

LABORATORY DATA CONSULTANTS, INC.

601 University Ave., Suite 105, Sacramento, CA 95825 Bus: 916/649-8740 Fax: 916/649-0508

ERM - West
2525 Natomas Park Dr., Suite 350
Sacramento, CA 95833
ATTN: Mr. Bruce Lewis

May 1, 2006

SUBJECT: Aerojet Site C41 Data Validation

Dear Mr. Lewis,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on April 28, 2006.

LDC Project # 14917:

<u>SDG #</u>	<u>Fraction</u>
See Attachment 1	Perchlorate

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

- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994

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

Sincerely,

Calvin Tanaka
Principal Chemist

cc: Jill Henes, LDC Inc.

**Aerojet Site C41
Data Validation Reports
LDC# 0604-01**

Perchlorate

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Aerojet Site C41
Collection Date: January 25, 2006
LDC Report Date: April 26, 2006
Matrix: Soil
Parameters: Perchlorate
Validation Level: EPA Level III & IV equivalent
Laboratory: Sequoia/Del Mar - Irvine
Sample Delivery Group (SDG): S601485

Sample Identification

C41-SB01-0	C41-SB07-60	C41-SB02-55
C41-SB02-0	C41-SB02-2	C41-SB02-60
C41-SB03-0	C41-SB02-5**	C41-SB01-2
C41-SB04-0	C41-SB02-10	C41-SB01-5
C41-SB07-15	C41-SB02-10D	C41-SB01-10
C41-SB07-20	C41-SB02-15	C41-SB01-15
C41-SB07-25	C41-SB02-20**	C41-SB01-20
C41-SB07-30	C41-SB02-25	C41-SB01-25
C41-SB07-35	C41-SB02-30	C41-SB01-30
C41-SB07-40**	C41-SB02-35	C41-SB01-40
C41-SB07-45	C41-SB02-40	C41-SB01-30D
C41-SB07-50	C41-SB02-45	
C41-SB07-55	C41-SB02-50	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 37 soil 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 Data Review (February 1994), as there are no current guidelines for the methods stated above.

A table summarizing all data qualification 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.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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.
- N Presumptive evidence of presence of the constituent.
- 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. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met.

The laboratory did not provide a summary of percent recovery (%R) values for the continuing calibration standards. However, the %R of concentrations in continuing calibration standards were re-calculated and were determined to be within the QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. 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.

The laboratory analyzed and reported another client's MS/MSD samples, which were prepared in the same analytical batch (6B13090) as the project's samples. Although the MS/MSD results were within QC criteria, matrix-specific effects cannot be assessed from a direct correlation of a spike on another client's sample to the project samples. Since only the associated parent sample results are qualified for MS/MSD failure, this MS/MSD data was not considered usable for the associated samples. Therefore, samples were not qualified where another client's MS/MSD is used.

V. Duplicates

Duplicate (DUP) sample analyses were not performed. Therefore, this parameter was not reviewed.

VI. Laboratory Control Samples

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

VII. Sample Result Verification

All sample result verifications 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.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of the report, if data has been qualified.

IX. Field Duplicates

Samples C41-SB02-10 and C41-SB02-10D and samples C41-SB01-30 and C41-SB01-30D were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/kg)		RPD
	C41-SB02-10	C41-SB02-10D	
Perchlorate	0.27	0.26	3.8

**Aerojet Site C41
Perchlorate - Data Qualification Summary - SDG S601485**

No Sample Data Qualified in this SDG

**Aerojet Site C41
Perchlorate - Laboratory Blank Data Qualification Summary - SDG S601485**

No Sample Data Qualified in this SDG



819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento 2525 Natomas Park Dr., Ste. 350 Sacramento CA, 95833	Project: Aerojet Site C41 Project Number: 0020648.03 Project Manager: Bruce Lewis	S601485 Reported: 03/07/06 19:01
--	---	--

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C41-SB01-0 (S601485-01) Soil Sampled: 01/25/06 08:35 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 15:23	EPA 314.0 MOD.	
C41-SB02-0 (S601485-02) Soil Sampled: 01/25/06 08:45 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 16:25	EPA 314.0 MOD.	
C41-SB03-0 (S601485-03) Soil Sampled: 01/25/06 09:00 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 17:30	EPA 314.0 MOD.	
C41-SB04-0 (S601485-04) Soil Sampled: 01/25/06 08:20 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 17:50	EPA 314.0 MOD.	
C41-SS07-15 (S601485-05) Soil Sampled: 01/25/06 09:30 Received: 01/26/06 09:25									
Perchlorate	0.24	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 18:11	EPA 314.0 MOD.	
C41-SS07-20 (S601485-06) Soil Sampled: 01/25/06 09:35 Received: 01/26/06 09:25									
Perchlorate	0.43	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 18:32	EPA 314.0 MOD.	
C41-SS07-25 (S601485-07) Soil Sampled: 01/25/06 10:35 Received: 01/26/06 09:25									
Perchlorate	0.16	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 18:52	EPA 314.0 MOD.	
C41-SS07-30 (S601485-08) Soil Sampled: 01/25/06 10:40 Received: 01/26/06 09:25									
Perchlorate	0.12	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 19:13	EPA 314.0 MOD.	
C41-SS07-35 (S601485-09) Soil Sampled: 01/25/06 11:00 Received: 01/26/06 09:25									
Perchlorate	0.044	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 18:00	EPA 314.0 MOD.	

CJ
4/27/06



819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento 2525 Natomas Park Dr., Ste. 350 Sacramento CA, 95833	Project:Aerojet Site C41 Project Number:0020648.03 Project Manager:Bruce Lewis	S601485 Reported: 03/07/06 19:01
--	--	--

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C41-SS07-40 (S601485-10) Soil Sampled: 01/25/06 11:05 Received: 01/26/06 09:25									
Perchlorate	0.21	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 19:05	EPA 314.0 MOD.	
C41-SS07-45 (S601485-11) Soil Sampled: 01/25/06 11:05 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 19:27	EPA 314.0 MOD.	
C41-SS07-50 (S601485-12) Soil Sampled: 01/25/06 12:00 Received: 01/26/06 09:25									
Perchlorate	0.14	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 19:49	EPA 314.0 MOD.	
C41-SS07-55 (S601485-13) Soil Sampled: 01/25/06 12:20 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 20:10	EPA 314.0 MOD.	
C41-SS07-60 (S601485-14) Soil Sampled: 01/25/06 12:25 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B13090	02/13/06	02/16/06 04:07	EPA 314.0 MOD.	
C41-SB02-2 (S601485-15) Soil Sampled: 01/25/06 13:45 Received: 01/26/06 09:25									
Perchlorate	0.14	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 19:34	EPA 314.0 MOD.	
C41-SB02-5 (S601485-16) Soil Sampled: 01/25/06 13:50 Received: 01/26/06 09:25									
Perchlorate	0.35	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 19:54	EPA 314.0 MOD.	
C41-SB02-10 (S601485-17) Soil Sampled: 01/25/06 13:55 Received: 01/26/06 09:25									
Perchlorate	0.27	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 20:15	EPA 314.0 MOD.	
C41-SB02-10D (S601485-18) Soil Sampled: 01/25/06 14:00 Received: 01/26/06 09:25									
Perchlorate	0.26	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 20:36	EPA 314.0 MOD.	

Handwritten: 4/27/06



819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento 2525 Natomas Park Dr., Ste. 350 Sacramento CA, 95833	Project:Aerojet Site C41 Project Number:0020648.03 Project Manager:Bruce Lewis	S601485 Reported: 03/07/06 19:01
--	--	--

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C41-SB02-15 (S601485-21) Soil Sampled: 01/25/06 14:20 Received: 01/26/06 09:25									
Perchlorate	0.46	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 21:38	EPA 314.0 MOD.	
C41-SB02-20 (S601485-22) Soil Sampled: 01/25/06 14:25 Received: 01/26/06 09:25									
Perchlorate	0.60	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 21:58	EPA 314.0 MOD.	
C41-SB02-25 (S601485-23) Soil Sampled: 01/25/06 15:35 Received: 01/26/06 09:25									
Perchlorate	0.21	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 22:19	EPA 314.0 MOD.	
C41-SB02-30 (S601485-24) Soil Sampled: 01/25/06 15:40 Received: 01/26/06 09:25									
Perchlorate	0.24	0.020	mg/kg	1	6B01113	02/01/06	02/01/06 22:40	EPA 314.0 MOD.	
C41-SB02-35 (S601485-25) Soil Sampled: 01/25/06 15:45 Received: 01/26/06 09:25									
Perchlorate	0.39	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 20:54	EPA 314.0 MOD.	
C41-SB02-40 (S601485-26) Soil Sampled: 01/25/06 15:50 Received: 01/26/06 09:25									
Perchlorate	0.32	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 21:15	EPA 314.0 MOD.	
C41-SB02-45 (S601485-27) Soil Sampled: 01/25/06 16:05 Received: 01/26/06 09:25									
Perchlorate	0.035	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 21:37	EPA 314.0 MOD.	
C41-SB02-50 (S601485-28) Soil Sampled: 01/25/06 16:10 Received: 01/26/06 09:25									
Perchlorate	0.090	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 21:59	EPA 314.0 MOD.	
C41-SB02-55 (S601485-29) Soil Sampled: 01/25/06 16:50 Received: 01/26/06 09:25									
Perchlorate	0.16	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 22:20	EPA 314.0 MOD.	

0)
4/27/06



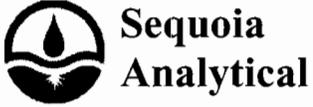
819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento 2525 Natomas Park Dr., Ste. 350 Sacramento CA, 95833	Project:Aerojet Site C41 Project Number:0020648.03 Project Manager:Bruce Lewis	S601485 Reported: 03/07/06 19:01
--	--	--

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C41-SB02-60 (S601485-30) Soil Sampled: 01/25/06 16:55 Received: 01/26/06 09:25									
Perchlorate	0.099	0.020	mg/kg	1	6B13090	02/13/06	02/15/06 23:25	EPA 314.0 MOD.	
C41-SB01-2 (S601485-31) Soil Sampled: 01/25/06 17:00 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 17:41	EPA 314.0 MOD.	
C41-SB01-5 (S601485-32) Soil Sampled: 01/25/06 17:05 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 18:43	EPA 314.0 MOD.	
C41-SB01-10 (S601485-33) Soil Sampled: 01/25/06 17:10 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 19:04	EPA 314.0 MOD.	
C41-SB01-15 (S601485-34) Soil Sampled: 01/25/06 17:15 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 19:25	EPA 314.0 MOD.	
C41-SB01-20 (S601485-35) Soil Sampled: 01/25/06 17:20 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 19:45	EPA 314.0 MOD.	
C41-SB01-25 (S601485-36) Soil Sampled: 01/25/06 17:25 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 20:06	EPA 314.0 MOD.	
C41-SB01-30 (S601485-37) Soil Sampled: 01/25/06 17:30 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 21:08	EPA 314.0 MOD.	
C41-SB01-40 (S601485-39) Soil Sampled: 01/25/06 17:40 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	1	6B13090	02/13/06	02/16/06 15:28	EPA 314.0 MOD.	

C)
4/27/06



819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento 2525 Natomas Park Dr., Ste. 350 Sacramento CA, 95833	Project:Aerojet Site C41 Project Number:0020648.03 Project Manager:Bruce Lewis	S601485 Reported: 03/07/06 19:01
--	--	---

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C41-SB01-30D (S601485-40) Soil Sampled: 01/25/06 17:45 Received: 01/26/06 09:25									
Perchlorate	ND	0.020	mg/kg	I	6B01114	02/01/06	02/01/06 21:29	EPA 314.0 MOD.	

C)
4/27/06

Method: Perchlorate by IC (EPA Method 314.0)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients > 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)		✓	✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) < 20% for waters and < 35% for soil samples? A control limit of < CRDL (< 2X CRDL for soil) was used for samples that were < 5X the CRDL, including when only one of the duplicate sample values were < 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓	✓	
Were the performance evaluation (PE) samples within the acceptance limits?				

LDC #: 0604-01A6
 SDG #: S601485

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: CS
 2nd Reviewer: KE

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

All circled dates have exceeded the technical holding time.

Y N N/A Were all samples preserved as applicable to each method ?

Y N N/A Were all cooler temperatures within validation criteria? 10.1°C & 2.0°C

Methods:		Method 314.0				
Parameters:		Perchlorate				
Technical holding time:		28 Days				
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
C41-SB01-0	1/25/2006	2/1/2006				None
C41-SB02-0	1/25/2006	2/1/2006				None
C41-SB03-0	1/25/2006	2/1/2006				None
C41-SB04-0	1/25/2006	2/1/2006				None
C41-SB07-15	1/25/2006	2/1/2006				None
C41-SB07-20	1/25/2006	2/1/2006				None
C41-SB07-25	1/25/2006	2/1/2006				None
C41-SB07-30	1/25/2006	2/1/2006				None
C41-SB07-35	1/25/2006	2/13/2006				None
C41-SB07-40	1/25/2006	2/13/2006				None
C41-SB07-45	1/25/2006	2/13/2006				None
C41-SB07-50	1/25/2006	2/13/2006				None
C41-SB07-55	1/25/2006	2/13/2006				None
C41-SB07-60	1/25/2006	2/13/2006				None
C41-SB02-2	1/25/2006	2/1/2006				None
C41-SB02-5	1/25/2006	2/1/2006				None
C41-SB02-10	1/25/2006	2/1/2006				None
C41-SB02-10D	1/25/2006	2/1/2006				None
C41-SB02-15	1/25/2006	2/1/2006				None
C41-SB02-20	1/25/2006	2/1/2006				None
C41-SB02-25	1/25/2006	2/1/2006				None
C41-SB02-30	1/25/2006	2/1/2006				None
C41-SB02-35	1/25/2006	2/1/2006				None
C41-SB02-40	1/25/2006	2/1/2006				None
C41-SB02-45	1/25/2006	2/1/2006				None

LDC#: 0604-DIAG
 SDG#: 8001485

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 3
 Reviewer: C7
 2nd Reviewer: MZ

Method: EPA Method 314.0 (Perchlorate)

Calibration Date	Column	Compound	Standard	(Y) Response	(X) Concentration	(X ²) Concentration
1/26/2006	primary	Perchlorate	Point 0	0	0	0
			Point 1	14577.6	1	1
			Point 2	33196.6	2	4
			Point 3	56844.2	4	16
			Point 4	113943.1	10	100
			Point 5	340203.7	25	625
			Point 6	669808	50	2500
			Point 7	1369230.4	100	10000

Regression Output

Constant	c	447.887
Std Err of Y Est		
R Squared		0.999715
Degrees of Freedom		
X Coefficient(s)	a	b
Std Err of Coef.	13116.111	5.732
Correlation Coefficient		0.99986
Coefficient of Determination (r ²)		0.99971

LDC#: 0604 01A6
 SDG#: S601485

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 2 of 3
 Reviewer: C
 2nd Reviewer: AK

Method: EPA Method 314.0 (Perchlorate)

Calibration Date	Column	Compound	Standard	(Y) Response	(X) Concentration	(X ²) Concentration
1/4/2006	primary	Perchlorate	Point 0	0	0	0
			Point 1	30737	1	1
			Point 2	57454.9	2	4
			Point 3	125663.4	4	16
			Point 4	288105.2	10	100
			Point 5	733827	25	625
			Point 6	1555815.05	50	2500
			Point 7	3045127.8	100	10000

Regression Output

Constant	c	-6258.464
Std Err of Y Est		
R Squared		0.999759
Degrees of Freedom		
X Coefficient(s)	a	b
Std Err of Coef.	30886.745	-3.281
Correlation Coefficient		0.99988
Coefficient of Determination (r ²)		0.99976

Method: EPA Method 314.0 (Perchlorate)

Calibration Date	Column	Compound	Standard	(Y) Response	(X) Concentration	(X ²) Concentration
2/14/2006	primary	Perchlorate	Point 0	8508.9	0	0
			Point 1	18360.5	1	1
			Point 2	29830.9	2	4
			Point 3	49887	4	16
			Point 4	131478.5	10	100
			Point 5	306736.4	25	625
			Point 6	653545.4	50	2500
			Point 7	1343483.9	100	10000

Regression Output

Constant	c	4783.592
Std Err of Y Est		
R Squared		0.999850
Degrees of Freedom		
X Coefficient(s)	a	b
Std Err of Coef.	12237.589	11.622
Correlation Coefficient		0.99992
Coefficient of Determination (r ²)		0.99985

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) of the calibration standards were calculated for the analytes identified below using the following calculation:

$$\%R = (AF * 100) / AS$$

Where:

AF = Analyte Found

AS = Analyte Spiked

Type of Analysis	Analyte	Standard ID	Found (peak area)	Spiked (Amount)	Percent Recovery		Accept? (Y/N)	Limits
					Reported	Calc'd		
Calibration Verification Low Level PQL Std. 2/1/06 (10:49)	Perchlorate	IPC	25.4265	25.0	NA	102	Y	90-110%
Calibration Verification Low Level PQL Std. 2/1/06 (11:09)	Perchlorate	IPC-MA	21.6292	25.0	NA	87	Y	80-120%
Calibration Verification 2/1/06 (10:28)	Perchlorate	ICCS	3.4340	4.0	NA	86	Y	75-125%
Calibration Verification 2/1/06 (17:04)	Perchlorate	CCV	24.4907	25.0	NA	98	Y	85-115%
Calibration Verification 2/1/06 (21:15)	Perchlorate	CCV	73.5073	75.0	NA	98	Y	85-115%
Calibration Verification 2/2/06 (1:23)	Perchlorate	CCV	23.5317	25.0	NA	94	Y	85-115%
Calibration Verification 2/2/06 (4:09)	Perchlorate	CCV	72.7665	75	NA	97	Y	85-115%

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) of the calibration standards were calculated for the analytes identified below using the following calculation:

$$\%R = (AF \div AS) \times 100$$

Where:

AF = Analyte Found

AS = Analyte Spiked

Type of Analysis	Analyte	Standard ID	Found (peak area)	Spiked (Amount)	Percent Recovery		Accept? (Y/N)	Limits
					Reported	Calc'd		
Calibration Verification Low Level PQL Std. 2/15/06 (12:10)	Perchlorate	IPC	24.6025	25.0	NA	98	Y	90-110%
Calibration Verification Low Level PQL Std. 2/15/06 (12:31)	Perchlorate	IPC-MA	24.3981	25.0	NA	98	Y	80-120%
Calibration Verification 2/15/06 (11:48)	Perchlorate	ICCS	3.7609	4.0	NA	94	Y	75-125%
Calibration Verification 2/16/06 (10:54)	Perchlorate	CCV	25.4798	25.0	NA	102	Y	85-115%
Calibration Verification 2/16/06 (22:21)	Perchlorate	CCV	78.3004	75.0	NA	104	Y	85-115%
Calibration Verification 2/16/06 (10:21)	Perchlorate	CCV	26.1271	25.0	NA	105	Y	85-115%
Calibration Verification 2/16/06 (10:21)	Perchlorate	CCV	75.6052	75	NA	101	Y	85-115%

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) of the laboratory control sample were calculated for perchlorate below using the following calculation:

$$\% \text{Recovery} = 100 * (\text{SSC} - \text{SC}) / \text{SA}$$

Where: SSC = Spiked concentration SC = Sample concentration
 SA = Spike added

$$\text{RPD} = | \text{LFB} - \text{LFBD} | * 2 / (\text{LFB} + \text{LFBD})$$

LFB = Laboratory Fortified Blank
 LFBD = Laboratory Fortified Blank duplicate recovery

LFB sample: 6B1113-BS1

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		LFB		LFB		LFB/LFBD	
	LFB	LFBD		LFB	LFBD	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Perchlorate	0.500	NA	0	0.482	NA	96	96	NA	NA	NA	NA

LFB sample: 6B01114-BS1

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		LFB		LFB		LFB/LFBD	
	LFB	LFBD		LFB	LFBD	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Perchlorate	0.500	NA	0	0.495	NA	99	99	NA	NA	NA	NA

LFB sample: 6B13090-BS1

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		LFB		LFB		LFB/LFBD	
	LFB	LFBD		LFB	LFBD	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Perchlorate	0.500	NA	0	0.481	NA	96	96	NA	NA	NA	NA

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) relative percent differences (RPD) of the matrix spike and matrix spike duplicate were calculated for perchlorate below using the following calculation:

$\% \text{Recovery} = 100 * (\text{SSC} - \text{SC}) / \text{SA}$

Where: SSC = Spiked concentration SC = Sample concentration
 SA = Spike added

$\text{RPD} = | \text{MS} - \text{MSD} | * 2 / (\text{MS} + \text{MSD})$

MS = Matrix spike recovery MSD = Matrix spike duplicate recovery

MS/MSD samples: C41-SB01-0MS & C41-SB01-0MSD

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		MS		MSD			
	MS	MSD		MS	MSD	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Perchlorate	0.499	0.499	0	0.470	0.470	94	94	94	94	0	0

MS/MSD samples: C41-SB01-2MS & C41-SB01-2MSD

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		MS		MSD			
	MS	MSD		MS	MSD	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Perchlorate	0.499	0.498	0	0.515	0.502	103	103	101	101	3	2

MS/MSD samples: 6B13090MS1 & 6B13090MSD1

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		MS		MSD			
	MS	MSD		MS	MSD	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Perchlorate	0.498	0.5	0	0.495	0.513	99	99	103	103	4	4

LDC #: 0604-01A6

VALIDATION FINDING WORKSHEET

Page: 1 of 1

SDG #: S601485

Field Duplicates

Reviewer: C7

2nd reviewer: le

METHOD: Perchlorate by IC (EPA method 314.0)

Y N NA Were field duplicate pairs identified in this SDG?

Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Qualifications
	C41-SB02-10	C41-SB02-10D			
Perchlorate	0.27	0.26	3.8		

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Qualifications
	C41-SB01-30	C41-SB01-30D			
Perchlorate	ND	ND	NA		

Notes: _____

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

Project/Site Name: Aerojet Site C41
Collection Date: January 26, 2006
LDC Report Date: April 28, 2006
Matrix: Soil
Parameters: Perchlorate
Validation Level: EPA Level III & IV equivalent
Laboratory: Sequoia/Del Mar - Irvine
Sample Delivery Group (SDG): S601526

Sample Identification

C41-SB03-2	C41-SB04-2
C41-SB03-2D	C41-SB04-5 **
C41-SB03-5	C41-SB04-5D
C41-SB03-10	C41-SB04-10
C41-SB03-15	C41-SB04-15
C41-SB03-20	C41-SB04-20
C41-SB03-25 **	C41-SB04-25
C41-SB03-30	C41-SB04-30 **
C41-SB17-0	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 soil 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 Data Review (February 1994), as there are no current guidelines for the methods stated above.

A table summarizing all data qualification 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.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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.
- N Presumptive evidence of presence of the constituent.
- 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. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met.

The laboratory did not provide a summary of percent recovery (%R) values for the continuing calibration standards. However, the %R of concentrations in continuing calibration standards were re-calculated and were determined to be within the QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. 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.

V. Duplicates

Duplicate (DUP) sample analyses were not performed. Therefore, this parameter was not reviewed.

VI. Laboratory Control Samples

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

VII. Sample Result Verification

All sample result verifications 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.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of the report, if data has been qualified.

IX. Field Duplicates

Samples C41-SB03-2 and C41-SB03-2D and samples C41-SB04-5 and C41-SB04-5D were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/kg)		RPD
	C41-SB04-5	C41-SB04-5D	
Perchlorate	0.17	0.22	25.6

Aerojet Site C41

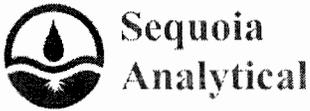
Perchlorate - Data Qualification Summary - SDG S601526

No Sample Data Qualified in this SDG

Aerojet Site C41

Perchlorate - Laboratory Blank Data Qualification Summary - SDG S601526

No Sample Data Qualified in this SDG



819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento
 2525 Natomas Park Dr., Ste. 350
 Sacramento CA, 95833

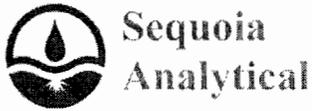
Project: Aerojet Site C41
 Project Number: 0020648.03
 Project Manager: Bruce Lewis

S601526
 Reported:
 02/09/06 14:55

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C41-HP02 (S601526-05) Water Sampled: 01/26/06 09:00 Received: 01/27/06 09:15									
Perchlorate	310	20	ug/l	10	6B02090	02/02/06	02/03/06 04:49	EPA 314.0	
C41-SB03-2 (S601526-06) Soil Sampled: 01/26/06 10:55 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 21:49	EPA 314.0 MOD.	
C41-SB03-2D (S601526-07) Soil Sampled: 01/26/06 11:00 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 22:10	EPA 314.0 MOD.	
C41-SB03-5 (S601526-08) Soil Sampled: 01/26/06 11:05 Received: 01/27/06 09:15									
Perchlorate	0.030	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 22:31	EPA 314.0 MOD.	
C41-SB03-10 (S601526-09) Soil Sampled: 01/26/06 11:10 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 22:51	EPA 314.0 MOD.	
C41-SB03-15 (S601526-10) Soil Sampled: 01/26/06 11:15 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 23:12	EPA 314.0 MOD.	
C41-SB03-20 (S601526-11) Soil Sampled: 01/26/06 11:20 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 23:33	EPA 314.0 MOD.	
C41-SB03-25 (S601526-12) Soil Sampled: 01/26/06 11:25 Received: 01/27/06 09:15									
Perchlorate	0.022	0.020	mg/kg	1	6B01114	02/01/06	02/01/06 23:53	EPA 314.0 MOD.	
C41-SB03-30 (S601526-13) Soil Sampled: 01/26/06 11:30 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/02/06 00:14	EPA 314.0 MOD.	

e.)
 2/27/06



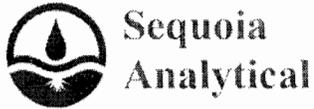
819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento 2525 Natomas Park Dr., Ste. 350 Sacramento CA, 95833	Project:Aerojet Site C41 Project Number:0020648.03 Project Manager:Bruce Lewis	S601526 Reported: 02/09/06 14:55
--	--	--

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C41-SS17-0 (S601526-14) Soil Sampled: 01/26/06 12:50 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/02/06 01:16	EPA 314.0 MOD.	
C41-HP03 (S601526-20) Water Sampled: 01/26/06 14:42 Received: 01/27/06 09:15									
Perchlorate	120	10	ug/l	5	6B02090	02/02/06	02/03/06 05:30	EPA 314.0	
C41-SB04-2 (S601526-21) Soil Sampled: 01/26/06 15:02 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B01114	02/01/06	02/02/06 01:37	EPA 314.0 MOD.	
C41-SB04-5 (S601526-22) Soil Sampled: 01/26/06 15:03 Received: 01/27/06 09:15									
Perchlorate	0.17	0.020	mg/kg	1	6B01114	02/01/06	02/02/06 01:57	EPA 314.0 MOD.	
C41-SB04-5D (S601526-23) Soil Sampled: 01/26/06 15:04 Received: 01/27/06 09:15									
Perchlorate	0.22	0.020	mg/kg	1	6B01114	02/01/06	02/02/06 02:18	EPA 314.0 MOD.	
C41-SB04-10 (S601526-24) Soil Sampled: 01/26/06 15:09 Received: 01/27/06 09:15									
Perchlorate	0.13	0.020	mg/kg	1	6B02098	02/02/06	02/02/06 23:39	EPA 314.0 MOD.	
C41-SB04-15 (S601526-25) Soil Sampled: 01/26/06 15:10 Received: 01/27/06 09:15									
Perchlorate	0.051	0.020	mg/kg	1	6B02098	02/02/06	02/03/06 00:41	EPA 314.0 MOD.	
C41-SB04-20 (S601526-26) Soil Sampled: 01/26/06 15:11 Received: 01/27/06 09:15									
Perchlorate	0.097	0.020	mg/kg	1	6B02098	02/02/06	02/03/06 01:01	EPA 314.0 MOD.	
C41-SB04-25 (S601526-27) Soil Sampled: 01/26/06 15:29 Received: 01/27/06 09:15									
Perchlorate	0.048	0.020	mg/kg	1	6B02098	02/02/06	02/03/06 01:22	EPA 314.0 MOD.	

G)
4/27/06



819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento 2525 Natomas Park Dr., Ste. 350 Sacramento CA, 95833	Project:Aerojet Site C41 Project Number:0020648.03 Project Manager:Bruce Lewis	S601526 Reported: 02/09/06 14:55
--	--	--

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C41-SB04-30 (S601526-28) Soil Sampled: 01/26/06 15:30 Received: 01/27/06 09:15										
Perchlorate	0.041	0.020		mg/kg	1	6B02098	02/02/06	02/03/06 01:43	EPA 314.0 MOD.	

0J
1/27/06

Method: Perchlorate by IC (EPA Method 314.0)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients > 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL (≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

LDC #: 0604-01B6
 SDG #: S601526

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: CJ
 2nd Reviewer: AL

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC#: 0004-0166
 SDG#: 001526

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 2
 Reviewer: CT
 2nd Reviewer: ME

Method: EPA Method 314.0 (Perchlorate)

Calibration Date	Column	Compound	Standard	(Y) Response	(X) Concentration	(X ²) Concentration
1/26/2006	primary	Perchlorate	Point 0	0	0	0
			Point 1	14577.6	1	1
			Point 2	33196.6	2	4
			Point 3	56844.2	4	16
			Point 4	113943.1	10	100
			Point 5	340203.7	25	625
			Point 6	669808	50	2500
			Point 7	1369230.4	100	10000

Regression Output

Constant	c	447.887
Std Err of Y Est		
R Squared		0.999715
Degrees of Freedom		
X Coefficient(s)	a	b
Std Err of Coef.	13116.111	5.732
Correlation Coefficient		0.99986
Coefficient of Determination (r ²)		0.99971

LDC#: 0604-0186
 SDG#: SC01526

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 2 of 2
 Reviewer: CT
 2nd Reviewer: NE

Method: EPA Method 314.0 (Perchlorate)

Calibration Date	Column	Compound	Standard	(Y) Response	(X) Concentration	(X ²) Concentration
1/4/2006	primary	Perchlorate	Point 0	0	0	0
			Point 1	30737	1	1
			Point 2	57454.9	2	4
			Point 3	125663.4	4	16
			Point 4	288105.2	10	100
			Point 5	733827	25	625
			Point 6	1555815.05	50	2500
			Point 7	3045127.8	100	10000

Regression Output

Constant	c	-6258.464
Std Err of Y Est		
R Squared		0.999759
Degrees of Freedom		
X Coefficient(s)	a	b
Std Err of Coef.	30886.745	-3.281
Correlation Coefficient		0.99988
Coefficient of Determination (r ²)		0.99976

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) of the calibration standards were calculated for the analytes identified below using the following calculation:
 $\%R = (AF * 100) / AS$

Where:

AF = Analyte Found

AS = Analyte Spiked

Type of Analysis	Analyte	Standard ID	Found (peak area)	Spiked (Amount)	Percent Recovery		Accept? (Y/N)	Limits
					Reported	Calc'd		
Calibration Verification Low Level PQL Std. 2/1/06 (10:48)	Perchlorate	IPC	26.2152	25.0	NA	105	Y	90-110%
Calibration Verification Low Level PQL Std. 2/1/06 (12:11)	Perchlorate	IPC-MA	24.2151	25.0	NA	97	Y	80-120%
Calibration Verification 2/1/06 (10:28)	Perchlorate	ICCS	4.0289	4.0	NA	101	Y	75-125%
Calibration Verification 2/1/06 (16:37)	Perchlorate	CCV	26.1753	25.0	NA	105	Y	85-115%
Calibration Verification 2/1/06 (20:45)	Perchlorate	CCV	76.4115	75.0	NA	102	Y	85-115%
Calibration Verification 2/2/06 (12:53)	Perchlorate	CCV	25.1997	25.0	NA	101	Y	85-115%
Calibration Verification 2/2/06 (12:08)	Perchlorate	CCV	80.4006	75	NA	107	Y	85-115%

LDC #: 0604-0154
 SDG #: S601526

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Page: 2 of 2
 Reviewer: CS
 2nd Reviewer: UC

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) of the calibration standards were calculated for the analytes identified below using the following calculation:

$$\%R = (AF \div AS) \times 100$$

Where:

AF = Analyte Found

AS = Analyte Spiked

Type of Analysis	Analyte	Standard ID	Found (peak area)	Spiked (Amount)	Percent Recovery		Accept? (Y/N)	Limits
					Reported	Calcd		
Calibration Verification Low Level PQL Std. 2/2/06 (13:30)	Perchlorate	IPC	26.9384	25.0	NA	108	Y	90-110%
Calibration Verification Low Level PQL Std. 2/2/06 (14:37)	Perchlorate	IPC-MA	24.7146	25.0	NA	99	Y	80-120%
Calibration Verification 2/2/06 (13:10)	Perchlorate	ICCS	4.4037	4.0	NA	110	Y	75-125%
Calibration Verification 2/2/06 (18:27)	Perchlorate	CCV	26.6706	25.0	NA	107	Y	85-115%
Calibration Verification 2/2/06 (22:35)	Perchlorate	CCV	76.6927	75.0	NA	102	Y	85-115%
Calibration Verification 2/3/06 (2:43)	Perchlorate	CCV	27.0931	25.0	NA	108	Y	85-115%
Calibration Verification 2/3/06 (6:30)	Perchlorate	CCV	77.3283	75	NA	103	Y	85-115%

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) of the laboratory control sample were calculated for perchlorate below using the following calculation:

%Recovery = $100 * (SSC - SC) / SA$

Where: SSC = Spiked concentration SC = Sample concentration
 SA = Spike added

RPD = $| LFB - LFBBD | * 2 / (LFB + LFBBD)$

LFB = Laboratory Fortified Blank
 LFBBD = Laboratory Fortified Blank duplicate recovery

LFB sample: 6B1113-BS1

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		LFB		LFBBD			
	LFB	LFBBD		LFB	LFBBD	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Perchlorate	0.500	NA	0	0.495	NA	99	99	NA	NA	NA	NA

LFB sample: 6B02098-BS1

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		LFB		LFBBD			
	LFB	LFBBD		LFB	LFBBD	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Perchlorate	0.500	NA	0	0.485	NA	97	97	NA	NA	NA	NA

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) relative percent differences (RPD) of the matrix spike and matrix spike duplicate were calculated for perchlorate below using the following calculation:

$$\% \text{Recovery} = 100 * (\text{SSC} - \text{SC}) / \text{SA}$$

Where: SSC = Spiked concentration SC = Sample concentration
 SA = Spike added

$$\text{RPD} = | \text{MS} - \text{MSD} | * 2 / (\text{MS} + \text{MSD})$$

MS = Matrix spike recovery MSD = Matrix spike duplicate recovery

MS/MSD samples: C41-SB01-2MS & C41-SB01-2MSD

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		MS		MSD			
	MS	MSD		MS	MSD	Percent Recovery		Percent Recovery			
	Reported	Recalc.		Reported	Recalc.	Reported	Recalc.	Reported	Recalc.		
Perchlorate	0.499	0.498	0	0.515	0.502	103	103	101	101	3	2

MS/MSD samples: C41-SB04-10MS & C41-SB04-10MSD

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		MS		MSD			
	MS	MSD		MS	MSD	Percent Recovery		Percent Recovery			
	Reported	Recalc.		Reported	Recalc.	Reported	Recalc.	Reported	Recalc.		
Perchlorate	0.499	0.499	0	0.641	0.609	102	102	96	96	5	6

LDC #: 0604-01B6

VALIDATION FINDING WORKSHEET

Page: 1 of 1

SDG #: S601526

Field Duplicates

Reviewer: CT

2nd reviewer: ME

METHOD: Perchlorate by IC (EPA method 314.0)

Y N NA Were field duplicate pairs identified in this SDG?

Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Qualifications
	C41-SB03-2	C41-SB03-2D			
Perchlorate	ND	ND	NA		

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Qualifications
	C41-SB04-5	C41-SB04-5D			
Perchlorate	0.17	0.22	25.6		

Notes: _____

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

Project/Site Name: Aerojet Site C41
Collection Date: January 26, 2006
LDC Report Date: April 26, 2006
Matrix: Soil
Parameters: Perchlorate
Validation Level: EPA Level III & IV equivalent
Laboratory: Sequoia/Del Mar - Irvine
Sample Delivery Group (SDG): S602193

Sample Identification

C41-SB01-50	C41-SB04-35
C41-SB01-60	C41-SB04-40 **
C41-SB03-40 **	C41-SB04-45
C41-SB03-35	C41-SB04-50
C41-SB03-45	C41-SB04-55
C41-SB03-50	C41-SB04-60
C41-SB03-55	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 13 soil 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 Data Review (February 1994), as there are no current guidelines for the methods stated above.

A table summarizing all data qualification 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.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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.
- N Presumptive evidence of presence of the constituent.
- 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. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met.

The laboratory did not provide a summary of percent recovery (%R) values for the continuing calibration standards. However, the %R of concentrations in continuing calibration standards were re-calculated and were determined to be within the QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. 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.

The laboratory analyzed and reported another client's MS/MSD samples, which were prepared in the same analytical batch as the project's samples. Although the MS/MSD results were within QC criteria, matrix-specific effects cannot be assessed from a direct correlation of a spike on another client's sample to the project samples. Since only the associated parent sample results are qualified for MS/MSD failure, this MS/MSD data was not considered usable for the associated samples. Therefore, samples were not qualified where another client's MS/MSD is used.

V. Duplicates

Duplicate (DUP) sample analyses were not performed. Therefore, this parameter was not reviewed.

VI. Laboratory Control Samples

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

VII. Sample Result Verification

All sample result verifications 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.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of the report, if data has been qualified.

IX. Field Duplicates

No samples were identified as field duplicates. Therefore, this parameter was not reviewed.

Aerojet Site C41

Perchlorate - Data Qualification Summary - SDG S602193

No Sample Data Qualified in this SDG

Aerojet Site C41

Perchlorate - Laboratory Blank Data Qualification Summary - SDG S602193

No Sample Data Qualified in this SDG



819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento 2525 Natomas Park Dr., Ste. 350 Sacramento CA, 95833	Project: Aerojet Site C41 Project Number: 0020648.03 Project Manager: Bruce Lewis	S602193 Reported: 02/24/06 15:49
--	---	--

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C41-SB01-50 (S602193-01) Soil Sampled: 01/26/06 08:30 Received: 01/27/06 09:15									
Perchlorate	0.030	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 01:57	EPA 314.0 MOD.	
C41-SB01-60 (S602193-02) Soil Sampled: 01/26/06 08:40 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 02:19	EPA 314.0 MOD.	
C41-SB03-40 (S602193-03) Soil Sampled: 01/26/06 13:20 Received: 01/27/06 09:15									
Perchlorate	0.064	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 02:40	EPA 314.0 MOD.	
C41-SB03-35 (S602193-04) Soil Sampled: 01/26/06 13:22 Received: 01/27/06 09:15									
Perchlorate	0.026	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 03:02	EPA 314.0 MOD.	
C41-SB03-45 (S602193-05) Soil Sampled: 01/26/06 14:33 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 03:24	EPA 314.0 MOD.	
C41-SB03-50 (S602193-06) Soil Sampled: 01/26/06 14:37 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 03:45	EPA 314.0 MOD.	
C41-SB03-55 (S602193-07) Soil Sampled: 01/26/06 14:37 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 04:07	EPA 314.0 MOD.	
C41-SB04-35 (S602193-08) Soil Sampled: 01/26/06 15:43 Received: 01/27/06 09:15									
Perchlorate	0.042	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 04:29	EPA 314.0 MOD.	
C41-SB04-40 (S602193-09) Soil Sampled: 01/26/06 15:44 Received: 01/27/06 09:15									
Perchlorate	0.14	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 04:50	EPA 314.0 MOD.	

CJ
4/27/06



819 Striker Ave Ste 8
 Sacramento, CA 95834
 (916) 921-9600
 FAX (916) 921-0100
 www.sequoialabs.com

ERM-West - Sacramento 2525 Natomas Park Dr., Ste. 350 Sacramento CA, 95833	Project: Aerojet Site C41 Project Number: 0020648.03 Project Manager: Bruce Lewis	S602193 Reported: 02/24/06 15:49
--	---	--

INORGANICS
Del Mar Analytical, Irvine

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C41-SB04-45 (S602193-10) Soil Sampled: 01/26/06 16:20 Received: 01/27/06 09:15									
Perchlorate	0.083	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 05:12	EPA 314.0 MOD.	
C41-SB04-50 (S602193-11) Soil Sampled: 01/26/06 16:53 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 06:17	EPA 314.0 MOD.	
C41-SB04-55 (S602193-12) Soil Sampled: 01/26/06 16:54 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 06:39	EPA 314.0 MOD.	
C41-SB04-60 (S602193-13) Soil Sampled: 01/26/06 16:56 Received: 01/27/06 09:15									
Perchlorate	ND	0.020	mg/kg	1	6B15145	02/15/06	02/17/06 07:00	EPA 314.0 MOD.	

ej
4/27/06

LDC #: 0604-01C6

VALIDATION COMPLETENESS WORKSHEET

Date: 4/20/06

SDG #: S602193

✓ EPA Level III/IV

Page: 1 of 1

Laboratory: Sequoia/Dsl Mar

Reviewer: CJ

2nd Reviewer: NE

METHOD: EPA Method 314.0 (Perchlorate) _____

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/26/2006
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IVa.	Matrix Spike/(Matrix Spike) Duplicates	A	non-client sample
IVb.	Laboratory control samples	A	
V.	Sample result verification	A	Not reviewed for Level III validation.
VI.	Overall assessment of data	A	
VII.	Field duplicates	N	
VIII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	C41-SB01-50	11	C41-SB04-50	21		31	
2	C41-SB01-60	12	C41-SB04-55	22		32	
3	C41-SB03-40 **	13	C41-SB04-60	23		33	
4	C41-SB03-35	14		24		34	
5	C41-SB03-45	15		25		35	
6	C41-SB03-50	16		26		36	
7	C41-SB03-55	17		27		37	
8	C41-SB03-35	18		28		38	
9	C41-SB04-40 **	19		29		39	
10	C41-SB04-45	20		30		40	

Notes: _____

Method: Perchlorate by IC (EPA Method 314.0)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995 ?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for waters and $\leq 35\%$ for soil samples? A control limit of $\leq \text{CRDL}$ ($\leq 2\text{X CRDL}$ for soil) was used for samples that were $\leq 5\text{X}$ the CRDL, including when only one of the duplicate sample values were $\leq 5\text{X}$ the CRDL.	✓			
V. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

LDC #: 0604-01C6
 SDG #: S602193

VALIDATION FINDINGS CHECKLIST

Page: of 2
 Reviewer: CJ
 2nd Reviewer: NE

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

Method: EPA Method 314.0 (Perchlorate)

Calibration Date	Column	Compound	Standard	(Y) Response	(X) Concentration	(X ²) Concentration
1/26/2006	primary	Perchlorate	Point 0	8508.9	0	0
			Point 1	18360.5	1	1
			Point 2	29830.9	2	4
			Point 3	49887	4	16
			Point 4	131478.5	10	100
			Point 5	306736.4	25	625
			Point 6	653545.4	50	2500
			Point 7	1343483.9	100	10000

Regression Output

Constant	c	4783.592
Std Err of Y Est		
R Squared		0.999850
Degrees of Freedom		
X Coefficient(s)	a	b
Std Err of Coef.	12237.589	11.622
Correlation Coefficient		0.99992
Coefficient of Determination (r ²)		0.99985

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) of the calibration standards were calculated for the analytes identified below using the following calculation:

$$\%R = (AF * 100)/AS$$

Where:

AF = Analyte Found

AS = Analyte Spiked

Type of Analysis	Analyte	Standard ID	Found (peak area)	Spiked (Amount)	Percent Recovery		Accept? (Y/N)	Limits
					Reported	Calc'd		
Calibration Verification Low Level PQL Std. 2/16/06 (09:50)	Perchlorate	IPC	25.8247	25.0	NA	103	Y	90-110%
Calibration Verification Low Level PQL Std. 2/16/06 (12:03)	Perchlorate	IPC-MA	25.4192	25.0	NA	102	Y	80-120%
Calibration Verification 2/16/06 (12:22)	Perchlorate	ICCS	3.7300	4.0	NA	93	Y	75-125%
Calibration Verification 2/16/06 (21:13)	Perchlorate	CCV	81.1546	75.0	NA	108	Y	85-115%
Calibration Verification 2/17/06 (1:33)	Perchlorate	CCV	26.9441	25.0	NA	108	Y	85-115%
Calibration Verification 2/17/06 (18:08)	Perchlorate	CCV	77.7889	75.0	NA	104	Y	85-115%
Calibration Verification 2/16/06 (10:46)	Perchlorate	CCV	26.1661	25	NA	105	Y	85-115%

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) relative percent differences (RPD) of the matrix spike and matrix spike duplicate were calculated for perchlorate below using the following calculation:

%Recovery = $100 * ((SSC - SC) / SA)$

Where: SSC = Spiked concentration SC = Sample concentration
 SA = Spike added

RPD = $| MS - MSD | * 2 / (MS + MSD)$

MS = Matrix spike recovery MSD = Matrix spike duplicate recovery

MS/MSD samples: 6B15145-MS1 & 6B15145-MSD1

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)		Spiked Sample Concentration (mg/kg)		MS		MSD			
	MS	MSD			MS	MSD	Percent Recovery	Recalc.	Percent Recovery	Recalc.		
							Reported	Recalc.	Reported	Recalc.		
Perchlorate	0.498	0.500	0		0.534	0.538	107	107	108	108	0.7	0.9

METHOD: Perchlorate by IC (EPA method 314.0)

The percent recoveries (%R) of the laboratory control sample were calculated for perchlorate below using the following calculation:

$$\% \text{Recovery} = 100 * ((\text{SSC} - \text{SC}) / \text{SA})$$

Where: SSC = Spiked concentration SC = Sample concentration
 SA = Spike added

$$\text{RPD} = | \text{LFB} - \text{LFBd} | * 2 / (\text{LFB} + \text{LFBd})$$

LFB = Laboratory Fortified Blank
 LFBd = Laboratory Fortified Blank duplicate recovery

LFB sample: 6B15145-BS1

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		LFB		LFBd			
	LFB	LFBd		LFB	LFBd	Percent Recovery Reported	Recalc.	Percent Recovery Reported	Recalc.		
Perchlorate	0.500	NA	0	0.525	NA	105	105	NA	NA	NA	NA
											RPD

