDATION AND DATA REVIEW

As described in the RFI Program Report (MWH 2004), the DTSC Hazardous Materials Laboratory (HML) was requested to conduct reviews of 5% of the RFI data and of some data collected for specific tasks. As task-specific requests, HML reviewed and/or validated the metals and dioxin background soil data for Bell Canyon, metals and dioxin background soil data for the RFI Standardized Risk Assessment Methodology Work Plan (2000), and the metals data for the samples from one April 2005 data package.

For Bell Canyon and RFI Standardized Risk Assessment Methodology Work Plan, the AMEC data validation program included a full EPA Level IV validation of the first laboratory package submitted from each analytical laboratory for each method, as specified in the DTSC-approved RFI work plans and quality assurance project plans. Level V validation is performed on the remainder of the data. In some instances, insufficient raw data was available for a full validation by HML or AMEC. However, the HML findings were consistent with the data validation findings of AMEC in Level IV data validation packages. The HML validation did not identify causes for rejection of the data not previously identified by AMEC. The data are considered acceptable by HML and the data validation findings are consistent with the findings reported by the AMEC data validators. Additionally, HML performed a cursory review of metals and mercury data from one April 2005 soil background data deliverable group and generally concurred with the qualification of the data.

Attachment B-1 provides individual validation reports prepared by AMEC, chain-of-custody information, and laboratory information. For each data set, AMEC provided HML with the most complete hard copy laboratory data available. Attachment B-1 presents the data validation reports and associated laboratory QC information for the comprehensive data set that defines ambient background concentrations of metals, polychlorinated dioxin and furan compounds, fluoride, and pH in soil at the Santa Susana

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Field Laboratory (SSFL) in Ventura County, California. Data validation was performed by AMEC Earth and Environmental (AMEC) following standard United States Environmental Protection Agency (USEPA) procedures. The data validation findings are described above.

Attachment B-2 presents the published DTSC/HML memorandum regarding the April 2005 metals background soils data. Other HML memoranda may be found in the RFI Program Report (MWH 2004).

B.9 REFERENCES

- ICF Kaiser Engineers (ICF) 1993a. Current Conditions Report and Draft RCRA Facility Investigation Work Plan, Areas I and III, Santa Susana Field Laboratory, Ventura County, California. October.
- ICF 1993b. Current Conditions Report and Draft RCRA Facility Investigation Work Plan, Area II and Area I LOX Plant, Santa Susana Field Laboratory, Ventura County, California. October.
- ICF 1993c. Current Conditions Report and Draft RCRA Facility Investigation Work Plan, Area IV, Santa Susana Field Laboratory, Ventura County, California. October.
- McLaren/Hart Environmental Engineering Corporation (McLaren/Hart) 1992. Workplan for Multi-Media Sampling at the Brandeis-Bardin Institute and the Santa Monica Mountains Conservancy. February.
- McLaren/Hart 1993a. Multi-Media Sampling Report for the Brandeis-Bardin Institute and the Santa Monica Mountains Conservancy. March.
- McLaren/Hart 1993b. Workplan for Additional Soil and Water Sampling at the Brandeis-Bardin Institute and the Santa Monica Mountains Conservancy. October.
- McLaren/Hart 1995. Additional Soil and Water Sampling at the Brandeis-Bardin Institute and the Santa Monica Mountains Conservancy. January.
- MWH 2004. RCRA Facility Investigation Program Report Surficial Media Operable Unit. July.

Ogden Environmental and Energy Services Co., Inc. (Ogden) 1996. RCRA Facility Investigation Work Plan Addendum, Santa Susana Field Laboratory, Ventura County, California. September.

Ogden 1998. Bell Canyon Residence Soil Sampling Work Plan, Santa Susana Field Laboratory, Ventura County, California. June.

Ogden 2000a. Standardized Risk Assessment Methodology Work Plan, Surficial Operable Unit, Santa Susana Field Laboratory, Ventura County, California. June.

Ogden 2000b. RCRA Facility Investigation Work Plan Addendum Amendments, Santa Susana Field Laboratory, Ventura County, California. June.

U.S. Environmental Protection Agency (USEPA) 1994a. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. February.

USEPA 1994b. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. February.

ATTACHMENT B-1
SOIL BACKGROUND LABORATORY INFORMATION AND VALIDATION
REPORTS
(ELECTRONIC COPY)

Electronic copy not included due to file size

ATTACHMENT B-1
Electronic Copy of Soil Background Laboratory Information and Validation Reports
Readme File

This Readme file contains information and instructions regarding use of Appendix B of the *Soil Background Report, Santa Susana Field Laboratory, Ventura County California* (MWH September 2005) and is also provided electronically on the CD provided in this appendix.

This appendix provides a read-only compact disc (CD-ROM) that contains electronic copies of validation reports, chain-of-custody (COC) forms, chain-of-custody analytical request change forms (Change Forms) and laboratory analytical reports which include case narratives, analytical results and laboratory quality control (QC) data (method blanks, matrix spike/matrix spike duplicates [MS/MSD] and laboratory control samples [LCS]). Data is presented in support of the soil matrix background data set contained in Table 4-1 of the Soil Background Report.

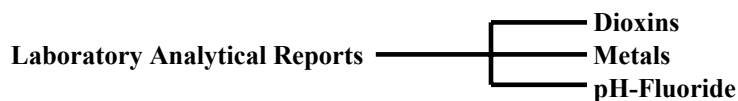
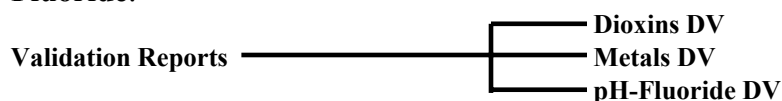
Electronic files are scanned images of hard copy documents presented in Portable Document Format (PDF) files, which can be viewed using Adobe Acrobat software.

Hard copy printouts of all documents on this CD will be included in copies of the *Soil Background Report* sent to Repositories, all other copies will include electronic files only.

Also included in this Appendix are two analytical results tables, **Table B-1-1 SSFL Soil Background Metals and Inorganics Data Set** and **Table B-1-2 SSFL Soil Background Dioxins Data Set**. These tables can be used as reference tables for locating associated laboratory and validation documentation as described below in Section 3C.

Files are organized into two main folders: **Validation Reports** and **Laboratory Analytical Reports**.

Each of these folders is subdivided into three analytical types, **Dioxins**, **Metals** and **pH-Fluoride**.



1. Validation Reports:

Validation reports include laboratory results and a data assessment form completed by AMEC Earth and Environmental, Inc. (AMEC) data validators. The validation report summaries identify the laboratory method and target compounds for each sample, in addition, the report indicates whether each compound was detected, the concentration (or detection limit if not detected), and applicable laboratory and data validation qualifiers. With the exception of field QC samples

(field blanks, equipment rinsates), all analytical data generated from background field samples were validated by AMEC. Data validation report PDFs are organized by chemical group (analytical method), with each folder containing validation reports specific to respective analytical method as shown above.

These files are organized by validation report number, which are listed in Tables B-1-1 and B-1-2 (Section 3).

2. Laboratory Analytical Reports:

Analytical data reports include analytical results for every soil background sample, and associated laboratory QC, COCs, laboratory report case narratives, and Change Forms (where applicable).

Analytical data reports are generated by the laboratory in Sample Delivery Groups (SDGs) of up to 20 samples (assigned upon receipt at the laboratory).

The case narrative is text typically found at the beginning of the laboratory report. Laboratories use the case narrative to describe any deviations from standard handling or analytical procedures for a sample or SDG.

Results and summaries of QC procedures implemented by the laboratory demonstrate that the laboratory is "in control" during sample analysis. Examples of such QC procedures include laboratory control samples, method blanks, matrix duplicates, matrix spike and matrix spike duplicates, and LCS samples. Analytical results are considered "in control" if QC procedure results meet prescribed precision, recovery, and accuracy criteria

Change Forms are generated for samples subsequent to shipment to the laboratory. Generally, change forms were generated when a changes/corrections to a COC were needed (e.g., when additional analyses were requested for a sample).

These files are organized by SDG number and are referenced in Tables B-1-1 and B-1-2 (Section 3).

3. Tables B-1-1 and B-1-2

Tables B-1-1 and B-1-2 are analytical summary analytical result tables for the soil background data set listed in Table 4-1 of the Soil Background Report. Both tables are structured identically and are sorted by analyte, then by Sample ID.

Results included in the soil background data set are flagged with an "X" in the last column of the table titled "Background Data Set".

These tables can be used as correlation look-up tables provided to make documents in this appendix easier to access.

A. Table B-1-1 SSFL Soil Background Metals and Inorganics Data Set

Table B-1-1 summarizes metals, pH and fluoride analytical results for the metals data set described in Table 4-1 of the Soil Background Report. These tables can be used as a reference for association of analytical results with their respective sampling, analytical, and validation documentation (laboratory and data validation reports) as described below in section 3C

B. Table B-1-2 SSFL Soil Background Dioxins Data Set

Table B-1-2 summarizes dioxin analytical results for the metals data set described in Table 4-2 of the Soil Background Report.

C. Instructions for use as look-up tables

These tables are configured to facilitate the search for a document in any of the folders described above. The table is arranged by sample identification. To locate documents for samples associated with a particular result:

1. Locate the sample of interest in the 'Sample Identification' column.
2. Scroll right to the Sample Delivery Group and Data Validation Number columns.
3. Note the appropriate SDG and Data Validation Number.
4. Locate the document of interest under the appropriate folder as described above. Laboratory Analytical Reports are organized by SDG Number and Validation Reports are organized by Data Validation Number.

ATTACHMENT B-2
HML SOIL BACKGROUND MEMORANDUM



Department of Toxic Substances Control



C. Lloyd, Ph.D.
Agency Secretary
Cal/EPA

Hazardous Materials Laboratory
700 Heinz Avenue, Suite 100
Berkeley, California 94710



Arnold Schwarzenegger
Governor

MEMORANDUM

TO: Gerard Abrams
Department of Toxic Substances Control
Geology, Permitting and Corrective Action Branch
5796 Corporate Ave
Cypress, CA 90630

FROM: Fred Seto, Ph.D. *FS*
Hazardous Materials Laboratory
Department of Toxic Substances Control
700 Heinz Avenue, Suite 100
Berkeley, CA 94710

DATE: September 15, 2005

SUBJECT: Review of Data Packages and Data Validation Reports
Metals by EPA Methods 6010B, 6020 (Sb, Se, Tl) and 7471A (Hg)
Boeing Rocketdyne, Santa Susana Field Laboratory RFI Background Soils

We have received data packages, chain-of-custody reports and data validation reports by AMEC for the background soil samples. The samples are described below.

<u>SDG.</u>	<u>Analysis</u>	<u>No. of Samples</u>	<u>Date Collected</u>
IOD0902	Metals, Fluoride, pH	10	April 12, 2005
IOD1092	Metals, Fluoride, pH	9	April 13, 2005
IOD1093	Metals, Fluoride, pH	4	April 13, 2005
IOD1094	Metals, Fluoride, pH	6	April 14, 2005
IOD1095	Metals, Fluoride, pH	2	April 13, 2005
IOD1178	Metals, Fluoride, pH	4	April 15, 2005
IOD1505	Metals, Fluoride, pH	6	April 18/19, 2005
ROCK01	Metals	3	May 22, 1996
ROCK02	Metals	5	May 22/23, 1996
ROCK05	Metals	7	May 24, 1996
4275	Metals	7	May 25, 1995
29403	Metals	9	March 10, 1992
16187	Metals	2	March 22, 2000

We selected a data package designated as SDG IOD1094 to review at this time. We can review more data packages if necessary. We reviewed the quality assurance/quality control (QA/QC) results and other materials such as the chain-of-custody reports and data validation reports associated with SDG IOD1094 for metals. The data package contains 6 soil samples collected on April 14, 2005. Del Mar Analytical analyzed the soil samples for metals by methods 6010B, 6020 (Sb, Se, Ti) and 7471A (Hg). AMEC performed the data validation. The samples are as follows:

<u>SDG</u>	<u>Sample ID</u>	<u>MWH Sample ID</u>	<u>Del Mar Analytical Sample ID</u>
IOD1094	BG039*	BG01005	IOD1094-01
	BG029	BG01008	IOD1094-02
	BG031	BG01100	IOD1094-03
	BG033	BG02007	IOD1094-04
	BG035	BG02074	IOD1094-05
	BG037	BG02076	IOD1094-06
	BG033REI	BG02007	IOD1094-04 REI (Hg reanalysis)

*Note: BG027 was changed to BG039 in the chain of custody report.

We have the following comments:

Sample Traceability

The samples are appropriately identified in the chain-of-custody reports to the final analytical reports. As described above, for SDG IOD1094, each sample was linked from sample collection through sample analysis by using Sample ID, MWH Sample ID and Del Mar Analytical Sample ID. It was noted in the chain-of-custody reports that sample BG027 was changed to BG039. The data package contained a table cross referencing the samples with the various ID numbers.

Data Validation Report

The data validation report was prepared by AMEC on May 12, 2005. As data validation guidelines, AMEC included the document, USEPA CLP National Functional Guidelines for Inorganic Data Review (2/94). We wish to point out that a newer version known as USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, Final, October 2004 is available.

In the validation report, for antimony (Sb) by method 6020, the MDLs were raised five fold due to contamination found in the continuing calibration blanks.

Antimony results were reported by Del Mar which analyzed the samples as follows:

	<u>MDL mg/kg</u>	<u>Reporting Limit mg/Kg</u>	<u>Sb Result mg/Kg</u>
IOD1094-01	0.094	1.0	ND
IOD1094-02	0.095	1.1	ND
IOD1094-03	0.098	1.1	ND
IOD1094-04	0.10	1.2	ND
IOD1094-05	0.10	1.2	0.18
IOD1094-06	0.11	1.2	ND

Antimony results were reported as follows after MDLs were raised five fold:

	<u>MDL mg/kg</u> (Raised 5X)	<u>Reporting Limit mg/kg</u>	<u>Sb Result mg/kg</u>
IOD1094-01	0.47	1.1	ND (UJ)
IOD1094-02	0.48	1.1	ND (UJ)
IOD1094-03	0.49	1.1	ND (UJ)
IOD1094-04	0.5	1.2	ND (UJ)
IOD1094-05	0.5	1.2	0.5 (UJ)
IOD1094-06	0.55	1.2	ND (UJ)

The raw data for the continuing calibration blanks indicated antimony contamination ranging from 0.32 ug/L to 0.88 ug/L. To account for the contamination, the MDL was raised five fold to 0.5 mg/kg after considering the sample analysis "dilution factor." With a MDL of 0.5 mg/kg, the 0.18 mg/kg for sample IOD1094-05 was qualified as not detected above an estimate quantity of 0.5 mg/kg. We believe that the qualification is reasonable. If the reporting limits are considered as "action levels", then, the sample antimony results are below the action levels.

Data Quality

We have evaluated the holding times, initial calibration (IC), initial calibration verification (ICV), continuing calibration verification (CCV), method blank, laboratory control sample

(LCS), matrix spike /matrix spike duplicate (MS/MSD) and quantitation. The results are summarized in Table 1.

As shown in Table 1, the holding times were met. The tuning, IC, ICV, CCV, ICS results were within the control limits. Method blanks were non-detect except for boron and thallium. LCS results were within the control limits, except for zirconium. MS/MSD results were within the control limits except for aluminum, iron, manganese and antimony. Some quantitations for methods 6010A, 6020 and 7471A were verified to be correct.

Gerard Abrams
September 15, 2005
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Thus, sample results associated with satisfactory QA/QC results should be acceptable. Sample results associated with unsatisfactory QA/QC results should be qualified as estimates.

If you have any questions, please contact me or Lorna Garcia at (510) 540-3003.

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Lorna Garcia
James Cheng
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TABLE1: SDG IOD1094 Data Review Summary: EPA Methods 6010A, 6020 and 7471A

	ACCEPTABILITY		
	Method 6010A	Method 6020 Se, Sb and TI only	Method 7471A Hg
1. Holding Times	Yes	Yes	Yes
2. Tuning	Not applicable	Yes	Not applicable
3. Initial Calibration	Yes	Yes	Yes
4. Initial Calibration Verification	Yes	Yes	Yes
5. Continuing Calibration Verification	Yes	Yes	Yes
6. Interference Check Standard	Yes	Yes	Not applicable
7. Method Blank	Yes, Except B = 1.82 mg/kg	Yes, Except TI = 0.147 mg/kg	Yes
8. Laboratory Control Sample 80% - 120% Recovery	Yes, Except Zr = 135%	Yes	Yes
9. Matrix Spike/Matrix Spike Duplicate 75% -125% Recovery	Yes, Except Al = 5530 %, 5530% Fe = -382%, 382% Mn = 52%, 67%	Yes, Except Sb = 33%, 34%	Yes