

ATTACHMENT 1: QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

This attachment summarizes the field quality assurance, laboratory quality assurance, data verification and data validation procedures utilized for the JPL groundwater monitoring program. Data validation was performed by an independent contractor, Laboratory Data Consultants, Inc. of Carlsbad, California. Data verification and validation indicated that the all volatile organic carbon (VOC), perchlorate and metal results obtained from the first quarter 2012 sampling event were acceptable for their intended use of characterizing aquifer quality.

ATTACHMENT 1: QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

Field and laboratory QC samples were collected and analyzed to fulfill quality requirements. Proper sample collection and handling procedures were utilized to ensure the integrity of the analytical results. A comprehensive quality assurance and quality control (QA/QC) plan for groundwater monitoring is described in the *Work Plan for Performing a Remedial Investigation/Feasibility Study* (Ebasco, 1993).

FIELD QUALITY ASSURANCE/QUALITY CONTROL

The field QA/QC samples collected for JPL groundwater monitoring included field duplicate samples, equipment rinsate blanks and trip blanks. The QC sample results were used for the qualitative evaluation of the data. Table 1-1 summarizes analytical results for the field quality control samples during the first quarter 2012 groundwater sampling event.

Field Duplicate Samples. Duplicate samples were collected to evaluate the precision of the sample collection process. Duplicate samples for volatile organic compounds (VOCs), perchlorate, total chromium and hexavalent chromium [Cr(VI)] analyses were collected from monitoring wells MW-6, MW-11 (Screen 4), MW-13, MW-16, MW-21 (Screen 2), MW-22 (Screen 2) and MW-23 (Screen 1). The analytical results for the field duplicate samples were comparable to the results of the original groundwater samples for VOCs (Table 1) and Metals (Table 2).

Equipment Rinsate Blanks. Equipment rinsate blanks were collected each day that non-dedicated sampling equipment was used. The equipment rinsate blanks, consisting of distilled water run through the sampling equipment after decontamination, were analyzed for all contaminants of concern to monitor possible cross-contamination of the samples due to inadequate decontamination. No VOC contaminants or TICs were detected in the equipment blanks as shown in Table 1-1.

Trip Blanks. Trip blanks, which consisted of reagent-grade water in vials transported with the sample bottles to and from the field, were submitted to the laboratory with each shipment of groundwater samples. Trip blanks were used to help identify cross-contamination of groundwater samples during transport and sample handling procedures. No VOC contaminants or TICs were detected in the trip blanks as shown in Table 1-1.

Source Blank. A source blank which consisted of distilled water used by sampling personnel for equipment decontamination was collected during this sampling event. This QC sample serves as a check for any contamination present in the source water. No VOC contaminants or TICs were detected in the source blank as shown in Table 1-1.

LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

Laboratory QC samples included surrogate compounds (for VOC analyses), matrix spike samples, blank spike samples, and method blanks. The results of the laboratory

QC samples were used by the laboratory to determine the accuracy and precision of the analytical techniques, and to identify anomalous results due to laboratory contamination or instrument malfunction.

DATA VERIFICATION AND VALIDATION

The purpose of data verification and validation is to assure that the data collected meet the data quality objectives (DQOs) outlined in the Quality Assurance Project Plan of the Groundwater Monitoring Plan (Ebasco, 1993).

Data Verification. Data verification is a review of the analytical data that includes confirming that the sample identification numbers on the laboratory reports match those on the chain-of-custody records. Data verification also includes a review of the analytical data reports to confirm that all samples were analyzed and all required analytes were quantified for each sample.

Data Validation. Data validation is a systematic review of the analytical data to determine the compliance with established method performance criteria. Validation of a data package included review of the technical holding time requirements, review of sample preparation, review of the initial and continuing calibration data, review and recalculation of the laboratory QC sample data, review of the equipment performance, reconciliation of the raw data with the reduced results, identification of data anomalies, and qualification of data to identify data usability limitations.

Data validation was performed by an independent contractor, Laboratory Data Consultants, Inc. (LDC) of Carlsbad, CA. All of the data provided by Alpha Analytical, Inc. and Columbia Analytical Services, Inc. (CAS) were validated. Ninety percent of the data were subjected to Level III validation and ten percent of the data were subjected to Level IV validation in accordance with the EPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic and Inorganic Data Review (U.S. EPA, 2008; 2010).

Data Validation Qualifiers. Analytical data were qualified based on data validation. Data qualifiers were assigned in accordance with EPA guidelines. All samples were analyzed within the analytical holding times. Data validation indicated that all of the data from the first quarter 2012 sampling event were acceptable for their intended use of characterizing aquifer quality.

The data validation reports are included in Attachment 2.

REFERENCES

- Ebasco. 1993. *Work Plan for Performing a Remedial Investigation/Feasibility Study*. National Aeronautics and Space Administration Jet Propulsion Laboratory, Pasadena, California. December.
- U.S. EPA. 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. June.
- U.S. EPA. 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*. January.

TABLE 1-1
SUMMARY OF CONTAMINANTS DETECTED IN QUALITY CONTROL SAMPLES
COLLECTED DURING THE JAN/FEB 2012 SAMPLING EVENT

(All concentrations reported in µg/L.)

Blank Type	Sample ID Number	Sampling Location(s)	Total Chromium	Methylene Chloride	1,2,3-Trichloropropane	2-Butanone	Other Organic Compounds	TICs
EQUIPMENT BLANK	EB-10-2/10/12	MW-22	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-1-1/30/12	MW-7, MW-21	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-11-2/13/12	MW-24	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-12-2/14/12	MW-25, MW-26	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-13-2/15/12	MW-12	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-2-1/31/12	MW-6, MW-13, MW-14, MW-15, MW-16	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-3-2/01/12	MW-5, MW-8, MW-10, MW-18	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-4-2/2/12	MW-17	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-5-2/3/12	MW-19	NA	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-6-2/6/12	MW-3, MW-4	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-7-2/7/12	MW-20	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-8-2/8/12	MW-11	5 U	1 U	1 U	10 U		
EQUIPMENT BLANK	EB-9-2/9/12	MW-23	5 U	1 U	1 U	10 U		
SOURCE BLANK	SB-1-1/30/12	--	5 U	1 U	1 U	10 U		
TRIP BLANK	TB-10-2/10/12	MW-22	NA	1 U	1 U	10 U		
TRIP BLANK	TB-1-1/30/12	MW-7, MW-21	NA	1 U	1 U	10 U		
TRIP BLANK	TB-11-2/13/12	MW-24	NA	1 U	1 U	10 U		
TRIP BLANK	TB-12-2/14/12	MW-25, MW-26	NA	1 U	1 U	10 U		
TRIP BLANK	TB-13-2/15/12	MW-12	NA	1 U	1 U	10 U		
TRIP BLANK	TB-2-1/31/12	MW-6, MW-13, MW-14, MW-15, MW-16	NA	1 U	1 U	10 U		
TRIP BLANK	TB-3-2/01/12	MW-5, MW-8, MW-10, MW-18	NA	1 U	1 U	10 U		
TRIP BLANK	TB-4-2/2/12	MW-17	NA	1 U	1 U	10 U		
TRIP BLANK	TB-5-2/3/12	MW-19	NA	1 U	1 U	10 U		
TRIP BLANK	TB-6-2/6/12	MW-3, MW-4	NA	1 U	1 U	10 U		
TRIP BLANK	TB-7-2/7/12	MW-20	NA	1 U	1 U	10 U		
TRIP BLANK	TB-8-2/8/12	MW-11	NA	1 U	1 U	10 U		
TRIP BLANK	TB-9-2/9/12	MW-23	NA	1 U	1 U	10 U		

Notes

NA Not Analyzed
U Analyte was analyzed for but not detected at or above the stated limit

ATTACHMENT 2: DATA VALIDATION REPORTS (SUMMARY SHEETS)

This attachment contains the summary sheets from the data validation performed by an independent subcontractor, Laboratory Data Consultants, Inc. (LDC) of Carlsbad, California. Complete data validation reports are available upon request.



Laboratory Data Consultants, Inc.

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Battelle
505 King Avenue
Room 10-1-170
Columbus, OH 43201
ATTN: Ms. Betsy Cutie

February 21, 2012

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on February 9, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27107:

<u>SDG #</u>	<u>Fraction</u>
P1200337, P1200338 P1200361, P1200362	Hexavalent Chromium

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: January 30, 2012
LDC Report Date: February 17, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III & IV
Laboratory: Columbia Analytical Services, Inc.
Sample Delivery Group (SDG): P1200337

Sample Identification

MW-21-5
MW-21-4
MW-21-3
MW-21-2
MW-21-1**
DUPE-1-1Q12
EB-1-1/30/12
SB-1-1/30/12
MW-21-1MS
MW-21-1MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-21-2 and DUPE-1-1Q12 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

XI. Field Blanks

Sample EB-1-1/30/12 was identified as an equipment blank. No hexavalent chromium was found.

Sample SB-1-1/30/12 was identified as a source blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200337**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200337**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: January 30, 2012
LDC Report Date: February 17, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III
Laboratory: Columbia Analytical Services, Inc.
Sample Delivery Group (SDG): P1200338

Sample Identification

MW-7

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report.

X. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200338**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200338**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: January 31, 2012
LDC Report Date: February 17, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III
Laboratory: Columbia Analytical Services, Inc.
Sample Delivery Group (SDG): P1200361

Sample Identification

MW-14-3
MW-14-2
MW-14-1
EB-2-1/31/12
MW-14-3MS
MW-14-3MSD

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report.

X. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Sample EB-2-1/31/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200361**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200361**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: January 31, 2012
LDC Report Date: February 17, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III
Laboratory: Columbia Analytical Services, Inc.
Sample Delivery Group (SDG): P1200362

Sample Identification

MW-6
DUPE-5-1Q12
MW-13
DUPE-6-1Q12
MW-16
DUPE-7-1Q12
MW-15
MW-13MS
MW-13MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report.

X. Field Duplicates

Samples MW-6 and DUPE-5-1Q12, samples MW-13 and DUPE-6-1Q12, and samples MW-16 and DUPE-7-1Q12 were identified as field duplicates. No hexavalent chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	MW-13	DUPE-6-1Q12	
Hexavalent chromium	0.007	0.008	13

X. Field Blanks

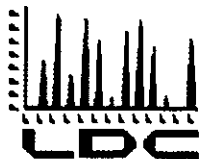
No field blanks were identified in this SDG.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200362**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200362**

No Sample Data Qualified in this SDG



Laboratory Data Consultants, Inc.

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Battelle
505 King Avenue
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Columbus, OH 43201
ATTN: Ms. Betsy Cutie

February 21, 2012

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on February 14, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27126:

<u>SDG #</u>	<u>Fraction</u>
P1200385	Hexavalent Chromium
P1200386	

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 1, 2012
LDC Report Date: February 17, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III
Laboratory: Columbia Analytical Services, Inc.
Sample Delivery Group (SDG): P1200385

Sample Identification

MW-18-4
MW-18-3
MW-18-2
EB-3-2/1/12
MW-18-4MS
MW-18-4MSD

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report.

X. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Sample EB-3-2/1/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200385**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200385**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 1, 2012
LDC Report Date: February 17, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III
Laboratory: Columbia Analytical Services, Inc.
Sample Delivery Group (SDG): P1200386

Sample Identification

MW-8
MW-5
MW-10
MW-8MS
MW-8MSD

Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report.

X. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

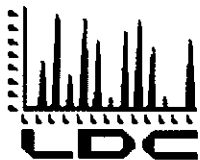
No field blanks were identified in this SDG.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200386**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200386**

No Sample Data Qualified in this SDG



Laboratory Data Consultants, Inc.

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Fax 760.634.0439

Battelle
505 King Avenue
Room 10-1-170
Columbus, OH 43201
ATTN: Ms. Betsy Cutie

February 22, 2012

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed is the final validation report for the fraction listed below. This SDG was received on February 15, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27137:

<u>SDG #</u>	<u>Fraction</u>
P1200395	Hexavalent Chromium

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 2, 2012
LDC Report Date: February 21, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III & IV
Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): P1200395

Sample Identification

MW-17-4
MW-17-3
MW-17-2**
EB-4-2/2/12
MW-17-4MS
MW-17-4MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-4-2/2/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200395**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200395**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: January 30, 2012
LDC Report Date: March 1, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12013123

Sample Identification

MW-21-5
MW-21-4
MW-21-3
MW-21-2
MW-21-1**
DUPE-1-1Q12
EB-1-1/30/12
SB-1-1/30/12
TB-1-1/30/12
MW-7
MW-21-1MS
MW-21-1MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0%.

The percent difference (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-21-1** and DUPE-1-1Q12 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-21-1**	DUPE-1-1Q12	
Chloroform	6.1	4.5	30 (≤20)

Compound	Concentration (ug/L)		RPD
	MW-21-1**	DUPE-1-1Q12	
Tetrachloroethene	2.2	1.5	38 (≤ 20)

XVII. Field Blanks

Sample TB-1-1/30/12 was identified as a trip blank. No volatile contaminants were found.

Sample EB-1-1/30/12 was identified as an equipment blank. No volatile contaminants were found.

Sample SB-1-1/30/12 was identified as a source blank. No volatile contaminants were found.

NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12013123

No Sample Data Qualified in this SDG

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12013123

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: January 30, 2012
LDC Report Date: March 1, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12013123

Sample Identification

MW-21-5
MW-21-4
MW-21-3
MW-21-2
MW-21-1**
DUPE-1-1Q12
EB-1-1/30/12
SB-1-1/30/12
MW-7
MW-21-1MS
MW-21-1MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples MW-21-2 and DUPE-1-1Q12 were identified as field duplicates. No chromium were detected in any of the samples.

XV. Field Blanks

Sample EB-1-1/30/12 was identified as an equipment blank. No chromium was found.

Sample SB-1-1/30/12 was identified as a source blank. No chromium was found.

**NASA JPL
Metals - Data Qualification Summary - SDG BMI12013123**

No Sample Data Qualified in this SDG

**NASA JPL
Metals - Laboratory Blank Data Qualification Summary - SDG BMI12013123**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: January 30, 2012
LDC Report Date: March 1, 2012
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12013123

Sample Identification

MW-21-5
MW-21-4
MW-21-3
MW-21-2
MW-21-1**
DUPE-1-1Q12
EB-1-1/30/12
SB-1-1/30/12
MW-7
MW-21-1MS
MW-21-1MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate, and EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-21-1MS/MSD (All samples in SDG BMI12013123)	Perchlorate	-	116 (85-115)	-	J (all detects)	A

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-21-2 and DUPE-1-1Q12 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-21-2	DUPE-1-1Q12	
Perchlorate	2.72	2.94	8

XI. Field Blanks

Sample EB-1-1/30/12 was identified as an equipment blank. No contaminant concentrations were found.

Sample SB-1-1/30/12 was identified as a source blank. No contaminant concentrations were found.

**NASA JPL
Wet Chemistry - Data Qualification Summary - SDG BMI12013123**

SDG	Sample	Analyte	Flag	A or P	Reason
BMI12013123	MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-21-1** DUPE-1-1Q12 EB-1-1/30/12 SB-1-1/30/12 MW-7	Perchlorate	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

**NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI12013123**

No Sample Data Qualified in this SDG



Laboratory Data Consultants, Inc.

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Battelle
505 King Avenue
Room 10-1-170
Columbus, OH 43201
ATTN: Ms. Betsy Cutie

February 22, 2012

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on February 21, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27157:

<u>SDG #</u>	<u>Fraction</u>
P1200435, P1200448 P1200460, P1200473 P1200493	Hexavalent Chromium

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 6, 2012
LDC Report Date: February 22, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III
Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): P1200435

Sample Identification

MW-4-3
MW-4-2
MW-4-1
EB-6-2/6/12
MW-3-4
MW-3-3
MW-3-2
MW-4-3MS
MW-4-3MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-6-2/6/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200435**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200435**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 7, 2012
LDC Report Date: February 21, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III & IV
Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): P1200448

Sample Identification

MW-20-5
MW-20-4
MW-20-3
MW-20-2
MW-20-1
EB-7-2/7/12
MW-20-1MS
MW-20-1MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-7-2/7/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200448**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200448**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 8, 2012
LDC Report Date: February 21, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III
Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): P1200460

Sample Identification

MW-11-3
MW-11-2
MW-11-1
EB-8-2/8/12
MW-11-1MS
MW-11-1MSD

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-8-2/8/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200460**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200460**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 9, 2012
LDC Report Date: February 21, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III
Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): P1200473

Sample Identification

MW-23-4
MW-23-3
MW-23-2
MW-23-1
DUPE-3-1Q12
EB-9-2/9/12
MW-23-4MS
MW-23-4MSD

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-23-1 and DUPE-3-1Q12 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

XI. Field Blanks

Sample EB-9-2/9/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200473**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200473**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 10, 2012
LDC Report Date: February 21, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III & IV
Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): P1200493

Sample Identification

MW-22-3**
MW-22-2
MW-22-1
DUPE-4-1Q12
EB-10-2/10/12
MW-22-3MS
MW-22-3MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-22-2 and DUP-4-1Q12 were identified as field duplicates. No hexavalent chromium was detected in any of the samples.

XI. Field Blanks

Sample EB-10-2/10/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200493**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200493**

No Sample Data Qualified in this SDG



Laboratory Data Consultants, Inc.

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Phone 760.634.0437

Web www.lab-data.com

Fax 760.634.0439

Battelle
505 King Avenue
Room 10-1-170
Columbus, OH 43201
ATTN: Ms. Betsy Cutie

February 28, 2012

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on February 21, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27166:

<u>SDG #</u>	<u>Fraction</u>
P1200522	Hexavalent Chromium
P1200541	
P1200569	

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

LDC #27166 (Battelle-San Diego / NASA JPL)

90/10 (client select)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Cr(VI) (7196A)	W		S		W		S		W		S		W		S		W		S		W		S		W		S								
					W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S							
Matrix: Water/Soil																																							
A	P1200522	02/21/12	03/13/12	6	0																																		
A	P1200522	02/21/12	03/13/12	10	0																																		
B	P1200541	02/21/12	03/13/12	10	0																																		
B	P1200541	02/21/12	03/13/12	10	0																																		
C	P1200569	02/21/12	03/13/12	6	0																																		
Total	T/LR				24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 13, 2012
LDC Report Date: February 23, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III & IV
Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): P1200522

Sample Identification

MW-24-4
MW-24-3**
MW-24-2
MW-24-1
EB-11-2/13/12
MW-24-1MS
MW-24-1MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-11-2/13/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200522**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200522**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 14, 2012
LDC Report Date: February 23, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III & IV
Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): P1200541

Sample Identification

MW-25-5
MW-25-4**
MW-25-3
MW-25-2
MW-25-1
SB-1-2/14/12
EB-12-2/14/12
MW-26-2
MW-26-1
MW-25-5MS
MW-25-5MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-12-2/14/12 was identified as an equipment blank. No hexavalent chromium was found.

Sample SB-1-2/14/12 was identified as a source blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200541**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200541**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 15, 2012
LDC Report Date: February 23, 2012
Matrix: Water
Parameters: Hexavalent Chromium
Validation Level: EPA Level III
Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): P1200569

Sample Identification

MW-12-3
MW-12-2
MW-12-1
EB-13-2/15/12
MW-12-2MS
MW-12-2MSD

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-13-2/15/12 was identified as an equipment blank. No hexavalent chromium was found.

**NASA JPL
Hexavalent Chromium - Data Qualification Summary - SDG P1200569**

No Sample Data Qualified in this SDG

**NASA JPL
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG
P1200569**

No Sample Data Qualified in this SDG



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Battelle
505 King Avenue
Room 10-1-170
Columbus, OH 43201
ATTN: Ms. Betsy Cutie

March 9, 2012

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed is the final validation report for the fractions listed below. This SDG was received on February 23, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27195:

<u>SDG #</u>	<u>Fraction</u>
BMI12020341	Volatiles, Chromium, Perchlorate

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,

Eriinda T. Rauto
Operations Manager/Senior Chemist

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 2, 2012
LDC Report Date: March 9, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020341

Sample Identification

MW-17-4
MW-17-3
MW-17-2**
EB-4-2/2/12
TB-4-2/2/12

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0%.

The percent difference (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample TB-4-2/2/12 was identified as a trip blank. No volatile contaminants were found.

Sample EB-4-2/2/12 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12020341

No Sample Data Qualified in this SDG

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12020341

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 2, 2012
LDC Report Date: March 9, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020341

Sample Identification

MW-17-4
MW-17-3
MW-17-2**
EB-4-2/2/12
MW-17-2MS
MW-17-2MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Sample EB-4-2/2/12 was identified as an equipment blank. No chromium was found.

NASA JPL
Metals - Data Qualification Summary - SDG BMI12020341

No Sample Data Qualified in this SDG

NASA JPL
Metals - Laboratory Blank Data Qualification Summary - SDG BMI12020341

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 2, 2012
LDC Report Date: March 9, 2012
Matrix: Water
Parameters: Perchlorate
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020341

Sample Identification

MW-17-4
MW-17-3
MW-17-2**
EB-4-2/2/12

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-21-1MS/MSD (All samples in SDG BMI12020341)	Perchlorate	-	116 (85-115)	-	J (all detects)	A

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-4-2/2/12 was identified as an equipment blank. No perchlorate was found.

NASA JPL

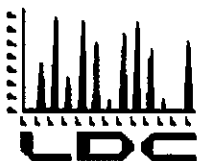
Perchlorate - Data Qualification Summary - SDG BMI12020341

SDG	Sample	Analyte	Flag	A or P	Reason
BMI12020341	MW-17 MW-17-3 MW-17-2** EB-4-2/2/12	Perchlorate	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

NASA JPL

Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI12020341

No Sample Data Qualified in this SDG



Laboratory Data Consultants, Inc.

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Battelle
505 King Avenue
Room 10-1-170
Columbus, OH 43201
ATTN: Ms. Betsy Cutie

March 12, 2012

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on February 24th & 27th, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27219:

<u>SDG #</u>	<u>Fraction</u>
BMI12020140	Volatiles, Chromium, Wet Chemistry
BMI12020240	

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: January 31, 2012
LDC Report Date: March 9, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020140

Sample Identification

MW-6
DUPE-5-1Q12
MW-13
DUPE-6-1Q12
MW-16
DUPE-7-1Q12
MW-14-5
MW-14-4
MW-14-3
MW-14-2
MW-14-1
EB-2-1/31/12
TB-2-1/31/12
MW-14-3MS
MW-14-3MSD

Introduction

This data review covers 15 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-6 and DUPE-5-1Q12, samples MW-13 and DUPE-6-1Q12, and samples MW-16 and DUPE-7-1Q12 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-6	DUPE-5-1Q12	
Trichloroethene	2.8	2.5	11
Tetrachloroethene	1.2	1.1	9

Compound	Concentration (ug/L)		RPD
	MW-13	DUPE-6-1Q12	
Chloroform	7.1	7.1	0
Carbon tetrachloride	1.5	1.5	0
Bromodichloromethane	2.6	2.6	0
Dibromochloromethane	0.55	0.55	0
Tetrachloroethene	0.56	0.52	7

XVII. Field Blanks

Sample TB-2-1/31/12 was identified as a trip blank. No volatile contaminants were found.

Sample EB-2-1/31/12 was identified as an equipment blank. No volatile contaminants were found.

**NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12020140**

No Sample Data Qualified in this SDG

**NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12020140**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: January 31, 2012
LDC Report Date: March 9, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020140

Sample Identification

MW-6
DUPE-5-1Q12
MW-13
DUPE-6-1Q12
MW-16
DUPE-7-1Q12
MW-15
MW-14-3
MW-14-2
MW-14-1
EB-2-1/31/12

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples MW-6 and DUPE-5-1Q12, samples MW-13 and DUPE-6-1Q12, and samples MW-16 and DUPE-7-1Q12 were identified as field duplicates. No chromium was found detected in any of the samples with the following exceptions:

Compound	Concentration (mg/L)		RPD
	MW-13	DUPE-6-1Q12	
Chromium	0.0058	0.0056	4

XV. Field Blanks

Sample EB-2-1/31/12 was identified as an equipment blank. No chromium was found.

**NASA JPL
Chromium - Data Qualification Summary - SDG BMI12020140**

No Sample Data Qualified in this SDG

**NASA JPL
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI12020140**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: January 31, 2012
LDC Report Date: March 9, 2012
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020140

Sample Identification

MW-6
DUPE-5-1Q12
MW-13
DUPE-6-1Q12
MW-16
DUPE-7-1Q12
MW-14-5
MW-14-4
MW-14-3
MW-14-2
MW-14-1
EB-2-1/31/12
MW-14-3MS
MW-14-3MSD

Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate and EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-6 and DUPE-5-1Q12, samples MW-13 and DUPE-6-1Q12, and samples MW-16 and DUPE-7-1Q12 were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-6	DUPE-5-1Q12	
Perchlorate	3.75	3.96	5

Analyte	Concentration (mg/L)		RPD
	MW-13	DUPE-6-1Q12	
Chloride	66 mg/L	66 mg/L	0
Sulfate	53 mg/L	52 mg/L	2
Nitrate as N	5.2 mg/L	5.1 mg/L	2
Perchlorate	346 ug/L	349 ug/L	1

Analyte	Concentration (mg/L)		RPD
	MW-16	DUPE-7-1Q12	
Chloride	54	53	2
Sulfate	45	45	0
Nitrate as N	1.4	1.4	0

XI. Field Blanks

Sample EB-2-1/31/12 was identified as an equipment blank. No contaminant concentrations were found.

**NASA JPL
Wet Chemistry - Data Qualification Summary - SDG BMI12020140**

No Sample Data Qualified in this SDG

**NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG
BMI12020140**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 1, 2012
LDC Report Date: March 9, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020240

Sample Identification

MW-8
MW-5
MW-10
MW-18-5
MW-18-4
MW-18-3
MW-18-2
EB-3-2/01/12
TB-3-2/01/12

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/9/12	Trichlorofluoromethane	31.1	All samples in SDG BMI12020240	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCS MS15W0209M	Trichlorofluoromethane	131 (70-130)	All samples in SDG BMI12020240	J (all detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample TB-3-2/01/12 was identified as a trip blank. No volatile contaminants were found.

Sample EB-3-2/01/12 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12020240

SDG	Sample	Compound	Flag	A or P	Reason
BMI12020240	MW-8 MW-5 MW-10 MW-18-5 MW-18-4 MW-18-3 MW-18-2 EB-3-2/01/12 TB-3-2/01/12	Trichlorofluoromethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
BMI12020240	MW-8 MW-5 MW-10 MW-18-5 MW-18-4 MW-18-3 MW-18-2 EB-3-2/01/12 TB-3-2/01/12	Trichlorofluoromethane	J (all detects)	P	Laboratory control samples (%R)

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12020240

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 1, 2012
LDC Report Date: March 7, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020240

Sample Identification

MW-8
MW-5
MW-10
MW-18-4
MW-18-3
MW-18-2
EB-3-2/01/12

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Sample EB-3-2/01/12 was identified as an equipment blank. No chromium was found.

**NASA JPL
Chromium - Data Qualification Summary - SDG BMI12020240**

No Sample Data Qualified in this SDG

**NASA JPL
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI12020240**

No Sample Data Qualified in this SDG

12/1/2014

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 1, 2012
LDC Report Date: March 7, 2012
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020240

Sample Identification

MW-8
MW-5
MW-10
MW-18-5
MW-18-4
MW-18-3
MW-18-2
EB-3-2/01/12

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate and EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-3-2/01/12 was identified as an equipment blank. No contaminant concentrations were found.

**NASA JPL
Wet Chemistry - Data Qualification Summary - SDG BMI12020240**

No Sample Data Qualified in this SDG

**NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG
BMI12020240**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 3 through February 6, 2012
LDC Report Date: March 19, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020740

Sample Identification

MW-4-3
MW-4-2
MW-4-1
EB-6-2/6/12
TB-6-2/6/12
MW-3-4
MW-3-3
MW-3-2
MW-19-5
MW-19-4
MW-19-3**
MW-19-2
MW-19-1
EB-5-2/3/12
TB-5-2/3/12
MW-4-3MS
MW-4-3MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/14/12	Chloromethane	41.2	All samples in SDG BMI12020740	J (all detects) UJ (all non-detects)	P

The percent difference (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCSMS15W0214M	Chloromethane	59 (70-130)	All samples in SDG BMI12020740	J (all detects) UJ (all non-detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Samples TB-6-2/6/12 and TB-5-2/3/12 were identified as trip blanks. No volatile contaminants were found.

Samples EB-6-2/6/12 and EB-5-2/3/12 were identified as equipment blanks. No volatile contaminants were found.

**NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12020740**

SDG	Sample	Compound	Flag	A or P	Reason
BMI12020740	MW-4-3 MW-4-2 MW-4-1 EB-6-2/6/12 TB-6-2/6/12 MW-3-4 MW-3-3 MW-3-2 MW-19-5 MW-19-3** MW-19-2 MW-19-1 EB-5-2/3/12 TB-5-2/3/12	Chloromethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (CCV %D)
BMI12020740	MW-4-3 MW-4-2 MW-4-1 EB-6-2/6/12 TB-6-2/6/12 MW-3-4 MW-3-3 MW-3-2 MW-19-5 MW-19-3** MW-19-2 MW-19-1 EB-5-2/3/12 TB-5-2/3/12	Chloromethane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

**NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12020740**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 6, 2012
LDC Report Date: March 8, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BM112020740

Sample Identification

MW-4-3
MW-4-2
MW-4-1
EB-6-2/6/12
MW-3-4
MW-3-3
MW-3-2
MW-4-3MS
MW-4-3MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Sample EB-6-2/6/12 was identified as an equipment blank. No chromium was found.

NASA JPL

Chromium - Data Qualification Summary - SDG BMI12020740

No Sample Data Qualified in this SDG

NASA JPL

Chromium - Laboratory Blank Data Qualification Summary - SDG BMI12020740

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 3 through February 6, 2012
LDC Report Date: March 8, 2012
Matrix: Water
Parameters: Perchlorate
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020740

Sample Identification

MW-4-3
MW-4-2
MW-4-1
EB-6-2/6/12
MW-3-4
MW-3-3
MW-3-2
MW-19-5
MW-19-4
MW-19-3**
MW-19-2
MW-19-1
EB-5-2/3/12
MW-4-3MS
MW-4-3MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 15 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
2/15/12	CCV (08:03)	Perchlorate	116.3 (85-115)	MW-4-2	J (all detects)	P

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Samples EB-6-2/6/12 and EB-5-2/3/12 were identified as equipment blanks. No perchlorate was found.

NASA JPL
Perchlorate - Data Qualification Summary - SDG BMI12020740

SDG	Sample	Analyte	Flag	A or P	Reason
BMI12020740	MW-4-2	Perchlorate	J (all detects)	P	Continuing calibration (%R)

NASA JPL
Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI12020740

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 7, 2012
LDC Report Date: March 19, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020840

Sample Identification

MW-20-5
MW-20-4
MW-20-3
MW-20-2
MW-20-1
EB-7-2/7/12
TB-7-2/7/12
MW-20-1MS
MW-20-1MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-20-1MS/MSD (MW-20-1)	Chloromethane	-	-	46.6 (27)	J (all detects)	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample TB-7-2/7/12 was identified as a trip blank. No volatile contaminants were found.

Sample EB-7-2/7/12 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12020840

SDG	Sample	Compound	Flag	A or P	Reason
BMI12020840	MW-20-1	Chloromethane	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD)

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12020840

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 7, 2012
LDC Report Date: March 8, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020840

Sample Identification

MW-20-5
MW-20-4
MW-20-3
MW-20-2
MW-20-1
EB-7-2/7/12

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Sample EB-7-2/7/12 was identified as an equipment blank. No chromium was found.

NASA JPL
Chromium - Data Qualification Summary - SDG BMI12020840

No Sample Data Qualified in this SDG

NASA JPL
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI12020840

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 7, 2012
LDC Report Date: March 8, 2012
Matrix: Water
Parameters: Perchlorate
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020840

Sample Identification

MW-20-5
MW-20-4
MW-20-3
MW-20-2
MW-20-1
EB-7-2/7/12

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
2/15/12	CCV (08:03)	Perchlorate	116.3 (85-115)	MW-20-4	J (all detects)	P

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-7-2/7/12 was identified as an equipment blank. No perchlorate was found.

NASA JPL
Perchlorate - Data Qualification Summary - SDG BMI12020840

SDG	Sample	Analyte	Flag	A or P	Reason
BMI12020840	MW-20-4	Perchlorate	J (all detects)	P	Continuing calibration (%R)

NASA JPL
Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI12020840

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 8, 2012
LDC Report Date: March 16, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020940

Sample Identification

MW-11-4
MW-11-3
MW-11-2
MW-11-1
DUP-2-1Q12
EB-8-2/8/12
TB-8-2/8/12
MW-11-1MS
MW-11-1MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-11-4 and DUP-2-1Q12 were identified as field duplicates. No volatiles were detected in any of the samples.

XVII. Field Blanks

Sample TB-8-2/8/12 was identified as a trip blank. No volatile contaminants were found.

Sample EB-8-2/8/12 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12020940

No Sample Data Qualified in this SDG

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12020940

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 8, 2012
LDC Report Date: March 8, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020940

Sample Identification

MW-11-3
MW-11-2
MW-11-1
EB-8-2/8/12

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Sample EB-8-2/8/12 was identified as an equipment blank. No chromium was found.

NASA JPL

Chromium - Data Qualification Summary - SDG BMI12020940

No Sample Data Qualified in this SDG

NASA JPL

Chromium - Laboratory Blank Data Qualification Summary - SDG BMI12020940

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 8, 2012
LDC Report Date: March 8, 2012
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12020940

Sample Identification

MW-11-4
MW-11-3
MW-11-2
MW-11-1
DUP-2-1Q12
EB-8-2/8/12
MW-11-1MS
MW-11-1MSD

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Phosphate, Orthophosphate as Phosphorus, and Sulfate and EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-11-1MS/MSD (MW-11-1)	Nitrite as N Orthophosphate as P	113 (90-110) 119 (90-110)	111 (90-110) 118 (90-110)	- -	J (all detects) J (all detects)	A

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS/LCSD	Nitrite as N Orthophosphate as P Sulfate	113 (90-110) 113 (90-110) 112 (90-110)	MW-11-1	J (all detects) J (all detects) J (all detects)	P

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-11-4 and DUP-2-1Q12 were identified as field duplicates. no contaminant concentrations were detected in any of the samples.

XI. Field Blanks

Sample EB-8-2/8/12 was identified as an equipment blank. No contaminant concentrations were found.

**NASA JPL
Wet Chemistry - Data Qualification Summary - SDG BMI12020940**

SDG	Sample	Analyte	Flag	A or P	Reason
BMI12020940	MW-11-1	Nitrite as N Orthophosphate as P	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
BMI12020940	MW-11-1	Nitrite as N Orthophosphate as P Sulfate	J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R)

**NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG
BMI12020940**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 9, 2012
LDC Report Date: March 15, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021042

Sample Identification

MW-23-3
MW-23-2
MW-23-1
DUPE-3-1Q12
EB-9-2/9/12
TB-9-2/9/12

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-23-1 and DUPE-3-1Q12 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-23-1	DUPE-3-1Q12	
Chloroform	1.5	1.2	22

XVII. Field Blanks

Sample TB-9-2/9/12 was identified as a trip blank. No volatile contaminants were found.

Sample EB-9-2/9/12 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12021042

No Sample Data Qualified in this SDG

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12021042

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 9, 2012
LDC Report Date: March 8, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021042

Sample Identification

MW-23-4
MW-23-3
MW-23-2
MW-23-1
DUPE-3-1Q12
EB-9-2/9/12
MW-23-4MS
MW-23-4MSD

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples MW-23-1 and DUPE-3-1Q12 were identified as field duplicates. No chromium was detected in any of the samples.

XV. Field Blanks

Sample EB-9-2/9/12 was identified as an equipment blank. No chromium was found.

**NASA JPL
Chromium - Data Qualification Summary - SDG BMI12021042**

No Sample Data Qualified in this SDG

**NASA JPL
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI12021042**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 9, 2012
LDC Report Date: March 8, 2012
Matrix: Water
Parameters: Perchlorate
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021042

Sample Identification

MW-23-3
MW-23-2
MW-23-1
DUPE-3-1Q12
EB-9-2/9/12

Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met when applicable.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-23-1 and DUPE-3-1Q12 were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-23-1	DUPE-3-1Q12	
Perchlorate	35.2	35.5	1

XI. Field Blanks

Sample EB-9-2/9/12 was identified as an equipment blank. No perchlorate was found.

NASA JPL
Perchlorate - Data Qualification Summary - SDG BMI12021042

No Sample Data Qualified in this SDG

NASA JPL
Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI12021042

No Sample Data Qualified in this SDG



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Battelle
505 King Avenue
Room 10-1-170
Columbus, OH 43201
ATTN: Ms. Betsy Cutie

March 28, 2012

SUBJECT: NASA JPL, Data Validation

Dear Ms. Cutie,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on March 6, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27271:

<u>SDG #</u>	<u>Fraction</u>
BMI12021444	Volatiles, Chromium, Perchlorate, Wet Chemistry
BMI12021540	
BMI12021640	

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 10 through February 13, 2012
LDC Report Date: March 27, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021444

Sample Identification

MW-22-3**
MW-22-2
MW-22-1
DUPE-4-1Q12
EB-10-2/10/12
TB-10-2/10/12
MW-24-3**
MW-24-2
MW-24-1
EB-11-2/13/12
TB-11-2/13/12
MW-24-1MS
MW-24-1MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/16/12	Bromomethane	32.7	All samples in SDG BMI12021444	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Although matrix spike (MS) and matrix spike duplicate (MSD) samples were not required by the method, MS and MSD samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-24-1MS/MSD (MW-24-1)	cis-1,2-Dichloroethene	-	-	22.2 (≤ 20)	J (all detects)	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
LCSMS15W0216M	Bromomethane	67 (70-130)	All samples in SDG BMI12021444	J (all detects) UJ (all non-detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples MW-22-2 and DUPE-4-1Q12 were identified as field duplicates. No volatile contaminants were found.

XVII. Field Blanks

Sample TB-10-2/10/12 and TB-11-2/13/12 were identified as trip blanks. No volatile contaminants were found.

Samples EB-11-2/13/12 and EB-10-2/10/12 were identified as equipment blanks. No volatile contaminants were found.

NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12021444

SDG	Sample	Compound	Flag	A or P	Reason
BMI12021444	MW-22-3** MW-22-2 MW-22-1 DUPE-4-1Q12 MW-EB-10-2/10/12 TB-10-2/10/12 MW-24-3** MW-24-2 MW-24-1 EB-11-2/13/12 TB-11-2/13/12	Bromomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
BMI12021444	MW-20-1	cis-1,2-Dichloroethene	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD)
BMI12021444	MW-22-3** MW-22-2 MW-22-1 DUPE-4-1Q12 MW-EB-10-2/10/12 TB-10-2/10/12 MW-24-3** MW-24-2 MW-24-1 EB-11-2/13/12 TB-11-2/13/12	Bromomethane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12021444

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 10 through February 13, 2012
LDC Report Date: March 27, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021444

Sample Identification

MW-22-3**
MW-22-2
MW-22-1
DUPE-4-1Q12
EB-10-2/10/12
MW-24-4
MW-24-3**
MW-24-2
MW-24-1
EB-11-2/13/12
MW-24-1MS
MW-24-1MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples MW-22-2 and DUPE-4-1Q12 were identified as field duplicates. No chromium was detected in any of the samples.

XV. Field Blanks

Samples EB-10-2/10/12 and EB-11-2/13/12 were identified as equipment blanks. No chromium was found.

NASA JPL
Chromium - Data Qualification Summary - SDG BMI12021444

No Sample Data Qualified in this SDG

NASA JPL
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI12021444

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 10 through February 13, 2012
LDC Report Date: March 27, 2012
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021444

Sample Identification

MW-22-3**
MW-22-2
MW-22-1
DUPE-4-1Q12
EB-10-2/10/12
MW-24-3**
MW-24-2
MW-24-1
EB-11-2/13/12
MW-24-1MS
MW-24-1MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate and EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-24-1MS/MSD (MW-24-1)	Orthophosphate as P	-	152 (90-110)	35.2 (≤ 15)	J (all detects) UJ (all non-detects)	A

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples MW-22-2 and DUPE-4-1Q12 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-22-2	DUPE-4-1Q12	
Perchlorate	3.24	3.19	2

XI. Field Blanks

Samples EB-11-2/13/12 and EB-10-2/10/12 were identified as equipment blanks. No contaminant concentrations were found.

**NASA JPL
Wet Chemistry - Data Qualification Summary - SDG BMI12021444**

SDG	Sample	Analyte	Flag	A or P	Reason
BMI12021444	MW-24-1	Orthophosphate as P	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)(RPD)

**NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG
BMI12021444**

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 14, 2012
LDC Report Date: March 22, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021540

Sample Identification

MW-25-5
MW-25-4**
MW-25-3
MW-25-2
MW-25-1
SB-1-2/14/12
EB-12-2/14/12
MW-26-2
MW-26-1
TB-12-2/14/12
MW-26-2MS
MW-26-2MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample TB-12-2/14/12 was identified as a trip blank. No volatile contaminants were found.

Sample EB-12-2/14/12 was identified as an equipment blank. No volatile contaminants were found.

Sample SB-1-2/14/12 was identified as a source blank. No volatile contaminants were found.

NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12021540

No Sample Data Qualified in this SDG

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12021540

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 14, 2012
LDC Report Date: March 21, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021540

Sample Identification

MW-25-5
MW-25-4**
MW-25-3
MW-25-2
MW-25-1
SB-1-2/14/12
EB-12-2/14/12
MW-26-2
MW-26-1

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Sample EB-12-2/14/12 identified as an equipment blank. No chromium was found.

Sample SB-1-2/14/12 was identified as a source blank. No chromium was found.

NASA JPL
Chromium - Data Qualification Summary - SDG BMI12021540

No Sample Data Qualified in this SDG

NASA JPL
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI12021540

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 14, 2012
LDC Report Date: March 27, 2012
Matrix: Water
Parameters: Perchlorate
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021540

Sample Identification

MW-25-5
MW-25-4**
MW-25-3
MW-25-2
MW-25-1
SB-1-2/14/12
EB-12-2/14/12
MW-26-2
MW-26-1

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
2/20/12	CCV (00:53)	Perchlorate	116.1 (85-115)	All samples in SDG BMI12021540	J (all detects)	P

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-12-2/14/12 was identified as an equipment blank. No perchlorate was found.

Sample SB-1-2/14/12 was identified as a source blank. No perchlorate was found.

NASA JPL

Perchlorate - Data Qualification Summary - SDG BMI12021540

SDG	Sample	Analyte	Flag	A or P	Reason
BMI12021540	MW-25-5 MW-25-4** MW-25-3 MW-25-2 MW-25-1 SB-1-2/14/12 EB-12-2/14/12 MW-26-2 MW-26-1	Perchlorate	J (all detects)	P	Calibration (CCV %R)

NASA JPL

Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI12021540

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 15, 2012
LDC Report Date: March 21, 2012
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021640

Sample Identification

MW-12-5**
MW-12-4
MW-12-3
MW-12-2
MW-12-1
EB-13-2/15/12
TB-13-2/15/12
MW-12-5MS
MW-12-5MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample TB-13-2/15/12 was identified as a trip blank. No volatile contaminants were found.

Sample EB-13-2/15/12 was identified as an equipment blank. No volatile contaminants were found.

NASA JPL
Volatiles - Data Qualification Summary - SDG BMI12021640

No Sample Data Qualified in this SDG

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI12021640

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: February 15, 2012
LDC Report Date: March 22, 2012
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021640

Sample Identification

MW-12-3
MW-12-2
MW-12-1
EB-13-2/15/12
MW-12-2MS
MW-12-2MSD

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No chromium was found in the initial, continuing and preparation blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Sample EB-13-2/15/12 was identified as an equipment blank. No chromium was found.

NASA JPL
Chromium - Data Qualification Summary - SDG BMI12021640

No Sample Data Qualified in this SDG

NASA JPL
Chromium - Laboratory Blank Data Qualification Summary - SDG BMI12021640

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL
Collection Date: February 15, 2012
LDC Report Date: March 21, 2012
Matrix: Water
Parameters: Perchlorate
Validation Level: EPA Level III & IV
Laboratory: Alpha Analytical, Inc.
Sample Delivery Group (SDG): BMI12021640

Sample Identification

MW-12-5**
MW-12-4
MW-12-3
MW-12-2
MW-12-1
EB-13-2/15/12
MW-12-2MS
MW-12-2MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
2/20/12	CCV (00:53)	Perchlorate	116.1 (85-115)	EB-13-2/15/12	J (all detects)	P

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Field Blanks

Sample EB-13-2/15/12 was identified as an equipment blank. No perchlorate was found.

**NASA JPL
Perchlorate - Data Qualification Summary - SDG BMI12021640**

SDG	Sample	Analyte	Flag	A or P	Reason
BMI12021640	EB-13-2/15/12	Perchlorate	J (all detects)	P	Calibration (CCV %R)

**NASA JPL
Perchlorate - Laboratory Blank Data Qualification Summary - SDG BMI12021640**

No Sample Data Qualified in this SDG