**APCL Project: JPL**

**ATL #: 061277-001A/020A**

001

*Advanced Technology Laboratories*

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

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APCL #: **NA**


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## Case Narrative

**Client:** Applied P & Ch Laboratory
**Attn:** Kenny Chan
**Client's Project:** JPL

**ATL Number:** 061277-001A/020A
**Date Received:** 2/12/02

Advanced Technology Laboratories received 20 water sample(s) for sample analysis. All receiving information is located on the Chain-of-Custody, which has been included in the data package.

Table's 1 describe in detail the individual sample information. Table 2 describes some important information associated with the sample batch.

Table 1: Sample Description

| Lab Sample ID | Client Sample ID | Sample Description | Matrix |
|---|---|---|---|
| 061277-001A | MW-21-5 | NA | Water |
| 061277-002A | MW-21-4 | NA | Water |
| 061277-003A | MW-21-3 | NA | Water |
| 061277-004A | MW-21-2 | NA | Water |
| 061277-005A | MW-21-1 | NA | Water |
| 061277-006A | EB-1-1/29/03 | NA | Water |
| 061277-007A | MW-20-5 | NA | Water |
| 061277-008A | MW-20-4 | NA | Water |
| 061277-009A | MW-20-3 | NA | Water |
| 061277-010A | MW-20-2 | NA | Water |
| 061277-011A | MW-20-1 | NA | Water |
| 061277-012A | EB-2-1/30/03 | NA | Water |
| 061277-013A | Dupe-1-IQ03 | NA | Water |
| 061277-014A | MW-19-5 | NA | Water |
| 061277-015A | MW-19-4 | NA | Water |
| 061277-016A | MW-19-3 | NA | Water |
| 061277-017A | MW-19-2 | NA | Water |
| 061277-018A | MW-19-1 | NA | Water |
| 061277-019A | EB-3-2/3/03 | NA | Water |
| 061277-020A | Dupe-2-IQ03 | NA | Water |

Table 2: Sample Batch Information

| Test Name | Analysis Method | QC Batch Number | Associated Samples | Analysis Date |
|---|---|---|---|---|
| ICP_MS Metals | EPA 200.8 | R25095 | 061277-001A /020A | 02/17/03 |
| | | R25311 | 061277-009A | 2/24/03 |

003



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ATL samples 061277-001A/020A did not require digestion. The Prep Date on the report is the analytical date of the turbidity check.

Table 3: QC Anomalies

| Item | Cause/Reason |
|---|---|
| None | |

The client requested a Level "D" data package requirement. The QC anomalies, which are listed in Table 3, appear to not have any significant impact on the analytical results. See cause and reasons for each anomaly that is listed in the table.

Thank you for the opportunity to service the needs of your company. Please feel free to call me at (562) 989-4045 if I can be of further assistance to your company.

Sincerely,

Eddie F. Rodriguez
Laboratory Director

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## Data Qualifiers

Data Qualifiers are used in conjunction with the results in order to explain certain anomalies which may have occurred during sample analysis. If a result data qualifier is reported, then an explanation of the occurrence and the effects it has on the results must accompany the report.
The following table describes each data qualifier:

| Symbol | Definition |
|---|---|
| B | This flag is used when the analyte is found in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. This flag shall be used for a tentatively identified compound as well as for a positively identified target compounds. |
| D | Duplicate injection precision not met. |
| E | The reported value is estimated because of interference. |
| J | This indicates an estimated value. This flag is used (1) when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL but greater than zero, (3) when the retention time data indicate the presence of a compound that meets the pesticide/Aroclor identification criteria, and the result is less than the CRQL but greater than zero. |
| N | This flag indicated presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N flag is not used. |
| S | Spike sample recovery not within control limits. |
| SA | The reported value was determined by the Method of Standard Additions (MSA). |
| U | This flag indicates the compound was analyzed for but not detected. The CRQL shall be adjusted accordingly. |
| W | Post Digestion Spike for Furnace AA analysis is out of control limits (85% - 115%), while sample absorbance is less than 50% of spike absorbance. |
| X | This flag is used for a pesticide/Aroclor target analyte when there is grater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported and flagged with an X. |
| Y | This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag. |
| P | Samples analyzed by ICP |
| PM | Samples analyzed by ICP_MS |
| CV | Samples analyzed by Manual Cold Vapor AA |
| CA | Samples analyzed by Midi-Distillation Spectrophotometer |
| SP | Samples analyzed by Spectrophotometer |
| TR | Samples analyzed by Infrared (TRPH) |
| AA | Samples analyzed by Flame, Atomic Absorption |
| M | Method Qualifier: Indicates the method by which each analyte is analyzed. |
| Q | Data Qualifier: Indicates any anomalies occurred during the QC sample analysis. |
| C | Concentration Qualifier: Indicates any effect on the reported value. |
| DLR | The DLR takes into account the dilution or concentration of the sample and is numerically defined as the MDL times the dilution or concentration factor. The dilution and concentration factors vary according to aliquot normally taken by the individual laboratory. |
| NC | Not calculated; at or near detection limit. |



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Sample Receiving Items



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

# Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

# Subcontract Chain of Custody

Please Print in pen



Subcontract Lab: Advanced Technology Laboratories Contact: Puri Romualdo Tel #: (562) 989 4045 Fax #: (562) 989-4040

Address: 3275 Walnut Ave City: Signal Hill State: CA Zip code: 90807

APCL Client: APCL Contact: Kenny Chan

Project Name/Code JPL Job #

BILL TO APCL Sub Quotation #

Due Date: ☐regular ☐rush: ___ days ___ hours Sampled by: Leo Williamson

Analysis Items: Cr hex 200.8

White – With report
Yellow – Lab copy
Pink – Originator

| Field Sample ID No. | Sample Description | Date Collected | Time Collected | Sample Matrix | Preservation | # of Containers | Cr hex 200.8 | Remarks |
|---|---|---|---|---|---|---|---|---|
| | MW-21-5 | 1/29/03 | 840 | W | $HNO_3$ | 1 | X | |
| | MW-21-4 | | 915 | | | | | With EDD |
| | MW-21-3 | | 1245 | | | | | and Level 4 |
| | MW-21-2 | | 1320 | | | | | package. |
| | MW-21-1 | | 1400 | | | | | |
| | EB-1-1/29/03 | | 1410 | | | | | |
| | MW-20-5 | 1/30/03 | 825 | | | | | |
| | MW-20-4 | | 925 | | | | | |
| | MW-20-3 | | 1055 | | | 2 | | ← MS/MSD |
| | MW-20-2 | | 1140 | | | 1 | | |
| | MW-20-1 | | 1300 | | | | | |
| | EB-2-1/30/03 | | 1340 | | | | | |
| | Dupe-1-1Q03 | | — | | | | | |
| | MW-19-5 | 2/3/03 | 810 | | | | | |
| | MW-19-4 | | 920 | | | | | |

QC Requirement: ☐Regular; ☐QA/QC Report; ☐WIP; ☐Raw Data; ☐Extended Raw Data ☐CLP; ☐ACE ☐AFCEE ☑NEESA D (E, C or D); ☑Other EDD (Please specify)

Sample Disposal: ☐Return ☐Disposal by APCL ☐Hold for _____ days after receiving date. **If not specified, samples will be discarded 45 days after samples are received.**

Sample Conditions: ☑Intact; ☐Broken. Cooler Seal: ☐Intact; ☐Broken; ☐ None . Tag # _____ Temperature: ☐ Room ☑Cold (_____ °C).

Relinquished by [signature] Date/Time 2/6/03 / 1000A Received by [signature] Date/Time 2/12/03 / 9:10

Relinquished by Date/Time / Received by Date/Time /

**APCL USE ONLY** Service # Note:

Clients understand that all terms described in the proposals, quotations for this project, and/or the general terms provided in the current APCL price schedules will be followed. APCL reserves the right to terminate its service or withhold delivery of any reports, if in APCL's sole discretion the terms of the project have been broken.

# Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

# Subcontract Chain of Custody

Please Print in pen



Subcontract Lab: Advanced Technology Laboratories Contact: Ruv: Romualdo Tel #: (562) 989 4045 Fax #: (562) 989-4040

Address: 3275 Walnut Ave City: Signal Hill State: CA Zip code: 90807

APCL Client: APCL Contact: Kenny Chan

Project Name/Code JPL Job #

BILL TO APCL Sub Quotation #

Due Date: ☑ regular ☐ rush: ___ days ___ hours Sampled by: Leo Williamson

Analysis Items: Cr Hex 218.6

White – With report
Yellow – Lab copy
Pink – Originator

| Field Sample ID No. | Sample Description | Date Collected | Time Collected | Sample Matrix | Preservation | # of Containers | Cr Hex 218.6 | Remarks |
|---|---|---|---|---|---|---|---|---|
| | MW-19-3 | 2/3/03 | 1105 | W | HNO3 | 1 | X | With EDD and Level 4 package. |
| | MW-19-2 | ↓ | 1020 | ↓ | ↓ | ↓ | ↓ | |
| | MW-19-1 | | 1145 | | | | | |
| | EB-3-2/3/03 | | 925 | | | | | |
| | Dupe-2-1Q03 | | — | | | | | |

QC Requirement: ☐ Regular; ☐ QA/QC Report; ☐ WIP; ☐ Raw Data; ☐ Extended Raw Data ☐ CLP; ☐ ACE ☐ AFCEE ☑ NEESA D (E, C or D); ☑ Other EDD (Please specify)

Sample Disposal: ☐ Return ☐ Disposal by APCL ☐ Hold for _____ days after receiving date. **If not specified, samples will be discarded 45 days after samples are received.**

Sample Conditions: ☑ Intact; ☐ Broken. Cooler Seal: ☐ Intact; ☐ Broken; ☐ None. Tag # _____ Temperature: ☐ Room ☑ Cold (_____ °C).

Relinquished by [signature] Date/Time 2/6/03 11:00 AM Received by [signature] Date/Time 2/12/03 / 9:00

Relinquished by Date/Time / Received by Date/Time /

**APCL USE ONLY** Service # Note:

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# Applied P & Ch Laboratory — Subcontract Chain of Custody

13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

Please Print in pen



Subcontract Lab: Advanced Technology Laboratories Contact: Rev. Romualdo Tel #: (562) 989 4045 Fax #: (562) 989-4040

Address: 3275 Walnut Ave City: Signal Hill State: CA Zip code: 90807

APCL Client: APCL Contact: Kenny Chan

Project Name/Code JPL Job #

BILL TO APCL Sub Quotation #

Due Date: ☑ regular ☐ rush: ___ days ___ hours Sampled by: Leo Williamson

Analysis Items: Cr (6) 200.8

White – With report
Yellow – Lab copy
Pink – Originator

| Field Sample ID No. | Sample Description | Date Collected | Time Collected | Sample Matrix | Preservation | # of Containers | Cr (6) 200.8 | Remarks |
|---|---|---|---|---|---|---|---|---|
| -16 | MW-19-3 | 2/3/03 | 1105 | W | HNO3 | 1 | X | With EDD and Level 4 package. |
| -17 | MW-19-2 | ↓ | 1020 | ↓ | ↓ | ↓ | ↓ | |
| -18 | MW-19-1 | ↓ | 1145 | ↓ | ↓ | ↓ | ↓ | |
| -19 | EB-3-2/3/03 | ↓ | 925 | ↓ | ↓ | ↓ | ↓ | |
| -20 | Dupe-2-1Q03 | ↓ | — | ↓ | ↓ | ↓ | ↓ | |

QC Requirement: ☐ Regular; ☐ QA/QC Report; ☐ WIP; ☐ Raw Data; ☐ Extended Raw Data ☐ CLP; ☐ ACE ☐ AFCEE ☑ NEESA D (E, C or D); ☑ Other EDD (Please specify)

Sample Disposal: ☐ Return ☐ Disposal by APCL ☐ Hold for _____ days after receiving date. **If not specified, samples will be discarded 45 days after samples are received.**

Sample Conditions: ☑ Intact; ☐ Broken. Cooler Seal: ☐ Intact; ☐ Broken; ☐ None. Tag # _____ Temperature: ☐ Room ☑ Cold (_____ °C).

Relinquished by [signature] Date/Time 2/6/03 11:00 AM Received by [signature] Date/Time 2/7/03 / 9:00

Relinquished by Date/Time / Received by Date/Time /

**APCL USE ONLY** Service # Note:

Clients understand that all terms described in the proposals, quotations for this project, and/or the general terms provided in the current APCL price schedules will be followed. APCL reserves the right to terminate its service or withhold delivery of any reports, if in APCL's sole discretion the terms of the project have been broken.

# INORGANICS COMPLETE INVENTORY SHEET

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL

Laboratory Name: Advanced Technology Laboratories
Laboratory Address: 3275 Walnut Avenue, Signal Hill, CA 90807

ATL Number: 060054-001A/009A
Date Sampled: 11/04/02
Date Received: 11/22/02

**Method 200.8 (Metals)**

| | Topic | Page(s) |
|---|---|---|
| Sample Data | Inorganic Data Result Sheet | 011-030 |
| Standards Data | Initial Calibration | 031 |
| | Initial Calibration Verification and Continuing Calibration Verification/External Reference Standard | 032-033 |
| | Tune File | 044-047 |
| | Internal Standard Table | 034-035 |
| Raw QC Data | Blank Report Sheet | 036-037 |
| | Spike Sample Recovery | 040-041 |
| | Laboratory Control Spike Report | 038-039 |
| | Duplicate Report Sheet | 042 |
| | Holding Times Summary Sheet | 043 |
| Miscellaneous Items | Preparation Log | 048-049 |
| | Analysis Run Log | 050-051 |
| | Standards Log | 052-061 |
| | List of Method Detection Limits | 062 |
| Raw Data Package | Standards Data<br>Sample Data<br>QC Data | 063-116 |



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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-21-5 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/29/2003 8:40:00 AM |
| **Lab ID:** | 061277-001A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | **EPA 200.8** | | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 5.7 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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



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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-21-4 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/29/2003 9:15:00 AM |
| **Lab ID:** | 061277-002A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 4.7 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-21-3 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/29/2003 12:45:00 PM |
| **Lab ID:** | 061277-003A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A QC Batch: R25095 | | | | | | Analyst: **RQ** |
| Chromium | 5.9 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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S - Spike/Surrogate outside of limits due to matrix interferen
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E - Value above quantitation range
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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-21-2 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/29/2003 1:20:00 PM |
| **Lab ID:** | 061277-004A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 6.7 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
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DO - Surrogate Diluted Out
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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-21-1 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/29/2003 2:00:00 PM |
| **Lab ID:** | 061277-005A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 4.6 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
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DO - Surrogate Diluted Out
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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | EB-1-1/29/03 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/29/2003 2:10:00 PM |
| **Lab ID:** | 061277-006A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A QC Batch: R25095 | | | | | | Analyst: **RQ** |
| Chromium | ND | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-20-5 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/30/2003 8:25:00 AM |
| **Lab ID:** | 061277-007A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 2.7 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out
S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-20-4 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/30/2003 9:25:00 AM |
| **Lab ID:** | 061277-008A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 2.4 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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



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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-20-3 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/30/2003 10:55:00 AM |
| **Lab ID:** | 061277-009A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030224A | QC Batch: R25311 | | | | | Analyst: **RQ** |
| Chromium | 1.7 | 1.0 | | µg/L | 1 | 2/24/2003 |

**Qualifiers:**

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



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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-20-2 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/30/2003 11:40:00 AM |
| **Lab ID:** | 061277-010A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 2.2 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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



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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-20-1 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/30/2003 1:00:00 PM |
| **Lab ID:** | 061277-011A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 2.8 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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



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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | EB-2-1/30/03 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 1/30/2003 1:40:00 PM |
| **Lab ID:** | 061277-012A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A QC Batch: R25095 | | | | | | Analyst: **RQ** |
| Chromium | ND | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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



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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | Dupe-1-IQ03 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | |
| **Lab ID:** | 061277-013A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A QC Batch: R25095 | | | | | | Analyst: **RQ** |
| Chromium | 2.5 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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



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# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-19-5 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 2/3/2003 8:10:00 AM |
| **Lab ID:** | 061277-014A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A QC Batch: R25095 | | | | | | Analyst: **RQ** |
| Chromium | 3.4 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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

024



*Advanced Technology Laboratories*

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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-19-4 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 2/3/2003 9:20:00 AM |
| **Lab ID:** | 061277-015A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 2.3 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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

025



*Advanced Technology Laboratories*

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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-19-3 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 2/3/2003 11:05:00 AM |
| **Lab ID:** | 061277-016A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 5.1 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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



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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-19-2 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 2/3/2003 10:20:00 AM |
| **Lab ID:** | 061277-017A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A QC Batch: R25095 | | | | | | Analyst: **RQ** |
| Chromium | 6.0 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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

027



*Advanced Technology Laboratories*

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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | MW-19-1 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 2/3/2003 11:45:00 AM |
| **Lab ID:** | 061277-018A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A QC Batch: R25095 | | | | | | Analyst: **RQ** |
| Chromium | 2.6 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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

026



*Advanced Technology Laboratories*

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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | EB-3-2/3/03 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | 2/3/2003 9:25:00 AM |
| **Lab ID:** | 061277-019A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A QC Batch: R25095 | | | | | | Analyst: **RQ** |
| Chromium | ND | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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

029



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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

| | | | |
|---|---|---|---|
| **CLIENT:** | Applied P & Ch Laboratories | **Client Sample ID:** | Dupe-2-IQ03 |
| **Lab Order:** | 061277 | | |
| **Project:** | JPL | **Collection Date:** | |
| **Lab ID:** | 061277-020A | **Matrix:** | WATER |

| Analyses | Result | Limit | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **ICP-MS METALS** | | | | | | |
| | | | | **EPA 200.8** | | |
| RunID: ICP4_030217A | QC Batch: R25095 | | | | | Analyst: **RQ** |
| Chromium | 1.9 | 1.0 | | µg/L | 1 | 2/17/2003 |

**Qualifiers:**

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

030



*Advanced Technology Laboratories*

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

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL
ATL Number: 061227
Date Received: 02/12/03

## (EPA 200.8) - INITIAL CALIBRATION

Instrument ID: ICP4
Date(s) Analyzed: 02/17/03

Initial Calibration:

| | INTENSITY | | | | |
|---|---|---|---|---|---|
| COMPOUND | LEVEL 1 | LEVEL 2 | LEVEL 3 | LEVEL 4 | r2 |
| Chromium | 16295 | 48953 | 83438 | 153404 | 0.9999 |
| | | | | | |
| | | | | | |

| Standard Concentra | 0.5 ppb | 5 ppb | 10 ppb | 20 ppb |
|---|---|---|---|---|
| Standard ID: | MST030217P | MST030217O | MST030217N | MST030217M |

Calibration Acceptance Criteria: > 0.995 Correlation



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

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL
ATL Number: 061277
Date Received: 02/12/03

## (EPA 200.8) INITIAL AND CONTINUING CALIBRATION VERFICATION

(EXTERNAL REFERENCE STANDARD)

Instrument ID: ICP4

Date Analyzed: 2/17/03

| | Source: | Standard Code: |
|---|---|---|
| Initial Calibration Verification: | CPI | MST030217R |
| Continuing Calibration Verification: | CPI | MST030217R |

Concentration Units: ug/L

| Analyte | Initial Calibration True | Initial Calibration Found | Initial Calibration %R(1) | Continuing Calibration True | Continuing Calibration Found CCV1 | Continuing Calibration %R(1) | Continuing Calibration Found CCV2 | Continuing Calibration %R(1) | M |
|---|---|---|---|---|---|---|---|---|---|
| Chromium | 10.0 | 10.2 | 102 | 10.0 | 10.4 | 104 | 10.2 | 102 | PM |
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ICV Limits: 90 -110%
CCV Limits: 85 -115%

032

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

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL
ATL Number: 061277
Date Received: 02/12/03

## (EPA 200.8) INITIAL AND CONTINUING CALIBRATION VERFICATION

(EXTERNAL REFERENCE STANDARD)

Instrument ID: ICP4

Date Analyzed: 2/17/03

| | Source: | Standard Code: |
|---|---|---|
| Initial Calibration Verification: | CPI | MST030217R |
| Continuing Calibration Verification: | CPI | MST030217R |

Concentration Units: ug/L

| Analyte | Initial Calibration True | Initial Calibration Found | Initial Calibration %R(1) | Continuing Calibration True | Continuing Calibration Found CCV1 | Continuing Calibration %R(1) | Continuing Calibration Found CCV2 | Continuing Calibration %R(1) | M |
|---|---|---|---|---|---|---|---|---|---|
| Chromium | 10.0 | 10.5 | 105 | 10.0 | 10.3 | 103 | | 0 | PM |
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ICV Limits: 90 -110%
CCV Limits: 85 -115%

033

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

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL
ATL Number: 061227
Date Received: 02/12/03

Instrument ID: ICP4 Internal Standard ID: MST030124A

Date Analyzed: 2/17/03 Standard Concentration: 50 ug/L

QC Batch: R25095

| | | | Scandium | | Terbium | |
|---|---|---|---|---|---|---|
| | | | Area | % Rec | Area | % Rec |
| Calibration Blank | | | 778618 | --- | 1490917 | --- |
| Lab ID | Sample Description | APCL Lab ID: | | | | |
| 061277-001A | MW-21-5 | -- | 840547 | 108 | 1366725 | 92 |
| 061277-002A | MW-21-4 | -- | 850257 | 109 | 1404873 | 94 |
| 061277-003A | MW-21-3 | -- | 888735 | 114 | 1443748 | 97 |
| 061277-004A | MW-21-2 | -- | 915761 | 118 | 1479776 | 99 |
| 061277-005A | MW-21-1 | -- | 926752 | 119 | 1504078 | 101 |
| 061277-006A | EB-1-1/29/03 | -- | 777865 | 100 | 1459779 | 98 |
| 061277-007A | MW-20-5 | -- | 812369 | 104 | 1406207 | 94 |
| 061277-008A | MW-20-4 | -- | 817629 | 105 | 1438054 | 96 |
| 061277-009A | MW-20-3 | -- | 766857 | 98 | 1323917 | 89 |
| 061277-009AMS | MW-20-3 | -- | 802669 | 103 | 1373116 | 92 |
| 061277-009AMSD | MW-20-3 | -- | 781405 | 100 | 1346971 | 90 |
| 061277-010A | MW-20-2 | -- | 810140 | 104 | 1377137 | 92 |
| 061277-011A | MW-20-1 | -- | 762875 | 98 | 1309439 | 88 |
| 061277-012A | EB-2-1/30/03 | -- | 659831 | 85 | 1225342 | 82 |
| 061277-013A | Dupe-1-IQ03 | -- | 777402 | 100 | 1320037 | 89 |
| 061277-014A | MW-19-5 | -- | 793523 | 102 | 1409641 | 95 |
| 061277-015A | MW-19-4 | -- | 826408 | 106 | 1423417 | 95 |
| 061277-016A | MW-19-3 | -- | 856526 | 110 | 1407998 | 94 |
| 061277-017A | MW-19-2 | -- | 849509 | 109 | 1363827 | 91 |
| 061277-018A | MW-19-1 | -- | 753609 | 97 | 1246767 | 84 |
| 061277-019A | EB-3-2/3/03 | -- | 704268 | 90 | 1236641 | 83 |
| 061277-020A | Dupe-2-IQ03 | -- | 731697 | 94 | 1245662 | 84 |
| MB-R25095 | --- | -- | 777011 | 100 | 1472259 | 99 |
| LCS-R25095 | --- | -- | 777223 | 100 | 1451939 | 97 |

* Outside Acceptance Criteria

Acceptance Criteria: 60 - 125%



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

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL
ATL Number: 061227
Date Received: 02/12/03

Instrument ID: ICP4 Internal Standard ID: MST030124A

Date Analyzed: 2/24/03 Standard Concentration: 50 ug/L

QC Batch: R25311

| | | | Scandium | | Terbium | |
|---|---|---|---|---|---|---|
| | | | Area | % Rec | Area | % Rec |
| Calibration Blank | | | 638869 | --- | 1278347 | --- |
| Lab ID | Sample Description | APCL Lab ID: | | | | |
| 061277-009A | MW-20-3 | -- | 657563 | 103 | 1269659 | 99 |
| 061277-009ADUP | MW-20-3 | -- | 665170 | 104 | 1287153 | 101 |
| 061277-009AMS | MW-20-3 | -- | 665308 | 104 | 1270929 | 99 |
| 061277-009AMSD | MW-20-3 | -- | 654961 | 103 | 1253020 | 98 |
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| MB-R25311 | --- | -- | 642816 | 101 | 1291049 | 101 |
| LCS-R25311 | --- | -- | 635542 | 99 | 1284579 | 100 |

* Outside Acceptance Criteria

Acceptance Criteria: 60 - 125%



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

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL

ATL Number: 061227
Date Received: 02/12/03

# (EPA 200.8) METHOD BLANKS *

Instrument ID: ICP 4
Date Digested: N/A
Digestion Method: N/A

Dilution Factor: 1
Matrix: Water
Date Analyzed: 2/17/03

QC Batch Number: R23003

| Analyte | DLR | Initial Calib. Blank (ug/L) | C | Continuing Calibration Blank (ug/L) 1 | C | 2 | C | 3 | C | Prepa-ration Blank | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 5 | 0.131 | | 0.220 | | 0.315 | | | | 0.213 | | PM |
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036

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

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL

ATL Number: 061227
Date Received: 02/12/03

# (EPA 200.8) METHOD BLANKS *

Instrument ID: ICP 4
Date Digested: N/A
Digestion Method: N/A

Dilution Factor: 1
Matrix: Water
Date Analyzed: 2/24/03

QC Batch Number: R25311

| Analyte | DLR | Initial Calib. Blank (ug/L) | C | Continuing Calibration Blank (ug/L) 1 | C | 2 | C | 3 | C | Prepa-ration Blank | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 5 | 0.376 | | 0.209 | | | | | | 0.381 | | PM |

037

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

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL

ATL Number: 061227
Date Received: 02/12/03

# (EPA 200.8) LABORATORY CONTROL SAMPLE

Lab Sample ID: LCS-R25095

Concentration Units: ug/L
Dilution Factor: 1

Date Digested: N/A
Digestion Method: N/A

Matrix: Water
Date Analyzed: 2/17/03
Instrument ID: ICP4

QC Batch Number: R25095

LCS Standard Code: MST030217Q

| Analyte | Aqueous (ug/L) Ref Value | True | Found | %R | Solid (ug/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 0 | 10 | 10.3 | 103 | | | | 85-115 | | |
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* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

038

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

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL

ATL Number: 061227
Date Received: 02/12/03

# (EPA 200.8) LABORATORY CONTROL SAMPLE

Lab Sample ID: LCS-R25311

Concentration Units: ug/L
Dilution Factor: 1

Date Digested: N/A
Digestion Method: N/A

Matrix: Water
Date Analyzed: 2/24/03
Instrument ID: ICP4

QC Batch Number: R25311

LCS Standard Code: MST030217Q

| Analyte | Aqueous (ug/L) Ref Value | True | Found | %R | Solid (ug/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 0 | 10 | 10.6 | 106 | | | | 85-115 | | |
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* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits



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

# Quantitative Analysis Summary

Sample Date/Time: Monday, February 17, 2003 16:38:28
Dataset File: D:\ELAN\Dataset\2003\February\030217\CCB.039
Method File: c:\elandata\Method\1-200.8crapcl-low.mth
Optimization File: c:\elandata\Optimize\default.dac
Number of Replicates: 3
**Sample ID: CCB**
**Sample Type:**

## Summary

| | Analyte | Mass | Blank Intensity | Meas. Intensity | Int. RSD | Conc. Mean | Conc. SD | | Conc. RSD |
|---|---|---|---|---|---|---|---|---|---|
| | **Li** | 7 | 120146 | 106617 | 1.2 | | | ug/L | % |
| | **Ge** | 72 | 186629 | 164941 | 0.7 | | | ug/L | % |
| > | **Sc-1** | 45 | 778618 | 732851 | 0.2 | | | ug/L | % |
| | **Cr** | 52 | 11529 | 14056 | 1.2 | **0.315** | 0.019 | ug/L | 6.1 % |
| | **In** | 115 | 1490917 | 1372731 | 0.3 | | | ug/L | % |
| | **Tb** | 159 | 1827927 | 1717869 | 1.3 | | | ug/L | % |
| | **Sc** | 45 | 778618 | 732851 | 0.2 | | | ug/L | % |

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

# Advanced Technology Laboratories

**Date:** *25-Feb-03*

**CLIENT:** Applied P & Ch Laboratories
**Work Order:** 061277
**Project:** JPL

## ANALYTICAL QC SUMMARY REPORT

**BatchID:** **R25095**

Sample ID: **MB-R25095** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030217A**
Client ID: **ZZZZZ** Batch ID: **R25095** TestNo: **EPA 200.8** Analysis Date: **2/17/2003** SeqNo: **380770**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 0.213 | 1.0 | | | | | | | | | J |

Sample ID: **LCS-R25095** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030217A**
Client ID: **ZZZZZ** Batch ID: **R25095** TestNo: **EPA 200.8** Analysis Date: **2/17/2003** SeqNo: **380769**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 10.28 | 1.0 | 10 | 0 | 103 | 85 | 115 | 0 | 0 | | |

Sample ID: **061277-009AMS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030217A**
Client ID: **MW-20-3** Batch ID: **R25095** TestNo: **EPA 200.8** Analysis Date: **2/17/2003** SeqNo: **380853**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 10.88 | 1.0 | 10 | 2.294 | 85.9 | 80 | 120 | 0 | 0 | | |

Sample ID: **061277-009AMSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030217A**
Client ID: **MW-20-3** Batch ID: **R25095** TestNo: **EPA 200.8** Analysis Date: **2/17/2003** SeqNo: **380854**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 11.08 | 1.0 | 10 | 2.294 | 87.9 | 80 | 120 | 10.88 | 1.81 | 20 | |

Sample ID: **061277-020ADUP** SampType: **DUP** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030217A**
Client ID: **Dupe-2-IQ03** Batch ID: **R25095** TestNo: **EPA 200.8** Analysis Date: **2/17/2003** SeqNo: **380866**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 1.501 | 1.0 | 0 | 0 | 0 | 0 | 0 | 1.851 | 20.9 | 30 | |

**Qualifiers:**
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
S - Spike/Surrogate outside limits due to matrix interference
B - Analyte detected in the associated Method Blank
**Calculations are based on raw values**
DO - Surrogate diluted out
H - Sample exceeded holding time

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

**CLIENT:** Applied P & Ch Laboratories
**Work Order:** 061277
**Project:** JPL

# ANALYTICAL QC SUMMARY REPORT

**BatchID: R25311**

041

Sample ID: **MB-R25311** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030224A**
Client ID: **ZZZZZ** Batch ID: **R25311** TestNo: **EPA 200.8** Analysis Date: **2/24/2003** SeqNo: **383710**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 0.381 | 1.0 | | | | | | | | | J |

Sample ID: **LCS-R25311** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030224A**
Client ID: **ZZZZZ** Batch ID: **R25311** TestNo: **EPA 200.8** Analysis Date: **2/24/2003** SeqNo: **383709**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 10.6 | 1.0 | 10 | 0 | 106 | 85 | 115 | 0 | 0 | | |

Sample ID: **061277-009AMS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030224A**
Client ID: **MW-20-3** Batch ID: **R25311** TestNo: **EPA 200.8** Analysis Date: **2/24/2003** SeqNo: **383713**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 11 | 1.0 | 10 | 1.673 | 93.2 | 80 | 120 | 0 | 0 | | |

Sample ID: **061277-009AMSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030224A**
Client ID: **MW-20-3** Batch ID: **R25311** TestNo: **EPA 200.8** Analysis Date: **2/24/2003** SeqNo: **383714**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 11.04 | 1.0 | 10 | 1.673 | 93.7 | 80 | 120 | 11 | 0.417 | 20 | |

Sample ID: **061277-009ADUP** SampType: **DUP** TestCode: **200.8_W** Units: **µg/L** Prep Date: Run ID: **ICP4_030224A**
Client ID: **MW-20-3** Batch ID: **R25311** TestNo: **EPA 200.8** Analysis Date: **2/24/2003** SeqNo: **383712**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 1.72 | 1.0 | 0 | 0 | 0 | 0 | 0 | 1.673 | 2.77 | 30 | |

**Qualifiers:**
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
S - Spike/Surrogate outside limits due to matrix interference
B - Analyte detected in the associated Method Blank
DO - Surrogate diluted out
H - Sample exceeded holding time

**Calculations are based on raw values**

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL

ATL Number: 061227
Date Received: 02/12/03

## (EPA 200.8) SAMPLE DUPLICATE

Lab Sample ID: 061227-009A
APCL Lab ID: –
Sample Description: MW-20-3

Date Sampled: 1/30/03
Date Digested: N/A
Digestion Method: N/A

Concentration Units: ug/l
Dilution Factor: 1

Matrix: Water
Date Analyzed: 2/24/03
Instrument ID: ICP 4

QC Batch Number: R23111

| Analyte | DLR | Sample (S) | C | Duplicate (D) | C | RPD | Q | M |
|---|---|---|---|---|---|---|---|---|
| Chromium | 5 | 1.67 | | 1.72 | | 3 | | |
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Acceptance Criteria: +/- 30%

042

Client: Applied P & Ch Laboratory
Attn: Kenny Chan
Client's Project: JPL
ATL Number: 061227
Date Received: 02/12/03

## HOLDING TIME SUMMARY _ EPA 200.8

| | Lab Sample ID | Client Sample ID | Sample Description | Date Sampled | Date Digested | Contract Holding Time |
|---|---|---|---|---|---|---|
| 1 | 061277-001A | MW-21-5 | -- | 1/29/03 | N/A | 6 Months |
| 2 | 061277-002A | MW-21-4 | -- | 1/29/03 | N/A | 6 Months |
| 3 | 061277-003A | MW-21-3 | -- | 1/29/03 | N/A | 6 Months |
| 4 | 061277-004A | MW-21-2 | -- | 1/29/03 | N/A | 6 Months |
| 5 | 061277-005A | MW-21-1 | -- | 1/29/03 | N/A | 6 Months |
| 6 | 061277-006A | EB-1-1/29/03 | -- | 1/29/03 | N/A | 6 Months |
| 7 | 061277-007A | MW-20-5 | -- | 1/30/03 | N/A | 6 Months |
| 8 | 061277-008A | MW-20-4 | -- | 1/30/03 | N/A | 6 Months |
| 9 | 061277-009A | MW-20-3 | -- | 1/30/03 | N/A | 6 Months |
| 10 | 061277-010A | MW-20-2 | -- | 1/30/03 | N/A | 6 Months |
| 11 | 061277-011A | MW-20-1 | -- | 1/30/03 | N/A | 6 Months |
| 12 | 061277-012A | EB-2-1/30/03 | -- | 1/30/03 | N/A | 6 Months |
| 13 | 061277-013A | Dupe-1-IQ03 | -- | | N/A | 6 Months |
| 14 | 061277-014A | MW-19-5 | -- | 2/3/03 | N/A | 6 Months |
| 15 | 061277-015A | MW-19-4 | -- | 2/3/03 | N/A | 6 Months |
| 16 | 061277-016A | MW-19-3 | -- | 2/3/03 | N/A | 6 Months |
| 17 | 061277-017A | MW-19-2 | -- | 2/3/03 | N/A | 6 Months |
| 18 | 061277-018A | MW-19-1 | -- | 2/3/03 | N/A | 6 Months |
| 19 | 061277-019A | EB-3-2/3/03 | -- | 2/3/03 | N/A | 6 Months |
| 20 | 061277-020A | Dupe-2-IQ03 | -- | | | |
| 21 | | | | | | |

____0____ of _20___ sample(s) were outside of holding time.



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

# Instrument Tuning Report

File Name: default.tun
File Path: C:\elandata\Tuning

| Analyte | Exact Mass | Meas. Mass | Mass DAC | Res. DAC | Meas. Pk. Width | Custom Res. |
|---|---|---|---|---|---|---|
| Be | 9.012 | 9.027 | 2065 | 2040 | 0.737 | |
| Mg | 23.985 | 24.028 | 5714 | 2020 | 0.712 | |
| Rh | 102.905 | 102.878 | 24978 | 1955 | 0.741 | |
| Ce | 139.905 | 139.929 | 33977 | 2010 | 0.761 | |
| Pb | 207.977 | 207.929 | 50405 | 2270 | 0.735 | |
| U | 238.050 | 238.025 | 57644 | 2435 | 0.759 | |

044

# Daily Performance Report

**Sample ID: 030217-daily**
Sample Date/Time: Monday, February 17, 2003 14:45:01
Sample Description:
Method File: c:\elandata\Method\Daily.mth
Dataset File: c:\elandata\Dataset\daily performance\030217-daily.012
Tuning File: c:\elandata\Tuning\default.tun
Optimization File: c:\elandata\Optimize\default.dac
Dual Detector Mode: Pulse

Acq. Dead Time(ns): 35
Current Dead Time (ns): 35

## Summary

| | Analyte | Mass | Meas. Intens. Mean | Net Intens. Mean | Net Intens. SD | Net Intens. RSD |
|---|---|---|---|---|---|---|
| | Mg | 24.0 | 50119.0 | 50119.031 | 178.991 | 0.4 |
| | Rh | 102.9 | 197230.8 | 197230.761 | 1507.521 | 0.8 |
| | In | 114.9 | 248760.3 | 248760.295 | 1532.906 | 0.6 |
| | Pb | 208.0 | 125325.5 | 125325.455 | 1511.161 | 1.2 |
| ⌈> | Ba | 137.9 | 229820.9 | 229820.946 | 1674.185 | 0.7 |
| ⌊ | Ba++ | 69.0 | 5056.4 | 0.022 | 0.000 | 1.2 |
| ⌈> | Ce | 139.9 | 272524.6 | 272524.590 | 2032.318 | 0.7 |
| ⌊ | CeO | 155.9 | 7370.0 | 0.027 | 0.000 | 1.0 |
| | Bkgd | 220.0 | 6.0 | 6.033 | 0.767 | 12.7 |

## Current Optimization File Data

| Current Value | Description |
|---|---|
| 0.86 | Nebulizer Gas Flow |
| 7.00 | Lens Voltage |
| 1100.00 | ICP RF Power |
| -1850.00 | Analog Stage Voltage |
| 1425.00 | Pulse Stage Voltage |
| 85.00 | Discriminator Threshold |
| -1.50 | AC Rod Offset |
| 60.00 | Service DAC 1 |
| 0.00 | Quadrupole Rod Offset |

## Current Autolens Data

| Analyte | Mass | Num of Pts | DAC Value | Maximum Intensity |
|---|---|---|---|---|
| Be | 9 | 9 | 5.0 | 5653.5 |
| Co | 59 | 9 | 5.5 | 85143.3 |
| In | 115 | 9 | 6.0 | 233166.4 |

# Instrument Tuning Report

File Name: 030224.tun
File Path: D:\ELAN\TUNING\2003\February

| Analyte | Exact Mass | Meas. Mass | Mass DAC | Res. DAC | Meas. Pk. Width | Custom Res. |
|---|---|---|---|---|---|---|
| Be | 9.012 | 8.976 | 2060 | 2040 | 0.739 | |
| Mg | 23.985 | 24.029 | 5700 | 2020 | 0.721 | |
| Rh | 102.905 | 102.929 | 24965 | 1955 | 0.764 | |
| Ce | 139.905 | 139.929 | 33976 | 2010 | 0.776 | |
| Pb | 207.977 | 207.979 | 50417 | 2270 | 0.756 | |
| U | 238.050 | 238.073 | 57648 | 2435 | 0.775 | |

046

# Daily Performance Report

**Sample ID: 030224-daily**
Sample Date/Time: Monday, February 24, 2003 12:06:42
Sample Description:
Method File: c:\elandata\Method\Daily.mth
Dataset File:
Tuning File: c:\elandata\Tuning\default.tun
Optimization File: c:\elandata\Optimize\default.dac
Dual Detector Mode: Pulse

Acq. Dead Time(ns): 35
Current Dead Time (ns): 35

## Summary

| | Analyte | Mass | Meas. Intens. Mean | Net Intens. Mean | Net Intens. SD | Net Intens. RSD |
|---|---|---|---|---|---|---|
| | Mg | 24.0 | 52177.3 | 52177.319 | 463.449 | 0.9 |
| | Rh | 102.9 | 253849.9 | 253849.866 | 2240.896 | 0.9 |
| | In | 114.9 | 294106.2 | 294106.228 | 2435.064 | 0.8 |
| | Pb | 208.0 | 114934.9 | 114934.923 | 937.028 | 0.8 |
| ⌈> | Ba | 137.9 | 221500.7 | 221500.707 | 937.382 | 0.4 |
| ⌊ | Ba++ | 69.0 | 5898.8 | 0.027 | 0.000 | 0.9 |
| ⌈> | Ce | 139.9 | 275411.7 | 275411.713 | 2100.259 | 0.8 |
| ⌊ | CeO | 155.9 | 5699.1 | 0.021 | 0.000 | 1.4 |
| | Bkgd | 220.0 | 6.4 | 6.400 | 0.450 | 7.0 |

### Current Optimization File Data

| Current Value | Description |
|---|---|
| 0.82 | Nebulizer Gas Flow |
| 7.00 | Lens Voltage |
| 1100.00 | ICP RF Power |
| -1850.00 | Analog Stage Voltage |
| 1425.00 | Pulse Stage Voltage |
| 85.00 | Discriminator Threshold |
| -1.50 | AC Rod Offset |
| 60.00 | Service DAC 1 |
| 0.00 | Quadrupole Rod Offset |

### Current Autolens Data

| Analyte | Mass | Num of Pts | DAC Value | Maximum Intensity |
|---|---|---|---|---|
| Be | 9 | 9 | 6.5 | 5258.0 |
| Co | 59 | 9 | 7.5 | 125591.6 |
| In | 115 | 9 | 8.5 | 301783.2 |

## ICP-MS : Turbidity Check and Sample Preparation Log

**QC Number:** R25095 **Date Read / Digested:** 2/17/03

| Method (Circle one): | Turb. Calibration | Matrix (Circle one): | | Acid Lot # |
|---|---|---|---|---|
| 1) 200.8 | 10 ~~100~~ NTU: 10 NTU | 1) Drinking Water | 4) Soil | Hydrochloric n/a |
| 2) 3010A | Std Code: SCR-0022 | 2) Ground Water | 5) Solid | Nitric n/a |
| 3) 3050B | Initials: RQ | 3) Liquid | 6) Other WATER | |
| 4) 3051 | | | | |

| Sample ID | Turbidity Result * | Sample Wt./Vol. | Spike / LCS Amt. Added | Spike / LCS Conc. (ppm) | Spike Code | Final Vol (ml) | Initials | Comments |
|---|---|---|---|---|---|---|---|---|
| MS 061277-009A | 0.25 | 10 | 0.1 mL | 10 ppb | MST030217L | 10 mL | RQ | |
| MSD 061277-009A | 0.25 | ↓ | 0.1 mL | ↓ | ↓ | ↓ | ↓ | |
| Method Blank | – | ↓ | – | – | – | ↓ | ↓ | |
| LCS | – | ↓ | 0.1 mL | 10 ppb | MST030217Q | ↓ | ↓ | |
| Blank MS | | | | | | | | |
| Blank MSD | | | | | | | | |
| 1 061277-001A | 0.58 | 10 | | | | 10 | RQ | |
| 2 002A | 0.68 | ↓ | | | | ↓ | ↓ | |
| 3 003A | 0.69 | ↓ | | | | ↓ | ↓ | |
| 4 004A | 0.40 | ↓ | | | | ↓ | ↓ | |
| 5 005A | 0.18 | ↓ | | | | ↓ | ↓ | |
| 6 006A | 0.19 | ↓ | | | | ↓ | ↓ | |
| 7 007A | 0.59 | ↓ | | | | ↓ | ↓ | |
| 8 008A | 0.19 | ↓ | | | | ↓ | ↓ | |
| 9 009A | 0.25 | ↓ | | | | ↓ | ↓ | |
| 10 010A | 0.23 | ↓ | | | | ↓ | ↓ | |
| 11 011A | 0.20 | ↓ | | | | ↓ | ↓ | |
| 12 012A | 0.16 | ↓ | | | | ↓ | ↓ | |
| 13 013A | 0.16 | ↓ | | | | ↓ | ↓ | |
| 14 014A | 0.22 | ↓ | | | | ↓ | ↓ | |
| 15 015A | 0.19 | ↓ | | | | ↓ | ↓ | |
| 16 016A | 0.34 | ↓ | | | | ↓ | ↓ | |
| 17 017A | 0.15 | ↓ | | | | ↓ | ↓ | |
| 18 018A | 0.42 | ↓ | | | | ↓ | ↓ | |
| 19 019A | 0.29 | ↓ | | | | ↓ | ↓ | |
| 20 020A | 0.12 | ↓ | | | | ↓ | ↓ | |
| DUP 061277-009A/020A | 0.27/0.12 | 10 | | | | 10 | RQ | |

* Turbidity <1 NTU **DOES NOT** need sample preparation.

Relinquished by / Date: _____

Received by / Date: _____

# ICP-MS : Turbidity Check and Sample Preparation Log

**QC Number:** R25311

**Date Read / Digested:** 2/24/03

| Method (Circle one): | Turb. Calibration | Matrix (Circle one): | | Acid Lot # |
|---|---|---|---|---|
| (1) 200.8 | ~~100~~ NTU: 10 NTU | 1) Drinking Water | 4) Soil | Hydrochloric na |
| 2) 3010A | Std Code: SCR-0022 | 2) Ground Water | 5) Solid | Nitric na |
| 3) 3050B | Initials: RQ | 3) Liquid | (6) Other Water | |
| 4) 3051 | | | | |

| | Sample ID | Turbidity Result * | Sample Wt./Vol. | Spike / LCS Amt. Added | Spike / LCS Conc. (ppm) | Spike Code | Final Vol (ml) | Initials | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | MSD061277-009A | 0.25 | 10 | 0.1 mL | 10 ppb | MSTD30224A | 10 mL | RQ | |
| | MSD 061277-009A | 0.25 | ↓ | 0.1 mL | ↓ | ↓ | ↓ | ↓ | |
| | Method Blank | – | ↓ | – | – | – | ↓ | ↓ | |
| | LCS | – | ↓ | 0.1 mL | 10 ppb | MSTD30224G | ↓ | ↓ | |
| | Blank MS | | | | | | | | |
| | Blank MSD | | | | | | | | |
| 1 | 061277-009A | 0.25 | 10 | | | | 10 | RQ | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
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| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| DUP | 061277-009A | 0.27 | 10 | | | | 10 | RQ | |

* Turbidity <1 NTU **DOES NOT** need sample preparation.

Relinquished by / Date: _____

Received by / Date: _____

# Sample/Batch Report

User Name: Rowena
Computer Name: ICPMS PE 6100
Sample File: D:\ELAN\Sample\2003\February\030217.sam
Report Date/Time: Monday, February 17, 2003 14:54:10

| A/S Loc. | Batch ID | Sample ID | Description | Sample Type | Init. Quant. | Prep. Vol. | Aliquot Vol. | Diluted Vol. | Solids Ratio |
|---|---|---|---|---|---|---|---|---|---|
| 7 | | ICV | | | | | | | |
| 1 | | ICB | | | | | | | |
| 9 | | MB- | R250995 | RQ 2/18/03 | | | | | |
| 10 | | LCS- | | | | | | | |
| 11 | | 061277-001A | | | | | | | |
| 12 | | 061277-002A | | | | | | | |
| 13 | | 061277-003A | | | | | | | |
| 14 | | 061277-004A | | | | | | | |
| 15 | | 061277-005A | | | | | | | |
| 16 | | 061277-006A | | | | | | | |
| 17 | | 061277-007A | | | | | | | |
| 18 | | 061277-008A | | | | | | | |
| 7 | | CCV | | | | | | | |
| 8 | | CCB | | | | | | | |
| 19 | | 061277-009A | | | | | | | |
| 20 | | 061277-010A | | | | | | | |
| 21 | | 061277-009ADUP | | | | | | | |
| 22 | | 061277-009AMS | | | | | | | |
| 23 | | 061277-009AMSD | | | | | | | |
| 24 | | 061277-011A | | | | | | | |
| 25 | | 061277-012A | | | | | | | |
| 26 | | 061277-013A | | | | | | | |
| 27 | | 061277-014A | | | | | | | |
| 28 | | 061277-015A | | | | | | | |
| 7 | | CCV | | | | | | | |
| 8 | | CCB | | | | | | | |
| 29 | | 061277-016A | | | | | | | |
| 30 | | 061277-017A | | | | | | | |
| 31 | | 061277-018A | | | | | | | |
| 32 | | 061277-019A | | | | | | | |
| 33 | | 061277-020A | | | | | | | |
| 34 | | 061277-020ADUP | | | | | | | |
| 7 | | CCV | | | | | | | |
| 8 | | CCB | | | | | | | |

CAL: MST030217M /20
N/10
O/5
P/0.5

ICV/CCV: MST030217R

LCS: MST030217Q

MS/MSD: MST030217L

050

# Sample/Batch Report

User Name: Rowena
Computer Name: ICPMS PE 6100
Sample File: D:\ELAN\Sample\2003\February\030224.sam
Report Date/Time: Monday, February 24, 2003 13:27:43

| A/S Loc. | Batch ID | Sample ID | Description | Sample Type | Init. Quant. | Prep. Vol. | Aliquot Vol. | Diluted Vol. | Solids Ratio |
|---|---|---|---|---|---|---|---|---|---|
| 7 | | ICV | | | | | | | |
| 1 | | ICB | | | | | | | |
| 9 | | MB- | | | | | | | |
| 10 | | LCS- | | | | | | | |
| 11 | | 061277-009A | | | | | | | |
| 12 | | 061277-009ADUP | | | | | | | |
| 13 | | 061277-009AMS | | | | | | | |
| 14 | | 061277-009AMSD | | | | | | | |
| 7 | | CCV | | | | | | | |
| 8 | | CCB | | | | | | | |

R25311 RA 2/24/03

ICPMS - 20 ppb - MSTD030224B
10 ppb - MSTD030224C
5 ppb - MSTD030224D
0.5 ppb - MSTD030224E
ICPMS - ICV/CCV 10 ppb - MSTD030224G

051

# Metals Working Standard Prep Log

| Date | Standard Name | Working Std Code | Stock Info: Stock Std Code | Preparation: Stock Concentration | Preparation: Amount Taken from Stock |
|---|---|---|---|---|---|
| 1-24-03 | ICPMS - Internal Std | MST030124A | MST020208C Ge | 1000 ppm | 1 ml |
| | | | MST020208E Tb | | 1 ml |
| | | | MST020208D Sc | | 1 ml |
| | | | MST020208F In | | 1 ml |
| | | | MST020208H Tm | | 1 ml |
| 2-4-03 | ICPMS - STD1 | MST030204A | MST021216D<br>MST021216B | 10 ppm<br>1000 ppm | 5<br>0.05 |
| | - 20 | B | MST030204A | 1 ppm | ~~75~~ 1 ml |
| | - 10 | C | B | 20 ppb | 25 |
| | - 5 | D | C | 10 ppb | 10 |
| | - 0.5 | E | D | 5 ppb | 2 |
| | ICPMS - LCS1 | F | MST030203W0F<br>MST030203W0G | 10 ppm<br>1000 ppm | 5<br>0.05 |
| | - ICV/CCV @ 10 | G | MST030204F | 1 ppm | 0.5 |
| | ICPMS - 200 | H | MST030204A | 1 ppm | 10 |
| | - 100 | I | MST030204H | 200 ppb | 25 |
| | - 50 | J | I | 100 ppb | 10 |
| | - ICV/CCV @ 100 | K | MST030204F | 1 ppm | 5 |
| 2-10-03 | ICPMS - STD1 | MST030210A | MST021216D<br>MST021216B | 10 ppm<br>1000 ppm | 5<br>0.05 |
| | - 20 | B | MST030210A | 1 ppm | 1 |
| | - 10 | C | B | 20 ppb | 25 |
| | - 5 | D | C | 10 ppb | 10 |

NS 2/4/03

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# Metals Working Standard Prep Log

| | Preparation | | | Expiration Dates | | | |
|---|---|---|---|---|---|---|---|
| | | | | Exp Date | | | |
| | Final Vol. (ml) | Final Conc. (ug/ml) | Diluent Matrix (ie $H_2O$) | Working STD * | Manufacturer | Comments | Initials |
| 1 | 100 ml | 10 ppm | DI $H_2O$ + 2% $HNO_3$ | 4-24-03 | High Purity | | NS |
| | ↓ | ↓ | ↓ | ↓ | ↓ | | ↓ |
| | ↓ | ↓ | ↓ | ↓ | ↓ | | ↓ |
| | ↓ | ↓ | ↓ | ↓ | ↓ | | ↓ |
| | ↓ | ↓ | ↓ | ↓ | ↓ | | ↓ |
| 5 | 50 | 1 ppm | DI $H_2O$ + 2% $HNO_3$ | 5-4-03 | Leeman | | WS |
| | 50 | 20 ppb | ↓ | ↓ | ↓ | | ↓ |
| | 50 | 10 ppb | ↓ | ↓ | ↓ | | ↓ |
| | 20 | 5 ppb | ↓ | ↓ | ↓ | | ↓ |
| 10 | 20 | 0.5 ppb | ↓ | ↓ | ↓ | | ↓ |
| | 50 | 1 ppm | ↓ | ↓ | Leeman | | ↓ |
| | 50 | 10 ppb | ↓ | ↓ | ↓ | | ↓ |
| | 50 | 200 ppb | ↓ | ↓ | Leeman | Zn, Fe | ↓ |
| | 50 | 100 ppb | ↓ | ↓ | ↓ | | ↓ |
| 15 | 20 | 10 ppb | ↓ | ↓ | ↓ | | ↓ |
| | 50 | 100 ppb | ↓ | ↓ | ↓ | | ↓ |
| | 50 | 1 ppm | DI $H_2O$ + 2% $HNO_3$ | 5-10-03 | Leeman | | NS |
| | 50 | 20 ppb | ↓ | ↓ | ↓ | | ↓ |
| | 50 | 10 ppb | ↓ | ↓ | ↓ | | ↓ |
| 20 | 20 | 5 ppb | ↓ | ↓ | ↓ | | ↓ |

* Check working std versus all manufacturer's



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# Metals Working Standard Prep Log

| Date | Standard Name | Working Std Code | Stock Info: Stock Std Code | Preparation: Stock Concentration | Preparation: Amount Taken from Stock |
|---|---|---|---|---|---|
| 2/21/03 | ICPMS - 0.5 ppb | MSTD30221E | MSTD30221D | 10 ppb | ~~1~~ 5 mL |
| 2/21/03 | ICPMS - LCS 1 | MSTD30221F | MSTD020320F<br>MSTD020320G | 10 ppm<br>1000 ppm | 5 mL<br>0.05 mL |
| 2/21/03 | ICPMS - ICV/CCV 10@ | MSTD30221G | MSTD30221F | 1 ppm | 0.5 mL |
| 2/24/03 | ICPMS - STD 1 | MSTD30224A | MSTD21216D | 10 ppm | 5 mL |
| | ICPMS - 20 ppb | MSTD30224B | MSTD30224A | ~~20 ppb~~ 1 ppm | 25 mL |
| | ICPMS - 10 ppb | MSTD30224C | MSTD30224B | 20 ppb | 25 mL |
| | ICPMS - 5 ppb | MSTD30224D | MSTD30224C | 10 ppb | 25 mL |
| | ICPMS - 0.5 ppb | MSTD30224E | MSTD3024D | 5 ppb | 5 mL |
| | ICPMS - LCS1 | MSTD30224F | MSTD020320F | 10 ppm | 5 mL |
| | ICPMS - ICV/CCV 10@ | MSTD30224G | MSTD30224F | 1 ppm | 0.5 mL |
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## Metals Working Standard Prep Log

| | Preparation | | | Expiration Dates | | | |
|---|---|---|---|---|---|---|---|
| | Final Vol. (ml) | Final Conc. (ug/ml) | Diluent Matrix (ie $H_2O$) | Exp Date: Working STD * | Exp Date: Manufacturer | Comments | Initials |
| 1 | 50 mL | 0.5ppm | DI H2O + 2% HNO3 | 5/22/03 | Leeman | | RQ |
| | 50 mL | 1 ppm ~~10 ppb~~ RQ | ↓ | ↓ | ↓ | | ↓ |
| | 50 mL | 10 ppb | ↓ | ↓ | ↓ | | ↓ |
| | RQ ~~1 ppm~~ 50 mL | 1ppm | DI H2O + 2% HNO3 | 5/25/03 | Leeman | | RQ |
| 5 | ~~2~~ 50 mL | 20 ppb | ↑ | ↑ | ↓ | | ↓ |
| | 50 mL | 10 ppb | ↑ | ↑ | ↓ | | ↓ |
| | 50 mL | 5 ppb | ↑ | ↑ | ↓ | | ↓ |
| | 50 mL | 0.5 ppb | ↑ | ↑ | ↓ | | ↓ |
| | 50 mL | 1 ppm | ↑ | ↑ | Leeman | | ↓ |
| 10 | 50 mL | 10 ppb | ↓ | ↓ | ↓ | | ↓ |
| | | | | | | | |
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| 15 | | | | | | | |
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| | | | | | | | |
| 20 | | | | | | | |

* Check working std versus all manufacturer's



CSO

## Metals Working Standard Prep Log

| Date | Standard Name | Working Std Code | Stock Info: Stock Std Code | Preparation: Stock Concentration | Preparation: Amount Taken from Stock |
|---|---|---|---|---|---|
| 2/17/03 | ICPMS - STD1 | MSTD030217L | MSTD021216D | 10 ppm | 5 mL |
| | ICPMS - 20 ppb | MSTD030217M | MSTD030217L | 1 ppm | 1 mL |
| | ICPMS - 10 ppb | MSTD030217N | MSTD030217M | 20 ppb | 25 mL |
| | ICPMS - 5 ppb | MSTD030217O | MSTD030217N | 10 ppb | 25 mL |
| | ICPMS - 0.5 ppb | MSTD030217P | MSTD030217O | 5 ppb | 5 mL |
| | ICPMS - LCS1 | MSTD030217Q | MSTD020320F | 10 ppm | 5 mL |
| | ICPMS - ICV/CCV 10@ | MSTD030217R | MSTD030217Q | 1 ppm | 0.5 mL |
| 2/20/03 | ICPMS - STD1 | MSTD030220A | MSTD021216D<br>MSTD021216B | 10 ppm<br>1000 ppm | 5 mL<br>0.05 mL |
| | ICPMS - ~~STD~~ 20 ppb | MSTD030220B | MSTD030220A | 1 ppm | 1 mL |
| | ICPMS - 10 ppb | MSTD030220C | MSTD030220B | 20 ppb | 25 mL |
| | ICPMS - 5 ppb | MSTD030220D | MSTD030220C | 10 ppb | 25 mL |
| | ICPMS - 0.5 ppb | MSTD030220E | MSTD030220D | 5 ppb | 5 mL |
| | ICPMS - LCS1 | MSTD030220F | MSTD020320F<br>MSTD020320G | 10 ppm<br>1000 ppm | 5 mL<br>0.05 mL |
| | ICPMS - ICV/CCV 10@ | MSTD030220G | MSTD030220F | 1 ppm | 0.5 mL |
| 2/20/03 | ICPMS - 10 ppb TUNING SOLN | MSTD030220H | MSTD030117A | 1 ppm | 10 mL |
| 2/20/03 | ICPMS - LCS @ 10ppm | MSP030220D | MSP030220B<br>MSP030220C | 100 ppm<br>100 ppm | 10 mL<br>10 mL |
| 2/21/03 | ICPMS - STD1 | MSTD030221A | MSTD021216D<br>MSTD021216B | 10 ppm<br>1000 ppm | 5 mL<br>0.05 mL |
| | ICPMS - 20 PPB | MSTD030221B | MSTD030221A | 1 ppm | 1 mL |
| | ICPMS - 10 PPB | MSTD030221C | MSTD030221B | 20 ppm | 25 mL |
| | ICPMS - 5 PPB | MSTD030221D | MSTD030221C | 10 ppm | 25 mL |



C56

| Preparation | | | Expiration Dates | | | |
|---|---|---|---|---|---|---|
| Final Vol. (ml) | Final Conc. (ug/ml) | Diluent Matrix (ie $H_2O$) | Exp Date: Working STD * | Exp Date: Manufacturer | Comments | Initials |
| 50 mL | 1 ppm | DI $H_2O$ + 2% $HNO_3$ | 5/18/03 | Leeman | CT | RQ |
| 50 mL | 20 ppb | | | | | |
| 50 mL | 10 ppb | | | | | |
| 50 mL | 5 ppb | | | | | |
| 50 mL | 0.5 ppb | | | | | |
| 50 mL | 1 ppm | | | | | |
| 50 mL | 10 ppb | | | | | |
| 50 mL | 1 ppm | DI $H_2O$ + 2% $HNO_3$ | 5/21/03 | Leeman | | RQ |
| 50 mL | 20 ppb | | | | | |
| 50 mL | 10 ppb | | | | | |
| 50 mL | 5 ppb | | | | | |
| 50 mL | 0.5 ppb | | | | | |
| 50 mL | 1 ppm | | | Leeman | | |
| 50 mL | 10 ppb | | | | | |
| 1000 mL | 10 ppb | DI $H_2O$ + 2% $HNO_3$ | 5/21/03 | ULTRA SCIENTIFIC HIGH PURITY | | RQ |
| 100 | 10 ppm | DI $H_2O$ + 2% $HNO_3$ | 5/21/03 | High Purity | | NS |
| 50 mL | 1 ppm | DI $H_2O$ + 2% $HNO_3$ | 5/22/03 | Leeman | | RQ |
| 50 mL | 20 ppb | | | | | |
| 50 mL | 10 ppb | | | | | |
| 50 mL | 5 ppb | | | | | |

* Check working std versus all manufacturer's

| Date | Standard Name | Working Std Code | Stock Info: Stock Std Code | Preparation: Stock Concentration | Preparation: Amount Taken from Stock |
|---|---|---|---|---|---|
| 1-14-03 | ICPMS - LCS1 | MST030114E | MST020320F | 10ppm | 5. |
| | ⊥ - ICV/CCV @ 50 | F | MST030114E | 1ppm | 2.5 |
| | ICPMS - 200 | G | MST030114A | 1ppm | 10 ml |
| | - 100 | H | G | 200ppb | 25 |
| | - 50 | I | H | 100ppb | 10 |
| | ICPMS - ICV/CCV @ 100 | J | MST030114E | 1ppm | 5 |
| 1-15-03 | ICPMS - STD1 | MST030115A | MST021216B<br>MST021216D | 1000 ppm<br>10ppm | 0.05<br>5 |
| | - 20 | B | MST030115A | 1ppm | 1 |
| | - 10 | C | B | 20ppb | 25 |
| | - 5 | D | C | 10ppb | 25 } NS |
| | - 0.5 | E | D | 5ppb | 5 |
| | ICPMS - LCS1 | F | MST020320F<br>MST020320G | 10ppm<br>1000 ppm | 5<br>0.05 |
| | ⊥ - ICV/CCV | G | MST030115F | 1ppm | 0.5 |
| 1-17-03 | Tuning Stock Solution | MST030117A | MST-010523E Mg | 1,000 ppm | 0.5 ml |
| | | | MST020619H Cu | | 0.5 |
| | | | MST020208K Rh | | 0.5 |
| | | | MST020619E Cd | | 0.5 |
| | | | MST020208F In | | 0.5 |
| | | | MST020619C Ba | | 0.5 |
| | | | MST020208I Ce | | 0.5 |



058

| | Preparation | | | Expiration Dates | | | | |
|---|---|---|---|---|---|---|---|---|
| | Final Vol. (ml) | Final Conc. (ug/ml) | Diluent Matrix (ie $H_2O$) | Exp Date | | Comments | Initials |
| | | | | Working STD * | Manufacturer | | |
| 1 | 50 | 1ppm | DI $H_2O$ + 2% $HNO_3$ | 4-14-03 | Leeman | | NS |
| | 50 | 50ppb | | | | | |
| | 50 | 200ppb | | | | Fe | |
| | 50 | 100ppb | | | | | |
| 5 | 50 | 50ppb | | | | | |
| | 50 | 100ppb | | | | | |
| | 50 | 1ppm | DI $H_2O$ + 2% $HNO_3$ | 4-15-03 | Leeman | Pb | NS / RQ |
| | 50 | 20ppb | | | | | |
| | 50 | 10ppb | | | | | |
| 10 | 50 | 5ppb | | | | | |
| | 50 | 0.5ppb | | | | | |
| | 50 | 1ppm | | | Leeman | | |
| | 50 | 10ppb | | | | | |
| | 500 ml | 1 ppm | DI $H_2O$ + 2% $HNO_3$ | 4-17-03 | Ultra Scientific | | NS |
| 15 | | | | | High Purity | | |
| | | | | | | | |
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| 20 | | | | | | | |

* Check working std versus all manufacturer's

# Metals Working Standard Prep Log

| Date | Standard Name | Working Std Code | Stock Info: Stock Std Code | Preparation: Stock Concentration | Preparation: Amount Taken from Stock |
|---|---|---|---|---|---|
| 1-17-03 | Tuning Stock Solution | MST030117A | MST020619I Pb | 1,000 ppm | 0.5 ml |
| | | | MST020619D Be | | |
| | | | MST020619G Co | | |
| | | | MST020208J Tl | | |
| | | | MST020208G U | | |
| 1-17-03 | 10 ppb Tuning Solution | MST030117B | MST030117A | 1 ppm | 5 ml |
| 1-20-03 | ICPMS - STD1 | MST030120A | MST021216D | 10 ppm | 5 |
| | - 200 | B | MST030120A | 1 ppm | 10 |
| | - 100 | C | B | 200 ppb | 25 |
| | - 50 | D | C | 100 ppb | 10 |
| | ICPMS - LCS1 | E | MST020320F | 10 ppm | 5 |
| | - ICV/CCV | F | MST030120E | 1 ppm | 5 |
| 1-22-03 | ICPMS - STD1 | MST030122A | MST021216D<br>MST021216B | 10 ppm<br>1000 ppm | 5<br>0.05 |
| | - 20 | B | MST030122A | 1 ppm | 1 |
| | - 10 | C | B | 20 ppb | 25 |
| | - 5 | D | C | 10 ppb | 10 |
| | - 0.5 | E | D | 5 ppb | 2 |
| | ICPM - LCS1 | F | MST020320F<br>MST020320G | 10 ppm<br>1000 ppm | 5<br>0.05 |
| | - ICV/CCV | G | MST030122F | 1 ppm | 0.5 |
| 1-24-03 | ICP MS - Internal Std. | MST030124A | MST020208B Li | 1000 ppm | 1 ml |

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# Metals Working Standard Prep Log

| | Preparation | | | Expiration Dates | | | |
|---|---|---|---|---|---|---|---|
| | Final Vol. (ml) | Final Conc. (ug/ml) | Diluent Matrix (ie $H_2O$) | Exp Date: Working STD * | Exp Date: Manufacturer | Comments | Initials |
| 1 | 500 ml | 1 ppm | DI $H_2O$ + 2% $HNO_3$ | 4-17-03 | High Purity | | NS |
| | ↓ | ↓ | ↓ | ↓ | ↓ | | ↓ |
| | ↓ | ↓ | ↓ | ↓ | ↓ | | ↓ |
| | ↓ | ↓ | ↓ | ↓ | ↓ | | ↓ |
| 5 | ↓ | ↓ | ↓ | ↓ | ↓ | | ↓ |
| | 500 ml | 10 ppb | DI $H_2O$ + 2% $HNO_3$ | 4-17-03 | ultra scientific High Purity | | NS |
| | 50 | 1 ppm | DI $H_2O$ + 2% $HNO_3$ | 4-20-03 | leeman | Fe | NS |
| | 50 | 200 ppb | ↓ | ↓ | ↓ | ↓ | ↓ |
| | 50 | 100 ppb | ↓ | ↓ | ↓ | ↓ | ↓ |
| 10 | 20 | 50 ppb | ↓ | ↓ | ↓ | ↓ | ↓ |
| | 50 | 1 ppm | ↓ | ↓ | leeman | ↓ | ↓ |
| | 50 | 100 ppb | ↓ | ↓ | ↓ | ↓ | ↓ |
| | 50 | 1 ppm | DI $H_2O$ + 2% $HNO_3$ | 4-22-03 | leeman | | NS |
| | 50 | 20 ppb | ↓ | ↓ | ↓ | | ↓ |
| 15 | 50 | 10 ppb | ↓ | ↓ | ↓ | ↓ | ↓ |
| | 20 | 5 ppb | ↓ | ↓ | ↓ | ↓ | ↓ |
| | 20 | 0.5 ppb | ↓ | ↓ | ↓ | ↓ | ↓ |
| | 50 | 1 ppm | ↓ | ↓ | leeman | ↓ | ↓ |
| | 50 | 10 ppb | ↓ | ↓ | ↓ | ↓ | ↓ |
| 20 | 100 ml | 10 ppm | DI $H_2O$ + 2% $HNO_3$ | 4-24-03 | High Purity | | NS |

* Check working std versus all manufacturer's

## Method Detection Limits

| | |
|---|---|
| Method: | 6020 / 200.8 |
| Date of Analysis: | 1/13/03 |
| Instrument ID: | ICP4 |
| Matrix: | Water |

| Compound | MDL (ug/L) | DLR (ug/L) |
|---|---|---|
| Chromium | 0.111 | 5 |



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