# NASA JPL
# Data Validation Reports
# LDC# 10822

## Wet Chemistry

LDC

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** July 29, 2003

**LDC Report Date:** September 18, 2003

**Matrix:** Water

**Parameters:** Wet Chemistry

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory

**Sample Delivery Group (SDG):** 03-4389

**Sample Identification**

EB-1-7-29-03
MW-21-1
MW-21-2
MW-21-3
MW-21-4
MW-21-5
MW-21-1MS
MW-21-1MSD

## Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic 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 were met.

### 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) analyses 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

No field duplicates were identified in this SDG.

## X. Field Blanks

Sample EB-1-7-29-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

**NASA JPL**
**Wet Chemistry - Data Qualification Summary - SDG 03-4389**

No Sample Data Qualified in this SDG

**NASA JPL**
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4389**

No Sample Data Qualified in this SDG

Applied P & Ch Laboratory

# Wet Analysis Results for Method 7196

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Anal. Method | 7196 |
| Project ID: | JPL | Service ID: | 34389 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4389-1 | EB-1-7-29-03 | Water | 07/29/03 | 07/29/03 | 07/29/03 | 03W3899 | mg/L | 0.01 | <0.01 | U |
| 03-4389-2 | MW-21-1 | Water | 07/29/03 | 07/29/03 | 07/29/03 | 03W3899 | mg/L | 0.01 | <0.01 | U |
| 03-4389-3 | MW-21-2 | Water | 07/29/03 | 07/29/03 | 07/29/03 | 03W3899 | mg/L | 0.01 | <0.01 | U |
| 03-4389-4 | MW-21-3 | Water | 07/29/03 | 07/29/03 | 07/29/03 | 03W3899 | mg/L | 0.01 | <0.01 | U |
| 03-4389-5 | MW-21-4 | Water | 07/29/03 | 07/29/03 | 07/29/03 | 03W3899 | mg/L | 0.01 | <0.01 | U |
| 03-4389-6 | MW-21-5 | Water | 07/29/03 | 07/29/03 | 07/29/03 | 03W3899 | mg/L | 0.01 | <0.01 | U |
| 03W3899-MB-01 | 03W3899-MB-01 | Water | 07/29/03 | 07/29/03 | 07/29/03 | 03W3899 | 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.

N918

Applied P & Ch Laboratory

# Wet Analysis Results for Method 314.0

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Anal. Method | 314.0 |
| Project ID: | JPL | Service ID: | 34389 | Collected by: | |

**Component Name: Perchlorate**

**CAS No:**

| Lab ID | Sample ID | Matrix | Coll. Date | Rcv Date | Anal. Date | Batch | Unit | RL | Result | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4389-1 | EB-1-7-29-03 | Water | 07/29/03 | 07/29/03 | 07/31/03 | 03W3913 | μg/L | 4 | <4 | U |
| 03-4389-2 | MW-21-1 | Water | 07/29/03 | 07/29/03 | 07/31/03 | 03W3913 | μg/L | 4 | 5.2 | |
| 03-4389-3 | MW-21-2 | Water | 07/29/03 | 07/29/03 | 07/31/03 | 03W3913 | μg/L | 4 | 2.1 | B |
| 03-4389-4 | MW-21-3 | Water | 07/29/03 | 07/29/03 | 07/31/03 | 03W3913 | μg/L | 4 | 2.7 | B |
| 03-4389-5 | MW-21-4 | Water | 07/29/03 | 07/29/03 | 07/31/03 | 03W3913 | μg/L | 4 | 2.7 | B |
| 03-4389-6 | MW-21-5 | Water | 07/29/03 | 07/29/03 | 07/31/03 | 03W3913 | μg/L | 4 | 2.6 | B |
| 03W3913-MB-01 | 03W3913-MB-01 | Water | 07/31/03 | 07/31/03 | 07/31/03 | 03W3913 | 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.

N918

LDC #: 10822A6
SDG #: 03-4389
Laboratory: Applied P & Ch Laboratory

# VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 9/17/03
Page: 1 of 1
Reviewer: LYB
2nd Reviewer: R

**METHOD: (Analyte)** Perchlorate (EPA Method 314.0), Hexavalent Chromium (EPA SW846 Method 7196A)

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: 9/29/03 |
| IIa. | Initial calibration | A | |
| IIb. | Calibration verification | A | |
| III. | Blanks | A | |
| IV | Matrix Spike/Matrix Spike Duplicates | A | 3 MS/MSD |
| V | Duplicates | A | |
| VI. | Laboratory control samples | A | LCS/LCSD |
| VII. | Sample result verification | N | |
| VIII. | Overall assessment of data | A | |
| IX. | Field duplicates | N | |
| X | Field blanks | ND | EB= 1 |

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

Notes:

LDC #: 12822A6
SDG #: 03-4389

# VALIDATION FINDINGS WORKSHEET
## Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

| Sample ID | Parameter |
|---|---|
| 1-6 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ $ClO_4$ ____ ____ ____ |
| 7,8 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |

Comments:

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** July 30, 2003

**LDC Report Date:** September 18, 2003

**Matrix:** Water

**Parameters:** Wet Chemistry

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory

**Sample Delivery Group (SDG):** 03-4406

**Sample Identification**

DUPE-1-3Q03
EB-2-7/30-03
MW-3-2
MW-3-3
MW-3-4
MW-17-2
MW-17-3
MW-17-4
MW-19-1
MW-19-2
MW-19-3
MW-19-4
MW-19-5
MW-3-3MS
MW-3-3MSD
MW-19-2MS
MW-19-2MSD

## Introduction

This data review covers 17 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic 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 were met.

### b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable with the following exceptions:

| Date | Lab. Reference/ID | Analyte | %R (Limits) | Associated Samples | Flag | A or P |
|---|---|---|---|---|---|---|
| 7/31/03 | CCV (13:18) | Perchlorate | 111 (90-110) | DUPE-1-3Q03<br>EB-2-7/30-03<br>MW-3-2<br>MW-3-3<br>MW-3-4<br>MW-17-2<br>MW-17-3<br>MW-19-2MS<br>MW-19-2MSD | J (all detects) | P |
| 7/31/03 | CCV (16:40) | Perchlorate | 111 (90-110) | MW-17-4<br>MW-19-1<br>MW-19-2<br>MW-19-3<br>MW-19-4<br>MW-19-5 | J (all detects) | P |

## 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) analyses 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-1-3Q03 and MW-19-4 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

## X. Field Blanks

Sample EB-2-7/30-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

## NASA JPL
## Wet Chemistry - Data Qualification Summary - SDG 03-4406

| SDG | Sample | Analyte | Flag | A or P | Reason |
|---|---|---|---|---|---|
| 03-4406 | DUPE-1-3Q03<br>EB-2-7/30-03<br>MW-3-2<br>MW-3-3<br>MW-3-4<br>MW-17-2<br>MW-17-3<br>MW-17-4<br>MW-19-1<br>MW-19-2<br>MW-19-3<br>MW-19-4<br>MW-19-5 | Perchlorate | J (all detects) | P | Calibration verification (%R) |

## NASA JPL
## Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4406

No Sample Data Qualified in this SDG

Applied P & Ch Laboratory

# Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 314.0
Project ID: JPL Service ID: 34406 Collected by:

**Component Name: Perchlorate**
**CAS No:**

| Lab ID | Sample ID | Matrix | Coll. Date | Rcv Date | Anal. Date | Batch | Unit | RL | Result | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4406-1 | DUPE-1-3Q03 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | <4 | U |
| 03-4406-2 | EB-2-7/30/03 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | <4 | U |
| 03-4406-3 | MW-3-2 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | 8.9 | J |
| 03-4406-4 | MW-3-3 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | <4 | U |
| 03-4406-5 | MW-3-4 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | <4 | U |
| 03-4406-6 | MW-17-2 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | 10.9 | J |
| 03-4406-7 | MW-17-3 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 20 | 209 | J |
| 03-4406-8 | MW-17-4 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | <4 | U |
| 03-4406-9 | MW-19-1 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | <4 | U |
| 03-4406-10 | MW-19-2 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | 3.6 | B J |
| 03-4406-11 | MW-19-3 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | 3.0 | B J |
| 03-4406-12 | MW-19-4 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | <4 | U |
| 03-4406-13 | MW-19-5 | Water | 07/30/03 | 07/30/03 | 07/31/03 | 03W3913 | μg/L | 4 | <4 | U |
| 03W3913-MB-01 | 03W3913-MB-01 | Water | 07/31/03 | 07/31/03 | 07/31/03 | 03W3913 | 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.

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Applied P & Ch Laboratory

# Wet Analysis Results for Method 7196

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Anal. Method | 7196 |
| Project ID: | JPL | Service ID: | 34406 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4406-3 | MW-3-2 | Water | 07/30/03 | 07/30/03 | 07/30/03 | 03W3907 | mg/L | 0.01 | <0.01 | U |
| 03-4406-4 | MW-3-3 | Water | 07/30/03 | 07/30/03 | 07/30/03 | 03W3907 | mg/L | 0.01 | <0.01 | U |
| 03-4406-5 | MW-3-4 | Water | 07/30/03 | 07/30/03 | 07/30/03 | 03W3907 | mg/L | 0.01 | <0.01 | U |
| 03-4406-6 | MW-17-2 | Water | 07/30/03 | 07/30/03 | 07/30/03 | 03W3907 | mg/L | 0.01 | <0.01 | U |
| 03-4406-7 | MW-17-3 | Water | 07/30/03 | 07/30/03 | 07/30/03 | 03W3907 | mg/L | 0.01 | <0.01 | U |
| 03-4406-8 | MW-17-4 | Water | 07/30/03 | 07/30/03 | 07/30/03 | 03W3907 | mg/L | 0.01 | <0.01 | U |
| 03W3907-MB-01 | 03W3907-MB-01 | Water | 07/30/03 | 07/30/03 | 07/30/03 | 03W3907 | 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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LDC #: 10822B6

# VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/17/03

SDG #: 03-4406

Page: 1 of 1

Laboratory: Applied P & Ch Laboratory

Reviewer: HB

2nd Reviewer: [illegible]

**METHOD: (Analyte)** Perchlorate (EPA Method 314.0), Hexavalent Chromium (EPA SW846 Method 7196A)

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: 7/30/03 |
| IIa. | Initial calibration | A | |
| IIb. | Calibration verification | GW | |
| III. | Blanks | A | |
| IV | Matrix Spike/Matrix Spike Duplicates | A | 3 MS/MSD |
| V | Duplicates | A | |
| VI. | Laboratory control samples | A | LCS/LCSD |
| VII. | Sample result verification | N | |
| VIII. | Overall assessment of data | A | |
| IX. | Field duplicates | ND | (1, 12) |
| X | 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: All

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

Notes:

LDC #: 10822B6
SDG #: 03-4406

# VALIDATION FINDINGS WORKSHEET
## Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: ✓

All circled methods are applicable to each sample.

| Sample ID | Parameter | | | | |
|---|---|---|---|---|---|
| 1-13 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC ~~$Cr^{6+}$~~ Hg | $ClO_4$ | | | |
| 3-8 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| or 14,15 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| ✓16,17 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | $ClO_4$ | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $Cr^{6+}$ | | | | |

Comments:

LDC #: 10822B6
SDG #: 03-4406

# VALIDATION FINDINGS WORKSHEET
## Calibration

Page: 1 of 1
Reviewer: MH
2nd Reviewer: [illegible]

**METHOD:** Inorganics, EPA Method See cover

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

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

**LEVEL IV/D ONLY:**

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations.
Y N N/A Was a balance check conducted prior to the TDS analysis.?
Y N N/A Was the titrant normality checked?

| # | Date | Calibration ID | Analyte | %R | Associated Samples | Qualifications |
|---|---|---|---|---|---|---|
| 1 | 7/31/03 | CCV (13:18) | ClO4 | 111 | 1-7, 16, 17 | J lab /p |
| 2 | ↓ | CCV (16:40) | ClO4 | 111 | 8-13 | ↓ |

Comments:

CAL.6

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** July 31, 2003

**LDC Report Date:** September 18, 2003

**Matrix:** Water

**Parameters:** Wet Chemistry

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory

**Sample Delivery Group (SDG):** 03-4425

**Sample Identification**

DUPE-2-3-Q03
EB-3-7-31-03
MW-20-1
MW-20-2
MW-20-3
MW-20-4
MW-20-5
MW-20-4MS
MW-20-4MSD

## 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 7196A 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 were met.

### b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable with the following exceptions:

| Date | Lab. Reference/ID | Analyte | %R (Limits) | Associated Samples | Flag | A or P |
|---|---|---|---|---|---|---|
| 8/1/03 | CCV (12:00) | Perchlorate | 113 (90-110) | DUPE-2-3-Q03<br>EB-3-7-31-03<br>MW-20-4<br>MB<br>LCS | J (all detects) | P |
| 8/1/03 | CCV (15:23) | Perchlorate | 113 (90-110) | MW-20-1<br>MW-20-2<br>MW-20-3<br>MW-20-5<br>MW-20-4MS<br>MW-20-4MSD | J (all detects) | P |

## 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) analyses 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-2-3-Q03 and MW-20-3 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

## X. Field Blanks

Sample EB-3-7-31-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

## NASA JPL
## Wet Chemistry - Data Qualification Summary - SDG 03-4425

| SDG | Sample | Analyte | Flag | A or P | Reason |
|---|---|---|---|---|---|
| 03-4425 | DUPE-2-3-Q03<br>EB-3-7-31-03<br>MW-20-1<br>MW-20-2<br>MW-20-3<br>MW-20-4<br>MW-20-5 | Perchlorate | J (all detects) | P | Calibration verification (%R) |

## NASA JPL
## Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4425

No Sample Data Qualified in this SDG

Applied P & Ch Laboratory

# Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 314.0
Project ID: JPL Service ID: 34425 Collected by:

**Component Name: Perchlorate**
**CAS No:**

| Lab ID | Sample ID | Matrix | Coll. Date | Rcv Date | Anal. Date | Batch | Unit | RL | Result | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4425-1 | DUPE-2-3-Q03 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3930 | μg/L | 4 | <4 | U |
| 03-4425-2 | EB-3-7-31-03 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3930 | μg/L | 4 | <4 | U |
| 03-4425-3 | MW-20-1 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3930 | μg/L | 4 | 1.5 | J |
| 03-4425-4 | MW-20-2 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3930 | μg/L | 4 | <4 | U |
| 03-4425-5 | MW-20-3 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3930 | μg/L | 4 | <4 | U |
| 03-4425-6 | MW-20-4 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3930 | μg/L | 4 | <4 | U |
| 03-4425-7 | MW-20-5 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3930 | μg/L | 4 | <4 | U |
| 03W3930-MB-01 | 03W3930-MB-01 | Water | 08/01/03 | 08/01/03 | 08/01/03 | 03W3930 | 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.

Applied P & Ch Laboratory

# Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4428.10
Service ID: 34425

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4425-1 | DUPE-2-3-Q03 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3919 | mg/L | 0.01 | <0.01 | U |
| 03-4425-2 | EB-3-7-31-03 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3919 | mg/L | 0.01 | <0.01 | U |
| 03-4425-3 | MW-20-1 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3919 | mg/L | 0.01 | <0.01 | U |
| 03-4425-4 | MW-20-2 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3919 | mg/L | 0.01 | <0.01 | U |
| 03-4425-5 | MW-20-3 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3919 | mg/L | 0.01 | <0.01 | U |
| 03-4425-6 | MW-20-4 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3919 | mg/L | 0.01 | <0.01 | U |
| 03-4425-7 | MW-20-5 | Water | 07/31/03 | 07/31/03 | 08/01/03 | 03W3919 | mg/L | 0.01 | <0.01 | U |
| 03W3919-MB-01 | 03W3919-MB-01 | Water | 08/01/03 | 08/01/03 | 08/01/03 | 03W3919 | 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.

LDC #: 10822C6

SDG #: 03-4425

Laboratory: Applied P & Ch Laboratory

# VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/17/03

Page: 1 of 1

Reviewer: MB

2nd Reviewer: A

**METHOD: (Analyte)** Perchlorate (EPA Method 314.0), Hexavalent Chromium (EPA SW846 Method 7196A)

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: 7/31/03 |
| IIa. | Initial calibration | A | |
| IIb. | Calibration verification | SW | |
| III. | Blanks | A | |
| IV | Matrix Spike/Matrix Spike Duplicates | A | MS/MSD |
| V | Duplicates | A | |
| VI. | Laboratory control samples | A | LCS/LCSD |
| VII. | Sample result verification | N | |
| VIII. | Overall assessment of data | A | |
| IX. | Field duplicates | ND | (1, 5) |
| X | Field blanks | ND | FB=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: MA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | DUPE-2-3-~~X~~Q03 | 11 | NB | 21 | | 31 | |
| 2 | EB-3-7-31-03 | 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 | ~~TB-3-7-31-03~~ | 18 | | 28 | | 38 | |
| 9 | MW-20-4MS | 19 | | 29 | | 39 | |
| 10 | MW-20-4MSD | 20 | | 30 | | 40 | |

Notes:

LDC #: 10822C6
SDG #: 03-4475

# VALIDATION FINDINGS WORKSHEET
## Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: N

All circled methods are applicable to each sample.

| Sample ID | Parameter | | | | |
|---|---|---|---|---|---|
| 1-7 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | $ClO_4$ | | | |
| 8, 9, 10 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | $ClO_4$ | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |

Comments:

LDC #: 10822C6
SDG #: 03-4425

# VALIDATION FINDINGS WORKSHEET
## Calibration

Page: 1 of 1
Reviewer: MH
2nd Reviewer: [signature]

**METHOD:** Inorganics, EPA Method see cover

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

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

**LEVEL IV/D ONLY:**

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations.
Y N N/A Was a balance check conducted prior to the TDS analysis.?
Y N N/A Was the titrant normality checked?

| # | Date | Calibration ID | Analyte | %R | Associated Samples | Qualifications |
|---|---|---|---|---|---|---|
| 1 | 8/1/03 | CCV (1200) | ClO4 | 113 | 1,2,6, MB, LCS | J dte/p |
| 2 | 8/1/03 | CCV (1523) | ClO4 | 113 | 3,4,5,7,9,10 | ↓ |

Comments:

CAL.6

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** August 4, 2003

**LDC Report Date:** September 18, 2003

**Matrix:** Water

**Parameters:** Wet Chemistry

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory

**Sample Delivery Group (SDG):** 03-4455

**Sample Identification**

DUPE-3-3-Q03
EB-4-8-4-03
MW-4-1
MW-4-2
MW-4-3
MW-18-2
MW-18-3
MW-18-4
MW-18-5
MW-4-2MS
MW-4-2MSD

## Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic 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 were met.

### 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) analyses 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-3-3-Q03 and MW-4-1 were identified as field duplicates. No contaminant concentrations were detected in any of the samples.

## X. Field Blanks

Sample EB-4-8-4-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

**NASA JPL**
**Wet Chemistry - Data Qualification Summary - SDG 03-4455**

No Sample Data Qualified in this SDG

**NASA JPL**
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4455**

No Sample Data Qualified in this SDG

DD22D

Applied P & Ch Laboratory

# Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 7196
Project ID: JPL Service ID: 34455 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4455-1 | DUPE-3-3-Q03 | Water | 08/04/03 | 08/04/03 | 08/04/03 | 03W3944 | mg/L | 0.01 | <0.01 | U |
| 03-4455-2 | EB-4-8-4-03 | Water | 08/04/03 | 08/04/03 | 08/04/03 | 03W3944 | mg/L | 0.01 | <0.01 | U |
| 03-4455-3 | MW-4-1 | Water | 08/04/03 | 08/04/03 | 08/04/03 | 03W3944 | mg/L | 0.01 | <0.01 | U |
| 03-4455-4 | MW-4-2 | Water | 08/04/03 | 08/04/03 | 08/04/03 | 03W3944 | mg/L | 0.01 | <0.01 | U |
| 03-4455-5 | MW-4-3 | Water | 08/04/03 | 08/04/03 | 08/04/03 | 03W3944 | mg/L | 0.01 | <0.01 | U |
| 03-4455-6 | MW-18-2 | Water | 08/04/03 | 08/04/03 | 08/04/03 | 03W3944 | mg/L | 0.01 | <0.01 | U |
| 03-4455-7 | MW-18-3 | Water | 08/04/03 | 08/04/03 | 08/04/03 | 03W3944 | mg/L | 0.01 | <0.01 | U |
| 03-4455-8 | MW-18-4 | Water | 08/04/03 | 08/04/03 | 08/04/03 | 03W3944 | mg/L | 0.01 | <0.01 | U |
| 03W3944-MB-01 | 03W3944-MB-01 | Water | 08/04/03 | 08/04/03 | 08/04/03 | 03W3944 | 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.

19182

Applied P & Ch Laboratory

# Wet Analysis Results for Method 314.0

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Anal. Method | 314.0 |
| Project ID: | JPL | Service ID: | 34455 | Collected by: | |

**Component Name: Perchlorate**
**CAS No:**

| Lab ID | Sample ID | Matrix | Coll. Date | Rcv Date | Anal. Date | Batch | Unit | RL | Result | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4455-1 | DUPE-3-3-Q03 | Water | 08/04/03 | 08/04/03 | 08/05/03 | 03W3948 | μg/L | 4 | <4 | U |
| 03-4455-2 | EB-4-8-4-03 | Water | 08/04/03 | 08/04/03 | 08/05/03 | 03W3948 | μg/L | 4 | <4 | U |
| 03-4455-3 | MW-4-1 | Water | 08/04/03 | 08/04/03 | 08/05/03 | 03W3948 | μg/L | 4 | <4 | U |
| 03-4455-4 | MW-4-2 | Water | 08/04/03 | 08/04/03 | 08/05/03 | 03W3948 | μg/L | 4 | 9.0 | |
| 03-4455-5 | MW-4-3 | Water | 08/04/03 | 08/04/03 | 08/05/03 | 03W3948 | μg/L | 4 | <4 | U |
| 03-4455-6 | MW-18-2 | Water | 08/04/03 | 08/04/03 | 08/05/03 | 03W3948 | μg/L | 4 | <4 | U |
| 03-4455-7 | MW-18-3 | Water | 08/04/03 | 08/04/03 | 08/05/03 | 03W3948 | μg/L | 4 | 1.3 | J |
| 03-4455-8 | MW-18-4 | Water | 08/04/03 | 08/04/03 | 08/05/03 | 03W3948 | μg/L | 4 | 15.0 | |
| 03-4455-9 | MW-18-5 | Water | 08/04/03 | 08/04/03 | 08/05/03 | 03W3948 | μg/L | 4 | <4 | U |
| 03W3948-MB-01 | 03W3948-MB-01 | Water | 08/05/03 | 08/05/03 | 08/05/03 | 03W3948 | 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.

1915

LDC #: 10822D6

SDG #: 03-4455

Laboratory: Applied P & Ch Laboratory

# VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/17/03

Page: 1 of 1

Reviewer: MB

2nd Reviewer: [illegible]

**METHOD: (Analyte)** Perchlorate (EPA Method 314.0), Hexavalent Chromium (EPA SW846 Method 7196A)

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: 8/4/03 |
| IIa. | Initial calibration | A | |
| IIb. | Calibration verification | A | |
| III. | Blanks | A | |
| IV | Matrix Spike/Matrix Spike Duplicates | A | 3 MS/MSD |
| V | Duplicates | A | |
| VI. | Laboratory control samples | A | LCS/LCSD |
| VII. | Sample result verification | N | |
| VIII. | Overall assessment of data | A | |
| IX. | Field duplicates | ND | (1,3) |
| X | 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: All

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

Notes:

LDC #: 12822
SDG #: 03-

# VALIDATION FINDINGS WORKSHEET
## Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

| Sample ID | Parameter | | | | |
|---|---|---|---|---|---|
| 1-8 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | $ClO_4$ | | | |
| 9 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | $ClO_4$ | | | |
| M10,11 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | $ClO_4$ | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ | | | | |

Comments:

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** August 6, 2003

**LDC Report Date:** September 18, 2003

**Matrix:** Water

**Parameters:** Wet Chemistry

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory

**Sample Delivery Group (SDG):** 03-4509

**Sample Identification**

DUPE-4-3-Q03
ER-5-8-6-03
MW-23-1
MW-23-2
MW-23-3
MW-23-4
MW-14-1
MW-14-2
MW-14-3
MW-14-4
MW-14-2MS
MW-14-2MSD

## Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic 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 were met.

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

| Analyte | Concentration (mg/L) | | RPD |
|---|---|---|---|
| | DUPE-4-3-Q03 | MW-14-3 | |
| Perchlorate | 2.3 | 3.0 | 26 |

## X. Field Blanks

Sample ER-5-8-6-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

**NASA JPL**
**Wet Chemistry - Data Qualification Summary - SDG 03-4509**

No Sample Data Qualified in this SDG

**NASA JPL**
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4509**

No Sample Data Qualified in this SDG

108222

Applied P & Ch Laboratory

# Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 314.0
Project ID: JPL Service ID: 34509 Collected by:

**Component Name: Perchlorate**
**CAS No:**

| Lab ID | Sample ID | Matrix | Coll. Date | Rcv Date | Anal. Date | Batch | Unit | RL | Result | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4509-1 | DUPE-4-3-Q03 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3974 | μg/L | 4 | 2.3 | J |
| 03-4509-2 | ER-5-8-6-03 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3974 | μg/L | 4 | <4 | U |
| 03-4509-3 | MW-23-1 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3974 | μg/L | 4 | 2.4 | J |
| 03-4509-4 | MW-23-2 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3974 | μg/L | 4 | 4.7 | |
| 03-4509-5 | MW-23-3 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3974 | μg/L | 4 | 2.0 | J |
| 03-4509-7 | MW-14-1 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3974 | μg/L | 4 | 3.8 | J |
| 03-4509-8 | MW-14-2 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3974 | μg/L | 4 | 5.4 | |
| 03-4509-9 | MW-14-3 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3974 | μg/L | 4 | 3.0 | J |
| 03W3974-MB-01 | 03W3974-MB-01 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3974 | 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.

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Applied P & Ch Laboratory

# Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 7196
Project ID: JPL Service ID: 34509 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4509-1 | DUPE-4-3-Q03 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03-4509-2 | ER-5-8-6-03 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03-4509-3 | MW-23-1 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03-4509-4 | MW-23-2 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03-4509-5 | MW-23-3 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03-4509-6 | MW-23-4 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03-4509-7 | MW-14-1 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03-4509-8 | MW-14-2 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03-4509-9 | MW-14-3 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03-4509-10 | MW-14-4 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | mg/L | 0.01 | < 0.01 | U |
| 03W3982-MB-01 | 03W3982-MB-01 | Water | 08/06/03 | 08/06/03 | 08/06/03 | 03W3982 | 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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LDC #: 10822E6
SDG #: 03-4509
Laboratory: Applied P & Ch Laboratory

# VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 9/19/03
Page: 1 of 1
Reviewer: MW
2nd Reviewer: [illegible]

**METHOD: (Analyte)** Perchlorate (EPA Method 314.0), Hexavalent Chromium (EPA SW846 Method 7196A)

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: 8/6/03 |
| IIa. | Initial calibration | A | |
| IIb. | Calibration verification | A | |
| III. | Blanks | A | |
| IV | Matrix Spike/Matrix Spike Duplicates | A | } MS/MSD |
| V | Duplicates | A | |
| VI. | Laboratory control samples | A | LCS/LCSD |
| VII. | Sample result verification | N | |
| VIII. | Overall assessment of data | A | |
| IX. | Field duplicates | SW | (1, 4) |
| X | 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-4-3-~~B~~SQ03 | 11 | MW-14-2MS | 21 | | 31 | |
| 2 | ER-5-8-6-03 | 12 | MW-14-2MSD | 22 | | 32 | |
| 3 | MW-23-1 | 13 | MB | 23 | | 33 | |
| 4 | MW-23-2 | 14 | | 24 | | 34 | |
| 5 | MW-23-3 | 15 | | 25 | | 35 | |
| 6 | MW-23-4 | 16 | | 26 | | 36 | |
| 7 | MW-14-1 | 17 | | 27 | | 37 | |
| 8 | MW-14-2 | 18 | | 28 | | 38 | |
| 9 | MW-14-3 | 19 | | 29 | | 39 | |
| 10 | MW-14-4 | 20 | | 30 | | 40 | |

Notes:

LDC #: 12822
SDG #: 03-

# VALIDATION FINDINGS WORKSHEET
## Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

| Sample ID | Parameter |
|---|---|
| 1-5, 7-9 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ $ClO_4$ ____ ____ ____ |
| 6, 10 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| 11, 12 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ $ClO_4$ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ ____ ____ ____ ____ |

Comments:

LDC #: 10822E6
SDG #: 03-4509

# VALIDATION FINDINGS WORKSHEET
## Field Duplicates

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

**METHOD:** Inorganics, Method see cover

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target analytes detected in the field duplicate pairs?

| Analyte | Concentration ( ug/L ) | | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| | 1 | 9 | | |
| Cr04 | 2.3 | 3.0 | 26 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Analyte | Concentration ( ) | | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Analyte | Concentration ( ) | | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Analyte | Concentration ( ) | | RPD (Limits) | Qualifier |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** August 7, 2003

**LDC Report Date:** September 18, 2003

**Matrix:** Water

**Parameters:** Wet Chemistry

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory

**Sample Delivery Group (SDG):** 03-4534

**Sample Identification**

EB-6-8-7-03
MW-11-1
MW-11-2
MW-11-3
MW-11-4
MW-14-4
MW-14-5
MW-24-1
MW-24-2
MW-24-3
MW-24-4
MW-11-1MS
MW-11-1MSD
MW-11-4MS
MW-11-4MSD

## Introduction

This data review covers 15 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate and EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic 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 were met.

### 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) analyses 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

No field duplicates were identified in this SDG.

## X. Field Blanks

Sample EB-6-8-7-03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

**NASA JPL**
**Wet Chemistry - Data Qualification Summary - SDG 03-4534**

No Sample Data Qualified in this SDG

**NASA JPL**
**Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-4534**

No Sample Data Qualified in this SDG

108227F

Applied P & Ch Laboratory

# Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 314.0
Project ID: JPL Service ID: 34534 Collected by:

**Component Name: Perchlorate**
**CAS No:**

| Lab ID | Sample ID | Matrix | Coll. Date | Rcv Date | Anal. Date | Batch | Unit | RL | Result | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4534-1 | EB-6-8-7-03 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 4 | <4 | U |
| 03-4534-2 | MW-11-1 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 4 | <4 | U |
| 03-4534-3 | MW-11-2 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 4 | <4 | U |
| 03-4534-4 | MW-11-3 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 4 | <4 | U |
| 03-4534-5 | MW-11-4 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 4 | <4 | U |
| 03-4534-6 | MW-14-4 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 4 | 2.3 | J |
| 03-4534-7 | MW-14-5 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 4 | <4 | U |
| 03-4534-8 | MW-24-1 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 400 | 2450 | |
| 03-4534-9 | MW-24-2 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 20 | 148 | |
| 03-4534-10 | MW-24-3 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | μg/L | 4 | <4 | U |
| 03W3998-MB-01 | 03W3998-MB-01 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3998 | 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.

N918

Applied P & Ch Laboratory

# Wet Analysis Results for Method 7196

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Anal. Method | 7196 |
| Project ID: | JPL | Service ID: | 34534 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 03-4534-2 | MW-11-1 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3997 | mg/L | 0.01 | <0.01 | U |
| 03-4534-3 | MW-11-2 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3997 | mg/L | 0.01 | <0.01 | U |
| 03-4534-4 | MW-11-3 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3997 | mg/L | 0.01 | <0.01 | U |
| 03-4534-8 | MW-24-1 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3997 | mg/L | 0.01 | <0.01 | U |
| 03-4534-9 | MW-24-2 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3997 | mg/L | 0.01 | <0.01 | U |
| 03-4534-10 | MW-24-3 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3997 | mg/L | 0.01 | <0.01 | U |
| 03-4534-11 | MW-24-4 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3997 | mg/L | 0.01 | <0.01 | U |
| 03W3997-MB-01 | 03W3997-MB-01 | Water | 08/07/03 | 08/07/03 | 08/07/03 | 03W3997 | 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.

1 9182

LDC #: 10822F6
SDG #: 03-4534
Laboratory: Applied P & Ch Laboratory

# VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 9/17/03
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

**METHOD: (Analyte)** Perchlorate (EPA Method 314.0), Hexavalent Chromium (EPA SW846 Method 7196A) ~~, Total Recoverable Petroleum Hydrocarbons (EPA Method 418.1)~~

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: 8/7/03 |
| IIa. | Initial calibration | A | |
| IIb. | Calibration verification | A | |
| III. | Blanks | A | |
| IV | Matrix Spike/Matrix Spike Duplicates | A | 3 MS/MSD |
| V | Duplicates | A | |
| VI. | Laboratory control samples | A | LCS/LCSD |
| VII. | Sample result verification | N | |
| VIII. | Overall assessment of data | A | |
| IX. | Field duplicates | N | |
| X | Field blanks | ND | TB=1 |

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: All

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

Notes:

LDC #: 10822F6
SDG #: 03-4834

# VALIDATION FINDINGS WORKSHEET
## Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

| Sample ID | Parameter |
|---|---|
| 1-10 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ $ClO_4$ |
| 2-4, 8-11 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| 12, 13 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| 14, 15 | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ $ClO_4$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |
| | pH TDS Cl F $NO_3$ $NO_2$ $SO_4$ $PO_4$ ALK $CN^-$ $NH_3$ TKN TOC $CR^{6+}$ |

Comments:

**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

October 20, 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 October 6, 2003. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 10962:**

| SDG # | Fraction |
|---|---|
| 03-4445, 03-4558, 03-4572, 03-4842, 03-4854, 03-4878 | Volatiles, Chromium, 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

Attachment 1

# LDC #10962 (Geofon, Inc.-Diamond Bar / NASA Jet Propulsion Laboratory, DO#001)

| LDC | SDG# | DATE REC'D | DATE DUE | VOA (524.2) | | Cr (200.8) | | $CLO_4$ (314.0) | | Cr(VI) (7196A) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix: | Water/Soil | | | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
| A | 03-4445 | 10/6/03 | 10/27/03 | - | - | 23 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | 03-4558 | 10/6/03 | 10/27/03 | - | - | 35 | 0 | - | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | 03-4572 | 10/6/03 | 10/27/03 | 13 | 0 | - | - | 12 | 0 | 10 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | 03-4842 | 10/6/03 | 10/27/03 | 6 | 0 | - | - | 3 | 0 | 5 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | 03-4854 | 10/6/03 | 10/27/03 | 4 | 0 | - | - | 5 | 0 | 5 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | 03-4878 | 10/6/03 | 10/27/03 | 2 | 0 | - | - | 1 | 0 | 5 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | B | | | 25 | 0 | 58 | 0 | 21 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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

10962ST.wpd

**NASA JPL**
**Data Validation Reports**
**LDC# 10962**

Volatiles

# Laboratory Data Consultants, Inc.
# Data Validation Report

**Project/Site Name:** NASA JPL

**Collection Date:** August 11, 2003

**LDC Report Date:** October 15, 2003

**Matrix:** Water

**Parameters:** Volatiles

**Validation Level:** EPA Level III

**Laboratory:** Applied P & Ch Laboratory

**Sample Delivery Group (SDG):** 03-4572

**Sample Identification**

DUPE-5-3-Q03
EB-7-8-11-03
MW-12-1
MW-12-2
MW-12-3
MW-12-4
MW-12-5
MW-22-1
MW-22-2
MW-22-3
TB-7-8-11-03
MW-12-4MS
MW-12-4MSD

## Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for 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% with the following exceptions:

| Date | Compound | %D | Associated Samples | Flag | A or P |
|---|---|---|---|---|---|
| 8/11/03 | Bromomethane | 36.22 | All samples in SDG 03-4572 | J (all detects)<br>UJ (all non-detects) | P |

## 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-5-3-Q03 and MW-22-2 were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

| Compound | Concentration (ug/L) | | RPD |
|---|---|---|---|
| | DUPE-5-3-Q03 | MW-22-2 | |
| 4-Methyl-2-pentanone | 0.4 | 0.6 | 40 |

## XVII. Field Blanks

Sample TB-7-8-11-03 was identified as a trip blank. No volatile contaminants were found in this blank with the following exceptions:

| Trip Blank ID | Compound | Concentration (ug/L) |
|---|---|---|
| TB-7-8-11-03 | Methylene chloride | 0.4 |

Sample EB-7-8-11-03 was identified as an equipment blank. No volatile contaminants were found in this blank.

## NASA JPL
## Volatiles - Data Qualification Summary - SDG 03-4572

| SDG | Sample | Compound | Flag | A or P | Reason |
|---|---|---|---|---|---|
| 03-4572 | DUPE-5-3-Q03<br>EB-7-8-11-03<br>MW-12-1<br>MW-12-2<br>MW-12-3<br>MW-12-4<br>MW-12-5<br>MW-22-1<br>MW-22-2<br>MW-22-3<br>TB-7-8-11-03 | Bromomethane | J (all detects)<br>UJ (all non-detects) | P | Continuing calibration (%D) |

## NASA JPL
## Volatiles - Laboratory Blank Data Qualification Summary - SDG 03-4572

No Sample Data Qualified in this SDG

10962C

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-1 | Received Date: | 08/11/2003 |
| Sample ID: | **DUPE-5-3-Q03** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 16:24 |
| Data File Name: | 4572-01 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | µg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | µg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | µg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | µg/L | 10 | <10 | 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 (CUMENE) | 98-82-8 | µg/L | 0.5 | <0.5 | U |

10/18/05

| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | 0.4 | J |
| 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 | 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 | 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 113 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 110 |
| 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 | 95 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 94 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 86 |
| # 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

10/18/05

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-2 | Received Date: | 08/11/2003 |
| Sample ID: | **EB-7-8-11-03** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 16:50 |
| Data File Name: | 4572-02 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | µg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | µg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | µg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | µg/L | 10 | <10 | 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 (CUMENE) | 98-82-8 | µg/L | 0.5 | <0.5 | U |

9/10/18/07

| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | <10 | 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 | 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 | 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 113 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 109 |
| 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 | 93 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 92 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 86 |
| # 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

10/18/05

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-3 | Received Date: | 08/11/2003 |
| Sample ID: | **MW-12-1** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 17:17 |
| Data File Name: | 4572-03 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | μg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | μg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | μg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | μg/L | 10 | <10 | 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 (CUMENE) | 98-82-8 | μg/L | 0.5 | <0.5 | U |

10/8/03

| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | <10 | 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 | 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 | 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 97 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 114 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 110 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 96 |
| # of out-of-control | | | | 0 |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 94 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 93 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 85 |
| # 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

10/18/05

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-4 | Received Date: | 08/11/2003 |
| Sample ID: | **MW-12-2** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 17:43 |
| Data File Name: | 4572-04 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | µg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | µg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | µg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | µg/L | 10 | <10 | U |
| 11 | CARBON TETRACHLORIDE | 56-23-5 | µg/L | 0.5 | 0.3 | J |
| 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 (CUMENE) | 98-82-8 | µg/L | 0.5 | <0.5 | U |

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| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | μg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | μg/L | 10 | <10 | 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 | 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 | 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 97 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 114 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 112 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 96 |
| # of out-of-control | | | | 0 |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 94 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 92 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 85 |
| # 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

10/18/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-5 | Received Date: | 08/11/2003 |
| Sample ID: | **MW-12-3** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 18:10 |
| Data File Name: | 4572-05 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | μg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | μg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | μg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | μg/L | 10 | <10 | U |
| 11 | CARBON TETRACHLORIDE | 56-23-5 | μg/L | 0.5 | 5.1 | |
| 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 | 1.7 | |
| 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 (CUMENE) | 98-82-8 | μg/L | 0.5 | <0.5 | U |

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| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | μg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | μg/L | 10 | <10 | 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 | 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 | 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 97 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 115 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 113 |
| 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 | 93 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 93 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 85 |
| # 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

10/18/05

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# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-6 | Received Date: | 08/11/2003 |
| Sample ID: | MW-12-4 | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 18:36 |
| Data File Name: | 4572-06 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | μg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | μg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | μg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | μg/L | 10 | <10 | U |
| 11 | CARBON TETRACHLORIDE | 56-23-5 | μg/L | 0.5 | 1.6 | |
| 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 | <0.5 | 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 (CUMENE) | 98-82-8 | μg/L | 0.5 | <0.5 | U |

9/10/18/03

| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | <10 | 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 | 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 | 79-01-6 | µg/L | 0.5 | 0.4 | J |
| 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 97 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 114 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 111 |
| 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 | 93 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 92 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 84 |
| # 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

9/10/18/07

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-7 | Received Date: | 08/11/2003 |
| Sample ID: | **MW-12-5** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 19:03 |
| Data File Name: | 4572-07 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | µg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | µg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | µg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | µg/L | 10 | <10 | U |
| 11 | CARBON TETRACHLORIDE | 56-23-5 | µg/L | 0.5 | 0.9 | |
| 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 (CUMENE) | 98-82-8 | µg/L | 0.5 | <0.5 | U |

9/10/12 lcr

| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | <10 | 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 | 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 | 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 113 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 112 |
| 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 | 93 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 92 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 84 |
| # 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

10/18/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-8 | Received Date: | 08/11/2003 |
| Sample ID: | **MW-22-1** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 19:29 |
| Data File Name: | 4572-08 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | μg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | μg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | μg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | μg/L | 10 | <10 | 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 | 0.3 | 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 (CUMENE) | 98-82-8 | μg/L | 0.5 | <0.5 | U |



9/10/18/07

| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | μg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | μg/L | 10 | 0.4 | J |
| 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 | 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 | 79-01-6 | μg/L | 0.5 | 0.3 | J |
| 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 115 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 112 |
| 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 | 93 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 91 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 84 |
| # 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

10/18/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-9 | Received Date: | 08/11/2003 |
| Sample ID: | **MW-22-2** | Sample Matrix | Water | Moisture %: | - |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | - | Anal. Time: | 19:55 |
| Data File Name: | 4572-09 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | µg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | µg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | µg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | µg/L | 10 | <10 | 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 (CUMENE) | 98-82-8 | µg/L | 0.5 | <0.5 | U |

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| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | μg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | μg/L | 10 | 0.6 | J |
| 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 | 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 | 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 97 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 115 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 113 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 98 |
| # of out-of-control | | | | 0 |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 93 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 93 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 84 |
| # 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

10/18/07

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-10 | Received Date: | 08/11/2003 |
| Sample ID: | **MW-22-3** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 20:21 |
| Data File Name: | 4572-10 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | μg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | μg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | μg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | μg/L | 10 | <10 | 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 | 2.0 | |
| 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 (CUMENE) | 98-82-8 | μg/L | 0.5 | <0.5 | U |

10/18/03

| # | 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 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | μg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | μg/L | 10 | 2 | J |
| 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 | 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 | 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 116 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 112 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 101 |
| # of out-of-control | | | | 0 |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 93 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 93 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 84 |
| # 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

10/18/03

Applied P & Ch Laboratory

# Organic Analysis Results for Method 524.2

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | GEOFON, Inc. | Project No: | 04-4428.10 | Collection Date: | 08/11/2003 |
| Project ID: | JPL | Service ID: | 34572 | Collected by: | |
| | | Lab Sample ID: | 03-4572-11 | Received Date: | 08/11/2003 |
| Sample ID: | **TB-7-8-11-03** | Sample Matrix | Water | Moisture %: | – |
| Sample Type: | Field Sample | Prep. Method: | 5030 | Instrument ID: | GC/MS: A |
| Anal. Method: | 524.2 | Prep. Date: | 08/11/03 | Anal. Date: | 08/11/03 |
| Batch No: | 03G3659 | Prep. No: | – | Anal. Time: | 20:47 |
| Data File Name: | 4572-11 | Sample Amount: | 25.0 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 UJ |
| 7 | N-BUTYLBENZENE | 104-51-8 | µg/L | 0.5 | <0.5 | U |
| 8 | SEC-BUTYLBENZENE | 135-98-8 | µg/L | 0.5 | <0.5 | U |
| 9 | TERT-BUTYLBENZENE | 98-06-6 | µg/L | 0.5 | <0.5 | U |
| 10 | 2-BUTANONE | 78-93-3 | µg/L | 10 | <10 | 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 (CUMENE) | 98-82-8 | µg/L | 0.5 | <0.5 | U |

10/18/03

| # | 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 | 0.4 | J |
| 42 | METHYL-T-BUTYL ETHER (MTBE) | 1634-04-4 | µg/L | 1 | <1 | U |
| 43 | 4-METHYL-2-PENTANONE (MIBK) | 108-10-1 | µg/L | 10 | <10 | 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 | 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 | 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 | 112TRICHLORO-122TRIFLUOROETHANE | 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 | 97 |
| 2 | 1,2-DICHLOROETHANE-D4 | 17060-07-0 | 70-129 | 114 |
| 3 | DIBROMOFLUOROMETHANE | 1868-53-7 | 70-122 | 110 |
| 4 | TOLUENE-D8 | 2037-26-5 | 73-129 | 96 |
| # of out-of-control | | | | 0 |

| Internal Standard | | | Control Limit, % | IS Rec.% |
|---|---|---|---|---|
| 1 | CHLOROBENZENE-D5 | 3114-55-4 | 50-200 | 93 |
| 2 | 1,4-DICHLOROBENZENE-D4 | 3855-82-1 | 50-200 | 91 |
| 3 | FLUOROBENZENE | 462-06-6 | 50-200 | 83 |
| # 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

10/18/03

LDC #: 10962C1

# VALIDATION COMPLETENESS WORKSHEET

Date: 10/9/03

SDG #: 03-4572

Level III

Page: 1 of 1

Laboratory: Applied Physics & Chemistry Laboratory

Reviewer:

2nd Reviewer:

**METHOD:** GC/MS Volatiles (EPA ~~SW 846~~ Method ~~8260B~~ 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: 8/11/03 |
| II. | GC/MS Instrument performance check | A | |
| III. | Initial calibration | A | %RSD. $r^2$. no RRFs |
| IV. | Continuing calibration | SW | |
| V. | Blanks | A | |
| VI. | Surrogate spikes | A | |
| VII. | Matrix spike/Matrix spike duplicates | A | |
| 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 | SW | D = 1 + 9 |
| XVII. | Field blanks | SW | TB = 11. 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

*ND

Validated Samples:

MW H2Os

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | DUPE-5-3-Q03 | 11 | TB-7-8-11-03 | 21 | 0343659MB01 | 31 | |
| 2 | EB-7-8-11-03 | 12 | MW-12-4MS | 22 | | 32 | |
| 3 | MW-12-1 | 13 | MW-12-4MSD | 23 | | 33 | |
| 4 | MW-12-2 | 14 | | 24 | | 34 | |
| 5 | MW-12-3 | 15 | | 25 | | 35 | |
| 6 | MW-12-4 | 16 | | 26 | | 36 | |
| 7 | MW-12-5 | 17 | | 27 | | 37 | |
| 8 | MW-22-1 | 18 | | 28 | | 38 | |
| 9 | MW-22-2 | 19 | | 29 | | 39 | |
| 10 | MW-22-3 | 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 choride | 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 #: 10962C1
SDG #: 03-45T2

# VALIDATION FINDINGS WORKSHEET
## Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

**METHOD:** GC/MS VOA (EPA Method 524.2)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were all percent differences (%D) ≤ 30% ?

| # | Date | Standard ID | Compound | Finding %D (Limit: ≤30.0%) | Associated Samples | Qualifications |
|---|---|---|---|---|---|---|
| | 8/11/03 | G3659Q01 | B | 36.22 | All + Blk | J/UJ/P |
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CONCAL1S5

LDC #: 109620C1
SDG #: 03-4572

# VALIDATION FINDINGS WORKSHEET
## Field Duplicates

Page: 1 of 1
Reviewer:
2nd reviewer:

**METHOD:** GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

| Compound | Concentration ( µg/L ) | | RPD |
|---|---|---|---|
| | 1 | 9 | |
| Y | 0.4 | 0.6 | 40 |
| | | | |
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| Compound | Concentration ( ) | | RPD |
|---|---|---|---|
| | | | |
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| Compound | Concentration ( ) | | RPD |
|---|---|---|---|
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LDC #: 10962C1
SDG #: 03-4572

# VALIDATION FINDINGS WORKSHEET
## Field Blanks

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

**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:** 11 Field Blank / Trip Blank / Rinsate (circle one)

| Compound | Concentration Units (ug/L) |
|---|---|
| E | 0.4 |
| | |
| | |
| | |
| | |
| | |

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

| Compound | Concentration Units ( ) |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

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

| Compound | Concentration Units ( ) |
|---|---|
| | |
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