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Date: 12 October 1999
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 105-DR FSB - QC Sample Analysis
Subject: Inorganics - Data Package No. W02839-QES (SDG No. W02839)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W02839-QES prepared by Quanterra Environmental Services (QES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

| Sample ID | Sample Date | Media | Validation | Analysis |
|-----------|-------------|-------|------------|-------------------------|
| B0W107 | 07/19/99 | Water | C | Chromium VI by EPA 7196 |

Data validation was conducted in accordance with the BHI validation statement of work and the "Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils" (DOE/RL-99-35). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within 24 hours for Chromium VI.

All holding times were acceptable.

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- **Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All blank results were acceptable.

Equipment Blanks

One equipment blank (BOW107) was submitted for analysis. No analytes were detected in the equipment blank.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

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- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30%. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 30% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were acceptable.

All laboratory duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 105DR PQLs or the CRDL if no PQL was specified, to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific PQL or CRDL.

- **Completeness**

Data package No. W02839-QES (SDG No. W02839) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-35, *Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils*

Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

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Appendix 2

Summary of Data Qualification

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DATA QUALIFICATION SUMMARY

| SDG: W02839 | REVIEWER: TLI | DATE: 10/12/99 | PAGE <u>1</u> OF <u>1</u> |
|----------------------------------|------------------|------------------|---------------------------|
| COMMENTS: No qualifiers assigned | | | |
| COMPOUND | QUALIFIER | SAMPLES AFFECTED | REASON |
| | | | |
| | | | |
| | | | |
| | | | |

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02839 / 8440
LAB SAMPLE ID: 9D08JP10 MATRIX: WATER
CLIENT ID: B0W107 DATE RECEIVED: 7/19/99 4:30:00 PM

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER |
|-----------|----------|---|---------------------|------------------|----------|-------------|-------|---------------|
| HEXCHROME | 2.00E-03 | U | N/A | N/A | 2.00E-03 | mg/L | N/A | EPA7196 |

Number of Results:

PC
10/12/99

[Handwritten signature]

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352



August 19, 1999

Attention: Joan Kessner

| | | |
|----------------------------|---|----------------|
| SAF Number | : | B99-082 |
| Date First Sample Received | : | July 19, 1999 |
| Number of Samples | : | One |
| Sample Type | : | Water |
| SDG Number | : | W02839 |
| Data Deliverable | : | 21 Day Summary |

I. Introduction

On July 19, 1999, one water sample was received by the Quanterra Environmental Services Richland Laboratory (QESRL) for chemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID's as found on the first page of the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical errors.

The requested analysis was: **Hexavalent Chromium**
Hexavalent Chromium by EPA7196

III. Quality Control

Bechtel Hanford, Inc.
August 19, 1999
Page 2

The analytical results for the analysis include a minimum of one Laboratory Control Sample (LCS), one matrix spike (MS), one matrix spike duplicate (MSD), and one method (reagent) blank. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results.

IV. Comments

Hexavalent Chromium

Hexavalent Chromium by EPA7196

The LCS, MS, MSD, batch blank, and sample results are within the requirements of the contract.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:



Doug Swenson
Project Manager

| | | | | | |
|--|------------------------------|---------------------------|---|------------------|----------------------------|
| Collector Fahlberg/ Porter | Company Contact J Adler | Telephone No. 373-4316 | Project Coordinator TRENT, SJ | Price Code 7L | Data Turnaround 21 Days |
| Project Designation 105-DR FSB - QC Sample Analysis | Sampling Location 105 DR | | SAF No. B99-082 | | |
| Ice Chest No. | Field Logbook No. EL 1281 | | Method of Shipment <i>Hand Delivered</i> | | |
| Shipped To Quanterra Incorporated | Offsite Property No. | | Bill of Lading/Air Bill No. | | |

COA R105 DY 2870

POSSIBLE SAMPLE HAZARDS/REMARKS

Preservation

None

Cool 4C

Type of Container

P

P

No. of Container(s)

1

1

Special Handling and/or Storage

Volume

20mL

500mL

SAMPLE ANALYSIS

Due 8-10

Activity Scan

Chromium
Hex - 7196

SDC W12839

JAC-200105

| Sample No. | Matrix * | Sample Date | Sample Time | Activity Scan | Chromium Hex - 7196 | | | | | | | | | | |
|----------------------|----------|----------------|-------------|---------------|---------------------|--|--|--|--|--|--|--|--|--|--|
| BOW107 <i>DOS JP</i> | Water | <i>7-19-99</i> | <i>1250</i> | <i>X</i> | <i>X</i> | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

CHAIN OF POSSESSION

Sign/Print Names

SPECIAL INSTRUCTIONS

Sample originated from a non radioactive area

Matrix *

- Soil
- Water
- Vapor
- Other Solid
- Other Liquid

| | | | |
|---------------------------------------|-----------------------------|-----------------------------------|-----------------------------|
| Relinquished By <i>R. Fahlberg</i> | Date/Time <i>7-15-99</i> | Received By <i>Candy Black</i> | Date/Time <i>7-19-99</i> |
| Relinquished By | Date/Time | Received By | Date/Time |
| Relinquished By | Date/Time | Received By | Date/Time |
| Relinquished By | Date/Time | Received By | Date/Time |

| | | | |
|--------------------------|-----------------|-------------|-----------|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

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Appendix 5
Data Validation Supporting Documentation

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

| | | | | | |
|-------------------------------------|--------------------------------------|------------------------------------|---|---|--------------------------|
| VALIDATION LEVEL: | A | B | C | D | E |
| PROJECT: 10SDR FSD-QC sample | | | DATA PACKAGE: W02839 | | |
| VALIDATOR: JLI | | LAB: QFS | | DATE: 10/4/99 | |
| CASE: | | | SDG: W02839 | | |
| ANALYSES PERFORMED | | | | | |
| <input type="checkbox"/> CLP/ICP | <input type="checkbox"/> CLP/GFAA | <input type="checkbox"/> CLP/Hg | <input type="checkbox"/> CLP/Cyanide | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> SW-846/ICP | <input type="checkbox"/> SW-846/GFAA | <input type="checkbox"/> SW-846/Hg | <input type="checkbox"/> SW-846 Cyanide | <input checked="" type="checkbox"/> CR VI | <input type="checkbox"/> |
| SAMPLES/MATRIX BOW107 | | | | | |
| water | | | | | |

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No **N/A**
 Is a case narrative present? **Yes** No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? **Yes** No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

- Were initial calibrations performed on all instruments? Yes No N/A
- Are initial calibrations acceptable? Yes No N/A
- Are ICP interference checks acceptable? Yes No N/A
- Were ICV and CCV checks performed on all instruments? Yes No N/A
- Are ICV and CCV checks acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
- Are ICB and CCB results acceptable? Yes No N/A
- Were preparation blanks analyzed? Yes No N/A
- Are preparation blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: ER _____

5. ACCURACY

- Were spike samples analyzed? Yes No N/A
- Are spike sample recoveries acceptable? Yes No N/A
- Were laboratory control samples (LCS) analyzed? Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

- Were laboratory duplicates analyzed? Yes No N/A
- Are laboratory duplicate samples RPD values acceptable? Yes No N/A
- Were ICP serial dilution samples analyzed? Yes No N/A
- Are ICP serial dilution %D values acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

Comments: _____

7. FURNACE AA QUALITY CONTROL

- Were duplicate injections performed as required? Yes No N/A
- Are duplicate injection %RSD values acceptable? Yes No N/A
- Were analytical spikes performed as required? Yes No N/A
- Are analytical spike recoveries acceptable? Yes No N/A
- Was MSA performed as required? Yes No N/A
- Are MSA results acceptable? Yes No N/A

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Are results calculated properly? Yes No N/A
- Do results meet the CRDLs? Yes No N/A

Comments: _____

