

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

Project/Site Name: NASA JPL
Collection Date: February 10, 2003
LDC Report Date: March 27, 2003
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-1534

Sample Identification

DUPE-3-1Q03
EB-7-2/10/03
MW-14-1
MW-14-2
MW-14-3
MW-14-4
MW-14-5
TB-7-2/10/03

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 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

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.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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.
- 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. 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 selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was 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% .

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 CRQLs

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 have been summarized at the end of the report.

XVI. Field Duplicates

Samples DUPE-3-1Q03 and MW-14-4 were identified as field duplicates. No volatiles were detected in any of the samples.

XVII. Field Blanks

Sample TB-7-2/10/03 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample EB-7-2/10/03 was identified as an equipment blank. No volatile contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Compound	Concentration (ug/L)
EB-7-2/10/03	2-Butanone	8

NASA JPL

Volatiles - Data Qualification Summary - SDG 03-1534

No Sample Data Qualified in this SDG

NASA JPL

Volatiles - Laboratory Blank Data Qualification Summary - SDG 03-1534

No Sample Data Qualified in this SDG

100000

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/10/2003
Project ID: JPL. GW MON-1Q03.	Service ID: 31534	Collected by:
Sample ID: DUPE-3-1Q03	Lab Sample ID: 03-1534-1	Received Date: 02/10/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1445	Prep. Date: 02/17/03	Anal. Date: 02/17/03
Data File Name: 1534-01	Prep. No: -	Anal. Time: 14:20
Methanol Vol: -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	<0.5	U
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	<0.5	U
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	0.5	<0.5	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	<0.5	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	<0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U
39	ISOPROPYLBENZENE	98-82-8	µg/L	0.5	<0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	0.5	<0.5	U
42	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE (PCE)	127-18-4	µg/L	0.5	<0.5	U
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE (TCE)	79-01-6	µg/L	0.5	<0.5	U
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	1,1,2-TRICHLOROTRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U
Surrogates				Control Limit, %	Surro. Rec. %	
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL)	460-00-4		70-129	96	
2	DIBROMOFLUOROMETHANE	1868-53-7		70-129	99	
3	1,2-DICHLOROETHANE-D4	17060-07-0		70-122	84	
4	TOLUENE-D8	2037-26-5		73-129	97	
# of out-of-control					0	
Internal Standard				Control Limit, %	IS Rec. %	
1	CHLOROBENZENE-D5	3114-55-4		50-200	78	
2	1,4-DICHLOROBENZENE-D4	3855-82-1		50-200	80	
3	FLUOROBENZENE	462-06-6		50-200	81	
# of out-of-control					0	

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

E - Exceed calibration range

B - A positive value was found in the method blank

D - Diluted

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3/26/03

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/10/2003
Project ID: JPL. GW MON-1Q03.	Service ID: 31534	Collected by:
Sample ID: EB-7-2/10/03	Lab Sample ID: 03-1534-2	Received Date: 02/10/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1445	Prep. Date: 02/17/03	Anal. Date: 02/17/03
Data File Name: 1534-02	Prep. No: -	Anal. Time: 14:48
Methanol Vol: -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	< 0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	< 0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	< 0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	< 0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	< 0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	< 0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	8	J
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	< 0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	< 0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	< 0.5	U
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38	HEXACHLOROBTADIENE	87-68-3	µg/L	0.5	< 0.5	U
39	ISOPROPYLBENZENE	98-82-8	µg/L	0.5	< 0.5	U

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42	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
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45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
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61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U

Surrogates

Control Limit, % Surro. Rec. %

1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL)	460-00-4
2	DIBROMOFLUOROMETHANE	1868-53-7
3	1,2-DICHLOROETHANE-D4	17060-07-0
4	TOLUENE-D8	2037-26-5

70-129	102
70-129	89
70-122	78
73-129	95

of out-of-control

0

Internal Standard

Control Limit, % IS Rec. %

1	CHLOROBENZENE-D5	3114-55-4
2	1,4-DICHLOROBENZENE-D4	3855-82-1
3	FLUOROBENZENE	462-06-6

50-200	93
50-200	96
50-200	100

of out-of-control

0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank

D - Diluted

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/10/2003
Project ID: JPL. GW MON-1Q03.	Service ID: 31534	Collected by:
Sample ID: MW-14-1	Lab Sample ID: 03-1534-3	Received Date: 02/10/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1445	Prep. Date: 02/17/03	Anal. Date: 02/17/03
Data File Name: 1534-03	Prep. No: -	Anal. Time: 15:17
Methanol Vol: -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
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6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U
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8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
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14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	0.4	J
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
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26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	0.5	
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	<0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U
39	ISOPROPYLBENZENE	98-82-8	µg/L	0.5	<0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	0.5	0.5	J
42	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE (PCE)	127-18-4	µg/L	0.5	0.9	
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE (TCE)	79-01-6	µg/L	0.5	<0.5	U
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	1,1,2-TRICHLOROTRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U

Surrogates

Control Limit, % Surro. Rec.%

1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL)	460-00-4	70-129	109
2	DIBROMOFLUOROMETHANE	1868-53-7	70-129	101
3	1,2-DICHLOROETHANE-D4	17060-07-0	70-122	88
4	TOLUENE-D8	2037-26-5	73-129	108

of out-of-control

0

Internal Standard

Control Limit, % IS Rec.%

1	CHLOROBENZENE-D5	3114-55-4	50-200	85
2	1,4-DICHLOROBENZENE-D4	3855-82-1	50-200	91
3	FLUOROBENZENE	462-06-6	50-200	88

of out-of-control

0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank

D - Diluted

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/10/2003
Project ID: JPL. GW MON-1Q03.	Service ID: 31534	Collected by:
Sample ID: MW-14-2	Lab Sample ID: 03-1534-4	Received Date: 02/10/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1445	Prep. Date: 02/17/03	Anal. Date: 02/17/03
Data File Name: 1534-04	Prep. No: -	Anal. Time: 15:46
Methanol Vol. -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	<0.5	U
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	0.6	
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	0.5	<0.5	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	0.4	J
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	<0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U
39	ISOPROPYLBENZENE	98-82-8	µg/L	0.5	<0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	0.5	<0.5	U
42	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE (PCE)	127-18-4	µg/L	0.5	0.7	
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE (TCE)	79-01-6	µg/L	0.5	6.2	
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	1,1,2-TRICHLOROTRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U
Surrogates				Control Limit, %	Surro. Rec.%	
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL)	460-00-4		70-129	90	
2	DIBROMOFLUOROMETHANE	1868-53-7		70-129	88	
3	1,2-DICHLOROETHANE-D4	17060-07-0		70-122	76	
4	TOLUENE-D8	2037-26-5		73-129	93	
# of out-of-control					0	
Internal Standard				Control Limit, %	IS Rec.%	
1	CHLOROBENZENE-D5	3114-55-4		50-200	103	
2	1,4-DICHLOROBENZENE-D4	3855-82-1		50-200	110	
3	FLUOROBENZENE	462-06-6		50-200	106	
# of out-of-control					0	

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank

D - Diluted

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3/16/03

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/10/2003
Project ID: JPL. GW MON-1Q03.	Service ID: 31534	Collected by:
Sample ID: MW-14-3	Lab Sample ID: 03-1534-5	Received Date: 02/10/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1445	Prep. Date: 02/17/03	Anal. Date: 02/17/03
Data File Name: 1534-05	Prep. No: -	Anal. Time: 16:15
Methanol Vol: -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	<0.5	U
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	0.5	J
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	0.5	<0.5	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	0.3	J
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	<0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U
39	ISOPROPYLBENZENE	98-82-8	µg/L	0.5	<0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	0.5	<0.5	U
42	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE (PCE)	127-18-4	µg/L	0.5	0.5	
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE (TCE)	79-01-6	µg/L	0.5	1.1	
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	1,1,2-TRICHLOROTRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U

Surrogates

Surrogates			Control Limit, %	Surro. Rec.%
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL	460-00-4	70-129	99
2	DIBROMOFLUOROMETHANE	1868-53-7	70-129	92
3	1,2-DICHLOROETHANE-D4	17060-07-0	70-122	81
4	TOLUENE-D8	2037-26-5	73-129	95
# of out-of-control				0

Internal Standard

Internal Standard			Control Limit, %	IS Rec.%
1	CHLOROBENZENE-D5	3114-55-4	50-200	88
2	1,4-DICHLOROBENZENE-D4	3855-82-1	50-200	89
3	FLUOROBENZENE	462-06-6	50-200	93
# of out-of-control				0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank
D - Diluted

3/28/03

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/10/2003
Project ID: JPL. GW MON-1Q03.	Service ID: 31534	Collected by:
	Lab Sample ID: 03-1534-6	Received Date: 02/10/2003
Sample ID: MW-14-4	Sample Matrix: Water	Moisture %: -
Sample Type: Field Sample	Prep. Method: 5030	Instrument ID: GC/MS: G
Anal. Method: 524.2	Prep. Date: 02/17/03	Anal. Date: 02/17/03
Batch No: 03G1445	Prep. No: -	Anal. Time: 16:44
Data File Name: 1534-06	Sample Amount: 25 mL	Dilution Factor: 1
Methanol Vol: -		
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	<0.5	U
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	<0.5	U
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	0.5	<0.5	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	<0.5	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	<0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U
39	ISOPROPYLBENZENE	98-82-8	µg/L	0.5	<0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	0.5	<0.5	U
42	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE (PCE)	127-18-4	µg/L	0.5	<0.5	U
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE (TCE)	79-01-6	µg/L	0.5	<0.5	U
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	1,1,2-TRICHLOROTRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U

Surrogates

1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL	460-00-4	70-129	98
2	DIBROMOFLUOROMETHANE	1868-53-7	70-129	92
3	1,2-DICHLOROETHANE-D4	17060-07-0	70-122	79
4	TOLUENE-D8	2037-26-5	73-129	97
# of out-of-control				0

Internal Standard

INTERNAL STUDIES				
1	CHLOROBENZENE-D5	3114-55-4	50-200	93
2	1,4-DICHLOROBENZENE-D4	3855-82-1	50-200	97
3	FLUOROBENZENE	462-06-6	50-200	98
# of out-of-control				0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank

D - Diluted

3/28/03

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/10/2003
Project ID: JPL. GW MON-1Q03.	Service ID: 31534	Collected by:
Sample ID: MW-14-5	Lab Sample ID: 03-1534-7	Received Date: 02/10/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1445	Prep. Date: 02/17/03	Anal. Date: 02/17/03
Data File Name: 1534-07	Prep. No: -	Anal. Time: 22:01
Methanol Vol. -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	< 0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	< 0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	< 0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	< 0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	< 0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	< 0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	< 10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	< 0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	< 0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	< 0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	< 0.5	U
12	CHLOROBENZENE	108-90-7	µg/L	0.5	< 0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	< 0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	< 0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	< 0.5	U
16	CHLOROMETHANE	74-87-3	µg/L	0.5	< 0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	< 0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	< 0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	0.5	< 0.5	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	< 0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	< 0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	< 0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	< 0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	< 0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	< 0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	< 0.5	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	< 0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	< 0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	< 0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	< 0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	< 0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	< 0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	< 0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	< 0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	< 0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	< 0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	< 0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	< 0.5	U
39	ISOPROPYLBENZENE	98-82-8	µg/L	0.5	< 0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	0.5	<0.5	U
42	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE (PCE)	127-18-4	µg/L	0.5	<0.5	U
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE (TCE)	79-01-6	µg/L	0.5	<0.5	U
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	1,1,2-TRICHLOROTRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U

Surrogates

Surrogates			Control Limit, %	Surro. Rec.%
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL	460-00-4	70-129	117
2	DIBROMOFLUOROMETHANE	1868-53-7	70-129	104
3	1,2-DICHLOROETHANE-D4	17060-07-0	70-122	91
4	TOLUENE-D8	2037-26-5	73-129	105
# of out-of-control				0

Internal Standard

Internal Standard			Control Limit, %	IS Rec. %
1	CHLOROBENZENE-D5	3114-55-4	50-200	87
2	1,4-DICHLOROBENZENE-D4	3855-82-1	50-200	82
3	FLUOROBENZENE	462-06-6	50-200	91
# of out-of-control				0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank

D - Diluted

3/28/03

Applied P & Ch Laboratory
Organic Analysis Results for Method 524.2

Client Name: GEOFON, Inc.	Project No: 04-4428.10	Collection Date: 02/10/2003
Project ID: JPL. GW MON-1Q03.	Service ID: 31534	Collected by:
Sample ID: TB-7-2/10/03	Lab Sample ID: 03-1534-8	Received Date: 02/10/2003
Sample Type: Field Sample	Sample Matrix: Water	Moisture %: -
Anal. Method: 524.2	Prep. Method: 5030	Instrument ID: GC/MS: G
Batch No: 03G1445	Prep. Date: 02/17/03	Anal. Date: 02/17/03
Data File Name: 1534-08	Prep. No: -	Anal. Time: 17:41
Methanol Vol: -	Sample Amount: 25 mL	Dilution Factor: 1
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	0.5	<0.5	U
2	BROMOBENZENE	108-86-1	µg/L	0.5	<0.5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	0.5	<0.5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	0.5	<0.5	U
5	BROMOFORM	75-25-2	µg/L	0.5	<0.5	U
6	BROMOMETHANE	74-83-9	µg/L	0.5	<0.5	U
7	2-BUTANONE	78-93-3	µg/L	10	<10	U
8	N-BUTYLBENZENE	104-51-8	µg/L	0.5	<0.5	U
9	SEC-BUTYLBENZENE	135-98-8	µg/L	0.5	<0.5	U
10	TERT-BUTYLBENZENE	98-06-6	µg/L	0.5	<0.5	U
11	CARBON TETRACHLORIDE	56-23-5	µg/L	0.5	<0.5	U
12	CHLOROBENZENE	108-90-7	µg/L	0.5	<0.5	U
13	CHLORODIBROMOMETHANE	124-48-1	µg/L	0.5	<0.5	U
14	CHLOROETHANE	75-00-3	µg/L	0.5	<0.5	U
15	CHLOROFORM	67-66-3	µg/L	0.5	<0.5	U
16	CHLOROMETHANE	74-87-3	µg/L	0.5	<0.5	U
17	2-CHLOROTOLUENE	95-49-8	µg/L	0.5	<0.5	U
18	4-CHLOROTOLUENE	106-43-4	µg/L	0.5	<0.5	U
19	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	µg/L	0.5	<0.5	U
20	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	0.5	<0.5	U
21	DIBROMOMETHANE	74-95-3	µg/L	0.5	<0.5	U
22	1,2-DICHLOROBENZENE	95-50-1	µg/L	0.5	<0.5	U
23	1,3-DICHLOROBENZENE	541-73-1	µg/L	0.5	<0.5	U
24	1,4-DICHLOROBENZENE	106-46-7	µg/L	0.5	<0.5	U
25	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	0.5	<0.5	U
26	1,1-DICHLOROETHANE	75-34-3	µg/L	0.5	<0.5	U
27	1,2-DICHLOROETHANE	107-06-2	µg/L	0.5	<0.5	U
28	1,1-DICHLOROETHENE	75-35-4	µg/L	0.5	<0.5	U
29	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	0.5	<0.5	U
30	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	0.5	<0.5	U
31	1,2-DICHLOROPROPANE	78-87-5	µg/L	0.5	<0.5	U
32	1,3-DICHLOROPROPANE	142-28-9	µg/L	0.5	<0.5	U
33	2,2-DICHLOROPROPANE	594-20-7	µg/L	0.5	<0.5	U
34	1,1-DICHLOROPROPENE	563-58-6	µg/L	0.5	<0.5	U
35	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	0.5	<0.5	U
36	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	0.5	<0.5	U
37	ETHYLBENZENE	100-41-4	µg/L	0.5	<0.5	U
38	HEXACHLOROBUTADIENE	87-68-3	µg/L	0.5	<0.5	U
39	ISOPROPYLBENZENE	98-82-8	µg/L	0.5	<0.5	U

#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	P-ISOPROPYLTOLUENE	99-87-6	µg/L	0.5	<0.5	U
41	METHYLENE CHLORIDE	75-09-2	µg/L	0.5	<0.5	U
42	4-METHYL-2-PENTANONE (MIBK)	108-10-1	µg/L	10	<10	U
43	METHYL-T-BUTYL ETHER (MTBE)	1634-04-4	µg/L	1	<1	U
44	NAPHTHALENE	91-20-3	µg/L	0.5	<0.5	U
45	N-PROPYLBENZENE	103-65-1	µg/L	0.5	<0.5	U
46	STYRENE	100-42-5	µg/L	0.5	<0.5	U
47	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	0.5	<0.5	U
48	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	0.5	<0.5	U
49	TETRACHLOROETHENE (PCE)	127-18-4	µg/L	0.5	<0.5	U
50	TOLUENE	108-88-3	µg/L	0.5	<0.5	U
51	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	0.5	<0.5	U
52	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	0.5	<0.5	U
53	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	0.5	<0.5	U
54	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	0.5	<0.5	U
55	TRICHLOROETHENE (TCE)	79-01-6	µg/L	0.5	<0.5	U
56	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	0.5	<0.5	U
57	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	0.5	<0.5	U
58	1,1,2-TRICHLOROTRIFLUOROETHANE	76-13-1	µg/L	0.5	<0.5	U
59	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	0.5	<0.5	U
60	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	0.5	<0.5	U
61	VINYL CHLORIDE	75-01-4	µg/L	0.5	<0.5	U
62	O-XYLENE	95-47-6	µg/L	0.5	<0.5	U
63	M/P-XYLENE	108-38-3	µg/L	0.5	<0.5	U

Surrogates

Surrogates			Control Limit, %	Surro. Rec. %
1	1-BROMO-4-FLUOROBENZENE (4-BROMOFL	460-00-4	70-129	90
2	DIBROMOFLUOROMETHANE	1868-53-7	70-129	91
3	1,2-DICHLOROETHANE-D4	17060-07-0	70-122	79
4	TOLUENE-D8	2037-26-5	73-129	95
# of out-of-control				0

Internal Standard

Internal Standard			Control Limit, %	IS Rec. %
1	CHLOROBENZENE-D5	3114-55-4	50-200	99
2	1,4-DICHLOROBENZENE-D4	3855-82-1	50-200	109
3	FLUOROBENZENE	462-06-6	50-200	103
# of out-of-control				0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

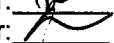
E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank
D - Diluted

3/28/03

LDC #: 10006C1 **VALIDATION COMPLETENESS WORKSHEET**
SDG #: 03-1534 Level III
Laboratory: Applied P & Ch Laboratory

Date: 3-21-03
Page: 1 of 1
Reviewer: 
2nd Reviewer: 

METHOD: GC/MS Volatiles (EPA Method 524.2)

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: 2-10-03
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD _r ²
IV.	Continuing calibration	A	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	DUPE-4-1003MS/MSD
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 1 + 6
XVII.	Field blanks	SW	TB = 8* EB = 2

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: AU H₂O's

1	DUPE-3-1Q03	11		21		31	
2	EB-7-2/10/03	12		22		32	
3	MW-14-1	13		23		33	
4	MW-14-2	14		24		34	
5	MW-14-3	15		25		35	
6	MW-14-4	16		26		36	
7	MW-14-5	17		27		37	
8	TB-7-2/10/03	18		28		38	
9	03G1445MBO1	19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	Q. 1,2-Dichloropropane	GG. Xylenes, total	WW. Bromobenzene	MMM. Naphthalene
B. Bromomethane	R. cis-1,3-Dichloropropene	HH. Vinyl acetate	XX. 1,2,3-Trichloropropane	NNN. 1,2,3-Trichlorobenzene
C. Vinyl chloride	S. Trichloroethene	II. 2-Chloroethylvinyl ether	YY. n-Propylbenzene	OOO. 1,3,5-Trichlorobenzene
D. Chloroethane	T. Dibromochloromethane	JJ. Dichlorodifluoromethane	ZZ. 2-Chlorotoluene	PPP. trans-1,2-Dichloroethene
E. Methylene chloride	U. 1,1,2-Trichloroethane	KK. Trichlorofluoromethane	AAA. 1,3,5-Trimethylbenzene	QQQ. cis-1,2-Dichloroethene
F. Acetone	V. Benzene	LL. Methyl-tert-butyl ether	BBB. 4-Chlorotoluene	RRR. m,p-Xylenes
G. Carbon disulfide	W. trans-1,3-Dichloropropene	MM. 1,2-Dibromo-3-chloropropane	CCC. tert-Butylbenzene	SSS. o-Xylene
H. 1,1-Dichloroethene	X. Bromoform	NN. Diethyl ether	DDD. 1,2,4-Trimethylbenzene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane
I. 1,1-Dichloroethane	Y. 4-Methyl-2-pentanone	OO. 2,2-Dichloropropane	EEE. sec-Butylbenzene	UUU. Benzyl chloride
J. 1,2-Dichloroethene, total	Z. 2-Hexanone	PP. Bromochloromethane	FFF. 1,3-Dichlorobenzene	VVV. 4-Ethyltoluene
K. Chloroform	AA. Tetrachloroethene	QQ. 1,1-Dichloropropene	GGG. p-Isopropyltoluene	WWW. Ethanol
L. 1,2-Dichloroethane	BB. 1,1,2,2-Tetrachloroethane	RR. Dibromomethane	HHH. 1,4-Dichlorobenzene	XXX. Ethyl ether
M. 2-Butanone	CC. Toluene	SS. 1,3-Dichloropropane	III. n-Butylbenzene	
N. 1,1,1-Trichloroethane	DD. Chlorobenzene	TT. 1,2-Dibromoethane	JJJ. 1,2-Dichlorobenzene	
O. Carbon tetrachloride	EE. Ethylbenzene	UU. 1,1,1,2-Tetrachloroethane	KKK. 1,2,4-Trichlorobenzene	
P. Bromodichloromethane	FF. Styrene	VV. Isopropylbenzene	LLL. Hexachlorobutadiene	

Notes:

LDC #: 10006C1
SDG #: 03-1534

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [Signature]
2nd reviewer: [Signature]

METHOD: GC/MS VOA (EPA Method 524.2)

☒ Y ☐ N ☐ N/A Were field blanks identified in this SDG?
☒ Y ☐ N ☐ N/A Were target compounds detected in the field blanks?

Sample: 2 Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (<u>ug/L</u>)
M	8

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

NASA JPL
Data Validation Reports
LDC# 10006

Chromium

LDC

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NASA JPL

Collection Date: January 29 through February 3, 2003

LDC Report Date: March 28, 2003

Matrix: Water

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: Advanced Technology Laboratories

Sample Delivery Group (SDG): 03-1425

Sample Identification

MW-21-5	MW-20-3MS
MW-21-4	MW-20-3MSD
MW-21-3	MW-20-3DUP
MW-21-2	DUPE-2-IQ03DUP
MW-21-1	
EB-1-1/29/03	
MW-20-5	
MW-20-4	
MW-20-3	
MW-20-2	
MW-20-1	
EB-2-1/30/03	
DUPE-1-IQ03	
MW-19-5	
MW-19-4	
MW-19-3	
MW-19-2	
MW-19-1	
EB-3-2/3/03	
DUPE-2-IQ03	

Introduction

This data review covers 24 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 200.8 for Chromium.

This 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 flags 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 specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

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.
- 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

An initial calibration was performed.

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

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB1 (prep blank)	Chromium	0.213 ug/L	MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-21-1 EB-1-1/29/03 MW-20-5 MW-20-4 MW-20-2 MW-20-1 EB-2-1/30/03 DUPE-1-IQ03 MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 EB-3-2/3/03 DUPE-2-IQ03

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB1	Chromium	0.315 ug/L	MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-21-1 EB-1-1/29/03 MW-20-5 MW-20-4 MW-20-2 MW-20-1 EB-2-1/30/03 DUPE-1-IQ03 MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 EB-3-2/3/03 DUPE-2-IQ03
PB2 (prep blank)	Chromium	0.381 ug/L	MW-20-3
ICB/CCB2	Chromium	0.376 ug/L	MW-20-3

Sample concentrations were compared to the maximum contaminant concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-20-3	Chromium	1.7 ug/L	1.7U ug/L

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check was not required by the method.

V. 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.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

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

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

Samples MW-20-1 and DUPE-1-IQ03 and samples MW-19-4 and DUPE-2-IQ03 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-20-1	DUPE-1-IQ03	
Chromium	2.8	2.5	11

Analyte	Concentration (ug/L)		RPD
	MW-19-4	DUPE-2-IQ03	
Chromium	2.3	1.9	19

XIV. Field Blanks

Samples EB-1-1/29/03, EB-2-1/30/03 and EB-3-2/3/03 were identified as equipment blanks. No chromium contaminants were found in these blanks.

NASA JPL

Chromium - Data Qualification Summary - SDG 03-1425

No Sample Data Qualified in this SDG

NASA JPL

Chromium - Laboratory Blank Data Qualification Summary - SDG 03-1425

SDG	Sample	Analyte	Modified Final Concentration	A or P
03-1425	MW-20-3	Chromium	1.7U ug/L	A

10006 B.

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-21-5

Lab Order: 061277

Project: JPL

Collection Date: 1/29/2003 8:40:00 AM

Lab ID: 061277-001A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

5.7

1.0

µg/L

1

2/17/2003

9/3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified

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011



Advanced Technology
Laboratories

2 of 23

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Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-002A

Client Sample ID: MW-21-4
Collection Date: 1/29/2003 9:15:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	4.7	1.0		µg/L	1	2/17/2003

Handwritten signature/initials
3/25/03

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out
S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-21-3

Lab Order: 061277

Project: JPL

Collection Date: 1/29/2003 12:45:00 PM

Lab ID: 061277-003A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

5.9

1.0

µg/L

1

2/17/2003

3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified

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013

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-21-2

Lab Order: 061277

Project: JPL

Collection Date: 1/29/2003 1:20:00 PM

Lab ID: 061277-004A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

6.7

1.0

µg/L

1

2/17/2003

3/28/07

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified

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014

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-21-1

Lab Order: 061277

Project: JPL

Collection Date: 1/29/2003 2:00:00 PM

Lab ID: 061277-005A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

4.6

1.0

µg/L

1

2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

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015

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-006A

Client Sample ID: EB-1-1/29/03
Collection Date: 1/29/2003 2:10:00 PM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	ND	1.0		µg/L	1	2/17/2003

2/28/03

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike/Surrogate outside of limits due to matrix interferen
J - Analyte detected below quantitation limits H - Sample exceeded analytical holding time
B - Analyte detected in the associated Method Blank E - Value above quantitation range
DO - Surrogate Diluted Out Results are wet unless otherwise specified

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016

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-007A

Client Sample ID: MW-20-5
Collection Date: 1/30/2003 8:25:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	2.7	1.0		µg/L	1	2/17/2003

3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out
S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-008A

Client Sample ID: MW-20-4
Collection Date: 1/30/2003 9:25:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	2.4	1.0		µg/L	1	2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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Advanced Technology
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Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-009A

Client Sample ID: MW-20-3
Collection Date: 1/30/2003 10:55:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030224A	QC Batch: R25311					Analyst: RQ
Chromium	1.7	1.0		µg/L	1	2/24/2003

U

1/3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike/Surrogate outside of limits due to matrix interferen
J - Analyte detected below quantitation limits H - Sample exceeded analytical holding time
B - Analyte detected in the associated Method Blank E - Value above quantitation range
DO - Surrogate Diluted Out Results are wet unless otherwise specified

019
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Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-20-2

Lab Order: 061277

Project: JPL

Collection Date: 1/30/2003 11:40:00 AM

Lab ID: 061277-010A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.2

1.0

µg/L

1

2/17/2003

2/28/03

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

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Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-20-1

Lab Order: 061277

Project: JPL

Collection Date: 1/30/2003 1:00:00 PM

Lab ID: 061277-011A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.8

1.0

µg/L

1

2/17/2003

3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: EB-2-1/30/03

Lab Order: 061277

Project: JPL

Collection Date: 1/30/2003 1:40:00 PM

Lab ID: 061277-012A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

ND

1.0

µg/L

1

2/17/2003

Handwritten signature
3/28/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: Dupe-1-IQ03

Lab Order: 061277

Project: JPL

Collection Date:

Lab ID: 061277-013A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS**EPA 200.8**

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.5

1.0

µg/L

1

2/17/2003

Handwritten signature
3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified

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023

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-19-5

Lab Order: 061277

Project: JPL

Collection Date: 2/3/2003 8:10:00 AM

Lab ID: 061277-014A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

3.4

1.0

µg/L

1

2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

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Advanced Technology
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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-19-4

Lab Order: 061277

Project: JPL

Collection Date: 2/3/2003 9:20:00 AM

Lab ID: 061277-015A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.3

1.0

µg/L

1

2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

Page 15 of 20

025



Advanced Technology
Laboratories

16 of 23

3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-016A

Client Sample ID: MW-19-3

Collection Date: 2/3/2003 11:05:00 AM

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

5.1

1.0

µg/L

1

2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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026



Advanced Technology
Laboratories

17 of 23

3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-017A

Client Sample ID: MW-19-2
Collection Date: 2/3/2003 10:20:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	6.0	1.0		µg/L	1	2/17/2003

3/28/03

Qualifiers:	ND - Not Detected at the Reporting Limit	S - Spike/Surrogate outside of limits due to matrix interferen
	J - Analyte detected below quantitation limits	H - Sample exceeded analytical holding time
	B - Analyte detected in the associated Method Blank	E - Value above quantitation range
	DO - Surrogate Diluted Out	Results are wet unless otherwise specified

027

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Advanced Technology
Laboratories

18 of 23

3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-19-1

Lab Order: 061277

Project: JPL

Collection Date: 2/3/2003 11:45:00 AM

Lab ID: 061277-018A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.6

1.0

µg/L

1

2/17/2003

Handwritten signature
2/28/03

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified

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028



Advanced Technology
Laboratories

19 of 23

3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: EB-3-2/3/03

Lab Order: 061277

Project: JPL

Collection Date: 2/3/2003 9:25:00 AM

Lab ID: 061277-019A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

ND

1.0

µg/L

1

2/17/2003

Handwritten signature/initials

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

Page 19 of 20

029



Advanced Technology
Laboratories

20 of 23

3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-020A

Client Sample ID: Dupe-2-IQ03
Collection Date:
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS**EPA 200.8**

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

1.9

1.0

µg/L

1

2/17/2003

1/3/26/03

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

030

Page 20 of 20



LDC #: 10006B4

VALIDATION COMPLETENESS WORKSHEET

Date: 3-27-03

SDG #: 03-1425

Level III

Page: 1 of 1

Laboratory: Advanced Technology Laboratories

Reviewer: MG

Chromium

2nd Reviewer: MZ

METHOD: Metals (EPA SW 846 Method 6040B/7000) 200.8

M.G.

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: 1-29-03 through 2-3-03
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not required
V.	Matrix Spike Analysis	A	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	NA	Not reviewed for
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	N	Not required
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	D = 11 + 13, D = 15 + 20
XIV.	Field Blanks	ND	EB = 6, 12, 19

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:

1	MW-21-5	W	11	MW-20-1	W	21	MW-20-3MS	W	31	
2	MW-21-4		12	EB-2-1/30/03		22	MW-20-3MSD		32	
3	MW-21-3		13	DUPE-1-IQ03		23	MW-20-3DUP		33	
4	MW-21-2		14	MW-19-5		24	PBW 1		34	
5	MW-21-1		15	MW-19-4		25	PBW 2		35	
6	EB-1-1/29/03		16	MW-19-3		26	Dupe-2-IQ03 DUP		36	
7	MW-20-5		17	MW-19-2		27			37	
8	MW-20-4		18	MW-19-1		28			38	
9	MW-20-3		19	EB-3-2/3/03		29			39	
10	MW-20-2		20	DUPE-2-IQ03		30			40	

Notes: _____

LDC #: 1000684
SDG #: 03-1425

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Soil preparation factor applied: NA

Sample Concentration units, unless otherwise noted: $\mu\text{g/L}$ Associated Samples: 1-8, 10-20 (No findings)

Page: 1 of 1
Reviewer: MGR
2nd Reviewer: MGR

Sample Identification					Blank Action Limit	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Maximum PB* (mg/kg)	Analyte
Al									Al
Sb									Sb
As									As
Ba									Ba
Be									Be
Cd									Cd
Ca									Ca
Cr					0.213	0.315	1.575		Cr
Cu									Cu
Fe									Fe
Pb									Pb
Mg									Mg
Mn									Mn
Hg									Hg
Ni									Ni
K									K
Se									Se
Ag									Ag
Na									Na
Ti									Ti
V									V
Zn									Zn
B									B
Mo									Mo
Sr									Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "ND".
Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 1000684

SDG #: 03-1425

VALIDATION FINDINGS WORKSHEET

PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 8010/7000)

Soil preparation factor applied: N/A

Sample Concentration units, unless otherwise noted: $\mu\text{g/L}$

Associated Samples: 9

Page: 1 of 1

Reviewer: MG

2nd Reviewer: MW

Sample Identification																			
Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	9														
Al																			Al
Sb																			Sb
As																			As
Ba																			Ba
Be																			Be
Cd																			Cd
Ca																			Ca
Cr		0.301	0.376	1.905	1.7														Cr
Co																			Co
Cu																			Cu
Fe																			Fe
Pb																			Pb
Mg																			Mg
Mn																			Mn
Hg																			Hg
Ni																			Ni
K																			K
Se																			Se
Ag																			Ag
Na																			Na
Ti																			Ti
V																			V
Zn																			Zn
B																			B
Mo																			Mo
Sr																			Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 10006 B4

SDG #: 03-1425

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1

Reviewer: MG

2nd reviewer: jmw

METHOD: Inorganics, Method 200.8

☒ N N/A

Were field duplicate pairs identified in this SDG?

☒ N N/A

Were target analytes detected in the field duplicate pairs?

Analyte	Concentration ($\mu\text{g/L}$)		RPD (Limit)	Difference (Limit)	Qualifier
	11	13			
Cr	2.8	2.5	11		

Analyte	Concentration ($\mu\text{g/L}$)		RPD (Limit)	Difference (Limit)	Qualifier
	15	20			
Cr	2.3	1.9	19		

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

NASA JPL
Data Validation Reports
LDC# 10006

Wet Chemistry

LDC

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

Project/Site Name: NASA JPL
Collection Date: January 30, 2003
LDC Report Date: March 28, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-1402

Sample Identification

DUPE-1-1Q03
EB-2-1/30/03
MW-20-1
MW-20-2
MW-20-3
MW-20-4
MW-20-5
MW-20-3MS
MW-20-3MSD

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 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

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. 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.

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.
- 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 of each method were met.

Instrument detection limits, interelement corrections and linear range analysis were performed at the required frequency with the following exceptions:

Analyte	Calibration	Date of Last Report	Report Frequency Requirement	Date of Analysis	Associated Samples	Flag	A or P
Perchlorate	ICAL	7/31/02	Every 6 months	2/3-2/10/03	All samples in SDG 03-1402	None	P

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

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 reviewed for each matrix as applicable.

VI. Laboratory Control Samples

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

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

Samples DUPE-1-1Q03 and MW-20-1 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

X. Field Blanks

Sample EB-2-1/30/03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL

Wet Chemistry - Data Qualification Summary - SDG 03-1402

SDG	Sample	Analyte	Flag	A or P	Reason
03-1402	DUPE-1-1 Q03 EB-2-1/30/03 MW-20-1 MW-20-2 MW-20-3 MW-20-4 MW-20-5	Perchlorate	None	P	Calibration

NASA JPL

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-1402

No Sample Data Qualified in this SDG

Applied P & Ch Laboratory
Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4428.10
Service ID: 31402

Anal. Method 314.0
Collected by:

Component Name: Perchlorate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1402-1	DUPE-1-1Q03	Water	01/30/03	01/30/03	02/03/03	03W1345	µg/L	4	<4	U
03-1402-2	EB-2-1/30/03	Water	01/30/03	01/30/03	02/10/03	03W1424	µg/L	4	<4	U
03-1402-3	MW-20-1	Water	01/30/03	01/30/03	02/03/03	03W1345	µg/L	4	<4	U
03-1402-4	MW-20-2	Water	01/30/03	01/30/03	02/03/03	03W1345	µg/L	4	<4	U
03-1402-5	MW-20-3	Water	01/30/03	01/30/03	02/03/03	03W1345	µg/L	4	<4	U
03-1402-6	MW-20-4	Water	01/30/03	01/30/03	02/10/03	03W1424	µg/L	4	<4	U
03-1402-7	MW-20-5	Water	01/30/03	01/30/03	02/03/03	03W1345	µg/L	4	<4	U
03W1345-MB-01	03W1345-MB-01	Water	02/03/03	02/03/03	02/03/03	03W1345	µg/L	4	<4	U
03W1424-MB-01	03W1424-MB-01	Water	02/10/03	02/10/03	02/10/03	03W1424	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

3/28/03

A1

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
 Project ID: JPL

Project No: 04-4428.10
 Service ID: 31402

Anal. Method 7196
 Collected by:

Component Name: Chromium (VI)
 CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1402-1	DUPE-1-1Q03	Water	01/30/03	01/30/03	01/30/03	03W1308	mg/L	0.01	<0.01	U
03-1402-2	EB-2-1/30/03	Water	01/30/03	01/30/03	01/30/03	03W1308	mg/L	0.01	<0.01	U
03-1402-3	MW-20-1	Water	01/30/03	01/30/03	01/30/03	03W1308	mg/L	0.01	<0.01	U
03-1402-4	MW-20-2	Water	01/30/03	01/30/03	01/30/03	03W1308	mg/L	0.01	<0.01	U
03-1402-5	MW-20-3	Water	01/30/03	01/30/03	01/30/03	03W1308	mg/L	0.01	<0.01	U
03-1402-6	MW-20-4	Water	01/30/03	01/30/03	01/30/03	03W1308	mg/L	0.01	<0.01	U
03-1402-7	MW-20-5	Water	01/30/03	01/30/03	01/30/03	03W1308	mg/L	0.01	<0.01	U
03W1308-MB-01	03W1308-MB-01	Water	01/30/03	01/30/03	01/30/03	03W1308	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

Handwritten signature
 3/28/03

LDC #: 10006A6 **VALIDATION COMPLETENESS WORKSHEET**
 SDG #: 03-1402 Level III
 Laboratory: Applied P & Ch Laboratory

Date: 3-27-03
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: MP

METHOD: Hexavalent chromium (EPA SW 846 Method 7196) Perchlorate (EPA Method 314.0)

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: <u>1-30-03</u>
IIa.	Initial calibration	SW	
IIb.	Calibration verification	A	
III.	Blanks	A	
IVa.	Matrix Spike/(Matrix Spike) Duplicates	A	<u>MW-4-1 MS/MSD (SDG: 03-1501)</u>
IVb.	Laboratory control samples	A	<u>LCS /LCSD</u>
V.	Sample result verification	N	
VI.	Overall assessment of data	A	
VII.	Field duplicates	ND	<u>D = 1 + 3</u>
VIII.	Field blanks	ND	<u>EB = 2</u>

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:

1	DUPE-1-1Q03	W	11		21		31	
2	EB-2-1/30/03		12		22		32	
3	MW-20-1		13		23		33	
4	MW-20-2		14		24		34	
5	MW-20-3		15		25		35	
6	MW-20-4		16		26		36	
7	MW-20-5		17		27		37	
8	MW-20-3MS		18		28		38	
9	MW-20-3MSD		19		29		39	
10	PBW		20		30		40	

Notes: _____

SDG #: 03-1402

Sample Specific Analysis Reference

2nd reviewer:

All circled methods are applicable to each sample.

[illegible]

Comments: _____

Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: byk

VALIDATION FINDINGS WORKSHEET

LDC #: 10006A6
SDG #: 03-1402

METHOD: Inorganics, EPA Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?	<u>Y</u>	<u>N</u>	<u>N/A</u>
Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110%?	<u>Y</u>	<u>N</u>	<u>N/A</u>
Are all correlation coefficients ≥ 0.995 ?	<u>Y</u>	<u>N</u>	<u>N/A</u>

LEVEL IV/D ONLY:		
Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.	Y	N
Was a balance check conducted prior to the TDS analysis?	Y	N
Was the titrant normality checked?	Y	N

[illegible]

Comments: _____

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

Project/Site Name: NASA JPL
Collection Date: February 10, 2003
LDC Report Date: March 28, 2003
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-1534

Sample Identification

DUPE-3-1Q03
EB-7-2/10/03
MW-14-1
MW-14-2
MW-14-3
MW-14-4
MW-14-5
MW-14-2MS
MW-14-2MS

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, and EPA SW 846 Method 7196 for Hexavalent Chromium.

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. 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.

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.
- 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 of each method were met.

Instrument detection limits, interelement corrections and linear range analysis were performed at the required frequency with the following exceptions:

Analyte	Calibration	Date of Last Report	Report Frequency Requirement	Date of Analysis	Associated Samples	Flag	A or P
Perchlorate	ICAL	7/31/02	Every 6 months	2/13/03	All samples in SDG 03-1534	None	P

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

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 reviewed for each matrix as applicable.

VI. Laboratory Control Samples

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

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

Samples DUPE-3-1Q03 and MW-14-4 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	DUPE-3-1Q03	MW-14-4	
Perchlorate	2.2	1.8	20

X. Field Blanks

Sample EB-7-2/10/03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL**Wet Chemistry - Data Qualification Summary - SDG 03-1534**

SDG	Sample	Analyte	Flag	A or P	Reason
03-1534	DUPE-3-1Q03 EB-7-2/10/03 MW-14-1 MW-14-2 MW-14-3 MW-14-4 MW-14-5	Perchlorate	None	P	Calibration

NASA JPL**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-1534**

No Sample Data Qualified in this SDG

C

Applied P & Ch Laboratory
Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
Project ID: JPL GW MON-1Q03.

Project No: 04-4428.10
Service ID: 31534

Anal. Method 7196
Collected by:

Component Name: Chromium (VI)
CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1534-1	DUPE-3-1Q03	Water	02/10/03	02/10/03	02/10/03	03W1428	mg/L	0.01	<0.01	U
03-1534-2	EB-7-2/10/03	Water	02/10/03	02/10/03	02/10/03	03W1428	mg/L	0.01	<0.01	U
03-1534-3	MW-14-1	Water	02/10/03	02/10/03	02/10/03	03W1428	mg/L	0.01	<0.01	U
03-1534-4	MW-14-2	Water	02/10/03	02/10/03	02/10/03	03W1428	mg/L	0.01	<0.01	U
03-1534-5	MW-14-3	Water	02/10/03	02/10/03	02/10/03	03W1428	mg/L	0.01	<0.01	U
03-1534-6	MW-14-4	Water	02/10/03	02/10/03	02/10/03	03W1428	mg/L	0.01	<0.01	U
03-1534-7	MW-14-5	Water	02/10/03	02/10/03	02/10/03	03W1428	mg/L	0.01	<0.01	U
03W1428-MB-01	03W1428-MB-01	Water	02/10/03	02/10/03	02/10/03	03W1428	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

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3/28/03

Applied P & Ch Laboratory
Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc.
Project ID: JPL. GW MON-1Q03.

Project No: 04-4428.10
Service ID: 31534

Anal. Method 314.0
Collected by:

Component Name: Perchlorate

CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1534-1	DUPE-3-1Q03	Water	02/10/03	02/10/03	02/13/03	03W1495	µg/L	4	2.2	B
03-1534-2	EB-7-2/10/03	Water	02/10/03	02/10/03	02/13/03	03W1495	µg/L	4	<4	U
03-1534-3	MW-14-1	Water	02/10/03	02/10/03	02/13/03	03W1495	µg/L	4	1.9	B
03-1534-4	MW-14-2	Water	02/10/03	02/10/03	02/13/03	03W1495	µg/L	4	2.6	B
03-1534-5	MW-14-3	Water	02/10/03	02/10/03	02/13/03	03W1495	µg/L	4	2.9	B
03-1534-6	MW-14-4	Water	02/10/03	02/10/03	02/13/03	03W1495	µg/L	4	1.8	B
03-1534-7	MW-14-5	Water	02/10/03	02/10/03	02/13/03	03W1495	µg/L	4	<4	U
03W1495-MB-01	03W1495-MB-01	Water	02/13/03	02/13/03	02/13/03	03W1495	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

Handwritten: 3/28/03

METHOD: Hexavalent chromium (EPA SW 846 Method 7196) Perchlorate (EPA Method 314.0)

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: 2-10-03
IIa.	Initial calibration	SW	
IIb.	Calibration verification	A	
III.	Blanks	A	
IVa.	Matrix Spike/(Matrix Spike) Duplicates	A	
IVb.	Laboratory control samples	A	LCS/LCSD
V.	Sample result verification	N	
VI.	Overall assessment of data	A	
VII.	Field duplicates	SW	D = 1 + 6
VIII.	Field blanks	ND	EB = 2

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:

1	DUPE-3-1Q03	W	11		21		31	
2	EB-7-2/10/03		12		22		32	
3	MW-14-1		13		23		33	
4	MW-14-2		14		24		34	
5	MW-14-3		15		25		35	
6	MW-14-4		16		26		36	
7	MW-14-5		17		27		37	
8	MW-14-2MS		18		28		38	
9	MW-14-2MSD	V	19		29		39	
10	PBW		20		30		40	

Notes: _____

LDC #: 1000606

SDG #: 03-1534

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1

Reviewer: MG

2nd reviewer: MV

METHOD: Inorganics, Method see cover
☒ N N/A
☒ N N/A

Were field duplicate pairs identified in this SDG?

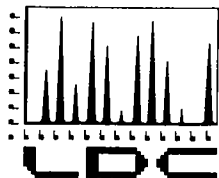
Were target analytes detected in the field duplicate pairs?

Analyte	Concentration ($\mu\text{g/L}$)		RPD (Limit)	Difference (Limit)	Qualifier
	1	6			
ClO_4	2.2	1.8	20		

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier



LABORATORY DATA CONSULTANTS, INC.

7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Geofon, Inc.
22632 Golden Springs Drive, Suite 270
Diamond Bar, CA 91765
ATTN: Mr. Leo Williamson

April 2, 2003

SUBJECT: NASA JPL, DO #01, Data Validation

Dear Mr. Williamson,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on March 24, 2003. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 10025:

<u>SDG #</u>	<u>Fraction</u>
03-1651, 03-1684, 0303045	Volatiles (TO-14A), Volatiles (524.2), Wet Chemistry

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 Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994
- 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

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

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

LDC #10025 (Geofon, Inc.-Diamond Bar / NASA Jet Propulsion Laboratory, DO#001)

Shaded cells indicate Level IV validation (all other cells are Level III validation).