Final

Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill

Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

Contract No. W912QR-15-C-0046

Prepared for:

US Army Corps of Engineers®

U.S. Army Corps of Engineers
Louisville District

Prepared by:

leidos

Leidos
8866 Commons Boulevard, Suite 201
Twinsburg, Ohio 44087

March 10, 2017

16-024(E)/030817

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
10-03-2017	Technical	May 2016 to Mar 2017

4. TITLE AND SUBTITLE

Final
Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill
Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

5a. CONTRACT NUMBER

W912QR-15-C-0046

5b. GRANT NUMBER

NA

5c. PROGRAM ELEMENT NUMBER

NA

6. AUTHOR(S)

Arunachalam, Selvam

5d. PROJECT NUMBER

NA

5e. TASK NUMBER

NA

5f. WORK UNIT NUMBER

NA

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Leidos
8866 Commons Boulevard
Suite 201
Twinsburg, Ohio 44087

8. PERFORMING ORGANIZATION REPORT NUMBER

16-024(E)/030817

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

USACE - Louisville District
U.S. Army Corps of Engineers
600 Martin Luther King Jr., Place
PO Box 59
Louisville, Kentucky 40202-0059

10. SPONSOR/MONITOR'S ACRONYM(S)

USACE

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

NA

12. DISTRIBUTION/AVAILABILITY STATEMENT

Reference distribution page.

13. SUPPLEMENTARY NOTES

None.

14. ABSTRACT

This Engineering Evaluation/Cost Analysis (EE/CA) was developed to facilitate a non-time critical removal action (NTCRA) for lead contamination within the Facility-wide Sewers AOC at the Load Line 2 FA, and mercury contamination within the George Road Sewage Treatment Plant Mercury Spill AOC. This EE/CA provides site histories, removal action objectives, cleanup goals, and estimated volumes of media requiring removal under this NTCRA. For both sites, Excavation and Off-site Disposal alternatives are selected as the recommended removal action alternative.

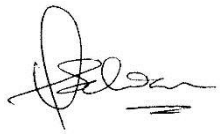
15. SUBJECT TERMS

Removal action, cleanup goal, remedial alternatives, removal action objective.

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Nathaniel Peters, II
U	U	U	U	775	19b. TELEPHONE NUMBER *(Include area code)* 502.315.2624

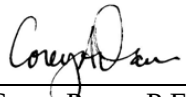
CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Leidos has completed the Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers (USACE) policy. In addition, an independent verification was performed to ensure all applicable changes were made per regulatory and Army comments.



3/10/17

Selvam Arunachalam, P.E. — Date
Study/Design Team Leader, Main Author



3/10/17

Corey Pacer, P.E. — Date
Independent Technical Review Team Leader

Significant concerns and the explanation of the resolution are as follows:

Internal Leidos Independent Technical Review comments are recorded on a Document Review Record per Leidos standard operating procedure ESE A3.1 Document Review. This Document Review Record is maintained in the project file. Changes to the report addressing the comments have been verified by the Study/Design Team Leader. As noted above, all concerns resulting from independent technical review of the project have been considered.



3/10/17

Lisa Jones-Bateman — Date
Senior Program Manager

Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

April 14, 2017

Mr. Mark Leeper, P.G., MBA
Manager
Restoration/Cleanup Program
ARNG Directorate
111 S. George Mason Dr.
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859087

Subject: Ohio EPA's Approval of the Final Engineering Evaluation/Cost Analysis for RVAAP-67, Facility-wide Sewers, Load Line 2 Functional Area, and RVAAP-75 George Road Sewage Treatment Plant Mercury Spill

Dear Mr. Leeper:

On March 10, 2017, the Ohio Environmental Protection Agency (Ohio EPA) received your response to Ohio EPA's March 2, 2017 comment letter on the Final Engineering Evaluation/Cost Analysis for RVAAP-67, Facility-wide Sewers, Load Line 2 Functional Area, and RVAAP-75 George Road Sewage Treatment Plant Mercury Spill.

Ohio EPA approves the document.

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please free feel to contact me at (330) 963-1170.

Sincerely,

Edward J. D'Amato
Project Coordinator
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

ec: Mark Leeper, ARNG Directorate
Bob Princic, Supervisor, DERR, NEDO
Kevin Palombo, DERR, NEDO
Brian Tucker, DERR, CO
Nathaniel Peters II, USACE Louisville
Kevin Sedlak, ARNG
Gail Harris, Vista Sciences Corp.
Rod Beals, Manager, DERR, NEDO
Tom Schneider, Supervisor, DERR, CO
Carrie Rasik, DERR, CO
Craig Coombs, USACE Louisville
Katie Tait, OHARNG RTLS
Gregory F. Moore, USACE
Rebecca Schreffler, Vista Sciences Corp.

Received -
19 Apr 2017 -

Final

Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill

Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

Contract No. W912QR-15-C-0046

Prepared for:
U.S. Army Corps of Engineers
Louisville District

Prepared by:
Leidos
8866 Commons Boulevard, Suite 201
Twinsburg, Ohio 44087

March 10, 2017

DOCUMENT DISTRIBUTION
Final Engineering Evaluation/Cost Analysis for
RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and
CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill
Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

Name/Organization	Number of Printed Copies	Number of Electronic Copies
Ed D'Amato, Project Manager, Ohio EPA NEDO-DERR	1	3
Brian Tucker, Ohio EPA, CO-DERR	1	1
Tom Schneider, Ohio EPA, SWDO-DERR	Email transmittal letter only	
Bob Princic, Ohio EPA, NEDO-DERR	Email transmittal letter only	
Rod Beals, Ohio EPA, NEDO-DERR	Email transmittal letter only	
Mark Leeper, ARNG-IED Cleanup	0	1
Katie Tait, OHARNG, Camp Ravenna Kevin Sedlak, ARNG, Camp Ravenna	Email transmittal letter only	
Craig Coombs, USACE – Louisville District	Email transmittal letter only	
Nathaniel Peters II, USACE – Louisville District	1	1
Admin Records Manager – Camp Ravenna	2	2
Pat Ryan, Leidos-REIMS	0	1
Jed Thomas, Leidos	1	1
Leidos Contract Document Management System	0	1

ARNG = Army National Guard.
CO = Central Office.
DERR = Division of Environmental Response and Revitalization.
IED = Installation and Environment Division.
NEDO = Northeast District Office.
OHARNG = Ohio Army National Guard.
Ohio EPA = Ohio Environmental Protection Agency.
REIMS = Ravenna Environmental Information Management System.
SWDO = Southwest District Office.
USACE = U.S. Army Corps of Engineers.

TABLE OF CONTENTS

LIST OF TABLES iii
LIST OF FIGURES iv
LIST OF PHOTOGRAPHS iv
LIST OF APPENDICES iv
ACRONYMS AND ABBREVIATIONS v

1.0 INTRODUCTION 1-1
1.1 PURPOSE 1-1
1.2 SCOPE 1-2
1.3 FACILITY DESCRIPTION 1-2

2.0 LOAD LINE 2 FUNCTIONAL AREA SITE CHARACTERIZATION 2-1
2.1 FACILITY-WIDE SEWERS 2-1
2.1.1 Area of Concern Description 2-1
2.1.2 Conceptual Site Exposure Model 2-1
2.1.2.1 Sediment and Water Inside Sewer Pipes and Pipe Bedding Material Below the Pipes 2-2
2.1.2.2 Sediment and Surface Water at Pipe Outfalls 2-2
2.1.2.3 Groundwater 2-2
2.1.2.4 Conclusions 2-2
2.2 LOAD LINE 2 FUNCTIONAL AREA DESCRIPTION 2-3
2.2.1 Site Evaluation 2-4
2.2.2 Source Area Description 2-4
2.2.2.1 Main Storm Sewer Line 2-4
2.2.2.2 Drainage Ditches 2-5
2.2.3 2016 Source Area Pre-Delineation Sampling 2-6
2.2.3.1 Investigation and Results 2-6
2.2.3.2 Data Quality 2-7
2.2.3.3 Conclusions 2-9

3.0 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL SITE CHARACTERIZATION 3-1
3.1 SITE DESCRIPTION 3-1
3.2 SITE EVALUATION 3-1
3.2.1 Historical Records Review 3-1
3.2.2 Site Inspection 3-2
3.2.2.1 Objective 3-3
3.2.2.2 Investigation Activities and Results 3-3
3.2.2.3 Conclusions 3-4

4.0 REMOVAL ACTION OBJECTIVES, CLEANUP GOALS, AND VOLUME CALCULATIONS 4-1
4.1 REMOVAL ACTION OBJECTIVE 4-1
4.1.1 Load Line 2 FA RAO 4-1

4.1.2 George Road Sewage Treatment Plant Mercury Spill AOC RAO 4-1
4.2 REMOVAL ACTION CLEANUP GOALS 4-1
4.2.1 Load Line 2 FA Cleanup Goal 4-1
4.2.2 George Road Sewage Treatment Plant Mercury Spill AOC Cleanup Goal 4-1
4.3 VOLUMES OF MEDIA REQUIRING REMOVAL 4-2
4.3.1 Load Line 2 FA Removal Volume 4-2
4.3.2 George Road Sewage Treatment Plant Mercury Spill AOC Removal Volume 4-2

5.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS 5-1
5.1 CHEMICAL-SPECIFIC ARARS 5-2
5.2 ACTION-SPECIFIC ARARS 5-2
5.3 LOCATION-SPECIFIC ARARS 5-4

6.0 IDENTIFICATION OF REMOVAL ACTION ALTERNATIVES 6-1
6.1 ALTERNATIVES FOR LOAD LINE 2 FUNCTIONAL AREA 6-1
6.1.1 Alternative LL2-1: No Action 6-1
6.1.2 Alternative LL2-2: Excavation with Off-site Disposal 6-1
6.1.2.1 Remedial Design 6-2
6.1.2.2 Excavation, Removal, and Disposal 6-3
6.1.2.3 Restoration 6-3
6.2 ALTERNATIVES FOR GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL 6-4
6.2.1 Alternative GR-1: No Action 6-4
6.2.2 Alternative GR-2: Excavation with Off-site Disposal 6-4
6.2.2.1 Remedial Design 6-4
6.2.2.2 Excavation, Removal, and Disposal 6-5
6.2.2.3 Restoration 6-5

7.0 ANALYSIS OF REMOVAL ACTION ALTERNATIVES 7-1
7.1 EFFECTIVENESS 7-1
7.1.1 Overall Protection of Human Health and the Environment 7-1
7.1.2 Compliance with ARARs 7-1
7.1.3 Long-term Effectiveness and Permanence 7-1
7.1.4 Reduction of Toxicity, Mobility, or Volume Through Treatment 7-2
7.1.5 Short-term Effectiveness 7-2
7.2 IMPLEMENTABILITY 7-2
7.2.1 Technical Feasibility 7-2
7.2.2 Administrative Feasibility 7-2
7.2.3 Availability of Services and Materials 7-2
7.2.4 State and Community Acceptance 7-3
7.3 COST 7-3
7.4 INDIVIDUAL ANALYSIS OF ALTERNATIVES FOR LOAD LINE 2 FUNCTIONAL AREA 7-3
7.4.1 Alternative LL2-1: No Action 7-3
7.4.1.1 Effectiveness 7-3
7.4.1.2 Implementability 7-4

7.4.1.3 Cost 7-4
7.4.1.4 Outcome 7-4
7.4.2 Alternative LL2-2: Excavation and Off-site Disposal 7-4
7.4.2.1 Effectiveness 7-4
7.4.2.2 Implementability 7-4
7.4.2.3 Cost 7-5
7.4.2.4 Outcome 7-5
7.5 INDIVIDUAL ANALYSIS OF ALTERNATIVES FOR GEORGE ROAD SEWAGE TREATMENT PLAN MERCURY SPILL AOC 7-5
7.5.1 Alternative GR-1: No Action 7-5
7.5.1.1 Effectiveness 7-5
7.5.1.2 Implementability 7-5
7.5.1.3 Cost 7-5
7.5.1.4 Outcome 7-6
7.5.2 Alternative GR-2: Excavation and Off-site Disposal 7-6
7.5.2.1 Effectiveness 7-6
7.5.2.2 Implementability 7-6
7.5.2.3 Cost 7-6
7.5.2.4 Outcome 7-6

8.0 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES 8-1
8.1 LOAD LINE 2 FUNCTIONAL AREA 8-1
8.2 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL AOC 8-1

9.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT 9-1
9.1 STATE ACCEPTANCE 9-1
9.2 COMMUNITY ACCEPTANCE 9-1

10.0 RECOMMENDED REMOVAL ACTION ALTERNATIVE 10-1
10.1 LOAD LINE 2 FUNCTIONAL AREA RECOMMENDED ALTERNATIVE 10-1
10.2 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL AOC RECOMMENDED ALTERNATIVE 10-1

11.0 REFERENCES 11-1

LIST OF TABLES

Table 2-1. Results from 2016 Pre-Delineation Sampling 2-9
Table 4-1. Estimated Sediment Volumes Requiring Removal at Load Line 2 FA 4-2
Table 4-2. Estimated Piping Removal at Load Line 2 FA 4-3
Table 4-3. Estimated Piping Removal at George Road Sewage Treatment Plant Mercury Spill AOC 4-3
Table 5-1. Potential Action-specific ARARs 5-6
Table 5-2. Location-specific ARARs 5-9

LIST OF FIGURES

Figure 1-1. General Location and Orientation of Camp Ravenna....1-3
Figure 1-2. Location of AOCs and Munitions Response Sites at Camp Ravenna....1-5
Figure 2-1. Facility-wide Sewers Drainage Networks and Functional Areas....2-11
Figure 2-2. CSEM for Facility-wide Sewers....2-13
Figure 2-3. Sanitary and Storm Sewers at the Load Line 2 FA....2-15
Figure 2-4. Pre-delineation Sediment Sampling Results for the Load Line 2 FA....2-16
Figure 3-1. George Road Sewage Treatment Plant Site Map....3-5
Figure 3-2. Comminutor Building Plan....3-6
Figure 3-3. George Road Treatment Plant Piping Plan....3-7
Figure 3-4. Elemental Mercury Spill Location and Possible Flow Direction....3-8
Figure 3-5. Site Investigation Results....3-9
Figure 4-1. Proposed Removal Area at Load Line 2 Functional Area....4-5
Figure 4-2. Proposed Removal Area at George Road Sewage Treatment Plant Mercury Spill AOC....4-6

LIST OF PHOTOGRAPHS

Photograph 2-1. Soil (or sediment) description for sample collected near Inlet DB-22....2-10
Photograph 2-2. Rail Road Ballast Removal via mini-excavator prior to sampling at LL2sd-653(st) (or DB20 Outfall)....2-10

LIST OF APPENDICES

Appendix A. Letter Work Plan for Pre-Delineation Sampling of Lead-Contaminated Sediment in the Load Line 2 Functional Area
Appendix B. Load Line 2 Functional Area - 2016 Pre-Delineation Sampling Laboratory Data Package
Appendix C. Investigation-Derived Waste Letter Report, Laboratory Data Package, and Waste Profile
Appendix D. Cost Estimates
Appendix E. Ohio EPA Comments

ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
Army	U.S. Department of the Army
bgs	below ground surface
Camp Ravenna	Camp Ravenna Joint Military Training Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSEM	Conceptual Site Exposure Model
CUG	Cleanup Goal
DERR	Division of Emergency and Remedial Response
DFFO	Director's Final Findings and Orders
DU	Decision Unit
EE/CA	Engineering Evaluation/Cost Analysis
FA	Functional Area
FS	Feasibility Study
FWCUG	Facility-wide Cleanup Goal
HQ	Hazard Quotient
LDR	Land Disposal Restrictions
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NCP	National Contingency Plan
NTCRA	Non-time Critical Removal Action
O&M	Operations and Maintenance
OAC	Ohio Administrative Code
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
RAO	Removal Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
RSL	Regional Screening Level
RVAAP	Ravenna Army Ammunition Plant
SI	Site Inspection
SRC	Site-related Contaminant
TCLP	Toxicity Characteristic Leaching Procedure
TR	Target Risk
U.S.C.	U.S. Code

USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USP&FO	U.S. Property and Fiscal Officer
UTS	Universal Treatment Standards

1.0 INTRODUCTION

This Engineering Evaluation/Cost Analysis (EE/CA) was prepared by Leidos under the U.S. Army Corps of Engineers (USACE), Louisville District Contract Number W912QR-15-C-0046. This document evaluates the alternatives and the preferred remedy for removing (1) lead contamination in storm sewer outfall sediment at the Load Line 2 Functional Area (FA) of the Facility-wide Sewers Area of Concern (AOC) and (2) mercury contamination within subsurface piping at the George Road Sewage Treatment Plant Mercury Spill AOC. Both AOCs are located within the former Ravenna Army Ammunition Plant (RVAAP) [now known as Camp Ravenna Joint Military Training Center (Camp Ravenna)] in Portage and Trumbull counties, Ohio (Figures 1-1 and 1-2). The Facility-wide Sewers AOC is designated as RVAAP-67, and the George Road Sewage Treatment Plant Mercury Spill AOC is designated as CC-RVAAP-75.

Planning and performance of all elements of this work will be in accordance with the requirements of the Director's Final Findings and Orders (DFFO) dated June 10, 2004 (Ohio EPA 2004).

1.1 PURPOSE

The U.S. Department of the Army (Army), in corporation with the Ohio Environmental Protection Agency (Ohio EPA), has agreed to proceed with a non-time critical removal action (NTCRA) for the following:

- Lead contamination within the Facility-wide Sewers AOC at the Load Line 2 FA, and
- Mercury contamination within the George Road Sewage Treatment Plant Mercury Spill AOC.

An NTCRA can provide substantial risk reduction at a site by addressing specific problems without requiring time-consuming investigation and decision-making. The NTCRA generally attempts to control the source of contamination and can be used to remediate a site completely (DOE 1998). The purpose of the NTCRAs at the Load Line 2 FA and George Road Sewage Treatment Plant Mercury Spill AOC is to provide remedies to eventually attain site closure at both sites.

Section 300.415(b)(4)(i) of the National Contingency Plan (NCP) requires an EE/CA for all NTCRAs. This EE/CA is intended to: (1) satisfy environmental review requirements for removal actions, (2) satisfy administrative record requirements for documentation of removal action selection, and (3) provide a framework for evaluating and selecting alternative technologies. Thus, this EE/CA identifies the objectives of the removal action and analyzes the effectiveness, implementability, and cost of various alternatives that may satisfy these objectives (USEPA 1993). This EE/CA will also provide recommended removal action alternatives that will be presented to the public and summarized in an Action Memorandum.

1.2 SCOPE

This report was prepared in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [42 U.S. Code (U.S.C.) 9601 et seq.] requirements to develop and evaluate removal action alternatives. Following the *Conducting Non-Time Critical Removal Actions under CERCLA* (USEPA 1993), the scope of this EE/CA is to develop removal action objectives (RAOs), identify and evaluate potential removal action alternatives, and recommend a removal action alternative for the Load Line 2 FA and the George Road Sewage Treatment Plant Mercury Spill AOC.

1.3 FACILITY DESCRIPTION

The facility, consisting of 21,683 acres, is located in northeastern Ohio within Portage and Trumbull counties, approximately 4.8 kilometers (3 miles) east/northeast of the city of Ravenna and approximately 1.6 kilometers (1 mile) northwest of the city of Newton Falls (Figure 1-1). The facility, previously known as RVAAP, was formerly used as a load, assemble, and pack facility for munitions production. As of September 2013, administrative accountability for the entire acreage of the facility has been transferred to the U.S. Property and Fiscal Officer (USP&FO) for Ohio and subsequently licensed to Ohio Army National Guard (OHARNG) for use as a military training site (Camp Ravenna). References in this document to RVAAP relate to previous activities at the facility as related to former munitions production activities or to activities being conducted under the restoration/cleanup program.

Camp Ravenna occupies east-central Portage County and southwestern Trumbull County. Census projections for 2010 indicated the populations of Portage and Trumbull counties are 161,419 and 210,312, respectively. Population centers closest to Camp Ravenna are Ravenna, with a population of 11,724, and Newton Falls, with a population of 4,795.

The facility is located in a rural area and is not close to any major industrial or developed areas. Approximately 55% of Portage County, in which the majority of Camp Ravenna is located, consists of either woodland or farmland acreage. The closest major recreational area, the Michael J. Kirwan Reservoir (also known as West Branch Reservoir), is located adjacent to the western half of Camp Ravenna, south of State Route 5.

Camp Ravenna is federally owned and is licensed to OHARNG for use as a military training site. Restoration activities at Camp Ravenna are managed by the Army National Guard and OHARNG. Training and related activities at Camp Ravenna include field operations and bivouac training, convoy training, maintaining equipment, C-130 aircraft drop zone operations, helicopter operations, and storing heavy equipment.

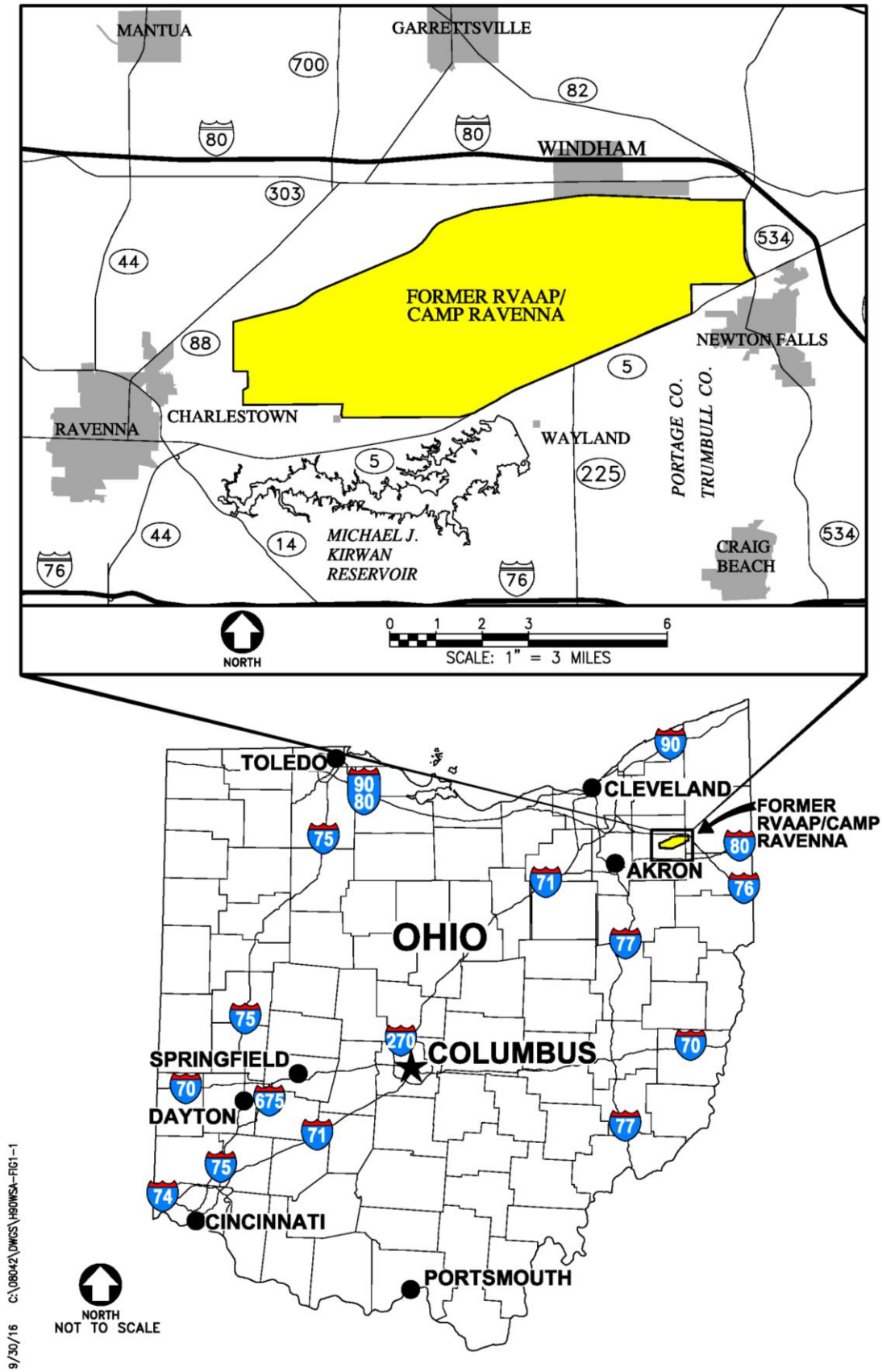
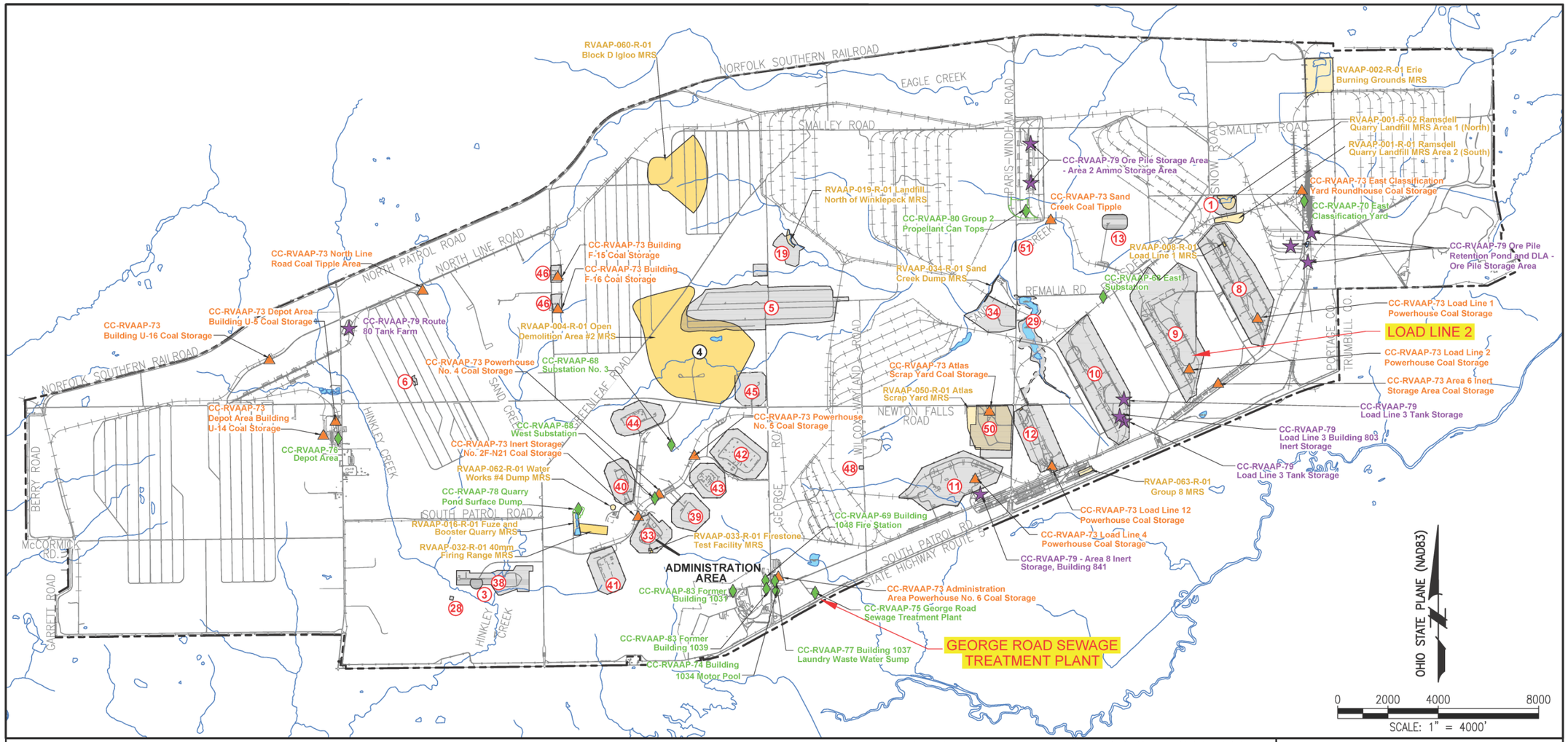


Figure 1-1. General Location and Orientation of Camp Ravenna

THIS PAGE INTENTIONALLY LEFT BLANK.



IRP SITES - CERCLA

- (1) RVAAP-01 ..... RAMSDELL QUARRY LANDFILL
- (3) RVAAP-03 ..... OPEN DEMOLITION AREA #1
- (5) RVAAP-05 ..... WINKLEPECK BURNING GROUNDS
- (6) RVAAP-06 ..... C BLOCK QUARRY
- (8) RVAAP-08 ..... LOAD LINE 1
- (9) RVAAP-09 ..... LOAD LINE 2
- (10) RVAAP-10 ..... LOAD LINE 3
- (11) RVAAP-11 ..... LOAD LINE 4
- (12) RVAAP-12 ..... LOAD LINE 12
- (13) RVAAP-13 ..... BLDG 1200 & DILUTION\SETTLING POND
- LANDFILL NORTH OF WINKLEPECK
- (19) RVAAP-19 ..... BURNING GROUNDS
- (28) RVAAP-28 ..... MUSTARD AGENT BURIAL SITE
- (29) RVAAP-29 ..... UPPER AND LOWER COBBS PONDS
- (33) RVAAP-33 ..... LOAD LINE 6
- (34) RVAAP-34 ..SAND CREEK DISPOSAL ROAD LANDFILL
- (38) RVAAP-38 ..... NACA TEST AREA
- (39) RVAAP-39 ..... LOAD LINE 5
- (40) RVAAP-40 ..... LOAD LINE 7
- (41) RVAAP-41 ..... LOAD LINE 8
- (42) RVAAP-42 ..... LOAD LINE 9
- (43) RVAAP-43 ..... LOAD LINE 10
- (44) RVAAP-44 ..... LOAD LINE 11
- (45) RVAAP-45 ..... WET STORAGE AREA
- (46) RVAAP-46 ..... BUILDINGS F-15 AND F-16
- (48) RVAAP-48 ..... ANCHOR TEST AREA
- (50) RVAAP-50 ..... ATLAS SCRAP YARD
- (51) RVAAP-51 ...DUMP ALONG PARIS-WINDHAM ROAD
- RVAAP-66 ..... FACILITY-WIDE GROUNDWATER
- RVAAP-67 ..... FACILITY-WIDE SEWERS

COMPLIANCE RESTORATION SITES (13 SITES)

- RVAAP-68 ..... ELECTRIC SUBSTATIONS (E,W,NO.3)
- RVAAP-69 ..... BUILDING 1048 – FIRE STATION
- RVAAP-70 ..... EAST CLASSIFICATION YARD
- RVAAP-72 ..... FACILITY-WIDE USTs
- RVAAP-73 ..... FACILITY-WIDE COAL STORAGE
- RVAAP-74 BUILDING 1034 MOTOR POOL HYDRAULIC LIFT
- RVAAP-75 .GEORGE ROAD SEWAGE TREATMENT PLANT
- RVAAP-76 ..... DEPOT AREA
- RVAAP-77 BUILDING 1037 LAUNDRY WASTE WATER SUMP
- RVAAP-78 ..... QUARRY POND SURFACE DUMP
- RVAAP-79 ..... DLA ORE STORAGE SITES
- RVAAP-80 ..... GROUP 2 PROPELLANT CAN TOPS
- RVAAP-83 ..... FORMER BUILDINGS 1031 AND 1039

MMRP SITES (14 SITES)

- RVAAP-001-R-02 ..... RAMSDELL QUARRY LANDFILL AREA 1 (NORTH)
- RVAAP-001-R-01 ..... RAMSDELL QUARRY LANDFILL AREA 2 (SOUTH)
- RVAAP-002-R-01 ..... ERIE BURNING GROUNDS MRS
- RVAAP-004-R-01 ..... OPEN DEMOLITION AREA #2 MRS
- RVAAP-008-R-01 ..... LOAD LINE 1 MRS
- RVAAP-016-R-01 ..... FUZE AND BOOSTER QUARRY MRS
- RVAAP-019-R-01 ... LANDFILL NORTH OF WINKLEPECK MRS
- RVAAP-032-R-01 ..... 40MM FIRING RANGE MRS
- RVAAP-033-R-01 ..... FIRESTONE TEST FACILITY MRS
- RVAAP-034-R-01 ..... SAND CREEK DUMP MRS
- RVAAP-050-R-01 ..... ATLAS SCRAP YARD MRS
- RVAAP-060-R-01 ..... BLOCK D IGLOO MRS
- RVAAP-061-R-01 ..... BLOCK D IGLOO – TD MRS
- RVAAP-062-R-01 ..... WATER WORKS #4 DUMP MRS
- RVAAP-063-R-01 ..... GROUP 8 MRS

OTHER REGULATORY - RCRA

- (4) RVAAP-04 ..... OPEN DEMOLITION AREA #2

LEGEND:

- COMPLIANCE RESTORATION SITES – APPROVED
- DLA ORE STORAGE AREAS (7 SITES)
- COAL STORAGE AREAS (17 SITES)
- AOC SITES
- MMRP SITES
- RAILROAD TRACKS
- FENCELINE
- STREAM OR CREEK

US Army Corps of Engineers Louisville District

leidos

FORMER RVAAP/CAMP RAVENNA
PORTAGE & TRUMBULL COUNTIES, OHIO

DRAWN BY:	REV. NO./DATE:	CAD FILE: C:\08042\DWGS
P. HOLM	REV.2/ 6/24/16	R10-FIG1-2

Figure 1-2. Location of AOCs and Munitions Response Sites at Camp Ravenna

THIS PAGE INTENTIONALLY LEFT BLANK.

2.0 LOAD LINE 2 FUNCTIONAL AREA SITE CHARACTERIZATION

The Load Line 2 FA is a subset of the 26 miles of storm and sanitary sewer lines that comprise the Facility-wide Sewers AOC. The following subsections describe the Facility-wide Sewers AOC and the Load Line 2 FA and discuss investigation activities and findings within the Load Line 2 FA.

2.1 FACILITY-WIDE SEWERS

2.1.1 Area of Concern Description

The Facility-wide Sewers AOC is comprised of approximately 26 miles (approximately 140,200 linear ft) of storm and sanitary sewers located throughout the former RVAAP. Figure 2-1 presents the Facility-wide sewers drainage networks and FAs. The AOC includes sewer lines containing residual sediment and water, pipe bedding below the sewer lines, and the sewer line discharge points. The storm sewer systems at the former RVAAP collected runoff from drainage areas along roads, railbeds, and buildings and diverted it to ditches and drainage conveyances through outfalls. Historically, the storm and sanitary sewer systems may have received inadvertent discharges of contaminated wastewater related to manufacturing munitions or other industrial processes.

The *Draft Remedial Investigation/Feasibility Study Report for RVAAP-67 Facility-wide Sewers* (SAIC 2012) [herein referred to as the Draft Facility-wide Sewers Remedial Investigation (RI)/Feasibility Study (FS) Report] was submitted to Ohio EPA in September 2012. During the subsequent comment resolution process, the Army provided Ohio EPA a revised conceptual site exposure model (CSEM) for the entire Facility-wide Sewers AOC in May 2013 (RVAAP 2013); Ohio EPA approved the revised CSEM (Ohio EPA 2014). The following subsections summarize the revised CSEM, and Figure 2-2 presents the revised CSEM. These changes will be reflected in a Revised Draft Facility-wide Sewers RI Report that will be submitted subsequent to implementing the NTRCA process at the Load Line 2 FA.

2.1.2 Conceptual Site Exposure Model

The Facility-wide Sewers AOC consists of sewer lines containing residual sediment and water, pipe bedding (e.g., soil or backfill) below the sewer lines, and the sewer line discharge points. There is no current or future use planned for this AOC; however, the sewers will remain intact and will function as intended until a construction project or military training activity impacts the sewer line causing the need for upgrade or removal. Future use of property, such as military training, in the vicinity of the AOC may occur (e.g., the land that lies above the sewer lines). The potential for human receptor exposure to each of the contaminated media included in this AOC is described in the following subsections.

2.1.2.1 Sediment and Water Inside Sewer Pipes and Pipe Bedding Material Below the Pipes

Sediment and water inside the sewer pipes and pipe bedding material below the pipes are generally not media of exposure in human health risk assessments and do not represent exposure media for anticipated future receptors (e.g., National Guard Trainee, Industrial Receptor, and Resident Receptor) developed under the receptor/exposure scenarios for RVAAP. The most likely form of exposure to these media would be through construction or excavation work.

A construction worker is not an applicable future receptor for the former RVAAP. If a construction worker entered the sewer system, it would be considered a confined space entry and would be addressed under Occupational Safety and Health Administration (OSHA) industry standards for confined spaces, including use of personal protective equipment. A construction worker who maintains and/or excavates the sewer pipes and may potentially contact contaminated sediment or water in the pipes or bedding material below the pipes is not applicable because (1) the sewer systems are not active; therefore, no sewer-specific digging will be conducted (i.e., for pipe repairs); (2) construction worker exposure to potential contaminants in the sewer system are mitigated through Army and regulatory requirements for worker protection and safety [e.g., OSHA (29 Code of Federal Regulations [CFR] 1926) and National Institute of Occupational Safety and Health]; and (3) any general construction-related excavation (e.g., constructing the foundation of a new building) would result in mixing a small amount of residue (i.e., a few centimeters of residual sewer sediment in a pipe) into a large amount of overlying soil being excavated by heavy equipment, such as a backhoe. Thus, any excavation-related activities would result in negligible exposure.

2.1.2.2 Sediment and Surface Water at Pipe Outfalls

The outfalls associated with the storm sewers are small (e.g., a few square feet), isolated discharge points and do not represent exposure units for conducting a human health risk assessment. Human health risks for contamination at downgradient surface water locations that may have received historical sewer discharges will be evaluated separately for those locations. The ecological risk evaluation will include an evaluation of potential water quality and biological impacts related to Facility-wide Sewer discharges.

2.1.2.3 Groundwater

Modeling of contaminants leaching from sewer sediment and pipe bedding material sources and transport via groundwater is included in the Draft Facility-wide Sewers RI/FS Report (SAIC 2012). Results of this fate and transport modeling are compared to a variety of groundwater screening criteria and are not included in a quantitative human health risk assessment. Groundwater under the RVAAP restoration program is being addressed under a separate facility-wide AOC (RVAAP-66).

2.1.2.4 Conclusions

The Facility-wide Sewers AOC consists of sewer lines containing residual sediment and water, pipe bedding below these sewer lines, and the sewer line discharge points. There is no current or future use

planned for this AOC; however, the sewers will remain intact and will function as intended until a construction project or military training activity impacts the sewer line causing the need for upgrade or removal.

Based on the CSEM, no complete human health exposure pathways exist; sewer pipes and outfalls are not viable exposure units for RVAAP receptors (i.e., National Guard Trainee, Industrial Receptor, and Resident Receptor) because of their extremely small size and the even smaller quantities of sediment/contamination in these small areas. Exposures to construction workers would be addressed through worker protection and safety requirements, such as OSHA (29 CFR 1926) and National Institute of Occupational Safety and Health. The CSEM indicates a quantitative human health risk assessment is not required for the Facility-wide Sewers AOC.

An ecological risk assessment is required to evaluate the Facility-wide Sewers AOC, it will be presented in the Revised Facility-wide Sewers RI Report. Piping segments of the Facility-wide Sewers AOC were determined not to be viable habitat; thus, the ecological risk assessment will not address accumulated sewer sediment and water within the pipelines. With the lack of permanent habitat and receptors, there is no exposure pathway and no ecological risk inside the piping system (SAIC 2012).

Due to possible receptor exposure to the outfall and downstream of the outfall, an ecological risk assessment was conducted for chemicals detected at outfalls. This evaluation considered evidence of ecological risk upstream and downstream at an outfall. As no ecological risk assessment was conducted for sewer interiors, evidence of ecological risk upstream of the outfall was based upon the presence of contaminants upstream of outfalls (i.e., within the storm sewer piping). Evidence of potential ecological risk downstream of the outfall was based upon analytical results collected from a downstream location and/or evidence of impaired metrics (e.g., sediment quality, surface water quality, fish composition, macroinvertebrate composition, and/or habitat quality) at a downstream biological/water station.

2.2 LOAD LINE 2 FUNCTIONAL AREA DESCRIPTION

Due to the size and structure of the Facility-wide Sewers AOC, it was divided into 19 FAs based on the spatial distribution of the systems and their operational characteristics. The Load Line 2 FA is the portion of sewers within the Facility-wide Sewers AOC that resides within Load Line 2, as shown in Figure 2-1. The Load Line 2 FA, shown in detail in Figure 2-3, includes any storm and sanitary sewers that exist in Load Line 2 and the corresponding sewer sediment, sewer water, outfall sediment, outfall water, and pipe bedding material.

Load Line 2 is a former melt pour load line located in the southeastern portion of RVAAP. Load Line 2 was in operation from 1941–1971. During 1941–1945, 1951–1957, and 1969–1971, Load Line 2 was used to melt and load 2,4,6-trinitrotoluene and composition B (a combination of 2,4,6-trinitrotoluene and hexahydro-1,3,5-trinitro-1,3,5-triazine) explosives into large-caliber shells. The primary buildings used for assembly and disassembly of munitions were DB-4 and DB-4A. All buildings and some associated structures have since been demolished. Remnant structures from

operational activities include asphalt and gravel access roads, man-made ditches, sewer lines, manholes, and ballast from former railroad tracks. The former buildings have been demolished, but portions of former walkways remain in some areas. The former main process area is heavily vegetated with heavy grass and scrub vegetation between the major structures of Load Line 2. The non-production areas around the main process area are characterized by scrub vegetation and immature hardwoods. The topography of Load Line 2 is characterized as moderately subdued on a reworked sandstone bedrock surface. Elevations are approximately 990–1,010 ft above mean sea level.

The Load Line 2 FA contains separate storm and sanitary sewer systems. The sanitary sewer system is part of the Sand Creek Treatment Plant Network. Sanitary effluent from the FA was pumped through a former ejector station located at the south end of the load line prior to exiting the central western portion of the Load Line 2 FA headed to the Load Line 3 FA. The storm sewer network is unique to the Load Line 2 FA and discharged to a series of surface drainage conveyances throughout the load line. Available historical documents do not indicate any incidents or occurrences of intentional dumping or discharging contaminated wastewaters to the Load Line 2 FA storm sewer (SAIC 2012).

2.2.1 Site Evaluation

Multiple investigations were performed at Load Line 2 FA storm and sanitary sewers. These investigations are summarized in Functional Area Evaluation-7 of the Draft Facility-wide Sewers RI/FS Report (SAIC 2012) that concluded that elevated lead concentrations may pose a potential ecological risk within a section of the storm sewer system surrounding sample location LL2sd-308 that may warrant a remedial action. This area included storm sewer lines immediately east of former Buildings DB-3 and DB-802. Figure 2-3 presents the results of historical lead analyses conducted on sediment samples collected from within the vitrified clay piping and/or at outfalls to the adjacent ditch.

2.2.2 Source Area Description

2.2.2.1 Main Storm Sewer Line

This section of storm sewer line evaluated spanned from drop inlet DB16 to the main terminus discharge location, where RI sample LL2sd/sw-311(st) was collected. The storm sewer line runs northwest to southeast immediately east of an old railroad bed.

The storm sewer line is a 10-inch vitrified clay pipe that has been impacted by demolition activities. Many of the drop inlets have been either demolished or backfilled, thus impacting water flow. Video surveys of the storm sewer system in the vicinity of Building DB-802 noted cracks and debris within the lines.

The main storm sewer line also received flow from storm sewer branch lines associated with inlets C2, C3, and C4. Site reconnaissance and visual inspections have indicated that inlets C2 and C3

were removed and/or demolished during the building demolition activities and inlet C4 has been filled in with debris and vegetation.

Historical sample locations with elevated concentrations of lead within the storm sewer line at the Load Line 2 FA are listed below and are presented on Figure 2-3:

- DB20, sample LL2-250 (collected on 07/28/01), had a lead concentration of 14,600 mg/kg, and sample LL2sd-615(st) (collected on 08/31/10) had a lead concentration of 29,200 mg/kg. Drop inlet DB20 is not visible from the ground surface; samples were collected from the storm sewer system at its approximate former location using a direct-push rig.
- DB21, sample LL2-251 (collected on 07/28/01), had a lead concentration of 5,280 mg/kg. Drop inlet DB21 is located in close proximity to the concrete dump area (former Building DB-802), which has been removed.
- DB22, sample LL2sd-308 (collected on 08/09/10), had a lead concentration of 872 mg/kg.

The horizontal extent of lead contamination in sediment within the clay pipeline is currently bounded by the following locations:

- DB16: location destroyed during building demolition activities.
- DB17: location destroyed during building demolition activities.
- DB18: location destroyed during building demolition activities.
- DB19: location destroyed during building demolition activities.
- C2: location destroyed during building demolition activities.
- C3: location destroyed during building demolition activities.
- C4: sample LL2-235 (collected on 07/29/01) had a lead concentration of 1,670 mg/kg, and sample LL2sd-296(st) (collected on 08/09/10) had a lead concentration of 277 mg/kg. The destruction of locations C2 and C3, both downstream of C4, has resulted in an incomplete exposure pathway for observed lead contamination at C4.
- Main outfall discharge: sample LL2sd-311(st) (collected on 10/03/09) had a lead concentration of 31.4 mg/kg at the terminus of the storm sewer line.

Results of pipe bedding analysis near former drop inlet DB20 indicate the lead contamination is localized in the storm sewer line and has not migrated to the pipe bedding material. Sample LL2pb-615(st) (collected on 08/31/10) consisted of the pipe bedding material beneath the contaminated sewer line and had a lead concentration of 215 mg/kg, below the residential regional screening level (RSL) of 400 mg/kg. Additional pipe bedding material samples were collected near drop inlet DB15 (lead concentration of 14.8 mg/kg) and C4 (lead concentration of 52.3 mg/kg). These results were well below the residential RSL of 400 mg/kg.

2.2.2.2 Drainage Ditches

Drop inlets DB16 through DB20 contain outfall discharge pipes that run perpendicular to the main storm sewer line toward the west and under the railroad bed, depicted in the insets of Figures 2-3 and 2-4. These pipes were installed to discharge a portion of the storm sewer flow into a drainage ditch

located immediately to the west of and roughly parallel to the old railroad bed. The drainage ditch is disconnected in the vicinity of DB18 due to the presence of a concrete path running east to west, which separates surface water flow within the ditch to the north from that within the ditch to the south. Drop inlet DB21 has an outfall discharge into another drop inlet, DB22, which is west of the old railroad bed and discharges directly into the drainage ditch.

The drainage ditch located parallel to the storm sewer line and west of the old railroad bed received storm water overflow discharge from outfall pipes DB16 through DB22. Within the ditch, the horizontal extent of lead in sediment is bounded downstream by sample LL2-212, which had a concentration of 50.4 mg/kg, and upstream by sample LL2sd-307(st) at DB16, which had a concentration of 30.3 mg/kg.

Lead also was observed in the sample at location LL2-252 at a concentration of 656 mg/kg. This location is approximately 1,000 ft downstream of DB22. At the request of Ohio EPA, the remedy for Load Line 2 in this EE/CA will include additional sediment sampling up to, including, and downstream of this sample location. This is specified in Section 6.1.2.2. In addition, the lead concentration at sample location LL2-252 is included in a future evaluation of soil at Load Line 2 in the *Draft Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12* (USACE 2016a).

2.2.3 2016 Source Area Pre-Delineation Sampling

In May 2016, an investigation was conducted to evaluate nature and extent of lead within the storm sewer lines immediately east of former Buildings DB-3 and DB-802 at the Load Line 2 FA. This investigation was executed in accordance with the *Letter Work Plan for Pre-Delineation Sampling of Lead-Contaminated Sediment in the Load Line 2 Functional Area* (Leidos 2016), presented in Appendix A. The results are used to determine if there are any risks to ecological receptors within the Load Line 2 FA.

The following sections summarize the results of the pre-delineation sampling, which serve as a basis for determining the removal action volumes in Section 4.3. The pre-delineation sampling results are shown in Figure 2-4 and are summarized below.

2.2.3.1 Investigation and Results

On May 16, 2016, a field team mobilized to collect samples to further investigate the nature and extent of contamination around the storm sewer lines immediately east of former Buildings DB-3 and DB-802. The following presents the investigation objectives and results. Table 2-1 presents the lead concentrations of the samples collected.

Objective 1: Determine the horizontal extent of lead at concentrations that may require remediation of storm sewer sediment within the vitrified clay piping and box inlets at the Load Line 2 FA.

To achieve Objective 1, the outfall from box inlet DB22 was resampled. The August 2010 sample collected below the outfall pipe at inlet DB22 had a lead concentration of 872 mg/kg, and a July 2001 sample from the manhole DB21 (immediately upstream of DB22) had a lead concentration of 5,280 mg/kg. A new sample was collected in May 2016 below the outfall pipe that had a lead concentration of 19,900 mg/kg.

Objective 2: Determine the horizontal and vertical extents of lead at concentrations that may require remediation of dry sediment in the segment of ditch line receiving intermediate outfall discharge between locations DB17 and DB20.

To achieve Objective 2, a 300.9D Mini Hydraulic Excavator was used to remove the top layer of railroad ballast from the sample location within the infilled ditch line. Once the railroad ballast was removed, in an attempt to locate the sewer overflow outfalls (none of which were found), the sediment [0–0.5 ft below ground surface (bgs)] was sampled and sent to an off-site laboratory for lead analysis. As indicated on Table 2-1 and presented on Figure 2-4, all the samples collected from the ditch line [samples LL2sd-650(st) to LL2sd-653(st)] receiving discharge from locations DB17 to DB22 were below 400 mg/kg.

Objective 3: Determine the horizontal and vertical extents of lead at concentrations that may require remediation of dry sediment in the ditch line downstream of location DB22.

To achieve Objective 3, hand augers were used to collect samples from 0–0.5, 0.5–1, and 1–2 ft bgs at four sample stations in the ditch line downgradient of inlet DB22. As shown on Figure 2-4, the horizontal extent of lead contamination is bound by the sample location furthest downstream [LL2sd-657(st)], as each sample result is below 400 mg/kg. The other three locations each have an exceedance of 400 mg/kg and vary in their vertical extent of contamination.

2.2.3.2 Data Quality

Sediment samples were analyzed in accordance with the methods and procedures established in the *Final Facility-wide Sampling and Analysis Plan for Environmental Investigations* (USACE 2011). The samples were analyzed for lead by U.S. Environmental Protection Agency (USEPA) method SW-846 6020. Field duplicates were collected at a frequency of 10% and matrix spike/matrix spike duplicates (MS/MSDs) were collected at a rate of 5% (i.e., 1 MS/MSD per 20 environmental samples). Analytical procedures were completed in accordance with USEPA requirements and government regulations and guidelines including the current U.S. Department of Defense Quality Systems Manual, USACE Louisville District analytical quality assurance guidelines, and project-specific goals and requirements.

Leidos employed a systematic process utilizing automated data review software for data verification to ensure the precision and accuracy of the analytical data were adequate for their intended use. This approach was consistent with the data quality objectives for the project. The data were then verified through the review process outlined in the project sampling and analysis plan following USEPA

functional guidelines, U.S. Department of Defense Quality Systems Manual criteria, and Leidos internal procedures for laboratory data review.

A total of 17 primary samples and 2 field duplicates were collected on May 16, 2016. The laboratory analytical data package is included in Appendix B. Sample analyses met specified criteria with the following exceptions.

- Lead was detected in the method blank at a concentration that exceeded criteria; all sample results were greater than 10 times the reported method blank concentration and therefore there was no impact on data quality.
- The sample selected for MS/MSD analysis, LL2SD-308(ST)-2527-SD, had elevated native concentrations of lead that were more than 100 times the spiked concentration; the MS/MSD percent recovery values were outside control limits but the background levels precluded an assessment of accuracy. The post-digestion spike was recovered outside of control limits. The precision between the spiked samples was also outside control limits and therefore the parent sample results were qualified as estimated "J." (Note that the same sample was also analyzed as a laboratory duplicate and met precision criteria.)
- Results for the two field duplicate pairs were not used to qualify data; one pair (LL2SD-655(ST)-2518-SD, LL2SD-655(ST)-4096-FD) had results with a relative percent difference of 150% and the second field duplicate pair (LL2SD-653(ST)-2514-SD, LL2SD-653(ST)-4095-FD) had an relative percent difference value of 15%. However, data from (LL2SD-655(ST)-2518-SD, LL2SD-655(ST)-4096-FD) will conservatively be used in estimating removal area because of the elevated lead concentration (608 mg/kg) detected in the field duplicate.

Based on the review of analytical data, the sample results detailed above have been identified as having quality control deficiencies such that the data require qualification if, as indicated, these qualified results as well as all other sample data not listed above can be used for evaluating project objectives.

The Investigation-Derived Waste Letter Report, Laboratory Data Package, and Waste Profile for the investigation-derived waste generated from the 2016 Source Area Pre-Delineation Sampling at Load Line 2 FA are included in Appendix C.

2.2.3.3 Conclusions

The May 2016 pre-delineation sampling event was conducted in accordance with the *Letter Work Plan for Pre-Delineation Sampling of Lead-Contaminated Sediment in the Load Line 2 Functional Area* (Leidos 2016). The following conclusions were made using this newly obtained information and data:

- The high concentration of lead within drop inlet DB22 was confirmed; the drop inlet is a source of lead contamination to the downstream ditch line that can pose risk to ecological resources.
- There is no ecological risk in sediment within the ditch receiving sewer overflow from DB17 to DB20. The sediment was below railroad ballast, which reduces exposure to ecological resources. In addition, all concentrations in the ditch were below 400 mg/kg. No removal actions are necessary in this ditch line.
- The ditch line downstream of drop inlet DB22 [represented by sample locations LL2sd-654(st) to LL2sd-657(st)] had concentrations of lead that can pose risk to ecological resources. The lead concentration of 400 mg/kg is bound horizontally by the sample location furthest downstream (LL2sd-657); this concentration was present in one sample location [LL2sd-656(st)] at up to 2 ft bgs.

Table 2-1. Results from 2016 Pre-Delineation Sampling

Evaluation Area	Station	Sample ID	Sample Depth	Lead Concentration (mg/kg)
Ditch Line Receiving Outfall Discharge between DB17 and DB22	LL2sd-650(st)	LL2SD-650(ST)-2511-SD	0–0.5	23.6
	LL2sd-651(st)	LL2SD-651(ST)-2512-SD	0–0.5	19.2
	LL2sd-652(st)	LL2SD-652(ST)-2513-SD	0–0.5	112
	LL2sd-653(st)	LL2SD-653(ST)-2514-SD	0–0.5	259
		LL2SD-653(ST)-4095-FD		300
Ditch Line Downstream of Location DB22	LL2sd-654(st)	LL2SD-654(ST)-2515-SD	0–0.5	3,740
		LL2SD-654(ST)-2516-SD	0.5–1	1,580
		LL2SD-654(ST)-2517-SD	1–2	251
	LL2sd-655(st)	LL2SD-655(ST)-2518-SD	0–0.5	83.4
		LL2SD-655(ST)-4096-FD		608
		LL2SD-655(ST)-2519-SD	0.5–1	63.5
		LL2SD-655(ST)-2520-SD	1–1.25	103
	LL2sd-656(st)	LL2SD-656(ST)-2521-SD	0–0.5	1,100
		LL2SD-656(ST)-2522-SD	0.5–1	456
		LL2SD-656(ST)-2523-SD	1–2	965
	LL2sd-657(st)	LL2SD-657(ST)-2524-SD	0–0.5	396
		LL2SD-657(ST)-2525-SD	0.5–1	58.2
		LL2SD-657(ST)-2526-SD	1–2	40
Box Inlet of Load Line 2	LL2sd-308(st)	LL2SD-308(ST)-2527-SD	0–0.5	19,900J

Red = Exceeds CUG of 400 mg/kg for lead.
ID = Identification.
mg/kg = Milligrams per kilogram.



Photograph 2-1. Soil (or sediment) description for sample collected near Inlet DB-22



Photograph 2-2. Rail Road Ballast Removal via mini-excavator prior to sampling at LL2sd-653(st) (or DB20 Outfall)

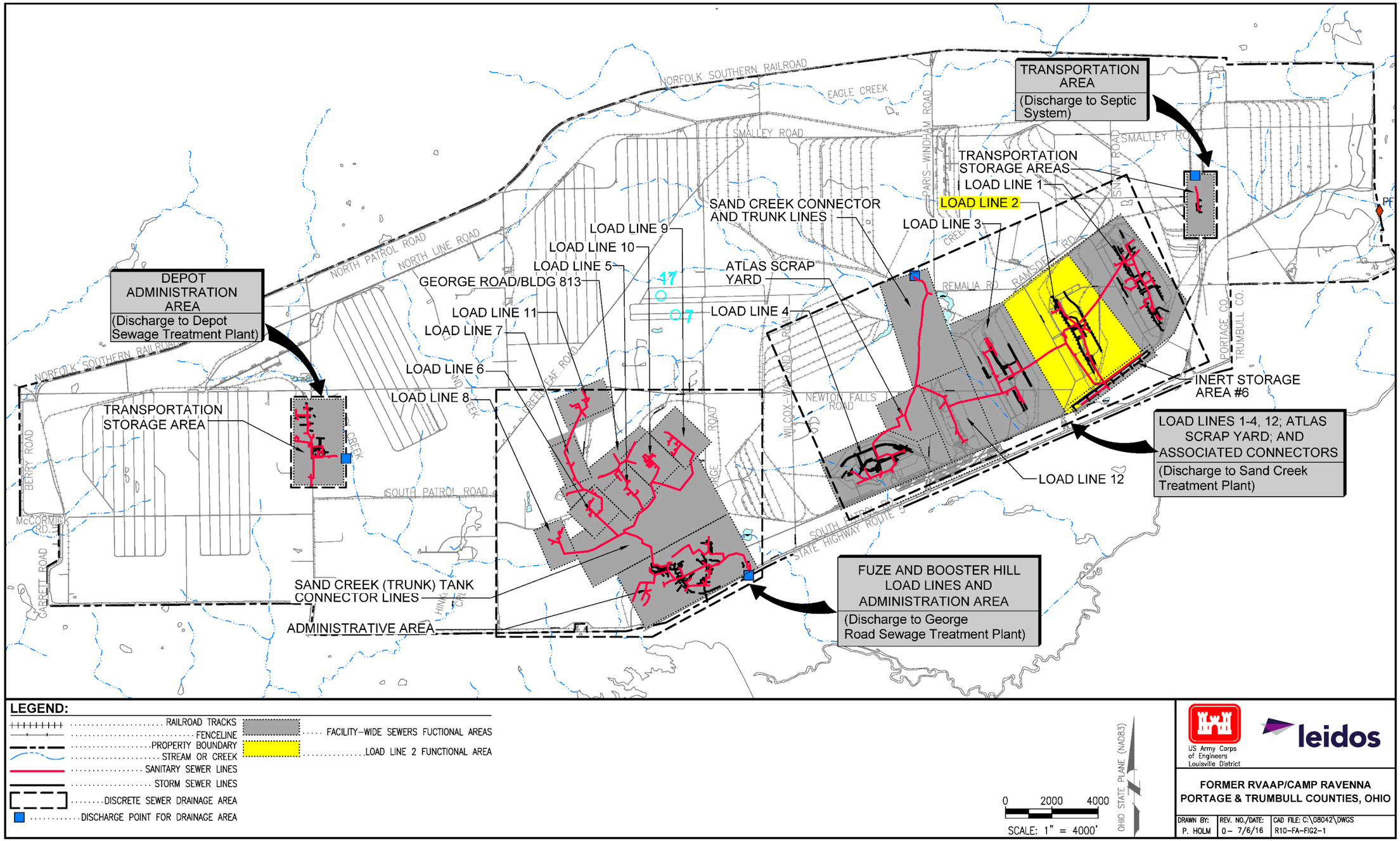


Figure 2-1. Facility-wide Sewers Drainage Networks and Functional Areas

THIS PAGE INTENTIONALLY LEFT BLANK.

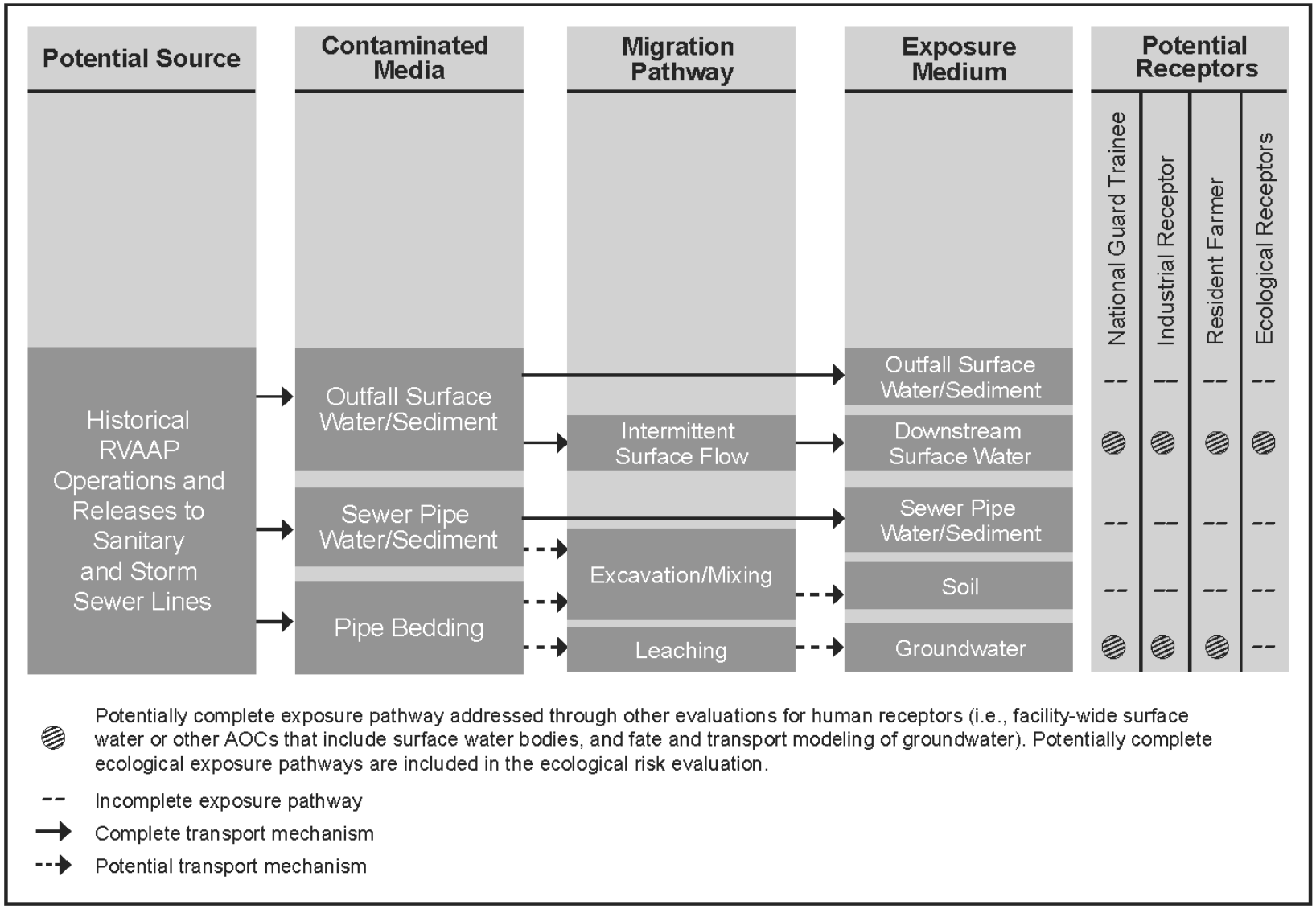


Figure 2-2. CSEM for Facility-wide Sewers

THIS PAGE INTENTIONALLY LEFT BLANK.

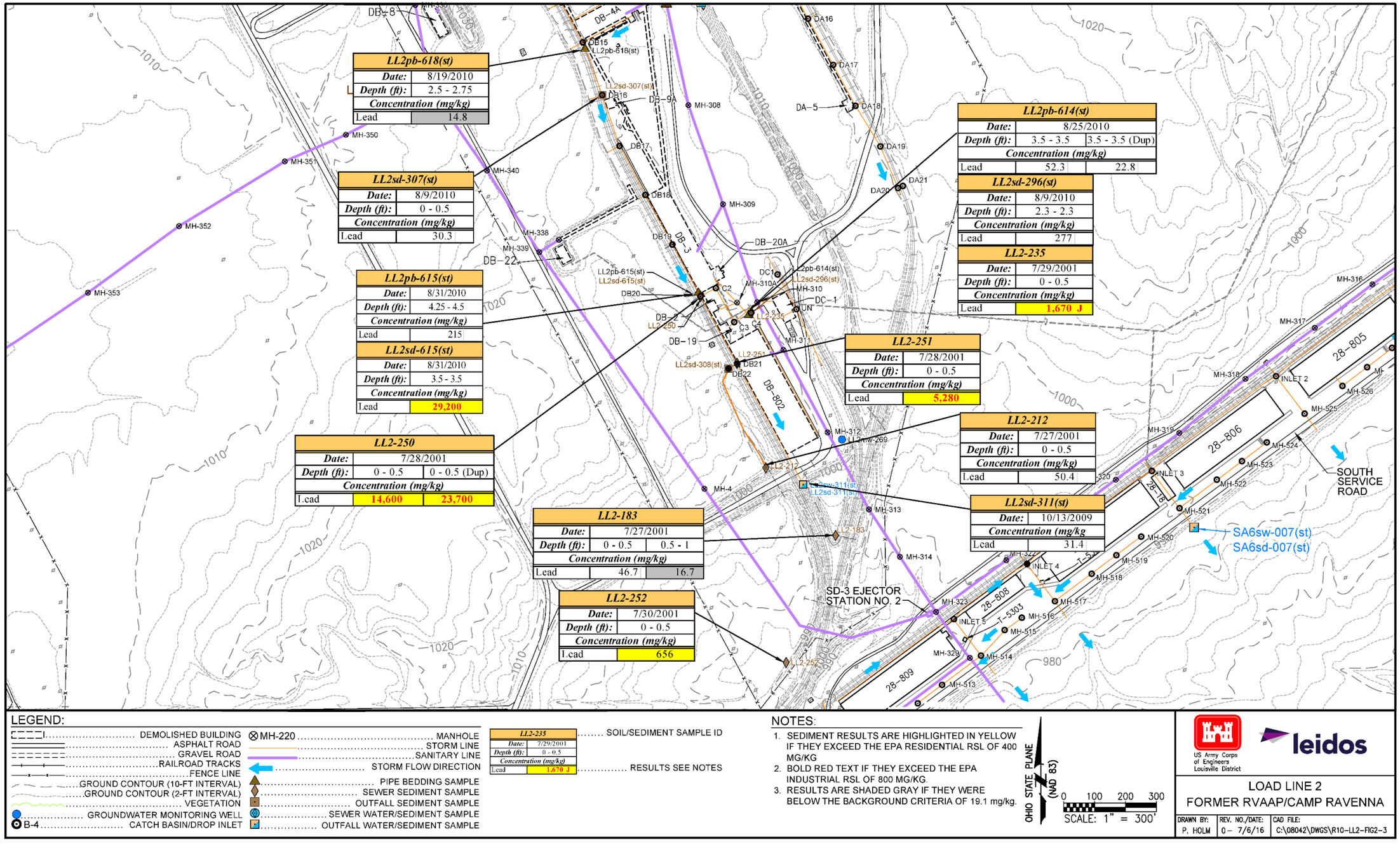


Figure 2-3. Sanitary and Storm Sewers at the Load Line 2 FA

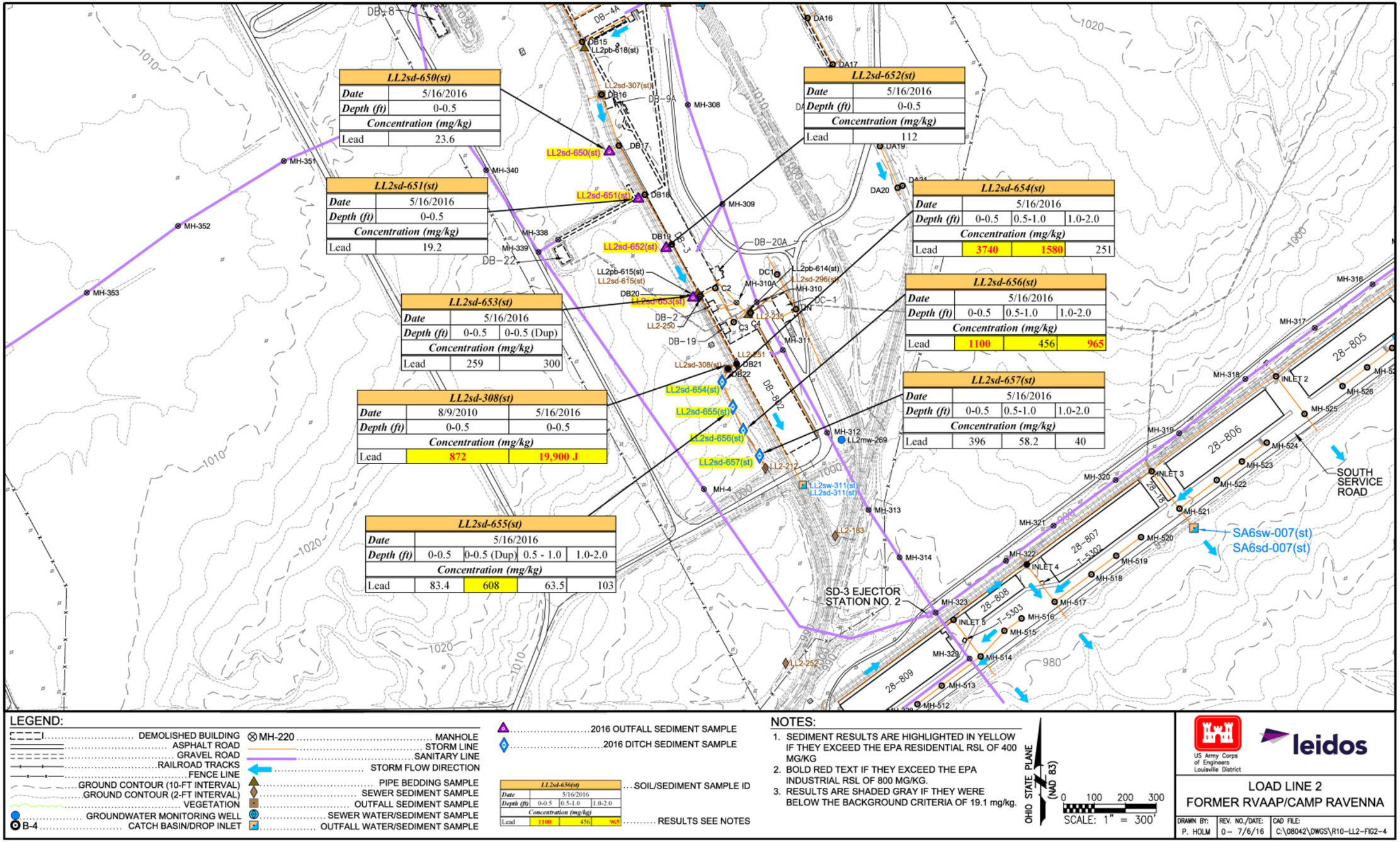


Figure 2-4. Pre-delineation Sediment Sampling Results for the Load Line 2 FA

3.0 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL SITE CHARACTERIZATION

3.1 SITE DESCRIPTION

The George Road Sewage Treatment Plant Mercury Spill AOC (Figure 3-1) is located south of the South Service Road and north of South Patrol Road and is about 0.5 miles east of the Administration Area. The George Road Sewage Treatment Plant was operated as part of the former activities associated with the facility. Administrative accountability for the AOC has been transferred to the Army National Guard who licenses the use of the AOC to OHARNG for military training. Currently, this AOC is not actively used by OHARNG for military training.

The inactive domestic sewage treatment plant was used to process domestic sewage from Load Lines 6 (RVAAP-15) and 7 (RVAAP-30), including influent from the Administration Area, Hospital, Family Housing, Power House No. 6, and the vehicle maintenance garage. The plant also received sludge from the Depot Sewage Treatment Plant (RVAAP-21). The George Road Sewage Treatment Plant was taken out of service in 1993 and was properly closed under Ohio National Pollutant Discharge Elimination System 1299 Permit Number 31000000BD. No records were discovered that document when plant operations began; however, a 1941 site schematic suggests that operations began circa 1941 (SAIC 2011).

The George Road Sewage Treatment Plant consisted of the comminutor building, two Imhoff tanks, two trickling filters, sludge beds contained within greenhouses, and a chlorine building. The Imhoff tanks were abandoned in place and filled with soil, the trickling filters were removed, and sludge from the drying beds was removed. The small brick comminutor and chlorine buildings remain. Figure 3-2 shows the Comminutor Building Plan, and Figure 3-3 shows the treatment plant piping plan.

3.2 SITE EVALUATION

3.2.1 Historical Records Review

According to the *Historical Records Review Report for the 2010 Phase I RI Services at CR Sites (9 Areas of Concern)* (SAIC 2011), the trickling filters had mercury seals that tended to leak. The trickling filters had drains under them that drained into a collection box; mercury was periodically collected after heavy flows and placed in a pint-sized jar for storage. Interviewees indicated elemental mercury contained in a pint-sized jar reportedly spilled into a floor drain in the comminutor building (SAIC 2011).

Utility plans indicate that liquids entering the comminutor building floor drain traveled through a 4-inch cast iron pipe to a 15-inch vitrified clay pipe (drain line) located along the northeast corner of the building (Figure 3-3). This 15-inch drain line formerly discharged into manhole MH-P1 (ECC 2015).

Figure 3-4 depicts where the elemental mercury was released and its possible subsequent flow direction.

Further investigation was recommended based on the findings of the historical records review, which recommended that the floor drain pipe and pipe trap within the comminutor be further inspected and soil samples be collected immediately surrounding the floor drain pipeline.

The historical records review indicated that potential contaminants in soil may represent a direct exposure pathway for human receptors under current and future Land Use. Surface and subsurface soil may represent a potential secondary source of contamination. Environmental sampling was recommended to confirm the presence or absence of any potential soil contamination.

3.2.2 Site Inspection

In 2012, a site inspection (SI) was initiated to investigate the historic mercury spill within the comminutor building, as documented in the *Site Inspection Report CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill* (USACE 2016b).

The SI established two decision units (DUs) at this AOC, as described below:

- DU01 consists of the floor drain inside the comminutor building, where a pint of elemental mercury had reportedly been spilled. The floor drain within the building connects directly above a P-trap and discharges to a 4-inch cast iron pipe. The 4-inch cast iron pipe connects to a 15-inch vitrified clay pipe. The 15-inch diameter pipe is approximately 22 ft in length and is plugged with brick and mortar at its discharging end. The 15-inch vitrified clay pipe formerly discharged flow eastwardly into the 10-inch vitrified clay storm water sewer line. The 10-inch pipe discharges to the outfall area south of the treatment plant.
- DU02 is located at the outfall area which is the drainage pipe discharge point located adjacent to the outfall headwall. During sewage treatment plant operations, this outfall served as the terminus of the former sanitary discharge. Currently, this outfall area is the discharge location for storm water runoff from the Administration Area which includes buildings, parking lots, rail road beds, and paved roads.

The following subsections discuss the objective, investigation, results, and recommendations of the SI.

3.2.2.1 Objective

The SI followed the steps below to determine the presence of potential contamination in soil and sediment at the AOC:

- Collect subsurface soil and wet sediment samples for laboratory analysis at CC-RVAAP-75.
- Identify whether site-related contaminants (SRCs) are present in the soil or sediment at the AOC. SRCs are identified following the process outlined in the *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant* (USACE 2010).
- Compare the maximum reported SRC concentrations to the most stringent Resident Receptor facility-wide cleanup goals (FWCUGs) at a hazard quotient (HQ) of 0.1, target risk (TR) of 1E-06.
- Complete a weight-of-evidence approach to further evaluate the SRCs.
- Provide a recommendation for either further investigation under CERCLA, in the form of an RI, if potential contamination has been identified, or no further action if no potential contamination has been identified at this AOC.

3.2.2.2 Investigation Activities and Results

The field investigation associated with the SI included a video survey, subsurface soil sampling, a sediment sample, and a drainage pipe deposit sample. Figure 3-5 presents the SI results and the cross-section of DU01 along the 15-inch drain line. Below summarizes the investigation activities and results.

Video Survey – A video survey was conducted of the 15-inch drain line; it indicated that the 15-inch drain line had been sealed with brick and mortar at its terminus at MH-P1. Brown deposits approximately 2 inches deep were observed throughout the 15-inch pipe, along with standing water approximately 2–3 inches deep (ECC 2015).

Subsurface soil sampling – Sampling activities included collecting nine subsurface soil samples from 2.75–13 ft bgs along the former flow path for mercury analysis. Mercury was not detected at concentrations exceeding the soil Resident Receptor FWCUG at an HQ of 0.1, TR of 1E-06 (2.27 mg/kg) in any of the subsurface soil samples collected at this AOC.

Sediment sampling – Wet sediment from the former drainage outfall area within DU02 was analyzed for mercury and RVAAP full-suite analytes (i.e., target analyte metals, explosives, propellants, semi-volatile organic compounds, volatile organic compounds, polychlorinated biphenyls, and pesticides). The mercury concentration of 0.47J was below the Resident Receptor FWCUG at an HQ of 0.1, TR of 1E-06 (2.27 mg/kg).

Drain pipe deposit sample – Mercury was detected within the drain line deposit sample at a concentration of 7.2 mg/kg, exceeding the Resident Receptor FWCUG at an HQ of 0.1, TR of 1E-06 (2.27 mg/kg).

3.2.2.3 Conclusions

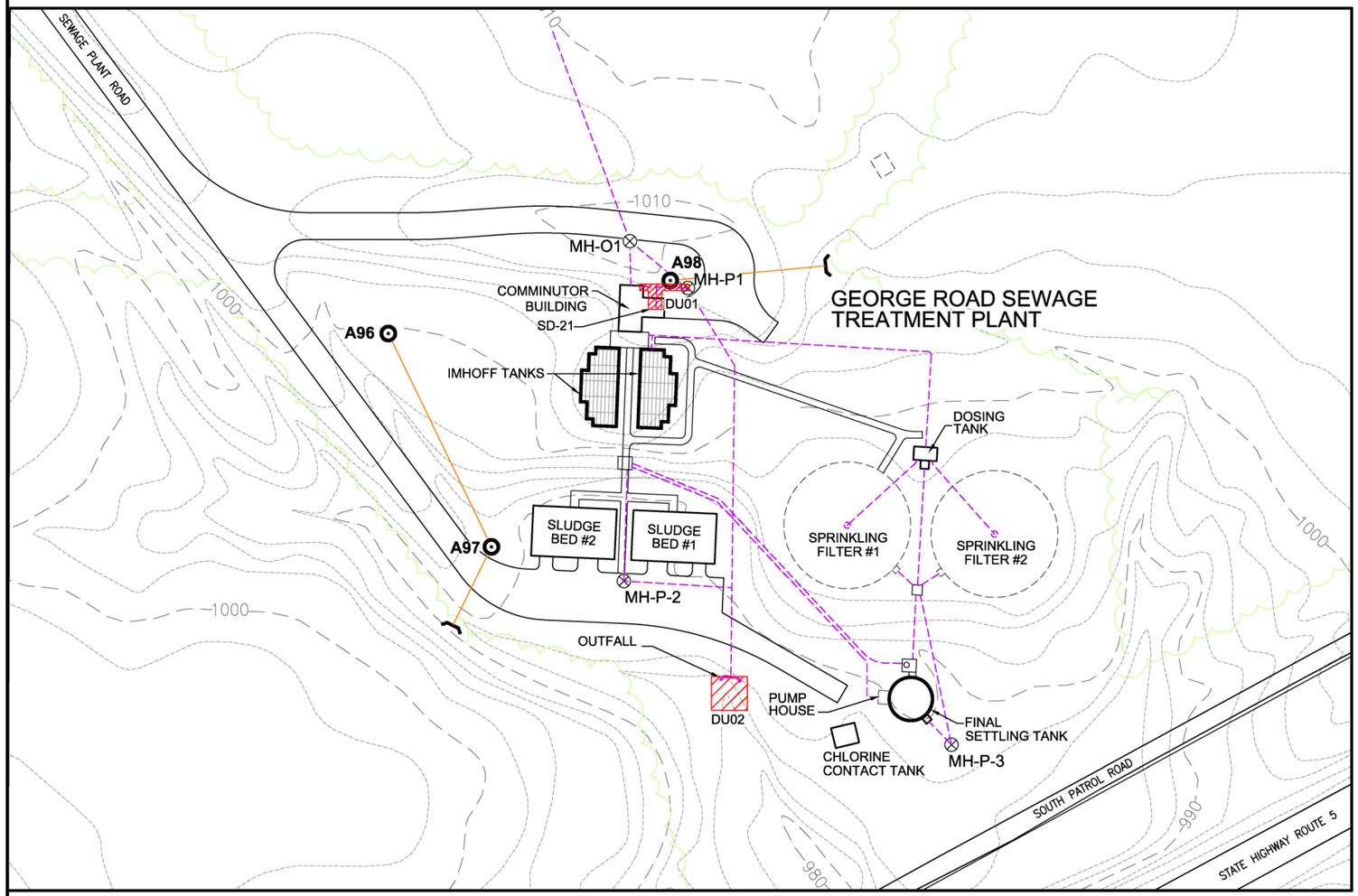
After the field activities were conducted and results were assessed, the SI made the following conclusions:

- Mercury was reported at a concentration of 7.2 mg/kg in the drainage pipe deposit sample located within the 15-inch vitrified clay pipe (drain line) that exceeds the Resident Receptor FWCUG at an HQ of 0.1, TR of 1E-06 (2.27 mg/kg). However, the mercury within the drainage deposit sample collected from within the enclosed 15-inch vitrified clay pipe (drain line) is not subsurface soil and therefore is not a potential source of contamination to the environment because there is no complete exposure pathway. This is supported by the following lines of evidence:
  - The end of the drain line is plugged with concrete (at the junction with manhole MH-P1) preventing any migration of the drainage pipe deposit, and this line is no longer used for drainage.
  - The SI sampling results of the subsurface soil surrounding and beneath the 15-inch vitrified clay pipe (drain line) do not contain any potential contamination from the estimated 0.5 grams of mercury contained in the drainage pipe deposit.
- The results of this SI indicate that the subsurface soil is not contaminated; therefore, soil is not a source of groundwater contamination at this AOC. Groundwater associated with CC-RVAAP-75 is currently being addressed separately under RVAAP-66, Facility-wide Groundwater.
- Removal of the drainage pipe, concrete plug, and all contents within will be addressed separately under RVAAP-67, Facility-wide Sewers.

The SI Report recommended no further action for CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill AOC. However, in a July 14, 2015 letter, Ohio EPA indicated:

> "Because mercury in the drain pipe deposits is present above the residential FWCUG of 7.2 mg/kg (for soil), steps must be taken to ensure the integrity of the concrete plug in the drain pipe and to ensure construction/excavation workers are not exposed should excavation activities ever occur. This can be accomplished by updating the Site Property Management Plan to include inspection of the concrete plug at regular intervals (such as every five years) and to require precautions during any excavation activities that may occur."

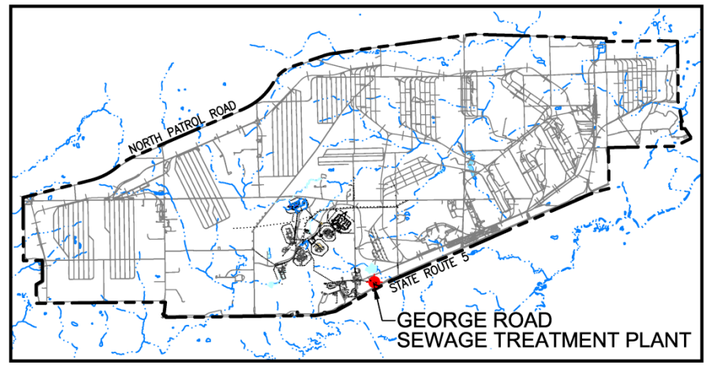
Accordingly, the Army has decided to implement this NTRCA to remove the mercury contamination within the 4-inch cast iron drain and 15-inch vitrified clay pipe at the George Road Sewage Treatment Plant Mercury Spill AOC and eliminate the potential risk to future potential users of this site.



CC-RVAAP-75: GEORGE ROAD SEWAGE TREATMENT PLANT

0 40 80 160

SCALE: 1" = 80'



RVAAP KEY MAP

0 1.25 2.5

SCALE:1"=2.5 MILES



GEORGE ROAD SEWAGE TREATMENT PLANT MAIN BUILDING

LEGEND:

- EXISTING BUILDING
- DEMOLISHED BUILDING
- ASPHALT ROAD
- GRAVEL ROAD
- RAILROAD TRACKS
- FENCE LINE
- VEGETATION
- GROUND CONTOUR (10-FT INTERVAL)
- GROUND CONTOUR (2-FT INTERVAL)
- B-4 STORM CATCH BASIN/DROP INLET
- MH-220 SANITARY MANHOLE
- STORM SEWER LINES
- SANITARY SEWER LINES
- DECISION UNIT

OHIO STATE PLANE (NAD 83)

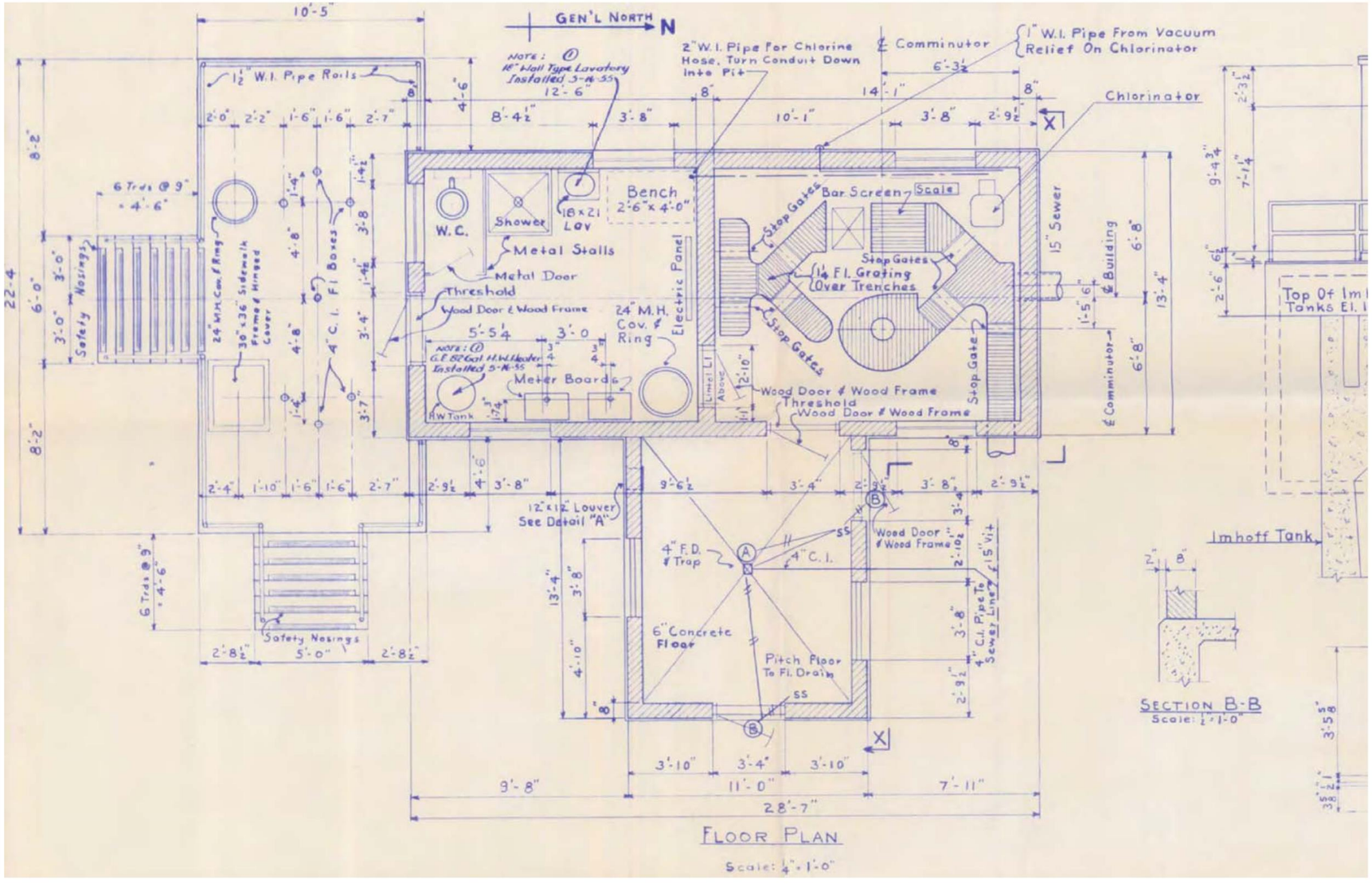
US Army Corps of Engineers Louisville District

leidos

GEORGE ROAD SEWAGE TREATMENT PLANT
FORMER RVAAP/CAMP RAVENNA

DRAWN BY:	REV. NO./DATE:	CAD FILE: C:\08042\DWGS
P. HOLM	0 – 7/5/16	R10-GEORGE-FIG3-1

Figure 3-1. George Road Sewage Treatment Plant Site Map



SOURCE:

Drawing from the Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern), Revision 0, Appendix I Maps/Drawings References (SAIC 2011b).

OHIO STATE PLANE (NAD 83)

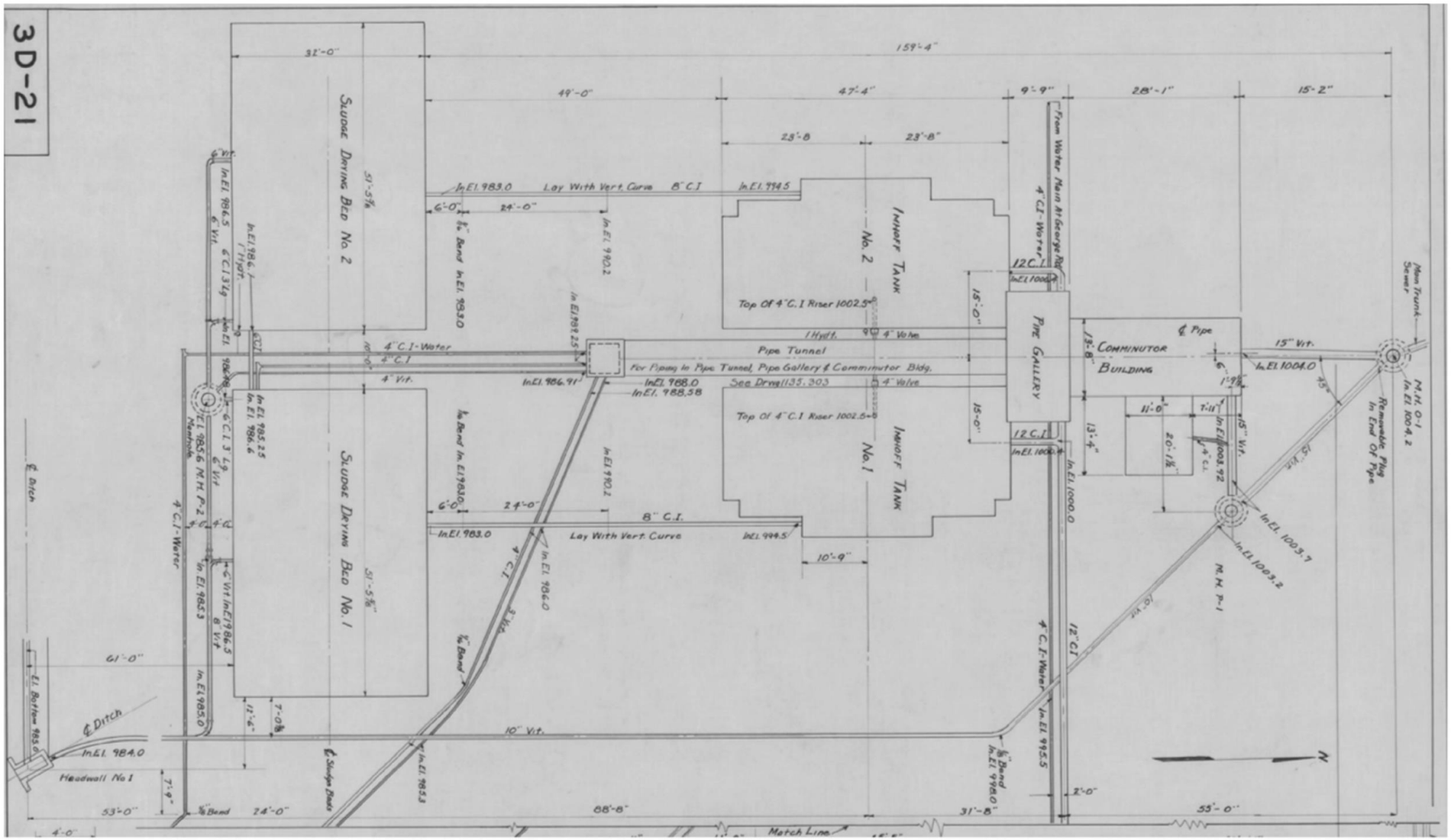
US Army Corps of Engineers Louisville District

leidos

GEORGE ROAD SEWAGE TREATMENT PLANT
FORMER RVAAP/CAMP RAVENNA

DRAWN BY:	REV. NO./DATE:	CAD FILE: C:\08042\DWGS
P. HOLM	0 – 7/6/16	R10-GEORGE-FIG3-2

Figure 3-2. Comminutor Building Plan



SOURCE:

Drawing from the Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern), Revision 0, Appendix I Maps/Drawings References (SAIC 2011b).

US Army Corps of Engineers Louisville District

leidos

GEORGE ROAD SEWAGE TREATMENT PLANT
FORMER RVAAP/CAMP RAVENNA

DRAWN BY:	REV. NO./DATE:	CAD FILE: C:\08042\DWGS
P. HOLM	0 – 7/22/16	R10-GEORGE-FIG3-3

Figure 3-3. George Road Treatment Plant Piping Plan

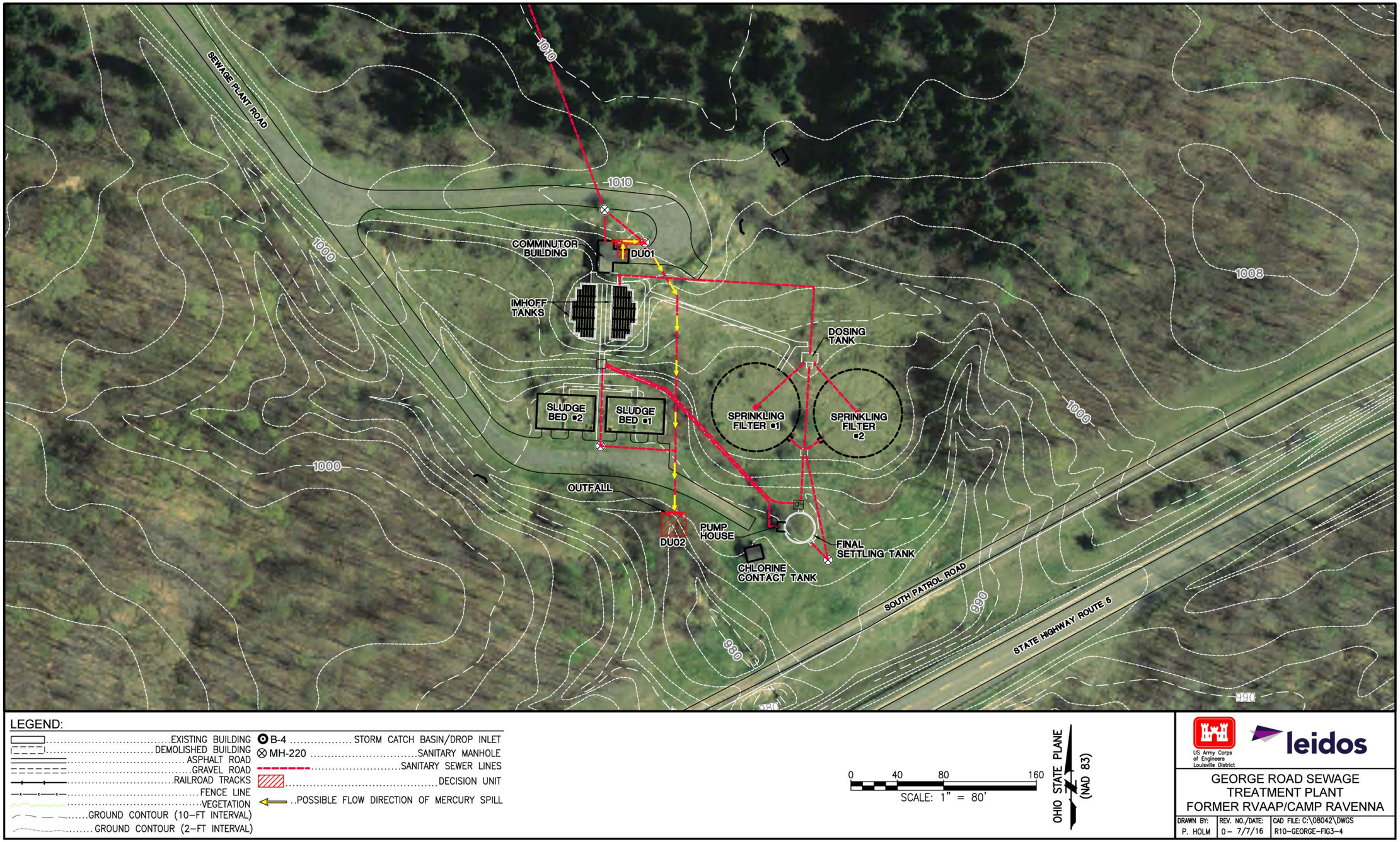


Figure 3-4. Elemental Mercury Spill Location and Possible Flow Direction

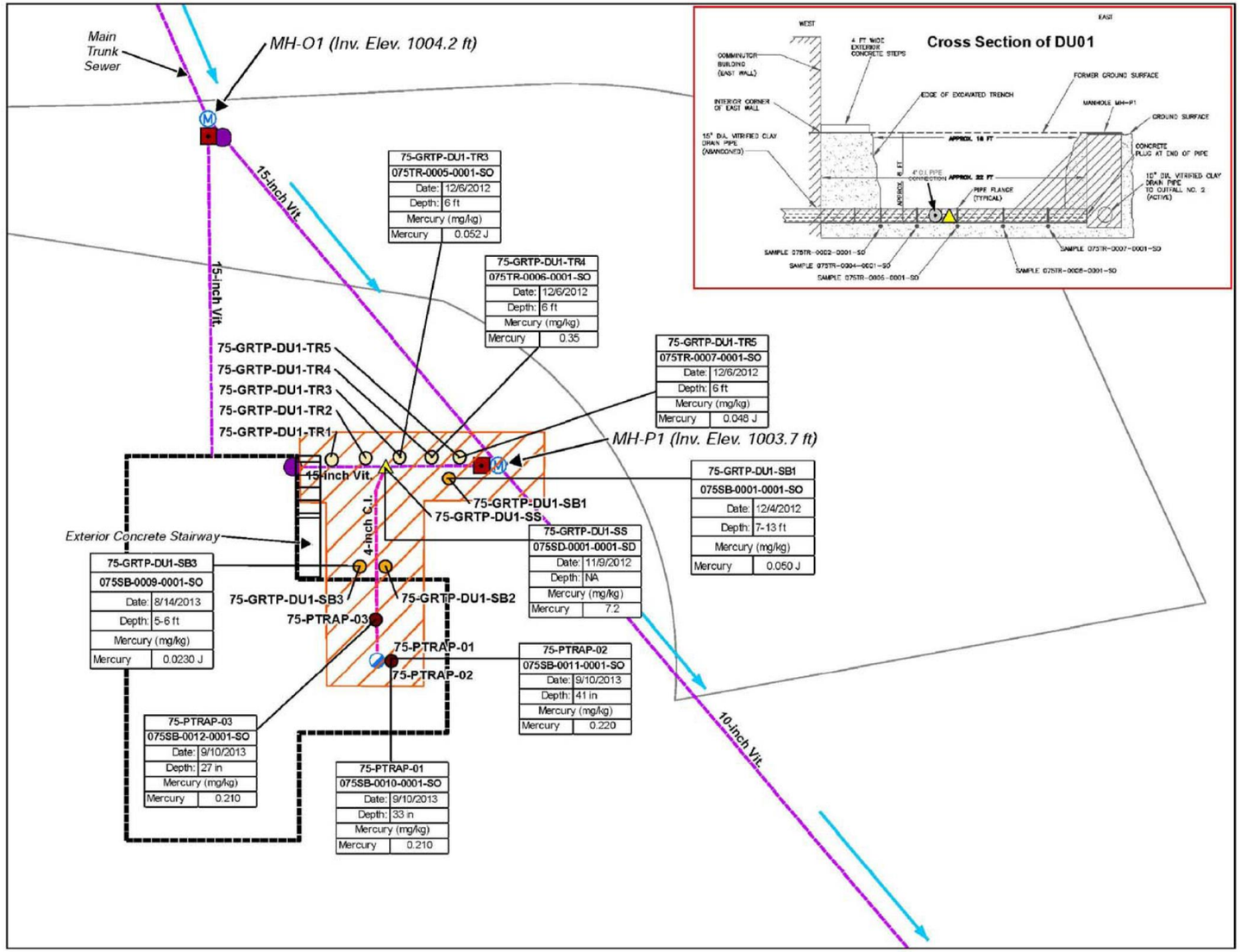


Figure 3-5. Site Investigation Results

THIS PAGE INTENTIONALLY LEFT BLANK

4.0 REMOVAL ACTION OBJECTIVES, CLEANUP GOALS, AND VOLUME CALCULATIONS

This section presents RAOs, appropriate cleanup goals (CUGs) for each AOC, and volume estimates of media requiring removal.

4.1 REMOVAL ACTION OBJECTIVE

RAOs specify the requirements that a removal action must fulfill in order to protect human health and the environment from contaminants and provide the basis for identifying removal action alternatives.

4.1.1 Load Line 2 FA RAO

The RAO for lead contamination at the Load Line 2 FA is to prevent adverse ecological effects from prior AOC activities and negative surface water impacts from contaminant migration from source media.

4.1.2 George Road Sewage Treatment Plant Mercury Spill AOC RAO

The RAO for mercury contamination at the George Road Sewage Treatment Plant Mercury Spill AOC is to remove mercury deposits contained within piping at concentrations above the Resident Receptor FWCUG of 2.27 mg/kg.

4.2 REMOVAL ACTION CLEANUP GOALS

The removal action CUG represents the media- and chemical-specific concentration below which remedial action is not required. The goal of the removal action is to treat or remove all impacted media with contaminant concentrations above the selected CUG.

4.2.1 Load Line 2 FA Cleanup Goal

The USEPA RSL for lead is 400 mg/kg for the Resident Receptor (Adult and Child). This RSL will serve as the CUG for the selected removal action at the Load Line 2 FA.

4.2.2 George Road Sewage Treatment Plant Mercury Spill AOC Cleanup Goal

The Resident Receptor (Child) FWCUG for mercury in soil is 2.27 mg/kg. This FWCUG will serve as the CUG for the selected removal action at the George Road Sewage Treatment Plant Mercury Spill AOC.

4.3 VOLUMES OF MEDIA REQUIRING REMOVAL

4.3.1 Load Line 2 FA Removal Volume

Figure 4-1 depicts the removal areas required at the Load Line 2 FA and the proposed sample scheme up to and around sample location LL2-252. The volume estimates do not assume that the additional proposed sample scheme will result in additional sediment removal. However, if sample results exceed the CUG, additional sediment removal will be performed.

The volume of lead-impacted sediment identified for removal at the Load Line 2 FA is presented in Table 4-1 and the extent of storm sewer pipe and culvert pipe removal is presented in Table 4-2. These estimates are based upon results of pre-delineation sampling, as discussed in Section 2.2.3. The approximate volume of outfall sediment with lead at concentrations above the CUG is 136 yd^3 (ex situ). The extent of storm sewer pipe to be removed is approximately 250 linear ft, and the extent of culvert pipe to be removed is 32 linear ft.

4.3.2 George Road Sewage Treatment Plant Mercury Spill AOC Removal Volume

The extent of piping identified for removal at the George Road Sewage Treatment Plant Mercury Spill AOC, as presented on Figure 4-2 and in Table 4-3, is 20 linear ft of 15-inch vitrified clay pipe and 18 linear ft of 4-inch cast iron pipe. Once the piping is removed, the excavated soil will be used to backfill the trench.

Table 4-1. Estimated Sediment Volumes Requiring Removal at Load Line 2 FA

Media	Length (ft)	Width (ft)	Depth (ft bgs)	In-situ		In-situ with Constructability[a]		Ex-situ[a,b]	
				Volume (ft^3)	Volume (yd^3)	Volume (ft^3)	Volume (yd^3)	Volume (ft^3)	Volume (yd^3)
Ditch Sediment [DB22 to LL2sd-657(st)]	325	4	2	2600	96	2990	111	3588	133
Sediment near DB-20 [LL2-250 and LL2sd-615(st)]	4	4	4	64.0	2.3	73.6	2.7	88.3	3.3
			Total	**2664**	**98**	**3064**	**114**	**3676**	**136**

[a]Includes 15% constructability factor.
[b]Includes 20% swell factor.
bgs = Below ground surface.
FA = Functional area.
ft^3 = Cubic feet.
ft = Feet.
yd^3 = Cubic yard.

Table 4-2. Estimated Piping Removal at Load Line 2 FA

Media	Length of Pipe (ft)	Diameter of Pipe (inches)	Weight of Pipe (tons)	Depth to top of Pipe (ft bgs)	Trench Depth (ft bgs)	Trench Width (ft)
Storm sewer pipe between DB-20 and DB-21	250	10	5.6	4	4-5	3
Culvert pipe between DB-21 and DB-22	32	18	2.3	4	4 -5	3

Note: Assume 45 lbs/ft for the 10-inch (5.6 tons) and 141 lbs/ft for 18-inch (2.3 tons) vitrified clay pipe. Assume approximately 1 ton of sediment contained in the pipe. Weight of pipe including sediment for off-site disposal = 8.9 tons.

bgs = Below ground surface.

ft = Feet.

Table 4-3. Estimated Piping Removal at George Road Sewage Treatment Plant Mercury Spill AOC

Media	Length of Pipe (ft)	Diameter of Pipe (inches)	Weight of Pipe (tons)	Depth to top of Pipe (ft bgs)	Trench Depth (ft bgs)	Trench Width (ft)
Pipe containing mercury	20	15	0.9	6	6 -7	3
deposits	18	4	0.04	6	6 – 7	3

Note: Assume 90 lbs/ft for 15-inch (0.9 tons) vitrified clay pipe and 13 lbs/ft for 4-inch (0.04 tons) cast iron pipe. Assume approximately 1 ton of sediment contained in the pipes. Weight of pipe including sediment for off-site disposal = 2 tons.

bgs = Below ground surface.

ft = Feet.

THIS PAGE INTENTIONALLY LEFT BLANK

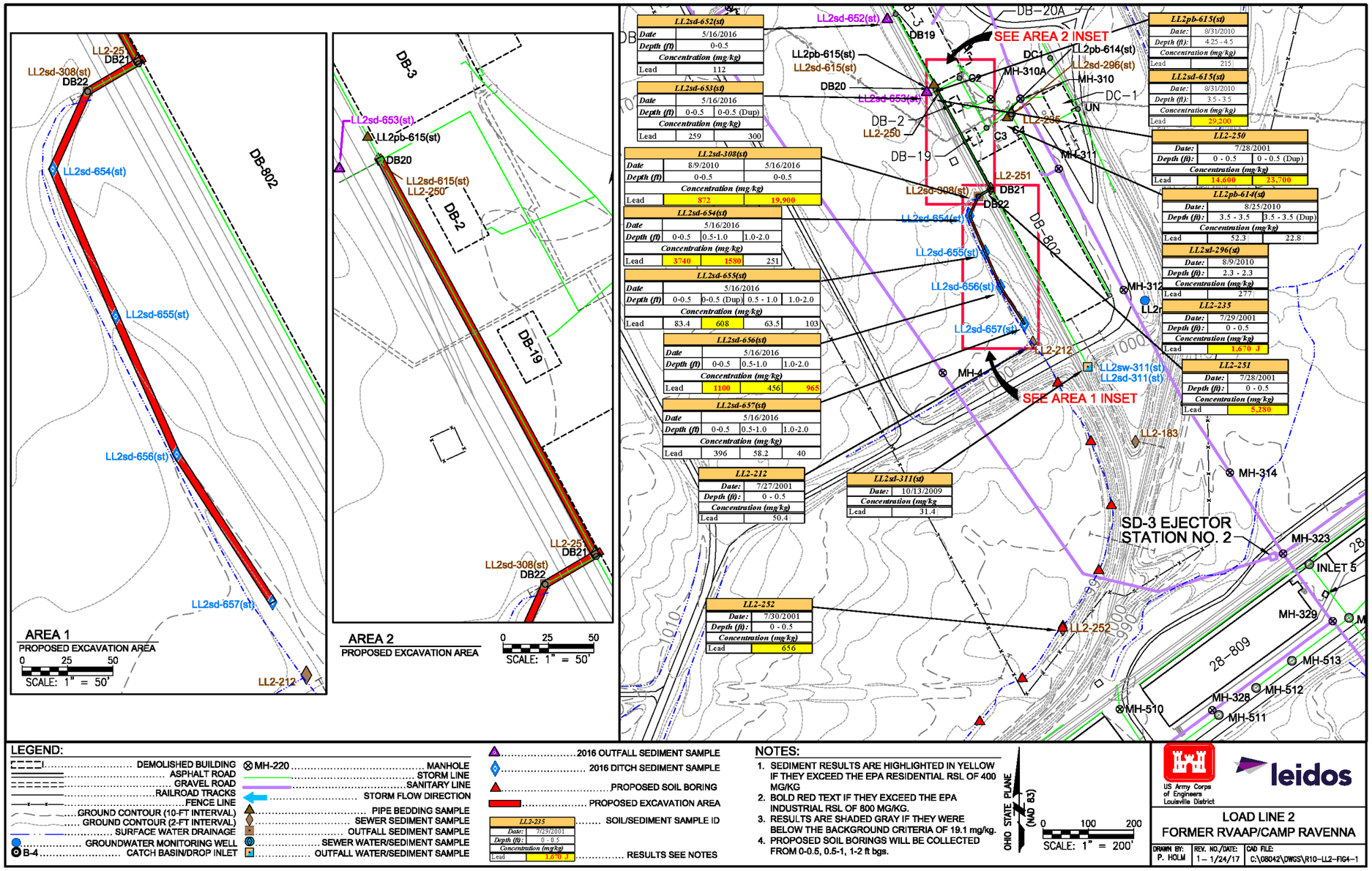


Figure 4-1. Proposed Characterization Sampling Scheme and Removal Area at Load Line 2 Functional Area

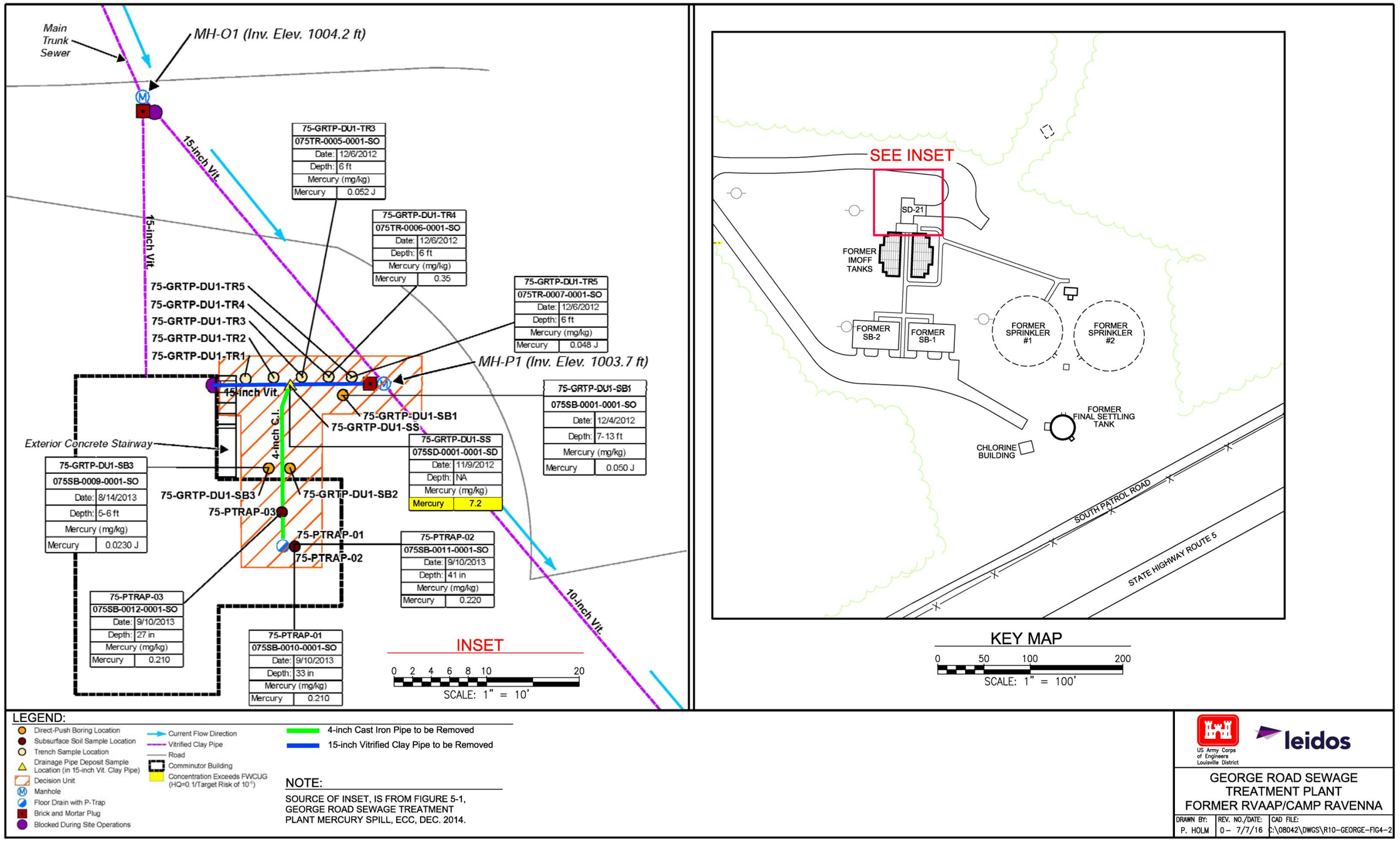


Figure 4-2. Proposed Removal Area at George Road Sewage Treatment Plant Mercury Spill AOC

5.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Applicable or relevant and appropriate requirements (ARARs) include those federal and state regulations that are designed to protect the environment. Applicable requirements are "those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site" (40 CFR 300.5). USEPA has stated in the NCP that applicable requirements are those requirements that would apply if the response action were not taken under CERCLA.

Relevant and appropriate requirements are "those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting law that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site such that their use is well suited to the particular site" (40 CFR 300.5).

In the absence of federal- or state-promulgated regulations, there are many criteria, advisories, guidance values, and proposed standards that are not legally binding but may serve as useful guidance for setting protective cleanup levels. These are not potential ARARs but are to-be-considered guidance [40 CFR 300.400(g)(3)].

CERCLA remedial response actions at an AOC must comply only with the substantive requirements of a regulation [CERCLA Section 121(e)]. Substantive requirements are those that pertain directly to the actions or conditions at an AOC, while administrative requirements facilitate their implementation. USEPA recognizes that certain administrative requirements (e.g., consultation with state agencies and reporting) are accomplished through state involvement and public participation. These administrative requirements should also be observed if they are useful in determining cleanup standards at the AOC (55 CFR 8757).

Although remedial actions for AOCs at National Priorities List sites must comply only with the substantive requirements of federal or state environmental regulations, the Ohio Revised Code does not provide a similar permit waiver for actions conducted under the Ohio EPA Remedial Response Program Policy. The Ohio EPA's Division of Emergency and Remedial Response (DERR) Policy DERR-00-RR-034 states, "it has been DERR's policy to require responsible parties to acquire and comply with all necessary permits, including the substantive and administrative requirements." However, a DFFO was entered into on June 10, 2004, that provided certain exemptions from the Ohio Administrative Code (OAC) administrative requirements and required groundwater monitoring and remediation at RVAAP to be performed under the CERCLA process. The DFFO includes provisions for compliance resulting in the potential negation of all provided exemptions within the DFFO in the event non-compliant activities are identified.

USEPA classifies ARARs as chemical-, action-, and location-specific to provide guidance for identifying and complying with ARARs (USEPA 1988).

- Chemical-specific ARARs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, allow numerical values to be established. These values establish the acceptable amount or concentration of a chemical that may be found in, or discharged to, the ambient environment.
- Action-specific ARARs are rules, such as performance or design or other activity-based rules, which place requirements or limitations on actions.
- Location-specific ARARs are rules that place restrictions on the concentration of hazardous substances or the conduct of activities solely because they occur in special locations.

5.1 CHEMICAL-SPECIFIC ARARS

No chemical-specific ARARs have been identified for lead in storm sewer outfall sediment or mercury in pipe deposits.

5.2 ACTION-SPECIFIC ARARS

Under the no action alternative, no activities would be conducted at the AOC; therefore, no action-specific ARARs are identified for this alternative.

Shipments of contaminated soils will comply with federal, state, and local rules, laws and regulations. In addition to the identified ARARs for the selected action, the Army will comply with requirements applicable to off-site actions, such as Resource Conservation and Recovery Act (RCRA) hazardous waste transportation requirements under OAC 3745-52-20 to OAC 3745-52-33, and off-site treatment prior to land disposal as required by RCRA's land disposal restrictions (LDRs) under OAC 3745-270, including alternative LDR treatment standards for contaminated soil under OAC 3745-270-49.

Implementing an excavation and disposal alternative triggers potential ARARs associated with land disturbance and emission controls. OAC 3745-15-07 requires that nuisance air pollution emissions be controlled. This includes controlling potential fugitive dust from excavation activities associated with the potential removal of the pipes/inlets/manholes. In addition, any construction (i.e., soil disturbance activities that would encompass over 1 acre) would trigger the storm water requirements found at 40 CFR Part 450. These requirements mandate that erosion and sedimentation control measures be designed and implemented to control erosion and sediment runoff.

Because excavation would include generating and managing contaminated media, RCRA requirements would be considered potential ARARs for this activity. The RCRA requirements mandate that a generator must determine whether a material is (or contains in the case of environmental media) hazardous waste under OAC 3745-52-11. If a material is determined to be or contain a listed hazardous waste, or exhibits a hazardous waste characteristic, additional management requirements under RCRA must be followed as an ARAR under CERCLA.

These requirements include how hazardous waste is stored, treated, transported, and disposed. These RCRA requirements are generally not considered to be chemical-specific ARARs because they do not relate directly to the degree of cleanup or to specific chemicals. In addition to the substantive requirements associated with managing and storing material that is also RCRA hazardous waste (or found to contain such waste), some RCRA requirements prescribe standards for disposing hazardous material, including LDRs prohibiting disposal of specific chemicals until they are treated to a specified level or by a specific treatment technology and minimum technical requirements for land disposal units.

USEPA cautions that LDRs should not be used to determine site-specific cleanup levels (USEPA 2002). LDRs require appropriate treatment of RCRA hazardous waste that is to be disposed to minimize short- and long-term threats to human health or the environment, based on available technology. Performing treatment to meet LDR standards is different from the CERCLA approach to remediation, which analyzes risk and then develops cleanup standards based on the risk present; this may result in cleanup levels that are different from those of a risk-based approach. Nevertheless, if RCRA hazardous waste is generated from the CERCLA action and is disposed on site, the material must meet the established LDR.

In order for LDRs to be triggered as potential ARARs, RCRA hazardous waste must be present. This requires: (1) the waste material must contain contaminants that derive from RCRA-listed waste or exhibit a characteristic of RCRA hazardous waste, and (2) the waste material is managed in a way that "generates" hazardous waste. Several methods of waste material management that do not "generate" hazardous waste, and so do not trigger LDRs, are available for use. These methods include using the AOC approach, using a staging pile, using a storage or treatment corrective action management unit, or using a temporary unit.

If waste material is managed in a manner that generates hazardous waste, such as removing it to an aboveground container and then redepositing the material within the land unit for disposal, then LDRs become potential ARARs. LDRs are assigned to the waste when it is removed from the unit under an AOC approach or when the waste material is excavated and lifted out of the unit. Potential LDR ARARs in Ohio are variances from treatment standards in OAC Section 3745-270-44, LDR standards for contaminated debris in OAC Section 3745-270-45, Universal Treatment Standards (UTS) in OAC Section 3745-270-48, and Alternative LDR Treatment Standards for Contaminated Soil in OAC Section 3745-270-49.

Ohio has adopted the alternative soil treatment standards promulgated by USEPA in its Phase IV LDR rule, effective August 1998. The rules provide that if RCRA hazardous waste is present, the material must meet one of two sets of LDRs before being disposed of in a land unit: (1) the UTS, or (2) the contaminated soil (technology-based treatment) standards promulgated in Phase IV of the LDRs, whichever is greater. Or, if a generator so chooses, he may use the generic treatment standards in OAC Section 3745-270-40 which apply to all hazardous waste. Only the alternative soil treatment standards are explained in this document. This alternative treatment standard may be relevant to the sediment in the piping since the regulatory definition of soil includes soil mixtures with liquid (i.e., sewer sediment).

Under the alternative soil treatment standards, all soil subject to treatment must be treated as follows:

1. For non-metals, treatment must achieve a 90% reduction in total constituent concentration (i.e., the primary constituent for which the waste is characteristically hazardous as well as for any organic or inorganic chemical underlying hazardous constituent), subject to item three below.
2. For contaminants in soil (e.g., inorganic chemicals, carbon disulfide, cyclohexanone, and methanol), treatment must achieve a 90% reduction in constituent concentrations as measured in leachate from the treated media [tested according to the toxicity characteristic leaching procedure (TCLP)] or a 90% reduction in total constituent concentrations (when an inorganic chemical removal treatment technology is used), subject to item three below.
3. When treating any constituent subject to treatment to a 90% reduction standard would result in a concentration less than 10 times the UTS for that constituent, treatment to achieve constituent concentrations less than 10 times the UTS is not required. This is commonly referred to as "90% capped by 10xUTS."
4. USEPA and Ohio EPA have established a site-specific variance from the soil treatment standards, which can be used when treatment to concentrations of hazardous constituents higher than those specified in the soil treatment standards minimizes short- and long-term threats to human health and the environment. In this way, on a case-by-case basis, risk-based LDR treatment standards approved through a variance process could supersede the soil treatment standards. Any variance granted cannot rely on capping, containment, or other physical or institutional controls.

Treatment standards are similar to LDR standards for contaminated soil, although alternative and adjusted standards may be approved or required by the Ohio EPA Director, as long as the adjusted standard is protective of human health and the environment.

In the event solid waste material is found to be contaminated but not a RCRA hazardous waste, management and disposal of this material would be subject to the requirements associated with managing and disposing solid waste within the state of Ohio. The OAC Section 3745-27-05 requirements would be potential ARARs for disposing non-hazardous contaminated waste material generated during excavation and subsequent disposal at an off-site location.

Potential action-specific ARARs for the two AOCs are provided in Table 5-1.

5.3 LOCATION-SPECIFIC ARARS

Location-specific requirements include those established for potential remedial activities conducted within wetlands, within a floodplain area, or with respect to threatened and endangered species. Generally, for wetlands and floodplains, rules require alternatives to remedial activity within the sensitive area be pursued; if that is not feasible, adverse effects from any actions taken within the sensitive area must be mitigated to the extent possible. These requirements do not relate to specific chemicals nor do they further change the degree of cleanup in the sense of protecting human health or the environment from the effects of harmful substances. Rather, their purpose is to protect the

sensitive areas (i.e., ecological areas or areas that include cultural resources and/or sites of historical/archeological significance) to the extent possible. Under CERCLA Section 121(d), relevance and appropriateness are related to the circumstances presented by the release of hazardous substances, with the goal of attaining a degree of cleanup and control of further release that ensures protection of human health and the environment.

Potential location-specific ARARs for the two AOCs are provided in Table 5-2.

In addition to the requirements identified as ARARs, any action taken by the federal government must be conducted in accordance with requirements established under the National Environmental Policy Act, Endangered Species Act, National Historic Preservation Act, and federal and state wetlands and floodplains construction and placement of material considerations, even though these laws and rules do not establish standards, requirements, limitations, or criteria relating to the degree of cleanup for chemicals remaining on site at the close of the response actions.

Table 5-1. Potential Action-specific ARARs

Media and Citation	Description of Requirement	Potential ARAR Status	Standard
Prohibition of air pollution nuisances (e.g., fugitive dust) OAC Section 3745-15-07	These rules prohibit a release of nuisance air pollution that endanger health, safety, or welfare of the public or cause personal injury or property damage.	Applies to any activity that could result in the release of a nuisance air pollutant. This would include dust from excavation or waste management processes.	Any person undertaking an activity is prohibited from emitting nuisance air pollution.
Storm water requirements at construction sites 40 CFR Part 450	These rules require that storm water controls be employed at construction sites that exceed 1 acre.	Applies to any construction activity that exceeds 1 acre.	Persons undertaking construction activities (including grubbing and land clearing) at an AOC where the construction footprint is over 1 acre must design and implement erosion and runoff controls.
Generation of contaminated waste material (i.e., soil, sediment, or debris) OAC Section 3745-52-11	These rules require that a generator determine whether a material generated is a hazardous waste.	Applies to any material that is or contains a solid waste. Must be characterized to determine whether the material is or contains a hazardous waste.	Any person that generates a waste as defined must use prescribed methods to determine if waste is considered characteristically hazardous.
Management of contaminated waste material that is or contains a hazardous waste OAC Sections 3745-52-30 through 3745-52-34	These rules require that hazardous waste is properly packaged, labeled, marked, placarded, and accumulated on site pending on-site or off-site disposal.	Applies to any hazardous waste, or media containing a hazardous waste, that is generated from on-site activities.	All hazardous waste must be accumulated in a compliant manner that includes proper packaging, labeling, marking, and placarding in accordance with the specified regulations. This includes inspecting containers or container areas where hazardous waste is accumulated on site.
Acquisition and use of manifests for hazardous waste shipments to off-site treatment, storage, or disposal facilities OAC Sections 3745-52-20 through 3745-52-23	These rules require that a Uniform Hazardous Waste Manifest be used for any off-site shipment of hazardous waste.	Applies to any shipment of hazardous waste to an off-site facility for treatment, storage, or disposal.	Requires a generator who transports or offers for transportation hazardous waste for off-site treatment, storage, or disposal to prepare a uniform hazardous waste manifest.

Table 5-1. Potential Action-specific ARARs (continued)

Media and Citation	Description of Requirement	Potential ARAR Status	Standard
Soil contaminated with RCRA hazardous waste OAC Section 3745-270-48 UTS OAC Section 3745-270-49 Soil	These rules prohibit land disposal of RCRA hazardous waste subject to them, unless the waste is treated to meet certain standards that are protective of human health and the environment. Standards for treating hazardous-waste--contaminated soil prior to disposal are set forth in the two cited rules. Using the greater of either technology-based standards or UTS is prescribed.	LDRs apply only to RCRA hazardous waste. These rules are considered for ARAR status only upon generation of a RCRA hazardous waste. If any soil is determined to be RCRA hazardous and will be disposed of on site, this rule is potentially applicable to disposal of the soil. These rules may be relevant to the sewer sediment since the regulatory definition of soil includes soil mixtures with liquid (i.e., sediment).	All soil subject to treatment must be treated as follows: 1. For non-metals, treatment must achieve a 90% reduction in total constituent concentration (i.e., the primary constituent for which the waste is characteristically hazardous as well as for any organic or metal UHC), subject to three below. 2. For metals, carbon disulfide, cyclohexanone, and methanol, treatment must achieve a 90% reduction in constituent concentrations as measured in leachate from the treated media (tested according to the TCLP) or a 90% reduction in total constituent concentrations (when a metal removal treatment technology is used), subject to three below. 2. When treating any constituent subject to treatment to a 90% reduction standard would result in a concentration less than 10 times the UTS for that constituent, treatment to achieve constituent concentrations less than 10 times the UTS is not required. This is commonly referred to as “90% capped by 10xUTS.”

Table 5-1. Potential Action-specific ARARs (continued)

Media and Citation	Description of Requirement	Potential ARAR Status	Standard
Debris Contaminated with RCRA Hazardous Waste OAC Section 3745-270-45	These rules prescribe conditions and standards for land disposal of debris contaminated with RCRA hazardous waste. Debris subject to this requirement for characteristic RCRA contamination that no longer exhibits the hazardous characteristic after treatment does not need to be disposed of as a hazardous waste. Debris contaminated with listed RCRA contamination remains subject to hazardous waste disposal requirements.	If RCRA hazardous debris is disposed of on site, these rules are potentially applicable to disposal of the debris.	Standards are extraction or destruction methods prescribed in OAC Section 3745-270-45. Treatment residues continue to be subject to RCRA hazardous waste requirements.
Soil/Debris Contaminated with RCRA Hazardous Waste – Variance OAC Section 3745-270-44	The Ohio EPA Director will recognize a variance approved by the USEPA from the alternative treatment standards for hazardous contaminated waste material.	Potentially applicable to RCRA hazardous waste material that is generated and placed back into a unit and that will be land disposed of on site.	Where the treatment standard is expressed as a concentration in a waste and the waste cannot be treated to the specific level, the generator may petition for a variance. A site-specific variance from the soil treatment standards can be used when treating concentrations of hazardous constituents greater higher than those specified in the soil treatment standards minimizes short- and long-term threats to human health and the environment. In this way, on a case-by-case basis, risk-based LDR treatment standards approved through a variance process could supersede the soil treatment standards.
Solid waste material that is contaminated but not a hazardous waste for disposal. OAC Section 3745-27-05	Establishes standard for disposal of solid waste within the state of Ohio.	Potentially applicable to contaminated solid waste material disposed of offsite under state solid waste disposal requirements.	Establishes allowable methods of solid waste disposal and prohibits management by open burning or dumping.

AOC = Area of concern.
ARAR = Applicable or Relevant and Appropriate Requirements
CFR = Code of Federal Regulations.
LDR = Land disposal restrictions.
OAC = Ohio Administrative Code.
RCRA = Resource Conservation and Recovery Act.
TCLP = Toxicity characteristic leaching procedure.
UHC = Underlying hazardous constituent.
USEPA = U.S. Environmental Protection Agency.
UTS = Universal Treatment Standard.

Table 5-2. Location-specific ARARs

Media and Citation	Description of Requirement	Potential ARAR Status	Standard
Presence of wetlands as defined in 10 CFR 1022.4(v).	Establishes the requirements to evaluate any action taken within a wetland to ensure that impacts are minimized or averted as required in 10 CFR 1022.3 (a) – (d).	Potentially applicable for activities that result in the impact of a wetland as defined.	To the extent possible, avoid the long- and short-term adverse effects associated with destruction, occupancy, and modification of wetlands. Measures to mitigate adverse effects of actions in a wetland include, but are not limited to, minimum grading requirements, runoff controls, design and construction constraints, and protection of ecologically sensitive areas in 10 CFR 1022.12(a)(3). To the extent practicable, take action to minimize destruction, loss, or degradation of wetlands and to preserve, restore, and enhance the nature and beneficial value of wetlands. Potential effects of any new construction in wetlands that are not in a floodplain shall be evaluated to identify and, as appropriate, implement alternative actions that may avoid or mitigate adverse impacts on wetlands.

ARAR = Applicable or Relevant and Appropriate Requirements.
CFR = Code of Federal Regulations.

THIS PAGE INTENTIONALLY LEFT BLANK.

6.0 IDENTIFICATION OF REMOVAL ACTION ALTERNATIVES

This section describes the removal action alternatives assembled for the Load Line 2 FA and the George Road Sewage Treatment Plant Mercury Spill AOC. Removal action alternatives should assure adequate protection of human health and the environment, achieve RAOs, meet ARARs, and permanently and significantly reduce the volume, toxicity, and/or mobility of contaminants.

Hydraulic cleaning (i.e., using a high-pressure water jet to mobilize trapped sediment and debris and conducting removal using a vacuum pump or other extraction methods) also was considered for contaminated sediment removal, but was eliminated from further evaluation due to concerns about (1) complete removal of contamination, (2) integrity of the current sewer system to contain the water applied at high pressures, and (3) generating liquid waste streams.

6.1 ALTERNATIVES FOR LOAD LINE 2 FUNCTIONAL AREA

Two alternatives were developed for evaluating the lead contamination in the Load Line 2 FA:

1. Alternative LL2-1: No Action.
2. Alternative LL2-2: Excavation with Off-site Disposal.

A detailed description of each alternative is provided in the following sections.

6.1.1 Alternative LL2-1: No Action

The no action alternative is required for evaluation under the NCP. This alternative is the baseline to which other alternatives are compared. This alternative assumes all current actions (e.g., access restrictions and environmental monitoring) are discontinued and assumes no future actions will take place to protect human receptors or the environment. Impacted media at the AOC would not be removed or treated.

6.1.2 Alternative LL2-2: Excavation with Off-site Disposal

Alternative LL2-2 consists primarily of conducting additional characterization sampling between LL2sd-657 and LL2-252 and downgradient of sample location LL2-252 and excavating and removing the lead-contaminated sediment above CUGs, followed by transportation by truck to an off-site licensed disposal facility.

Figure 4-1 presents the extent of characterization sampling scheme and sediment excavation. The depth of sediment excavation is approximately 2 ft bgs from immediately downstream of DB22 to sample location LL2sd-657(st), which is an estimated 325 ft long. The estimated total disposal volume (ex situ) is conservatively estimated to be 133 yd^3. This extent and total disposal volume was determined based on the delineation sampling performed in May 2016 to refine/confirm the extent of

sediment requiring excavation and off-site disposal. An estimated 3.3 yd^3 of sediment will also be removed for off-site disposal at DB-20. In addition, the storm sewer pipe between DB-20 and DB-21 (250 linear ft of 10-inch storm sewer) and the culvert pipe between DB-21 and DB-22 (32 linear ft of 18-inch culvert vitrified clay pipe) will be removed for off-site disposal.

This alternative requires coordinating removal activities with Ohio EPA, OHARNG, and the Army. Coordinating with stakeholders during implementation of the excavation minimizes health and safety risks to on-site personnel and potential disruptions of Camp Ravenna activities. The time period to complete this removal action is relatively short and does not include an operations and maintenance (O&M) period to assess impacts from excavating lead-contaminated sediment, as Unrestricted (Residential) Land Use is achieved. Components of this alternative include:

- Remedial design (RD);
- Characterization sampling;
- Pre-mobilization activities;
- Excavation, removal, and disposal; and
- Restoration.

6.1.2.1 Remedial Design

An RD will be developed prior to initiating removal actions. This plan will outline construction requirements, site preparation activities (e.g., staging and equipment storage areas, truck routes, and storm water controls), the extent of sediment excavation, sequence of excavation activities, decontamination, and transportation and disposal of the waste. Erosion controls and health and safety controls will be developed as part of the RD to ensure protection of remediation workers and the environment.

6.1.2.2 Characterization Sampling

Seven soil borings will be installed to collect samples from 0–0.5, 0.5–1, and the 1–2 ft bgs intervals at each location. As shown on Figure 4-1, four borings will be installed between LL2sd-657 and LL2-252, one boring will be installed at LL2-252, and two borings will be installed downstream of LL2-252. Samples will be analyzed for lead by USEPA method SW-846-6020. Field duplicates will be collected for analysis at a rate of 10% (1 duplicate per up to 10 primary environmental samples). Matrix spikes/matrix spike duplicates (MS/MSD) will be collected for analysis at a rate of 5% (1 MS/MSD per 20 environmental samples).

When the analytical results and received, they will be compared against the CUG of 400 mg/kg for lead. The removal extent will be modified to include areas that are above the CUG.

Waste characterization sampling of the sediment will also be completed. Samples will be subjected to full TCLP characterization to determine disposal requirements. If the waste characterization results indicate hazardous characteristics, on-site stabilization of sediment will not be economical due to the small volume of sediment requiring disposal.

6.1.2.3 Excavation, Removal, and Disposal

Prior to any ground disturbance, erosion control material such as silt fences and straw bales will be installed to minimize sediment runoff from the excavation area. Dust generation will be minimized during excavation activities by keeping equipment movement areas and excavation areas misted with water. The health and safety of remediation workers, on-site Camp Ravenna employees, and the general public will be detailed in a site-specific health and safety plan.

To achieve a scenario in which the AOC is protective for Unrestricted (Residential) Land Use, lead-contaminated sediment requiring removal will be removed from the proposed excavation extent shown in Figure 4-1. The depth of the excavation is approximately 2 ft bgs from immediately downstream of DB22 to sample location LL2sd-657(st). The depth of the excavation is approximately 4 ft bgs near DB-20. In addition, the storm sewer pipe between DB-20 and DB-21 and the culvert pipe between DB-21 and DB-22 will be removed for off-site disposal. The excavated sediment and pipe will be directly loaded on to trucks for off-site disposal at a licensed and permitted disposal facility. For cost estimation purposes, it is assumed the waste will be disposed as non-hazardous waste.

All trucks will be inspected prior to exiting the AOC. Appropriate waste manifests will accompany each waste shipment. Only regulated and licensed transporters and vehicles will be used. All trucks will travel pre-designated routes within Camp Ravenna.

6.1.2.4 Restoration

The site restoration at Load Line 2 FA will be completed as follows:

- **Restoration between DB-20 and DB-21 –** The overburden from storm sewer pipe excavation will be used as backfill to create an open ditch to convey storm water.
- **Restoration between DB-21 and DB-22** – A new culvert pipe will be installed and the overburden from excavating the existing culvert pipe will be used as backfill to ensure railroad bed and access roadway can be used.
- **Restoration of Ditch** – The ditch will be restored using backfill material obtained from a clean source that will be sampled and approved. The ditch will be graded to convey storm water.

Following restoration of the areas, workers will apply a seed mixture (as approved by OHARNG) and mulch. Restored areas will be inspected and monitored consistent with best management practices.

6.2 ALTERNATIVES FOR GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL

Two alternatives were developed for evaluating the mercury-contaminated pipeline within the George Road Sewage Treatment Plant Mercury Spill AOC:

- Alternative GR-1: No Action.
- Alternative GR-2: Excavation with Off-site Disposal.

A detailed description of each alternative is provided in the following sections.

6.2.1 Alternative GR-1: No Action

The no action alternative is required for evaluation under the NCP. This alternative is the baseline to which other alternatives are compared. This alternative assumes all current actions (e.g., access restrictions and environmental monitoring) are discontinued and assumes no future actions will take place to protect human receptors or the environment. Impacted media at the AOC would not be removed or treated.

6.2.2 Alternative GR-2: Excavation with Off-site Disposal

Alternative GR-2 consists of excavating and removing piping containing mercury-contaminated sediment, followed by transportation by truck to an off-site licensed disposal facility. As shown on Figure 4-2, approximately 20 linear ft of 15-inch vitrified clay pipe and 18 linear ft of 4-inch cast iron pipe will be removed from approximately 6 ft bgs.

This alternative requires coordinating removal activities with Ohio EPA, OHARNG, and the Army. Coordinating with stakeholders during implementation of the excavation minimizes health and safety risks to on-site personnel and potential disruptions of Camp Ravenna activities. The time period to complete this removal action is relatively short and does not include an O&M period to assess impacts from excavating mercury-contaminated piping and sediment, as Unrestricted (Residential) Land Use is achieved. Components of this alternative include:

- RD;
- Pre-mobilization activities;
- Excavation, removal, and disposal; and
- Restoration.

6.2.2.1 Remedial Design

An RD will be developed prior to initiating removal actions. This plan will outline construction requirements; site preparation activities (e.g., staging and equipment storage areas, truck routes, and storm water controls); the extent of piping removal; the sequence of excavation activities; decontamination; and segregation, transportation, and disposal of the waste. Erosion controls and

health and safety controls will be developed as part of the RD to ensure protection of remediation workers and the environment. Waste characterization sampling of the mercury-contaminated sediment also will be completed. Samples will be subjected to full TCLP characterization to determine disposal requirements. If the waste characterization results indicate hazardous characteristics, on-site stabilization of sediment will not be economical due to the small volume of sediment requiring disposal.

6.2.2.2 Excavation, Removal, and Disposal

Prior to any ground disturbance, erosion control material such as silt fences and straw bales will be installed to minimize sediment runoff from the excavation area. Dust generation will be minimized during excavation activities by keeping equipment movement areas and excavation areas misted with water. The health and safety of remediation workers, on-site Camp Ravenna employees, and the general public will be detailed in a site-specific health and safety plan.

To achieve a scenario in which the AOC is protective for Unrestricted (Residential) Land Use, mercury-contaminated piping and sediment requiring removal will be removed from the proposed excavation extent shown in Figure 4-2. Approximately 20 linear ft of 15-inch vitrified clay pipe and 18 linear ft of 4-inch cast iron pipe (and associated P-trap) will be removed from approximately 6 ft bgs. The soil above the pipe will be removed from the excavation and segregated for reuse.

An approximate 7.5-ft section of the 4-inch cast iron pipe requiring removal is located beneath the floor of the comminutor building, During the SI, an approximate 4 by 3 ft section (6 inches thick) of the concrete floor was removed. Following completion of SI, the pieces of concrete floor were then replaced in their original locations. Additional saw cutting of the concrete floor prior to excavation of the pipe will likely be required.

The excavated piping with sediment will be directly loaded on to trucks for off-site disposal at a licensed and permitted disposal facility. For cost estimation purposes, it is assumed the waste will be disposed as non-hazardous waste.

All trucks will be inspected prior to exiting the AOC. Appropriate waste manifests will accompany each waste shipment. Only regulated and licensed transporters and vehicles will be used. All trucks will travel pre-designated routes within Camp Ravenna.

6.2.2.3 Restoration

Upon completing the excavation, disturbed areas will be backfilled with overburden from the pipe excavation and clean soil will be used if needed to assist in grading to neighboring contours. Surface restoration with concrete inside the comminutor building is not required. After the exterior area is backfilled and graded, workers will apply a seed mixture (as approved by OHARNG) and mulch. Restored areas will be inspected and monitored consistent with best management practices.

THIS PAGE INTENTIONALLY LEFT BLANK.

7.0 ANALYSIS OF REMOVAL ACTION ALTERNATIVES

This section presents a detailed analysis of the two removal action alternatives formulated for further evaluation. From this set of alternatives, one will ultimately be chosen as the remedy for Load Line 2 FA and George Road Sewage Treatment Plant Mercury Spill AOC. Consistent with the *Guidance for Conducting Non-Time Critical Removal Actions Under CERCLA* EPA/540-R-93-057 (USEPA 1993), the proposed alternatives are judged by three criteria: effectiveness, implementability, and cost. This section contains a detailed analysis of the two alternatives against the evaluation criteria. The detailed analysis further defines each alternative, and if necessary, compares the alternatives against one another and presents considerations common to alternatives.

7.1 EFFECTIVENESS

USEPA defines effectiveness as the ability to meet the objectives of the removal action. The criteria that determines the level of effectiveness is the overall protection of human health and the environment; compliance with ARARs; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; and short-term effectiveness.

7.1.1 Overall Protection of Human Health and the Environment

Each alternative must be evaluated to determine how it achieves and maintains protection of human health and the environment.

7.1.2 Compliance with ARARs

Section 121(d)(1) of CERCLA, 42 U.S.C. § 9621(d)(1), requires that on-site removal actions attain federal standards, requirements, criteria, limitations, or more stringent state standards determined to be legally applicable or relevant and appropriate to the circumstances at a given site. For removal actions, compliance with ARARs is required to the extent possible based on the urgency of the situation and the scope of the action contemplated [40 CFR §16 300.415(j)]. Each alternative must be evaluated against the ARARs presented in Section 5.0. On-site response actions must comply with the substantive requirements that may be an ARAR, where practical.

7.1.3 Long-term Effectiveness and Permanence

Long-term effectiveness and permanence evaluates the magnitude of residual risk (i.e., risk remaining after implementing the alternative) and the adequacy and reliability of controls used to manage the remaining waste (i.e., untreated waste and treatment residuals) over the long term. Alternatives that provide the highest degree of long-term effectiveness and permanence leave little or no untreated waste at the AOC, make long-term maintenance and monitoring unnecessary, and minimize the need for land use controls.

7.1.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Reduction of toxicity, mobility, or volume through treatment evaluates the ability of the alternative to reduce the toxicity, mobility, or volume of the waste. The evaluation involves assessing the amount of hazardous material destroyed or treated; the degree of reduction in toxicity, mobility, or volume; and the type and quantities of residuals remaining after treatment. The irreversibility of the treatment process and the type and quantity of residuals remaining after treatment also are assessed.

7.1.5 Short-term Effectiveness

Short-term effectiveness addresses the protection of workers and the community during the removal action, the environmental effects of implementing the action, and the time required to achieve media-specific preliminary CUGs. This criterion accounts for potential threats to workers (e.g., fugitive dust and transportation of hazardous materials), the environment (e.g., potential spills and releases) and reliability of mitigation measures.

7.2 IMPLEMENTABILITY

Implementability addresses the technical and administrative feasibility of implementing an alternative, availability of various services and materials required during implementation, and state and community acceptance.

7.2.1 Technical Feasibility

Technical feasibility assesses the reliability of the technology and operational difficulties and the environmental conditions of construction/removal implementation. It assesses the ability to perform the removal in the allotted amount of time. Technical feasibility also considers the potential need and ease of future removal actions.

7.2.2 Administrative Feasibility

Administrative feasibility assesses the coordination of all aspects involved with the removal action by addressing concerns from regulatory agencies and adhering to non-environmental laws.

7.2.3 Availability of Services and Materials

The availability of services and materials to implement the removal actions is assessed by the availability of prospective treatments; availability of materials; availability of contractors and specialists; and the availability of facilities for off-site treatment, storage, and disposal of excavated material.

7.2.4 State and Community Acceptance

State acceptance considers comments received from agencies of the state of Ohio. The primary state agency supporting this investigation is Ohio EPA. Community acceptance considers comments made by the community, including stakeholders, on the alternatives being considered during the public comment period. Comments will be accepted from the community on the EE/CA and the preferred remedy and will be presented in an Action Memo.

7.3 COST

Cost analyses estimate the dollar cost of each alternative. This analysis includes an estimate of the capital cost in dollars, annual O&M cost (if applicable), and indicates the period of time to complete the proposed action. Cost estimates in this EE/CA are reported in base year 2016 dollars. Details and assumptions used in developing cost estimates for each of the alternatives are provided in Appendix D.

7.4 INDIVIDUAL ANALYSIS OF ALTERNATIVES FOR LOAD LINE 2 FUNCTIONAL AREA

The two removal action alternatives evaluated for the Load Line 2 FA are described in Section 6.1. These removal action alternatives are as follows:

- Alternative LL2-1: No Action.
- Alternative LL2-2: Excavation and Off-site Disposal.

The following sections analyze each removal action alternative using the criteria described in Sections 7.1 through 7.3. This analysis will provide the advantages and disadvantages of each alternative.

7.4.1 Alternative LL2-1: No Action

7.4.1.1 Effectiveness

Under this alternative, contaminated sediment would remain in place at the AOC. Therefore, this alternative would not provide for overall protection of human health and the environment. Removal goals would not be achieved and this alternative provides for no long-term effectiveness and permanence. This alternative has no removal or treatment; therefore, there is no reduction in toxicity, mobility, or volume. There would be no mitigation of potential risks to ecological receptors from chemicals of potential ecological concern in soil under this alternative.

7.4.1.2 Implementability

No actions are proposed under this alternative. The no action alternative is implementable and no services or materials would be required for implementation. However, it is not likely that the state and community would accept no action to occur as contaminated sediment would remain on site.

7.4.1.3 Cost

The present value cost to complete Alternative LL2-1 is zero.

7.4.1.4 Outcome

The no action Alternative will not be further evaluated or considered because it fails the effectiveness and implementability criteria.

7.4.2 Alternative LL2-2: Excavation and Off-site Disposal

7.4.2.1 Effectiveness

Alternative LL2-2 will remove lead-contaminated sediment from the site. Excavating and removing the impacted sediment would result in a permanent reduction in risks at the AOC. The lead-contaminated sediment would be removed and placed in a permanent disposal facility. As a result, long-term management and CERCLA five-year reviews would not be required. Because no treatment is involved with this alternative, there would be no reduction in toxicity, mobility, or volume of contaminants. During implementation, risks will be mitigated through use of proper controls such as:

- Requiring workers to follow a health and safety plan and wear appropriate personal protective equipment to minimize exposures,
- Implementing mitigation measures such as erosion and dust control during construction;,
- Inspecting vehicles transporting soils before and after use, and
- Limiting the distance waste is transported in vehicles.

7.4.2.2 Implementability

This alternative is implementable. Coordination would be required between removal action planners and OHARNG to minimize disruptions and/or impacts to OHARNG operations. Excavation and truck transport of soil are conventional construction activities. Resources such as standard excavation and construction equipment would be used and are readily available. Soil borrow sites and permitted waste disposal facilities are available within a reasonable distance.

7.4.2.3 Cost

The present value cost to complete Alternative LL2-2 is approximately $164,482 (in base year 2016 dollars). Costs include implementing the removal, off-site disposal, and site restoration. See Appendix D for a detailed description of Alternative LL2-2 costs.

7.4.2.4 Outcome

Alternative LL2-2 would effectively remove and dispose lead-contaminated sediment. Excavation and off-site disposal are conventional technologies which can be readily implemented.

7.5 INDIVIDUAL ANALYSIS OF ALTERNATIVES FOR GEORGE ROAD SEWAGE TREATMENT PLAN MERCURY SPILL AOC

The two removal action alternatives evaluated for the George Road Sewage Treatment Plant Mercury Spill AOC are described in Section 6.2. These removal action alternatives are as follows:

- Alternative GR-1: No Action.
- Alternative GR-2: Excavation and Off-site Disposal.

The following sections analyze each removal action alternative using the criteria described in Sections 7.1 through 7.3. This analysis will provide the advantages and disadvantages of each alternative.

7.5.1 Alternative GR-1: No Action

7.5.1.1 Effectiveness

Under this alternative, contaminated piping and sediment would remain in place at the AOC. Therefore, this alternative would not provide additional overall protection of human health and the environment. Removal goals would not be achieved and this alternative provides for no long-term effectiveness and permanence. This alternative has no removal or treatment; therefore, there is no reduction in toxicity, mobility, or volume.

7.5.1.2 Implementability

No actions are proposed under this alternative. The no action alternative is implementable and no services or materials would be required for implementation. However, it is not likely that the state and community would accept no action to occur as contaminated piping and sediment would remain on site.

7.5.1.3 Cost

The present value cost to complete Alternative GR-1 is zero.

7.5.1.4 Outcome

The no action alternative will not be further evaluated or considered because it fails the effectiveness and implementability criteria.

7.5.2 Alternative GR-2: Excavation and Off-site Disposal

7.5.2.1 Effectiveness

Alternative GR-2 will remove mercury-contaminated piping and sediment from the site. Excavating and removing the piping containing mercury-contaminated sediment would result in a permanent reduction in risks at the AOC. The mercury-contaminated piping and sediment would be removed and placed in a permanent disposal facility. As a result, long-term management and CERCLA five-year reviews would not be required. Because no treatment is involved with this alternative, there would be no reduction in toxicity, mobility, or volume of contaminants. During implementation, risks will be mitigated through use of proper controls such as:

- Requiring workers to follow a health and safety plan and wear appropriate personal protective equipment to minimize exposures,
- Implementing mitigation measures such as erosion and dust control during construction,
- Inspecting vehicles transporting soils before and after use, and
- Limiting the distance waste is transported in vehicles.

7.5.2.2 Implementability

This alternative is implementable. Coordination would be required between removal action planners and OHARNG to minimize disruptions and/or impacts to OHARNG operations. Excavation and truck transport of contaminated piping and sediment are conventional construction activities. Resources such as standard excavation and construction equipment would be used and are readily available. Permitted waste disposal facilities are available within a reasonable distance.

7.5.2.3 Cost

The present value cost to complete Alternative GR-2 is approximately $63,581 (in base year 2016 dollars). Costs include implementing the removal, off-site disposal, and site restoration. See Appendix D for a detailed description of Alternative GR-2 costs.

7.5.2.4 Outcome

Alternative GR-2 would be an effective method of removing and disposing mercury-contaminated sediment. Excavation and off-site disposal are conventional technologies which can be readily implemented.

8.0 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

The comparative analysis provides a means by which alternatives can be directly compared to one another with respect to common criteria.

8.1 LOAD LINE 2 FUNCTIONAL AREA

The no action alternative was eliminated during the individual analysis due to the lack of effectiveness and implementability. As Alternative LL2-2 is the only remaining alternative for addressing contaminated sediment at Load Line 2 FA, it is the recommended removal action alternative. A sampling scheme to further characterize the media between LL2sd-657 and downstream of LL2-252 will be implemented. The lead-contaminated sediment and piping at the AOC will be removed from the former RVAAP facility, hauled to a licensed and permitted disposal facility, and appropriately disposed. The removal areas will be restored with clean fill material. No long-term monitoring or five-year reviews would be required.

8.2 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL AOC

The no action alternative was eliminated during the individual analysis due to the lack of effectiveness and implementability. As Alternative GR-2 is the only remaining alternative for addressing the mercury-contaminated piping and sediment at George Road Sewage Treatment Plant, it is the recommended removal action alternative. The contaminated piping and sediment from the AOC will be removed from the former RVAAP facility, hauled to a licensed and permitted disposal facility, and appropriately disposed. The removal areas will be restored with clean fill material. No long-term monitoring or five-year reviews would be required.

THIS PAGE INTENTIONALLY LEFT BLANK.

9.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

The Army is the lead agency responsible for implementing these NTRCAs. This section reviews actions that have been conducted and that are planned to ensure regulatory agencies and the public have been provided with appropriate opportunities to stay informed of the progress of the removal actions and to provide meaningful input on the planning effort as well as the final selection of a remedy.

9.1 STATE ACCEPTANCE

State acceptance considers comments received from agencies of the state of Ohio on the actions being considered. For removing lead-contaminated sediment and the mercury-contaminated piping and sediment, Ohio EPA is the lead regulatory agency. This EE/CA has been prepared in consultation with Ohio EPA. Ohio EPA provided input during the ongoing investigation and report development process to ensure the action ultimately selected meets the needs of the state of Ohio and fulfills the requirements of the DFFO (Ohio EPA 2004).

Comments will be solicited from Ohio EPA on the EE/CA. The Army is obtaining Ohio EPA concurrence of the final selection of the remedy for the Load Line 2 FA of the Facility-wide Sewers AOC and the George Road Sewage Treatment Plant.

9.2 COMMUNITY ACCEPTANCE

Community acceptance considers comments provided by the community on the actions being considered. CERCLA 42 U.S.C. 9617(a) emphasizes early, constant, and responsive community relations. The Army has prepared a *Community Relations Plan for the Ravenna Army Ammunition Plant Restoration Program* (Vista 2016) for Camp Ravenna to ensure the public has convenient access to information regarding project progress. The community relations program interacts with the public through news releases, public meetings, public workshops, and Restoration Advisory Board meetings with local officials, interest groups, and the general public.

The public will be provided the opportunity during a 30-day public comment period to comment on the Final EE/CA. The Army will issue a Notice of Availability when the Final EE/CA is ready for public review and comment. These comments will be considered prior to the final selection of a remedy for the Load Line 2 FA of the Facility-wide Sewers AOC and the George Road Sewage Treatment Plant.

CERCLA 42 U.S.C. 9617(a) requires that an Administrative Record be established "at or near the facility at issue." Relevant documents regarding the former RVAAP have been made available to the public for review and comment.

The Administrative Record for this project is available at the following location:

Camp Ravenna
Environmental Office
1438 State Route 534 SW
Newton Falls, OH 44444

Access to Camp Ravenna is restricted but can be obtained by contacting the environmental office at (614) 336-6136. In addition, an Information Repository of current information and final documents is available to any interested reader at the following libraries:

Reed Memorial Library
167 East Main Street
Ravenna, Ohio 44266

Newton Falls Public Library
204 South Canals
Newton Falls, Ohio 44444-1694

Additionally, RVAAP has an online resource for restoration news and information. This website can be viewed at www.rvaap.org.

10.0 RECOMMENDED REMOVAL ACTION ALTERNATIVE

This section presents the recommended alternative for the two AOCs.

10.1 LOAD LINE 2 FUNCTIONAL AREA RECOMMENDED ALTERNATIVE

Alternative LL2-2: Excavation and Off-site Disposal is the recommended removal action alternative for the Load Line 2 FA. A sampling scheme to further characterize the media between LL2sd-657 and downstream of LL2-252 will be implemented. A current estimate of 136 yd^3 of lead-contaminated sediment will be removed from the AOC for off-site disposal. In addition, approximately 8.9 tons of piping, including sediment (i.e., 250 linear ft of 10-inch storm sewer and 32 linear ft of 18-inch culvert vitrified clay pipes) will be removed from the AOC for off-site disposal. This removal will be conducted as an NTCRA and will achieve quick, protective results at the AOC and was determined to be cost effective (estimated $164,482 for removal).

10.2 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL AOC RECOMMENDED ALTERNATIVE

Alternative GR-2: Excavation and Off-site Disposal is the recommended removal action alternative for the George Road Sewage Treatment Plant. Approximately 2 tons of piping, including mercury-contaminated sediment (i.e., 20 linear ft of 15-inch vitrified clay pipe and 18 linear ft of 4-inch cast iron pipe) will be removed from the AOC for off-site disposal. This removal will be conducted as an NTCRA and will achieve quick, protective results at the AOC and was determined to be cost effective (estimated $63,581 for removal).

THIS PAGE INTENTIONALLY LEFT BLANK.

11.0 REFERENCES

DOE (U.S. Department of Energy) 1998. *Non-Time-Critical Removal Actions*. CERCLA Information Brief, DOE/EH-413-9811. April 1998.

ECC (Environmental Chemical Corporation) 2015. *Draft Site Inspection Report, CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, Revision 0, Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio*. March 2015.

Leidos 2016. *Letter Work Plan for Pre-Delineation Sampling of Lead-Contaminated Sediment in the Load Line 2 Functional Area of the Ravenna Army Ammunition Plant, Facility-wide Sewers Area of Concern*. May 2016.

Ohio EPA (Ohio Environmental Protection Agency) 2004. *Director's Final Findings and Orders for RVAAP*. June 2004.

Ohio EPA 2014. *Ravenna Army Ammunition Plant Portage/Trumbull Counties, RVAAP-67, Facility-wide Sewers, Request for Review of Draft Remedial Investigation/Feasibility Study (RI/FS), Conceptual Site Exposure Model, Ohio EPA ID #267-000859-087*. Letter transmittal from Edward J. D'Amato, Ohio EPA Environmental Specialist to Brett Merkel, Army National Guard Directorate. May 15, 2014.

RVAAP (Ravenna Army Ammunition Plant) 2013. *Read-Ahead for Requested Clarification Meeting Regarding Ohio EPA Notice of Deficiency – Health Risk Assessment Methodology RVAAP-67 Facility-Wide Sewers Draft RI/FS Report Ravenna Army Ammunition Plant/Camp Ravenna*. Letter transmittal from Mark Patterson, RVAAP Facility Manager to Eileen Mohr, Ohio EPA Project Manager. May 23, 2013.

SAIC (Science Applications International Corporation) 2011. *Historical Records Review Report for the 2010 Phase I RI Services at CR Sites (9 Areas of Concern) Revision 0, at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. December 2011.

SAIC 2012. *Draft Remedial Investigation/Feasibility Study Report for RVAAP-67 Facility-Wide Sewers at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. September 2012.

USACE (U.S. Army Corps of Engineers) 2010. *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant, RVAAP, Ravenna, Ohio*. March 2010.

USACE 2011. *Final Facility-wide Sampling and Analysis Plan for Environmental Investigations. Ravenna Army Ammunition Plant, Ravenna, Ohio.* February 2011.

USACE 2016a. *Draft Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12*. November 2016.

USACE 2016b. *Site Inspection Report, CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, Revision 0, Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio*. January 2016.

USEPA (U.S. Environmental Protection Agency) 1988. *Guidance for Conducting Remedial Investigation/Feasibility Studies under CERCLA*. October 1988.

USEPA 1993. *Guidance for Conducting Non-Time Critical Removal Actions under CERCLA*. August 1993.

USEPA 2002. *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*. Office of Emergency and Remedial Response, Washington D.C. September 2002.

Vista (Vista Sciences Corporation) 2016. *Community Relations Plan for the Ravenna Army Ammunition Plant Restoration Program*. February 2016.

APPENDIX A

Letter Work Plan for Pre-Delineation Sampling of Lead-Contaminated Sediment in the Load Line 2 Functional Area

THIS PAGE INTENTIONALLY LEFT BLANK.

May 3, 2016

leidos

Mr. Nathaniel Peters
U.S. Army Corps of Engineers, Louisville District
ATTN: CELRL-ED-E-C
600 Martin Luther King, Jr. Place, P.O. Box 59
Louisville, Kentucky 40202-0059

Reference: **Contract No. W912QR-15-C-0046, Completion of RI, FS, PP, and ROD Documents, Multiple Areas of Concern, Former Ravenna Army Ammunition Plant Restoration Program**

Subject: **Letter Work Plan for Pre-Delineation Sampling of Lead-Contaminated Sediment in the Load Line 2 Functional Area of the Ravenna Army Ammunition Plant Facility-wide Sewers Area of Concern**

Dear Mr. Peters:

This memorandum provides a plan to establish the approach for pre-delineation sampling activities in the Load Line 2 Functional Area of the Ravenna Army Ammunition Plant (RVAAP) Facility-wide Sewers Area of Concern. This memorandum has been revised per Army comments on the version issued on March 15, 2016. This pre-delineation sampling will be conducted to verify the approximate extent of sediment containing lead at concentrations requiring remediation to support the development and evaluation of remedial alternatives in an engineering evaluation/cost analysis.

If you have any questions or comments regarding this recommended path forward, please feel free to contact me at (330) 405-5802. Leidos appreciates the opportunity to provide these services to the U.S. Army Corps of Engineers, Louisville District and RVAAP.

Sincerely,

LEIDOS

Jed Thomas, P.E.
Project Manager

cc: Mark Leeper, Army National Guard (ARNG) Directorate
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, Ohio Army National Guard, Camp Ravenna
Greg Moore, USACE Louisville
Angela Schmidt, USACE Louisville
Kevin Jago, Leidos

May 3, 2016

leidos

ATTACHMENT 1.
PRE-DELINEATION SAMPLING APPROACH FOR THE
LOAD LINE 2 FUNCTIONAL AREA

TABLE OF CONTENTS

LIST OF FIGURES iii
LIST OF TABLES iii
ACRONYMS AND ABBREVIATIONS v

1.0 INTRODUCTION 1-1
1.1 PURPOSE 1-1
1.2 OBJECTIVES 1-1

2.0 SITE DESCRIPTION 2-1
2.1 MAIN STORM SEWER LINE 2-1
2.2 DRAINAGE DITCHES 2-1

3.0 RISK ASSESSMENT APPROACH 3-1
3.1 CONCEPTUAL SITE EXPOSURE MODEL 3-1
3.1.1 Sediment and Water Inside Sewer Pipes and Pipe Bedding Material Below the Pipes 3-1
3.1.2 Sediment and Surface Water at Pipe Outfalls 3-1
3.1.3 Groundwater 3-2
3.1.4 Conclusions 3-2
3.2 HUMAN HEALTH RISK ASSESSMENT 3-2
3.3 ECOLOGICAL RISK ASSESSMENT 3-2

4.0 NATURE AND EXTENT OF CONTAMINATION 4-1
4.1 STORM SEWER LINE 4-1
4.1.1 Segments with Known Contamination 4-1
4.1.2 Segments with Low Concentrations or Incomplete Exposure Pathway 4-1
4.1.3 Vertical Migration 4-5
4.2 DITCH LINE 4-5
4.3 ADEQUATE DELINEATION 4-5
4.4 DATA GAPS 4-6

5.0 SAMPLING APPROACH 5-1
5.1 SAMPLE LOCATIONS 5-1
5.2 DATA QUALITY OBJECTIVES 5-2

6.0 FIELD METHODS AND REPORTING 6-1
6.1 ANALYTICAL METHODS AND QUALITY ASSURANCE/QUALITY CONTROL 6-1
6.2 HEALTH AND SAFETY 6-1
6.3 REPORTING 6-1

7.0 REFERENCES 7-1

THIS PAGE INTENTIONALLY LEFT BLANK.

LIST OF FIGURES

Figure 1-1. Proposed Pre-delineation Sediment Sampling for Lead in Facility-wide Sewers, Load Line 2 Functional Area 1-2
Figure 3-1. Conceptual Site Exposure Model for Facility-wide Sewers 3-4

LIST OF TABLES

Table 4-1. Summary of Storm Sewer Inlets and Outfalls in the Load Line 2 FA Pre-delineation Sampling Study Area 4-3
Table 5-1. Proposed Load Line 2 Functional Area Pre-delineation Samples for Lead Analysis 5-1

THIS PAGE INTENTIONALLY LEFT BLANK.

ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
bgs	Below Ground Surface
CFR	Code of Federal Regulations
CSEM	Conceptual Site Exposure Model
CUG	Cleanup Goal
DQO	Data Quality Objective
EE/CA	Engineering Evaluation/Cost Analysis
FA	Functional Area
FS	Feasibility Study
MS/MSD	Matrix spike/matrix spike duplicate
NIOSH	National Institute of Occupational Safety and Health
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
RI	Remedial Investigation
RSL	Regional Screening Level
RVAAP	Ravenna Army Ammunition Plant
USEPA	U.S. Environmental Protection Agency

THIS PAGE INTENTIONALLY LEFT BLANK.

1.0 INTRODUCTION

This document was prepared by Leidos under U.S. Army Corps of Engineers, Louisville District Contract Number W912QR-15-C-0046.

1.1 PURPOSE

The purpose of this pre-delineation sampling and analysis plan is to establish the approach for pre-delineation sampling activities in the Load Line 2 Functional Area (FA) of the Ravenna Army Ammunition Plant (RVAAP) Facility-wide Sewers Area of Concern (AOC). This pre-delineation sampling will be conducted to verify the approximate extent of sediment in the defunct storm sewer system and at related outfalls containing lead at concentrations requiring remediation to support the development and evaluation of remedial alternatives in an engineering evaluation/cost analysis (EE/CA).

The *Draft Remedial Investigation/Feasibility Study Report for RVAAP-67 Facility-Wide Sewers* [herein referred to as the Draft Remedial Investigation/Feasibility Study (RI/FS) Report], provided to the Ohio Environmental Protection Agency (Ohio EPA) in September 2012, identified a need for remediation in the Load Line 2 FA to protect human health and the environment (SAIC 2012). However, during RI/FS comment resolution with Ohio EPA, the conceptual site exposure model (CSEM) was revised. Section 3.0 discusses the revised CSEM and resulting recommendation for remedial action, which form the basis for proposed pre-delineation sampling activities.

1.2 OBJECTIVES

The objectives of pre-delineation sampling are to achieve the following:

- Determine the horizontal extent of lead at concentrations that may require remediation of storm sewer sediment within the vitrified clay piping and box inlets at Load Line 2.

- Determine the horizontal and vertical extents of lead at concentrations that may require remediation of dry sediment in the segment of ditch line receiving intermediate outfall discharge between locations DB17 and DB22 (Figure 1-1).

- Determine the horizontal and vertical extents of lead at concentrations that may require remediation of dry sediment in the ditch line downstream of location DB22.

Pre-delineation sampling activities will be conducted to define areas with lead impacts greater than 400 mg/kg, which is the residential U.S. Environmental Protection Agency (USEPA) regional screening level (RSL) for lead in soil. A cleanup goal (CUG) has not yet been established but will be developed in the EE/CA.

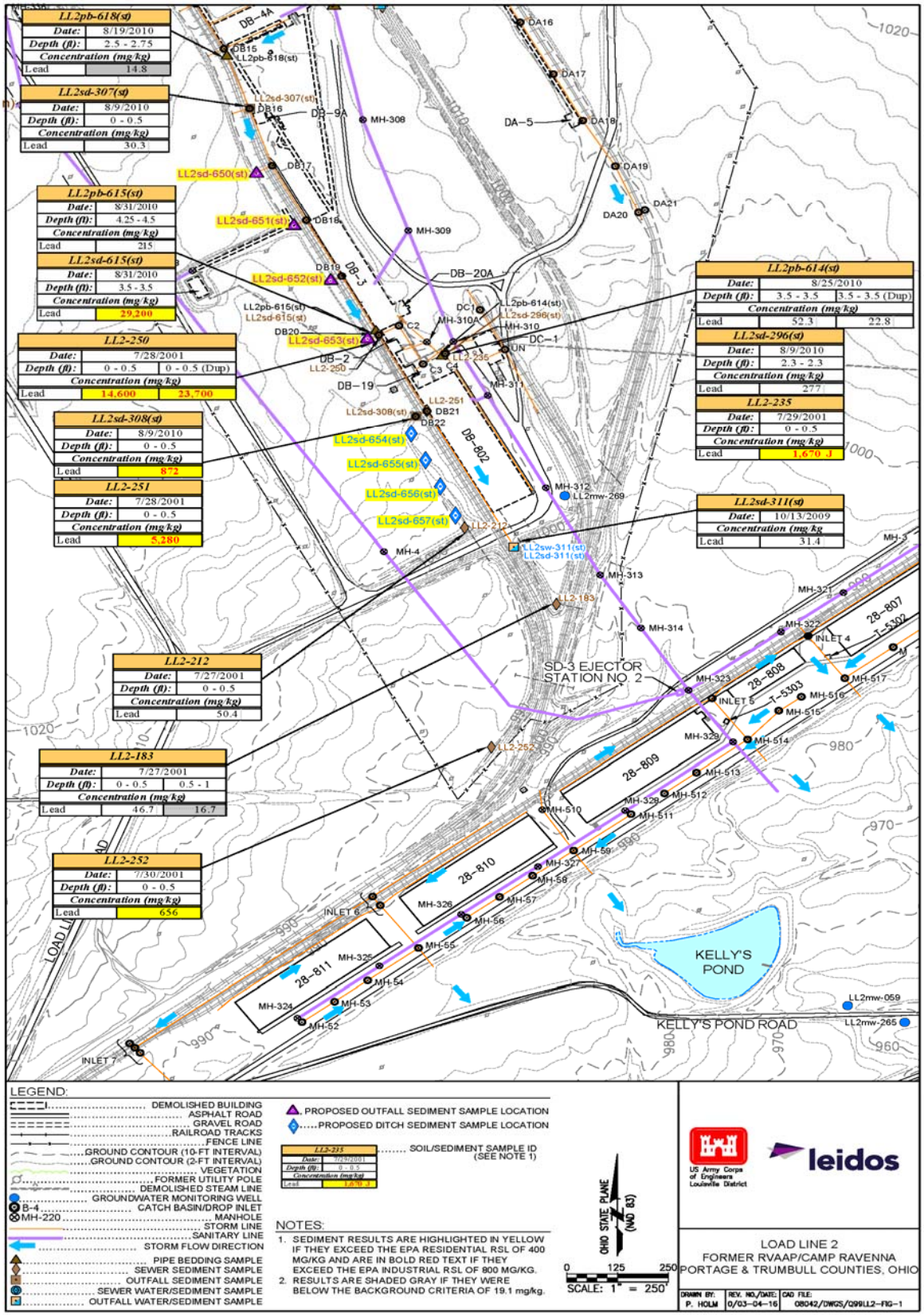


Figure 1-1. Proposed Pre-delineation Sediment Sampling for Lead in Facility-wide Sewers, Load Line 2 Functional Area

2.0 SITE DESCRIPTION

A comprehensive description of the Load Line 2 FA was presented in the Draft RI/FS Report (SAIC 2012). The area recommended for remediation and requiring further evaluation through pre-delineation sampling is located at the southern portion of Load Line 2 in/along storm sewer lines immediately east of former Buildings DB-3 and DB-802 (Figure 1-1).

2.1 MAIN STORM SEWER LINE

The section of storm sewer line being evaluated spans from drop inlet DB16 to the main terminus discharge location, where RI sample LL2sd/sw-311(st) was collected. The storm sewer line runs northwest to southeast immediately east of an old railroad bed.

The storm sewer line is an 8-inch vitrified clay pipe. The pipe line has been impacted by demolition activities. Many of the drop inlets have been either demolished or backfilled, thus impacting water flow. Video surveys of the storm sewer system in the vicinity of Building DB-802 noted cracks and debris within the lines.

This section of the sewer line also received flow from storm sewer branch lines associated with Inlets C2, C3, and C4. Site reconnaissance and visual inspections have indicated that inlets C2 and C3 were removed and/or demolished during the building demolition activities and inlet C4 has been filled in with debris and vegetation.

2.2 DRAINAGE DITCHES

Drop inlets DB16 through DB20 contain outfall discharge pipes that run perpendicular to the main storm sewer line toward the west and under the railroad bed (Figure 1-1). These pipes were installed to discharge a portion of the storm sewer flow into a drainage ditch located immediately to the west of and roughly parallel to the old railroad bed. The drainage ditch is disconnected in the vicinity of DB18 due to the presence of a concrete path running east to west, which separates surface water flow within the ditch to the north from that within the ditch to the south. Drop inlet DB21 has an outfall discharge into another drop inlet, DB22. Drop inlet DB22, which is west of the old railroad bed, then discharges directly into the drainage ditch.

THIS PAGE INTENTIONALLY LEFT BLANK.

3.0 RISK ASSESSMENT APPROACH

In June 2014, the Army provided Ohio EPA a revised CSEM for the Facility-wide Sewers AOC. The following subsections summarize the revised CSEM, and Figure 3-1 presents the revised CSEM.

3.1 CONCEPTUAL SITE EXPOSURE MODEL

The Facility-wide Sewers AOC consists of sewer lines containing residual sediment and water, pipe bedding (e.g., soil or backfill) below these sewer lines, and the discharge points of these sewer lines. There is no current or future use of this AOC. Future use of property in the vicinity of the AOC may occur (e.g., the land that lies above the sewer lines), and there may be future land use that includes use of the groundwater located below the AOC or surface water downstream of the AOC. The potential for exposure of human receptors to each of the contaminated media included in this AOC is described in the following subsections.

3.1.1 Sediment and Water Inside Sewer Pipes and Pipe Bedding Material Below the Pipes

Sediment and water inside the sewer pipes and pipe bedding material below the pipes are generally not media of exposure in human health risk assessments and do not represent exposure media for anticipated future receptors (e.g., National Guard Trainee and Resident Receptor) developed under the receptor/exposure scenarios for RVAAP. The most likely form of exposure to these media would be through construction or excavation work.

A construction worker is not an applicable future receptor for RVAAP. If a construction worker entered the sewer system, it would be considered a confined space entry and would be addressed under Occupational Safety and Health Administration (OSHA) industry standards for confined spaces, including use of personal protective equipment. A construction worker maintaining and excavating the sewer pipes and potentially contacting contaminated sediment or water in the pipes or bedding material below the pipes is not applicable because (1) the sewer systems are not active; therefore, no sewer-specific digging will be conducted (i.e., for pipe repairs); (2) exposures of construction workers to potential contaminants in the sewer system are mitigated through Army and regulatory requirements for worker protection and safety [e.g., OSHA (29 Code of Federal Regulations [CFR] 1926) and National Institute of Occupational Safety and Health (NIOSH)]; and (3) any general construction-related excavation (e.g., to build the foundation of a new building) would result in the mixing of a small amount of residue (i.e., few centimeters of residual sewer sediment in a pipe) into a large amount of overlying soil being excavated by heavy equipment, such as a backhoe. Thus, any excavation-related activities would result in negligible exposure.

3.1.2 Sediment and Surface Water at Pipe Outfalls

The outfalls associated with the storm sewers are small (e.g., a few square feet) isolated discharge points and do not represent exposure units for conducting human health risk assessment. Human health risks for contamination at downgradient surface water locations that may have received historical sewer discharges are evaluated separately for those locations. Evaluation of potential water

quality and biological impacts related to facility-wide sewer discharges is included in the ecological risk evaluation.

3.1.3 Groundwater

Modeling of contaminants leaching from sewer sediment and pipe bedding material sources and transport via groundwater is included in the Draft RI/FS Report (SAIC 2012). Results of this fate and transport modeling are compared to a variety of groundwater screening criteria and are not included in a quantitative human health risk assessment. Groundwater at RVAAP is being addressed under a separate Facility-wide AOC (RVAAP-66), which will include assessment of risk respective to groundwater exposures.

3.1.4 Conclusions

The Facility-wide Sewers AOC consists of sewer lines containing residual sediment and water, pipe bedding below these sewer lines, and the discharge points of these sewer lines. There is no current or future use of this AOC. Based on the CSEM, no complete human health exposure pathways exist; sewer pipes and outfalls are not viable exposure units for RVAAP receptors because of their extremely small size and the even smaller quantities of sediment/contamination in these small areas. Exposures to construction workers would be addressed through worker protection and safety requirements, such as OSHA (29 CFR 1926) and NIOSH. The CSEM indicates a quantitative human health risk assessment is not required for the Facility-wide Sewers AOC. Assessment of potential water quality and biological impacts is addressed under the evaluation of ecological risks.

3.2 HUMAN HEALTH RISK ASSESSMENT

Sediment and water inside the sewer pipes and pipe bedding material below the pipes do not represent exposure media for anticipated future receptors for RVAAP (e.g., National Guard Trainee and Resident Receptor). Therefore, a quantitative human health risk assessment is not required as part of the Facility-wide Sewers RI to identify risk or areas requiring remedial action to be protective of human health. The Draft RI/FS Report (SAIC 2012) will be revised accordingly.

3.3 ECOLOGICAL RISK ASSESSMENT

An assessment of ecological risk is required to complete the Facility-wide Sewers RI. An ecological risk assessment was presented in the Draft RI/FS Report (SAIC 2012) that assessed water quality and biological impact to determine if there is a need for remediation.

Piping segments of the Facility-wide Sewers AOC were determined not to be viable habitat; thus, the ecological risk assessment did not address accumulated sewer sediment and water within the pipelines. With the lack of permanent habitat and receptors, there is no exposure pathway and no ecological risk inside the piping system (SAIC 2012).

Due to the possibility of exposure to receptors at the outfall and downstream of the outfall, an ecological risk assessment was conducted for chemicals detected at outfalls. This evaluation considered evidence of ecological risk upstream and downstream of an outfall. As no ecological risk assessment was conducted for sewer interiors, evidence of ecological risk upstream of the outfall was based upon the presence of contaminants upstream of outfalls (e.g., within the storm sewer piping). Evidence of potential ecological risk downstream of the outfall was based upon analytical results collected from a downstream location and/or evidence of impaired metrics (e.g., sediment quality, surface water quality, fish composition, macroinvertebrate composition, and/or habitat quality) at a downstream biological/water station.

Results of the Load Line 2 FA RI indicate that elevated lead concentrations may pose a potential ecological risk within a section of the storm sewer system surrounding sample location LL2sd-308 that may warrant a remedial action. Figure 1-1 presents the results of lead analysis conducted on sediment samples collected from within the vitrified clay piping and/or at outfalls to the adjacent ditch.

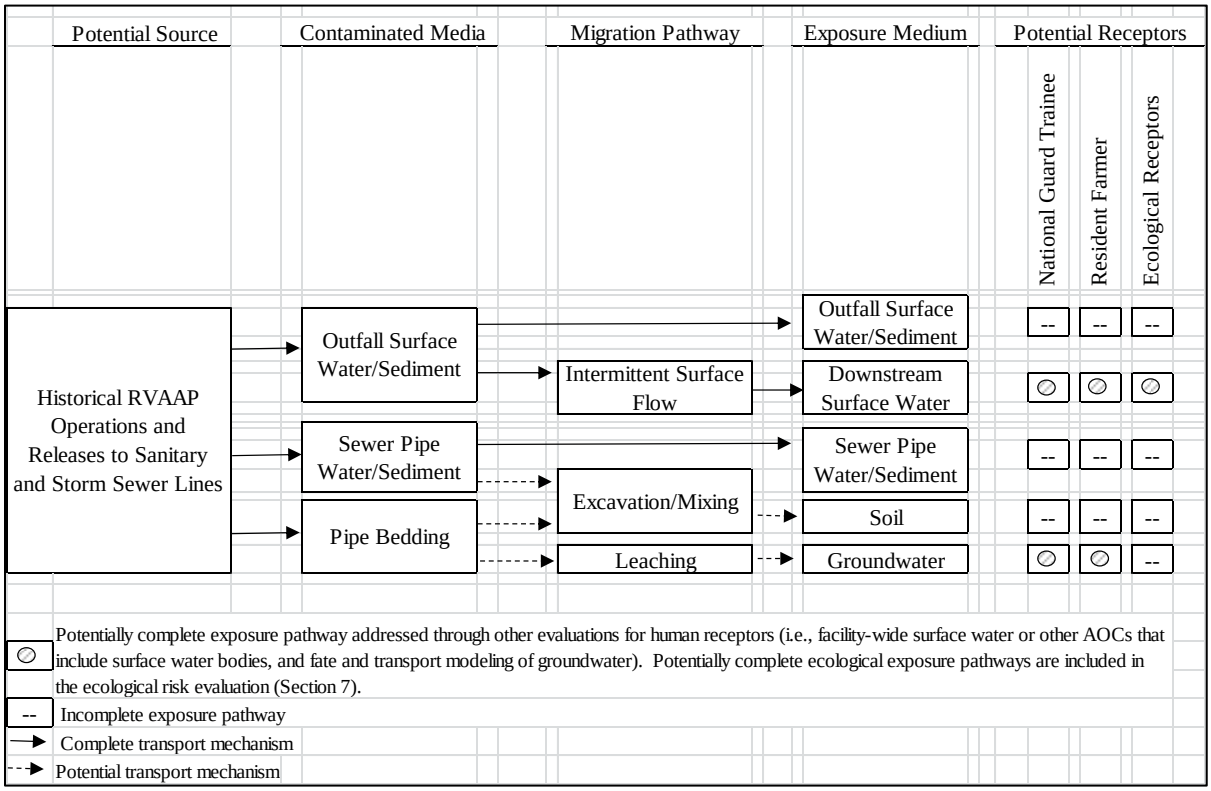


Figure 3-1. Conceptual Site Exposure Model for Facility-wide Sewers

4.0 NATURE AND EXTENT OF CONTAMINATION

The following subsections present the nature and extent of contamination within the storm sewer line at the Load Line 2 FA identified as being an ecological risk, as well as the receiving ditch line. Table 4-1 provides a summary of activities and a status at each notable location within this sewer segment.

4.1 STORM SEWER LINE

The evaluation of contamination in the localized storm sewer line consists of the main storm sewer segment from drop inlet DB16 to the main terminus discharge point, the adjacent sewer segment from inlets C2 to C4, the adjacent sewer segment from drop inlets DB21 to DB22, and the associated pipe bedding material.

4.1.1 Segments with Known Contamination

Sample locations with elevated concentrations of lead within the storm sewer line at the Load Line 2 FA are listed below:

- DB20, sample LL2-250 (collected on 07/28/01) had a lead concentration of 14,600 mg/kg, and sample LL2sd-615(st) (collected on 08/31/10) had a lead concentration of 29,200 mg/kg. Drop inlet DB20 is not visible from the ground surface; samples were collected from the storm sewer system at its approximate former location using a direct-push rig.

- DB21, sample LL2-251 (collected on 07/28/01) had a lead concentration of 5,280 mg/kg. Drop inlet DB21 is located in close proximity to the concrete dump area (former Building DB-802), which has been removed.

- DB22, sample LL2sd-308 (collected on 08/09/10) had a lead concentration of 872 mg/kg.

4.1.2 Segments with Low Concentrations or Incomplete Exposure Pathway

The horizontal extent of lead contamination in sediment within the clay pipeline is currently bounded by the following locations:

- DB16; location destroyed during building demolition activities.

- DB17; location destroyed during building demolition activities.

- DB18; location destroyed during building demolition activities.

- DB19; location destroyed during building demolition activities.

- C2; location destroyed during building demolition activities.

THIS PAGE INTENTIONALLY LEFT BLANK.

Table 4-1. Summary of Storm Sewer Inlets and Outfalls in the Load Line 2 FA Pre-delineation Sampling Study Area

Location	Date	Activity	Sample Number	Location Depth (ft bgs)	Lead Concentration	Purpose and/or Note
DB15	08/06/01	Video Survey	NA	NA	NA	Survey from DB14-DB-15. Noted cracks throughout.
	09/02/09	Visual Inspection	NA	NA	NA	Unable to be found. Considered destroyed as part of building demolition.
	08/19/10	Pipe Bedding Material	LL2pb-618(st)	2.5 – 2.75	14.8 mg/kg	Inlet DB15 destroyed. Excavation performed to collect pipe bedding material due to shallowness of sewer line.
DB16	09/02/09	Visual Inspection	NA	NA	NA	Unable to be found. Considered destroyed as part of building demolition.
	08/08/10	Outfall Sediment Sample	LL2sd-307(st)	0 – 0.5	30.3 mg/kg	Primary location destroyed; alternate sample location recommended; collected sediment under outfall pipe.
DB17	09/02/09	Visual Inspection	NA	NA	NA	Catch basin was filled almost to grade with ballast, gravel, and debris.
DB18	09/02/09	Visual Inspection	NA	NA	NA	Unable to be found. Considered destroyed as part of building demolition.
	08/31/10	Pipe Bedding Material (attempt)	NA	NA	NA	Five attempts using Geoprobe, also tried handclearing; no pipe present; area heavily demolished; no sample collected.
DB19	09/02/09	Visual Inspection	NA	NA	NA	Unable to be found. Considered destroyed as part of building demolition.
DB20	07/28/01	Sewer Sediment	LL2-250	0 – 0.5	14,600 mg/kg	None.
	08/06/01	Video Survey	NA	NA	NA	Survey from DB20 to C-2 and C-4. Cracks/fractures and light debris throughout.
	09/02/09	Visual Inspection	NA	NA	NA	Unable to be found. Considered destroyed as part of building demolition.
	08/31/10	Sewer Sediment Sample	LL2sd-615(st)	3.5 ft deep	29,200 mg/kg	Geoprobe used to collect sample within storm sewer pipe, northwest of former Inlet DB20. Sediment had a hydrocarbon odor; therefore, full suite analysis was performed.
	08/31/10	Pipe Bedding Material	LL2pb-615(st)	4.25 – 4.5	215 mg/kg	Collected northwest of DB20. Multiple boreholes were drilled to obtain necessary sample volume.
DB21	08/06/01	Video Survey	NA	NA	NA	DB21 to DB20. Noted cracking and heavy debris throughout. Intermediate flooded section.
	07/28/01	Sewer Sediment Sample	LL2-251	0 – 0.5	5280 mg/kg	Possibly collected downstream from DB22.
	09/02/09	Visual Inspection	NA	NA	NA	Unable to be found. Considered destroyed as part of building demolition.
	08/09/10	Sediment Sample (attempt)	LL2sd-309(st)	NA	NA	Sample not collected from DB21. Due to the shallowness of this structure, it was likely destroyed in its entirety with the demolition of the adjacent buildings. Collected sediment sample LL2sd-308(st) at downstream location, the outfall into the ditch at Inlet DB22.
DB22	09/02/09	Visual Inspection	NA	NA	NA	Grate intact but the east concrete wall is collapsing. Flooded with approximately 0.5 inches of water.
	08/09/10	Outfall Sediment Sample	LL2sd-308(st)	4.3	872 mg/kg	Collected sediment sample below outfall pipe.
Outfall South of Building DB-802	09/02/09	Visual Inspection	NA	NA	NA	Unable to be found. Considered destroyed as part of building demolition.
	10/13/09	Outfall Sediment Sample	LL2sd-311(st)	At discharge	31.4 mg/kg	Characterization of storm drainage from building complex at south end of the Load Line 2 Functional Area, 8-inch culvert pipe located. Collected sediment below pipe.
	10/09/09	Outfall Surface Water Sample	LL2sw-311(st)	At discharge	0.0748 mg/L	Collected water from pipe.
C2	09/02/09	Visual Inspection	NA	NA	NA	Unable to be found. Presumed destroyed based on site conditions.
C3	09/02/09	Visual Inspection	NA	NA	NA	Unable to be found. Considered destroyed as part of building demolition.
C4	07/29/01	Sewer Sediment Sample	LL2-235	2.3	1,670 mg/kg	None.
	09/02/09	Visual Inspection	NA	NA	NA	Filled in with debris and vegetation. Cannot see pipes. No grate and south wall collapsed.
	08/09/10	Sewer Sediment Sample	LL2sd-296(st)	2.3	277 mg/kg	Sediment was able to be collected from inlet; some demolition material may have been in sample.
	08/25/10	Pipe Bedding Material	LL2pb-614(st)	3 – 5	52.3 mg/kg	Power auger used to locate pipe approximately 4 ft downstream of the inlet; collected pipe bedding sample.

bgs = Below Ground Surface.
NA = Not Applicable.

THIS PAGE INTENTIONALLY LEFT BLANK.

- C3; location destroyed during building demolition activities.

- C4; sample LL2-235 (collected on 07/29/01) had a lead concentration of 1,670 mg/kg, and sample LL2sd-296(st) (collected on 08/09/10) had a lead concentration of 277 mg/kg. The destruction of locations C2 and C3, both downstream of C4, has resulted in an incomplete exposure pathway for observed lead contamination at C4.

- Main outfall discharge; sample LL2sd-311(st) (collected on 10/03/09) had a lead concentration of 31.4 mg/kg at the terminus of the storm sewer line.

4.1.3 Vertical Migration

Results of pipe bedding analysis near former drop inlet DB20 indicate the lead contamination is localized in the storm sewer line and has not migrated to the pipe bedding material. Sample LL2pb-615(st) (collected on 08/31/10) consisted of the pipe bedding material beneath the contaminated sewer line and had a lead concentration of 215 mg/kg, below the residential RSL of 400 mg/kg. Additional pipe bedding material samples were collected near drop inlet DB15 (lead concentration of 14.8 mg/kg) and C4 (lead concentration of 52.3 mg/kg). These results were well below the residential RSL of 400 mg/kg.

4.2 DITCH LINE

The drainage ditch located parallel to the storm sewer line and west of the old railroad bed received storm water overflow discharge from outfall pipes at DB16 through DB22. Within the ditch, the horizontal extent of lead in sediment is bounded downstream by sample LL2-212, which had a concentration of 50.4 mg/kg, and upstream by sample LL2sd-307(st) at DB16, which had a concentration of 30.3 mg/kg.

Lead also was observed in downstream sample LL2-252 at a concentration of 656 mg/kg; however, this exceedance is not attributed to the storm sewer system, as lead concentrations in multiple samples [LL2-212, LL2sd-311(st), and LL2-183] collected between the storm sewer and the elevated concentration at LL2-252 remain two orders of magnitude below the CUG.

4.3 ADEQUATE DELINEATION

The horizontal extent of lead contamination within the storm sewer line has been adequately delineated, as summarized below:

- The extent of potential source material resulting in potential downstream ecological risk is limited to piping segments downstream of DB19 through DB22.

- The storm sewer segments from DB16 to DB19 and C3 to C2 are associated with incomplete exposure pathways, as the storm sewer structures have been destroyed during building demolition activities.

- The storm sewer segment from DB21 to the outfall at the main terminus at sample location LL2sd-311(st) does not contain media posing an ecological risk, demonstrated by a reported lead concentration (at the terminus) of 31.4 mg/kg.

The vertical extent of lead contamination in the storm sewer segment is limited to the sewer infrastructure. Bedding material samples collected below the vitrified clay pipe indicate there has not been vertical migration of contamination at concentrations above the residential RSL of 400 mg/kg.

4.4 DATA GAPS

The ditch line that receives intermediate storm sewer discharge from DB17 through DB20 and downstream of DB22 requires additional sampling to delineate nature and extent of contamination. Although DB17, DB18, and DB19 have been demolished, additional sampling within the ditch line at the respective outfall locations for historical lead impacts is appropriate. Additional samples in the ditch between DB22 and sample location LL2-212 are required to fully delineate lead contamination within the ditch.

5.0 SAMPLING APPROACH

5.1 SAMPLE LOCATIONS

Table 5-1 lists proposed pre-delineation samples; proposed sample locations are provided on Figure 1-1. A total of nine locations will be sampled for lead:

- Four sediment samples will be collected from the 0 – 0.5-ft-below ground surface (bgs) interval at the intermediate outfalls that conveyed overflow storm sewer flow to the northern portion of the ditch line from DB17, DB18, DB19, and DB20.

- Twelve sediment samples will be collected from a total of four locations within the southern portion of the ditch (i.e., downstream of DB22); samples will be collected from the 0 – 0.5-ft-bgs interval, the 0.5 – 1.0-ft-bgs interval; and the 1.0 – 2.0-ft-bgs interval at each location.

- DB22, the location of sample LL2sd-308 (collected on 08/09/10), will be re-sampled to confirm the current lead concentration at the outfall.

Table 5-1. Proposed Load Line 2 Functional Area Pre-delineation Samples for Lead Analysis

Sample Location	Sample Depth (ft bgs)	Location Description
LL2sd-650(st)	0 – 0.5	Storm sewer overflow outfall to ditch west of DB17 and old railroad bed.
LL2sd-651(st)	0 – 0.5	Storm sewer overflow outfall to ditch west of DB18 and old railroad bed.
LL2sd-652(st)	0 – 0.5	Storm sewer overflow outfall to ditch west of DB19 and old railroad bed.
LL2sd-653(st)	0 – 0.5	Storm sewer overflow outfall to ditch west of DB20 and old railroad bed.
LL2sd-654(st)	0 – 0.5	Approximately 50 ft downstream of DB22 outfall within ditch line.
	0.5 – 1.0	
	1.0 – 2.0	
LL2sd-655(st)	0 – 0.5	Approximately 125 ft downstream of DB22 outfall within ditch line.
	0.5 – 1.0	
	1.0 – 2.0	
LL2sd-656(st)	0 – 0.5	Approximately 225 ft downstream of DB22 outfall within ditch line.
	0.5 – 1.0	
	1.0 – 2.0	
LL2sd-657(st)	0 – 0.5	Approximately 300 ft downstream of DB22 outfall within ditch line.
	0.5 – 1.0	
	1.0 – 2.0	
LL2sd-308(st)	0 – 0.5	DB22, last sampled in 2010

bgs = Below Ground Surface.

5.2 DATA QUALITY OBJECTIVES

The following presents the data quality objectives (DQOs) of this pre-delineation sampling event:

- Identify segments in the ditch line that have a lead concentration greater than 400 mg/kg.
- Determine the current lead concentration in sediment at the DB22 outfall.

6.0 FIELD METHODS AND REPORTING

Sediment samples will be collected in accordance with the methods and procedures established in the *Final Facility-Wide Sampling and Analysis Plan for Environmental Investigations* (SAIC 2011b). A combination of scoops, hand augers, and direct-push probing will be used, depending on conditions at each sample location.

6.1 ANALYTICAL METHODS AND QUALITY ASSURANCE/QUALITY CONTROL

Sediment samples will be analyzed for lead by USEPA method SW-846 6020. Field duplicates will be collected for analysis at a rate of 10% (1 duplicate per 10 primary environmental samples). Matrix spike/matrix spike duplicate (MS/MSD) will be collected for analysis at a rate of 5% (1 MS/MSD per 20 environmental samples). Based on DQOs, no other quality control samples are proposed.

6.2 HEALTH AND SAFETY

Field activities will be conducted in accordance with the approved *Final Facility-Wide Safety and Health Plan for Environmental Investigations* (SAIC 2011a).

6.3 REPORTING

Results of the pre-delineation sampling will be documented in the EE/CA and used to guide the extent of the removal action.

THIS PAGE INTENTIONALLY LEFT BLANK.

7.0 REFERENCES

SAIC (Science Applications International Corporation) 2011a. *Final Facility-Wide Safety and Health Plan for Environmental Investigations*, Revision 0. February 2011.

SAIC 2011b. *Final Facility-Wide Sampling and Analysis Plan for Environmental Investigations*, Revision 0. February 2011.

SAIC 2012. *Draft Remedial Investigation/Feasibility Study Report for RVAAP-67 Facility-Wide Sewers*. September 2012.

THIS PAGE INTENTIONALLY LEFT BLANK.

APPENDIX B

Load Line 2 Functional Area - 2016 Pre-Delineation Sampling Laboratory Data Package

THIS PAGE INTENTIONALLY LEFT BLANK.

CT LABORATORIES

delivering more than data from your environmental analyses

Marie Simpson
Leidos
301 Laboratory Road
Oak Ridge, TN 37831

PROJECT SITE:	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2), RVAAP, Ravenna, OH
DOD CONTRACT #:	W12QR-12-D-0020 DO 0008
PROJECT #:	315391.00.00.10.00.1
SDG:	119075
PREPARED:	June 8, 2016
# of Document Pages:	520

The data contained in the following report have been reviewed by the appropriate CT Laboratories LLC's staff members. In addition, CT Laboratories LLC certifies that to the best of our knowledge that the analyses reported herein are true, complete and correct within the limits of the methods employed and that they follow the applicable requirements as specified by the project plan, state-specific, NELAC or DOD QSM requirements. The estimated uncertainty of measurement is only available upon request. The reported results relate only to the tested samples. This report shall not be reproduced, except in full, without written approval of CT Laboratories LLC.

APPROVED BY: _____ LABORATORY DIRECTOR

APPROVED BY: _____ PROJECT MANAGER

Certifications: IL (NELAP 002413), KS (NELAP E-10368), KY (0023), WI (157066030), DOD ELAP (A2LA 3806.01), VA (7608), MD (344), LA (NELAP 115843), ISO17025 (A2LA 3806.01, GA EDP Stipulation (Accreditor: LA NELAP, ACC#: E971111, Scope: Non-potable water solid and chemical materials, biological tissue, Effective: 12/10/2014, Expires: annually)

ACCREDITED IN ACCORDANCE WITH nelac

CT LABORATORIES

delivering more than data from your environmental analyses

Table of Contents

Section	Page
Cover Page	1
Table of Contents	2
Case Narrative and Summary of Detects (if applicable)	3
Data Qualifier Sheet	4
Sample Delivery Group Summary	6
QC Batch Cross Reference	7
Metals CLP Forms Documents	9
Metals Raw Data Documents	67
Metals Logbook Documents	302
Inorganic CLP Forms Documents	485
Inorganic Raw Data Documents	506
Inorganic Logbook Documents	508
Chain of Custody, PM Confirmation and Sample Condition Forms	512

CT LABORATORIES

delivering more than data from your environmental analyses

Case Narrative

Client: Leidos
Project: FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2), RVAAP, Ravenna, OH
Sample Receipt Date(s): 05-18-2016
SDG #: 119075

Fifteen soil samples were analyzed for lead. The assigned sample ID numbers, date sampled, and date received are indicated in the attached Project Summary. The samples were received intact and at a temperature within method specified acceptance limits. Any exceptions are noted below. The analyses were performed following DOD QSM 5.0.

Sample Analysis and Quality Control

Metals:

The samples were analyzed using US EPA Method 6010C (ICP). All samples were analyzed within the holding time. The following summaries of quality control procedures are included:

Initial and Continuing Calibration Verification
Blanks Summary
ICP Interference Check Data
Spike Sample Recovery
Duplicates Data
Laboratory Control Sample Data
Analysis Run Log

All analysis results met the method specified quality control criteria with the following exceptions:

Continuing Calibration Verifications standards were analyzed at two levels (CCV1 & CCV2) with potentially differing wavelengths. Data associated with CCV's were evaluated based on the concentration of the element in the samples and compared to the appropriate CCV level/wavelength.

Some samples may have been analyzed and/or reanalyzed diluted to obtain results for all target analytes within the calibration range of the instrument.

ICP Metals (6010C) Soil Analyses

<u>Analytical Run # 126342</u>

Lead was detected in the Method Blank (MB) above the Method Detection Limit (MDL) and greater than ½ the Reporting Limit (RL). The samples were reported and not reanalyzed because the MB result was less than 1/10th of the sample results.

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) for sample # 724949 exceeded the recovery limit for lead. A PDS was analyzed and was unacceptable. The parent sample was reported and qualified with an "M" flag for lead.

CT LABORATORIES

delivering more than data from your environmental analyses

Data Qualifiers

Code	Description
A	Analyte averaged calibration criteria within acceptable limits.
B	Analyte detected in associated Method Blank.
C	Toxicity present in BOD sample.
D	Diluted Out.
E	Safe, No Total Coliform detected.
F	Unsafe, Total Coliform detected, no E. Coli detected.
G	Unsafe, Total Coliform detected and E. Coli detected.
H	Holding time exceeded.
J	Estimated value.
L	Significant peaks were detected outside the chromatographic window.
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits.
N	Insufficient BOD oxygen depletion.
O	Complete BOD oxygen depletion.
P	Concentration of analyte differs more than 40% between primary and confirmation analysis.
Q	Laboratory Control Sample outside acceptance limits.
R	See Narrative at end of report.
S	Surrogate standard recovery outside acceptance limits due to apparent matrix effects.
T	Sample received with improper preservation or temperature.
U	Analyte concentration was not above the detection level.
V	Raised Quantitation or Reporting Limit due to limited sample amount or dilution for matrix background interference.
W	Sample amount received was below program minimum.
X	Analyte exceeded calibration range.
Y	Replicate/Duplicate precision outside acceptance limits.
Z	Calibration criteria exceeded.

CT LABORATORIES

delivering more than data from your environmental analyses

MANUAL INTEGRATION REASON CODES

CTLaboratories has identified four general cases with valid reasons supporting the use of manual integration techniques. These codes are used on chromatograms in this data package to document the reasons for manual integrations per CTLaboratories' SOP SS-10 current revision.

#1: **Data system failed to select the correct peak or missed the peak entirely.**
In some cases the chromatography system selects and integrates the "wrong peak". In this case the analyst must correct the selection and force the system to integrate the proper peak. In other instances the system may miss the peak completely. In this case the analyst manually integrated the peak

#2: **Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak.**
This phenomenon is common at low concentrations where the signal to noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low or high area counts for the target compound.

#3: Improperly Integrated Isomers and/or coeluting compounds.
For when the system fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations may be inaccurate, and they must be corrected by manual integration. Prime examples are compounds that are unresolved and integrated improperly when present at low concentrations in standards or samples.

#4: System Established Incorrect Baseline.
There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and may be corrected via manual procedures.

#5: Miscellaneous.
Some situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the group supervisor. If the form of manual integration is not clearly covered by these four cases, then review and approval by the group supervisor or the *QA/QC* Supervisor will be required.

CT LABORATORIES
delivering more than data from your environmental analyses
1230 Lange Court • Baraboo, WI 53913 • 608-356-2760
www.ctlaboratories.com

Sample Delivery Group

119075

LEIDOS
MARIE SIMPSON
301 LABORATORY ROAD
OAKRIDGE, TN 37831

Project Name: FW SEWERS EE/CA PRE-DELINEATION S
Project #: 315391.00.00.10.00.1

CT Sample #	Folder #	Client Sample #	Sample Description	Matrix	Date Sampled	Date Received
724949	119075	LL2SD-308(ST)	LL2SD-308(ST)-2527-SD	SOIL	05/16/2016	05/18/2016
724950	119075	LL2SD-654(ST)	LL2SD-654(ST)-2515-SD	SOIL	05/16/2016	05/18/2016
724951	119075	LL2SD-654(ST)	LL2SD-654(ST)-2516-SD	SOIL	05/16/2016	05/18/2016
724952	119075	LL2SD-654(ST)	LL2SD-654(ST)-2517-SD	SOIL	05/16/2016	05/18/2016
724953	119075	LL2SD-655(ST)	LL2SD-655(ST)-2518-SD	SOIL	05/16/2016	05/18/2016
724954	119075	LL2SD-655(ST)	LL2SD-655(ST)-4096-FD	SOIL	05/16/2016	05/18/2016
724955	119075	LL2SD-655(ST)	LL2SD-655(ST)2519-SD	SOIL	05/16/2016	05/18/2016
724956	119075	LL2SD-655(ST)	LL2SD-655(ST)-2520-SD	SOIL	05/16/2016	05/18/2016
724957	119075	LL2SD-653(ST)	LL2SD-653(ST)-4095-FD	SOIL	05/16/2016	05/18/2016
724958	119075	LL2SD-653(ST)	LL2SD-653(ST)-2514-SD	SOIL	05/16/2016	05/18/2016
724959	119075	LL2SD-656(ST)	LL2SD-656(ST)-2521-SD	SOIL	05/16/2016	05/18/2016
724960	119075	LL2SD-656(ST)	LL2SD-656(ST)-2522-SD	SOIL	05/16/2016	05/18/2016
724961	119075	LL2SD-656(ST)	LL2SD-656(ST)-2523-SD	SOIL	05/16/2016	05/18/2016
724962	119075	LL2SD-657(ST)	LL2SD-657(ST)-2524-SD	SOIL	05/16/2016	05/18/2016
724963	119075	LL2SD-657(ST)	LL2SD-657(ST)-2525-SD	SOIL	05/16/2016	05/18/2016
724964	119075	LL2SD-657(ST)	LL2SD-657(ST)-2526-SD	SOIL	05/16/2016	05/18/2016
724965	119075	LL2SD-651(ST)	LL2SD-651(ST)-2512-SD	SOIL	05/16/2016	05/18/2016
724966	119075	LL2SD-652(ST)	LL2SD-652(ST)-2513-SD	SOIL	05/16/2016	05/18/2016
724967	119075	LL2SD-650(ST)	LL2SD-650(ST)-2511-SD	SOIL	05/16/2016	05/18/2016

CT LABORATORIES
delivering more than data from your environmental analyses
1230 Lange Court • Baraboo, WI 53913 • 608-356-2760
www.ctlaboratories.com

QC Batch Cross Reference Summary

LEIDOS
MARIE SIMPSON
301 LABORATORY ROAD
OAKRIDGE, TN 37831

Project Name:	FW SEWERS EE/CA PRE-DEL
Project #:	315391.00.00.10.00.1
Report Date:	06/08/2016
Date Received:	05/18/2016
SDG #:	119075

Inorganic Parameters

CTI LAB#:	Parameter	Method	Matrix	Prep Batch #	Analytical Run #
724949	Solids, Percent	EPA 8000C	SOIL		126186
724950	Solids, Percent	EPA 8000C	SOIL		126186
724951	Solids, Percent	EPA 8000C	SOIL		126186
724952	Solids, Percent	EPA 8000C	SOIL		126186
724953	Solids, Percent	EPA 8000C	SOIL		126186
724954	Solids, Percent	EPA 8000C	SOIL		126186
724955	Solids, Percent	EPA 8000C	SOIL		126186
724956	Solids, Percent	EPA 8000C	SOIL		126186
724957	Solids, Percent	EPA 8000C	SOIL		126186
724958	Solids, Percent	EPA 8000C	SOIL		126186
724959	Solids, Percent	EPA 8000C	SOIL		126186
724960	Solids, Percent	EPA 8000C	SOIL		126186
724961	Solids, Percent	EPA 8000C	SOIL		126186
724962	Solids, Percent	EPA 8000C	SOIL		126186
724963	Solids, Percent	EPA 8000C	SOIL		126186
724964	Solids, Percent	EPA 8000C	SOIL		126186
724965	Solids, Percent	EPA 8000C	SOIL		126186
724966	Solids, Percent	EPA 8000C	SOIL		126186
724967	Solids, Percent	EPA 8000C	SOIL		126186

Metal Parameters

CTI LAB#:	Parameter	Method	Matrix	Prep Batch #	Analytical Run #
724949	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724950	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342

CT LABORATORIES
delivering more than data from your environmental analyses

Project Name: FW SEWERS EE/CA PRE-DEL
Project #: 315391.00.00.10.00.1
SDG #: 119075

CTI LAB#:	Parameter	Method	Matrix	Prep Batch #	Analytical Run #
724951	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724952	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724953	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724954	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724955	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724956	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724957	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724958	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724959	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724960	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724961	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724962	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724963	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724964	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724965	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724966	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342
724967	ICP Metals QSM 5.0	EPA 6010C	SOIL	57354	126342

METALS
CLP FORMS
DOCUMENTS

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-308(ST)-2527-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	37.1	Lab Sample ID:	724949
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	10.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/26/2016 14:20
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	19900	M	1.1	3.4	6.7	6.7

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-650(ST)-2511-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	57.3	Lab Sample ID:	724967
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 15:45
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	23.6		0.069	0.21	0.43	0.43

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-651(ST)-2512-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	74.8	Lab Sample ID:	724965
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 15:32
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	19.2		0.052	0.16	0.33	0.33

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-652(ST)-2513-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	72.1	Lab Sample ID:	724966
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 15:38
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	112		0.056	0.18	0.35	0.35

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-653(ST)-2514-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	72.1	Lab Sample ID:	724958
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 14:29
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	259		0.055	0.17	0.35	0.35

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-656(ST)-2521-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	42.3	Lab Sample ID:	724959
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 14:35
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	1100		0.092	0.29	0.57	0.57

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-653(ST)-4095-FD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	68.0	Lab Sample ID:	724957
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 14:22
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	300		0.057	0.18	0.36	0.36

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-654(ST)-2515-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	24.8	Lab Sample ID:	724950
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 13:19
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	3740		0.16	0.51	1.0	1.0

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-654(ST)-2516-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	54.7	Lab Sample ID:	724951
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 13:44
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	1580		0.074	0.23	0.46	0.46

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-654(ST)-2517-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	77.8	Lab Sample ID:	724952
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 13:50
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	251		0.050	0.16	0.32	0.32

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-655(ST)-2518-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	73.7	Lab Sample ID:	724953
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 13:56
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	83.4		0.055	0.17	0.35	0.35

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-655(ST)2519-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	74.9	Lab Sample ID:	724955
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 14:09
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	63.5		0.052	0.16	0.33	0.33

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-655(ST)-2520-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	75.1	Lab Sample ID:	724956
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 14:16
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	103		0.052	0.16	0.32	0.32

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-655(ST)-4096-FD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	65.4	Lab Sample ID:	724954
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 14:03
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	608		0.064	0.20	0.40	0.40

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-656(ST)-2522-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	71.8	Lab Sample ID:	724960
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 14:41
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	456		0.053	0.17	0.33	0.33

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-656(ST)-2523-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	58.3	Lab Sample ID:	724961
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 15:06
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	965		0.066	0.21	0.41	0.41

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-657(ST)-2524-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	72.0	Lab Sample ID:	724962
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 15:12
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	396		0.056	0.17	0.35	0.35

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-657(ST)-2525-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	77.0	Lab Sample ID:	724963
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 15:19
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	58.2		0.051	0.16	0.32	0.32

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-657(ST)-2526-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	79.2	Lab Sample ID:	724964
Analytical Method:	EPA 6010C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126342	Analysis Date/Time	05/25/2016 15:25
Analytical Prep Batch #:	57354	Prep. Date/Time:	05/23/2016 06:00
ICAL Calibration #:		Concentration Units:	mg/kg

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
7439-92-1	Lead	40.0		0.049	0.15	0.31	0.31

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

ICV

2A-1

INITIAL CALIBRATION VERIFICATION

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342

Lab Sample ID: 728592

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/25/16 11:36	500.0	516.0	103	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

LLQC

2A-1

LOWER LIMIT OF QUANTITATION CHECK (LLQC)

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342

Lab Sample ID: 728593

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/25/16 11:42	30.00	32.00	107	80	120

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

ICV

2A-1

INITIAL CALIBRATION VERIFICATION

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342

Lab Sample ID: 729109

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/26/16 13:06	500.0	526.0	105	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

LLQC

2A-1

LOWER LIMIT OF QUANTITATION CHECK (LLQC)

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342

Lab Sample ID: 729110

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/26/16 13:12	30.00	28.50	95	80	120

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

CCV High Level

2A-2

CONTINUING CALIBRATION VERIFICATION (LEVEL 1 - HIGH RANGE)

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 728601

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/25/16 13:26	5000	5230	105	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

CCV Low Level

2A-2

CONTINUING CALIBRATION VERIFICATION (LEVEL 2 - LOW RANGE)

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342

Lab Sample ID: 728602

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/25/16 13:31	500.0	502.0	100	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

CCV High Level

2A-2

CONTINUING CALIBRATION VERIFICATION (LEVEL 1 - HIGH RANGE)

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 728604

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/25/16 14:48	5000	5190	104	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

CCV Low Level

2A-2

CONTINUING CALIBRATION VERIFICATION (LEVEL 2 - LOW RANGE)

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 728605

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/25/16 14:53	500.0	514.0	103	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

CCV High Level

2A-2

CONTINUING CALIBRATION VERIFICATION (LEVEL 1 - HIGH RANGE)

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 728607

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/25/16 16:10	5000	5180	104	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

CCV Low Level

2A-2

CONTINUING CALIBRATION VERIFICATION (LEVEL 2 - LOW RANGE)

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 728608

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/25/16 16:15	500.0	536.0	107	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

CCV High Level

2A-2

CONTINUING CALIBRATION VERIFICATION (LEVEL 1 - HIGH RANGE)

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 729115

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/26/16 14:59	5000	5290	106	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No.

CCV Low Level

2A-2

CONTINUING CALIBRATION VERIFICATION (LEVEL 2 - LOW RANGE)

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMP

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 729116

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R**	Lower Limit (1)	Upper Limit (1)
Lead	5/26/16 15:05	500.0	517.0	103	90	110

Default Limits (not applicable to MDL Check) **No percent recovery is calculated for MDL checks. The check is simply whether the analyte is detected.

(1) Control Limits: 70-130

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No

3-1

INITIAL CALIBRATION BLANKS

ICB

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 728594

Analytical Prep Batch # 0 Preparation Date/Time:

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Measured Concentration	C***	Detection Limit**	Control Limit
Lead	05/25/2016 11:55	-2.36	U	1.4	5.0

** Detection Limit only reported if value was less than the control limit.
***A "U" indicates the analyte was not detected in the method blank at the detection limit or the Control Limit whichever was less.

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No

3-1

INITIAL CALIBRATION BLANKS

ICB

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 729111

Analytical Prep Batch # 0 Preparation Date/Time:

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Measured Concentration	C***	Detection Limit**	Control Limit
Lead	05/26/2016 13:25	-4.27	U	1.4	5.0

** Detection Limit only reported if value was less than the control limit.
***A "U" indicates the analyte was not detected in the method blank at the detection limit or the Control Limit whichever was less.

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No

CCB

3-2

CONTINUING CALIBRATION BLANKS

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 728603

Analytical Prep Batch # 0 Preparation Date/Time:

ICAL Calibration #: Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Measured Concentration	C***	Detection Limit**	Control Limit
Lead	05/25/2016 13:37	-1.68	U	1.4	5.0

** Detection Limit only reported if value was less than the control limit.
***A "U" indicates the analyte was not detected in the method blank at the detection limit or the Control Limit whichever was less.

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No

CCB

3-2

CONTINUING CALIBRATION BLANKS

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

SDG No.: 119075

Analytical Run #: 126342

Lab Sample ID: 728606

Analytical Prep Batch # 0

Preparation Date/Time:

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Measured Concentration	C***	Detection Limit**	Control Limit
Lead	05/25/2016 14:59	-3.66	U	1.4	5.0

** Detection Limit only reported if value was less than the control limit.
***A "U" indicates the analyte was not detected in the method blank at the detection limit or the Control Limit whichever was less.

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No

CCB

3-2

CONTINUING CALIBRATION BLANKS

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

SDG No.: 119075

Analytical Run #: 126342

Lab Sample ID: 728609

Analytical Prep Batch # 0

Preparation Date/Time:

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Measured Concentration	C***	Detection Limit**	Control Limit
Lead	05/25/2016 16:21	-3.92	U	1.4	5.0

** Detection Limit only reported if value was less than the control limit.
***A "U" indicates the analyte was not detected in the method blank at the detection limit or the Control Limit whichever was less.

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No

CCB

3-2

CONTINUING CALIBRATION BLANKS

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

SDG No.: 119075

Analytical Run #: 126342

Lab Sample ID: 729117

Analytical Prep Batch # 0

Preparation Date/Time:

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Measured Concentration	C***	Detection Limit**	Control Limit
Lead	05/26/2016 15:11	-10.6	U	1.4	5.0

** Detection Limit only reported if value was less than the control limit.
***A "U" indicates the analyte was not detected in the method blank at the detection limit or the Control Limit whichever was less.

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No

MB

3-3

METHOD BLANKS

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

SDG No.: 119075

Analytical Run #: 126342 Lab Sample ID: 726116

Analytical Prep Batch # 57354 Preparation Date/Time: 05/23/2016 06:00

ICAL Calibration #: Concentration Units: mg/kg

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Measured Concentration	C***	Detection Limit**	Control Limit	
Lead	05/25/2016 12:34	0.21		0.04	0.125	FAIL

** Detection Limit only reported if value was less than the control limit.
***A "U" indicates the analyte was not detected in the method blank at the detection limit or the Control Limit whichever was less.

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No:

4-1

ICP INTERFERENCE CHECK SAMPLE (SOL. A)

ICSA

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

ICP ID Number: TJA 6000

SDG No.: 119075

ICS Source: SPEX

Analytical Run #: 126342

Lab Sample ID: 728596

Inorganics MRL Standard Source: SPEX, Ultra,Inorganic Ventures and Mallinkrodt

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R	Lower Limit (1)	Upper Limit (1)
Aluminum	05/25/2016 12:08	500000	545000	109	80	120
Calcium	05/25/2016 12:08	500000	505000	101	80	120
Iron	05/25/2016 12:08	500000	500000	100	80	120
Lead	05/25/2016 12:08	0	0.00100		-5	5
Magnesium	05/25/2016 12:08	500000	542000	108	80	120

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No:

4-1

ICP INTERFERENCE CHECK SAMPLE (SOL. A)

ICSA

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

ICP ID Number: TJA 6000

SDG No.: 119075

ICS Source: SPEX

Analytical Run #: 126342

Lab Sample ID: 729112

Inorganics MRL Standard Source: SPEX, Ultra,Inorganic Ventures and Mallinkrodt

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R	Lower Limit (1)	Upper Limit (1)
Aluminum	05/26/2016 13:39	500000	526000	105	80	120
Calcium	05/26/2016 13:39	500000	508000	102	80	120
Iron	05/26/2016 13:39	500000	507000	101	80	120
Lead	05/26/2016 13:39	0	0		-5	5
Magnesium	05/26/2016 13:39	500000	532000	106	80	120

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No:

4-2

ICP INTERFERENCE CHECK SAMPLE (SOL. AB)

ICSAB

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

ICP ID Number: TJA 6000

SDG No.: 119075

ICS Source: SPEX, Ultra

Analytical Run #: 126342

Lab Sample ID: 728597

Inorganics MRL Standard Source: SPEX, Ultra,Inorganic Ventures and Mallinkrodt

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R	Lower Limit (1)	Upper Limit (1)
Aluminum	05/25/2016 12:15	500000	536000	107	80	120
Calcium	05/25/2016 12:15	500000	497000	99	80	120
Iron	05/25/2016 12:15	500000	474000	95	80	120
Lead	05/25/2016 12:15	500.0	484.0	97	80	120
Magnesium	05/25/2016 12:15	500000	532000	106	80	120

CT LABORATORIES
delivering more than data from your environmental analyses

Sample No:

4-2

ICP INTERFERENCE CHECK SAMPLE (SOL. AB)

ICSAB

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

ICP ID Number: TJA 6000

SDG No.: 119075

ICS Source: SPEX, Ultra

Analytical Run #: 126342

Lab Sample ID: 729113

Inorganics MRL Standard Source: SPEX, Ultra,Inorganic Ventures and Mallinkrodt

ICAL Calibration #:

Concentration Units: ug/L

Analysis Type: Initial Analysis

Analyte	Analysis Date/Time	Spiked Conc.	Measured Conc.	%R	Lower Limit (1)	Upper Limit (1)
Aluminum	05/26/2016 13:46	500000	524000	105	80	120
Calcium	05/26/2016 13:46	500000	508000	102	80	120
Iron	05/26/2016 13:46	500000	487000	97	80	120
Lead	05/26/2016 13:46	500.0	423.0	85	80	120
Magnesium	05/26/2016 13:46	500000	535000	107	80	120

CT LABORATORIES
delivering more than data from your environmental analyses

5A

SPIKE SAMPLE RECOVERY

Sample Description

LL2SD-308(ST)-2527-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL
Matrix:	SOLID	SDG No.:	119075
% Solids for Sample:	37.1	Concentration Units:	mg/kg
Sample No	726075	Parent Sample No.:	724949
Analytical Prep Batch #	57354	Analytical Preparation Date/Time:	05/23/2016 06:00
Analytical Run #:	126342	ICAL Calibration #:	

Analysis Type *Initial Analysis* Analysis Date: ----- 05/26/2016 Analysis Time: -------- 14:40

Analyte	Control Limit (%R)	Spike Result	C (Spike)	Parent Result	C (Parent)	Spike Amount	%R	Q	M	
Lead	81-112	21800		19900		66.1	2874		P	*FAIL*

BDL = analyte concentration was below detection limit

CT LABORATORIES
delivering more than data from your environmental analyses

5B

POST DIGESTION SPIKE SAMPLE RECOVERY

Sample Description

LL2SD-308(ST)-2527-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL
Matrix:	SOLID	SDG No.:	119075
% Solids for Sample:	37.1	Concentration Units:	ug/L
Sample No	728600	Parent Sample No.:	724949
Analytical Prep Batch #	0	Analytical Preparation Date/Time:	
Analytical Run #:	126342	ICAL Calibration #:	

Analysis Type	*Initial Analysis*	Analysis Date: -----	05/26/2016	Analysis Time: --------	14:53

Analyte	Control Limit (%R)	Spike Result	C (Spike)	Parent Result	C (Parent)	Spike Amount	%R	Q	M	
Lead	80-120	47800		29500		1000	1830		P	*FAIL*

BDL = analyte concentration was below detection limit

CT LABORATORIES
delivering more than data from your environmental analyses

5C

SPIKE DUPLICATE SAMPLE RECOVERY

Sample Description

LL2SD-308(ST)-2527-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL
Matrix:	SOLID	SDG No.:	119075
% Solids for Sample:	37.1	Concentration Units:	mg/kg
Sample No	726076	Parent Sample No.:	726075
Analytical Prep Batch #	57354	Analytical Preparation Date/Time:	05/23/2016 06:00
Analytical Run #:	126342	ICAL Calibration #:	

Analysis Type *Initial Analysis* Analysis Date: ----- 05/26/2016 Analysis Time: -------- 14:46

Analyte	Control Limit (%R)	Spike Result	C (Spike)	Parent Result	C (Parent)	Spike Amount	%R	Q	M	
Lead	81-112	29000		19900		69.1	13169		P	*FAIL*

BDL = analyte concentration was below detection limit

CT LABORATORIES
delivering more than data from your environmental analyses

6

DUPLICATES

Sample Description

LL2SD-308(ST)-2527-SD

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

Matrix: SOLID

SDG No.: 119075

% Solid for Sample: 37.1

Concentration Units: mg/kg

Analytical Prep Batch # 1

Analytical Preparation Date/Time 57354

Analytical Run #: 126342

ICAL Calibration #:

Sample #: 726074

Parent Sample #: 724949

Analysis Type *Initial Analysis*

Analyte	Analysis Date/Tim		RPD Limit	Original Parent Conc. (S)	C	Duplicate Conc. (D)	C	RPD	Q	M
Lead	05/26/2016	14:33	20	19900		24000		19		P

CT LABORATORIES
delivering more than data from your environmental analyses

6A

MATRIX SPIKE DUPLICATES

Sample Description

LL2SD-308(ST)-2527-SD

Lab Name: CT Laboratories | Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

Matrix: SOLID | SDG No.: 119075

% Solid for Sample: 37.1 | Concentration Units: mg/kg

Analytical Prep Batch #: 57354 | Analytical Preparation Date/Time: 05/23/2016 06:00

Analytical Run #: 126342 | ICAL Calibration #:

Sample #: 726076 | Parent Sample #: 726075

Analysis Type *Initial Analysis*

Analyte	Analysis Date/Tim		RPD Limit	Matrix Spik Parent Conc. (S)	C	Matrix Spike Duplicate Conc. (D)	C	RPD	Q	M	
Lead	05/26/2016	14:46	20	21800		29000		24		P	*FAIL*

CT LABORATORIES
delivering more than data from your environmental analyses

7-2

Sample No:

LABORATORY CONTROL SAMPLE - SOLID

LCS

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

LCS Source: SPEX and Ultra SDG No.: 119075

Concentration Units: mg/kg

Analytical Run #: 126342 Sample No.:#: 726117

Analytical Prep Batch #: 57354 Preparation Date/Time: 05/23/2016 06:00

ICAL Calibration #:

Analysis Type ---------- Initial Analysis

Analyte	Analysis Date/Time	Control Limit (%R)	Spike Result	C	Spike Amount	%R	Q	M
Lead	05/25/2016 12:28	81-112	24.4		25.0	98		P

CT LABORATORIES
delivering more than data from your environmental analyses

9

ICP SERIAL DILUTION

Sample Description

LL2SD-308(ST)-2527-SD

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

Matrix: SOLID SDG No.: 119075

Concentration Units: ug/L

Sample No.: 728599 Parent Sample No.: 724949

LIMS Run #: 126342 ICAL Calibration #:.:

Analysis Type ---------- Initial Analysis

Analyte	Analysis Date/Time	Initial Sample Result (I)	C (I)	Serial Dilution Result (S)	C (S)	% Diff.	Q	M
Lead	05/26/2016 14:27	29500		26700		9		P

CT LABORATORIES
delivering more than data from your environmental analyses

10

METHOD DETECTION LIMITS (ANNUALLY)

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

ICP ID Number: TJA SDG No.: 119075

Matrix: SOLID

Analyte	Wavelength (nm)	Background	CRDL (ug/L)	MDL (mg/k)	M
Lead	220.35			0.04	P

ICP INTERELEMENT CORRECTION FACTORS (ANNUAL)

ICP ID NUMBER: TA ICAP6000 / ICAP6500

Element, Wavelength and Order	Use?	# IECs	IEC	k1
Ag 328.068 {103}	☒	1	Fe	0.000006
Al 308.215 {109}	☒	None		
Al 309.271 {109}	☒	None		
Al 396.152 { 85}	☒	None		
Al 167.079 {502}	☒	1	Fe	0.000627
As 193.759 {474}	☒	3	Fe	-0.000324
			Mo	0.000000
			Co	0.000000
As 189.042 {479}	☒	1	Fe	0.000027
Ba 455.403 { 74}	☒	1	Fe	-0.000000
Ba 493.409 { 68}	☒	1	Fe	0.000106
Be 313.042 {108}	☒	1	Fe	0.000000
Be 234.861 {144}	☒	1	Fe	0.000101
Ca 315.887 {107}	☒	None		
Ca 317.933 {106}	☒	None		
Ca 393.366 { 86}	☒	None		
Ca 396.847 { 85}	☒	None		
Cd 226.502 {449}	☒	2	Fe	0.000381
			Ag	-0.049000
Cd 228.802 {447}	☒	1	Fe	0.000100
Co 228.616 {447}	☒	6	Ti	-0.002110
			Mo	-0.001300
			Cr	-0.000235
			Ba	0.000315
			Ni	0.000000
			Fe	0.000017
Co 238.892 {141}	☒	1	Fe	0.000242
Cr 267.716 {126}	☒	1	Fe	0.000010
Cr 283.563 {119}	☒	1	Fe	0.000949
Cu 224.700 {450}	☒	2	Fe	0.000062
			Ag	-0.050000
Cu 324.754 {104}	☒	1	Fe	0.000200
Cu 327.396 {103}	☒	1	Fe	-0.000016
Fe 234.349 {144}	☒	None		
Fe 239.562 {141}	☒	None		
Fe 259.940 {130}	☒	None		
Mg 202.582 {466}	☒	None		
Mg 279.079 {121}	☒	None		
Mg 280.270 {120}	☒	None		
Mn 257.610 {131}	☒	1	Al	-0.000055
Mn 259.373 {130}	☒	1	Mg	0.001246
Mo 203.844 {465}	☒	1	Fe	-0.000027
Mo 202.030 {467}	☒	1	Fe	-0.000020
Mo 204.598 {465}	☒	1	Fe	-0.000100

CT LABORATORIES
delivering more than data from your environmental analyses

ICP INTERELEMENT CORRECTION FACTORS (ANNUAL)

ICP ID NUMBER: TA ICAP6000 / ICAP6500

Element, Wavelength and Order	Use?	# IECs	IEC	k1
Ni 221.647 {452}	☒	1	Ca	0.000022
Ni 231.604 {445}	☒	4	Fe	0.000117
			Co	-0.050000
			Ag	-0.050000
			Mo	-0.000200
Pb 216.999 {455}	☒	2	Al	0.000478
			Na	0.000000
Pb 220.353 {153}	☒	1	Fe	0.000024
Pb 220.353 {453}	☒	9	Fe	0.000071
			Si	0.000940
			Tl	0.000640
			Cu	0.000370
			Ni	0.000109
			Al	0.000000
			Co	-0.000149
			Mn	0.000074
			Ti	0.000004
Sb 206.833 {463}	☒	1	Fe	0.000032
Sb 217.581 {455}	☒	1	Fe	-0.000048
Se 196.090 {172}	☒	1	Fe	-0.000205
Se 196.090 {472}	☒	1	Fe	0.000022
Se 206.279 {463}	☒	1	Fe	0.001119
Tl 276.787 {122}	☒	1	Mg	0.006492
Tl 190.856 {477}	☒	10	Ti	0.000050
			Al	-0.000002
			V	0.000586
			Mn	0.000398
			Mo	-0.000120
			Be	-0.000013
			Fe	-0.000033
			Sr	-0.000027
			Co	0.000016
			Cr	0.000251
V 290.882 {116}	☒	1	Fe	0.000170
V 292.402 {115}	☒	1	Fe	0.000041
Zn 206.200 {463}	☒	1	Fe	0.000173
Zn 213.856 {458}	☒	1	Fe	0.000380
Y 360.073 { 94}*	☒	None		
Na 330.298 {102}	☒	1	Fe	0.000991
Si 251.611 {134}	☒	1	Fe	-0.000042
Ti 334.941 {101}	☒	1	Fe	0.000050
Ti 337.280 {100}	☒	1	Fe	0.000006
Sr 407.771 { 83}	☒	1	Fe	0.000039
Sr 421.552 { 80}	☒	1	Fe	0.000039

CT LABORATORIES
delivering more than data from your environmental analyses

ICP INTERELEMENT CORRECTION FACTORS (ANNUAL)
ICP ID NUMBER: TA ICAP6000 / ICAP6500

Element, Wavelength and Order	Use?	# IECs	IEC	k1
Sn 189.989 {477}	☒	1	Fe	0.000011
Sn 283.999 {119}	☒	1	Fe	-0.003092
B 249.678 {135}	☒	1	Fe	-0.000918
B 249.773 {135}	☒	1	Fe	0.000199
Li 670.784 { 50}	☒	1	Fe	0.000029
K 766.490 { 44}	☒	1	Fe	0.006630

Element, Wavelength and Order	Use?	# IECs	IEC	k1
K 766.490 { 44}	☒	1	Fe	0.000178
Na 330.237 {102}	☒	1	Fe	-0.004289
Na 589.592 { 57}	☒	1	Fe	0.000173
Y 350.073 { 94}	☒	None		
Y 320.332 {105}*	☒	None		
Al 308.215 {109}	☒	1	Fe	0.000000
Al 396.152 { 85}	☒	None		
Mg 285.213 {118}	☒	None		
Ca 317.933 {106}	☒	None		
Fe 234.349 {144}	☒	None		

ICP LINEAR RANGES (QUARTERLY)

Lab Name: CT Laboratories Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

ICP ID Number: TA SDG No.: 119075

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	15.00	1000000	P
Antimony	15.00	10000	P
Arsenic	15.00	10000	P
Barium	15.00	10000	P
Beryllium	15.00	1000	P
Boron	15.00	1000	P
Cadmium	15.00	1000	P
Calcium	15.00	1000000	P
Chromium	15.00	100000	P
Cobalt	15.00	10000	P
Copper	15.00	100000	P
Iron	15.00	1000000	P
Lead	15.00	100000	P
Lithium	15.00	10000	P
Magnesium	15.00	1000000	P
Manganese	15.00	100000	P
Molybdenum	15.00	10000	P
Nickel	15.00	10000	P
Potassium	15.00	200000	P
Selenium	15.00	10000	P
Silicon	15.00	1000	P
Silver	15.00	100	P
Sodium	15.00	200000	P
Strontium	15.00	10000	P
Thallium	15.00	10000	P
Tin	15.00	10000	P
Titanium	15.00	1000	P
Tungsten	15.00	10000	P
Vanadium	15.00	10000	P
Zinc	15.00	100000	P

CT LABORATORIES
delivering more than data from your environmental analyses

13

PREPARATION LOG

Lab Name: CT Laboratories

Project: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

Method: EPA 3050B

SDG No.: 119075

Preparation Batch #: 57354

Preparation Date/Time: 05/23/2016 / 06:00

Lab Sample #	QC Type	Sample Description	Matrix	**Weight (g for solid/soil) or Volume (mL for liquid/aqueous)**
724949	Normal Sample	LL2SD-308(ST)-2527-SD	SOIL	2.00
724950	Normal Sample	LL2SD-654(ST)-2515-SD	SOIL	1.98
724951	Normal Sample	LL2SD-654(ST)-2516-SD	SOIL	1.97
724952	Normal Sample	LL2SD-654(ST)-2517-SD	SOIL	2.04
724953	Normal Sample	LL2SD-655(ST)-2518-SD	SOIL	1.96
724954	Normal Sample	LL2SD-655(ST)-4096-FD	SOIL	1.91
724955	Normal Sample	LL2SD-655(ST)2519-SD	SOIL	2.05
724956	Normal Sample	LL2SD-655(ST)-2520-SD	SOIL	2.05
724957	Normal Sample	LL2SD-653(ST)-4095-FD	SOIL	2.06
724958	Normal Sample	LL2SD-653(ST)-2514-SD	SOIL	2.00
724959	Normal Sample	LL2SD-656(ST)-2521-SD	SOIL	2.06
724960	Normal Sample	LL2SD-656(ST)-2522-SD	SOIL	2.09
724961	Normal Sample	LL2SD-656(ST)-2523-SD	SOIL	2.07
724962	Normal Sample	LL2SD-657(ST)-2524-SD	SOIL	2.00
724963	Normal Sample	LL2SD-657(ST)-2525-SD	SOIL	2.02
724964	Normal Sample	LL2SD-657(ST)-2526-SD	SOIL	2.05
724965	Normal Sample	LL2SD-651(ST)-2512-SD	SOIL	2.05
724966	Normal Sample	LL2SD-652(ST)-2513-SD	SOIL	1.97
724967	Normal Sample	LL2SD-650(ST)-2511-SD	SOIL	2.03
726074	Lab Duplicate	LL2SD-308(ST)-2527-SD	SOIL	2.10
726075	Matrix Spike	LL2SD-308(ST)-2527-SD	SOIL	2.04
726076	Matrix Spike Duplicate	LL2SD-308(ST)-2527-SD	SOIL	1.95
726116	Method Blank		SOLID	2.00
726117	Lab Control Spike		SOLID	2.00

CT LABORATORIES
delivering more than data from your environmental analyses

14

ANALYSIS RUN LOG

Lab Name: CT Laboratories | Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

Lab Code: CTL | SDG No.: 119075

Instrument ID Number: TJA | Method Number: P

Start & End Date: 05/25/2016 to 05/26/2016 | Analytical Run #: 126342

Sample Number	Analysis or QC Type	DF	Analysis Date/ Time	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Hg	Mo	Li	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	W	V	Zn
728592	ICV	1.00	5/25 11:36													X																
728593	ICVLL	1.00	5/25 11:42													X																
728594	ICB	1.00	5/25 11:55													X																
728596	ICSA	1.00	5/25 12:08	X							X				X	X	X															
728597	ICSAB	1.00	5/25 12:15	X							X				X	X	X															
726117	LCSS	1.00	5/25 12:28													X																
726116	MBS	1.00	5/25 12:34													X																
724950	Initial	1.00	5/25 13:19													X																
728601	CCV1	1.00	5/25 13:26													X																
728602	CCV2	1.00	5/25 13:31													X																
728603	CCB	1.00	5/25 13:37													X																
724951	Initial	1.00	5/25 13:44													X																
724952	Initial	1.00	5/25 13:50													X																
724953	Initial	1.00	5/25 13:56													X																
724954	Initial	1.00	5/25 14:03													X																
724955	Initial	1.00	5/25 14:09													X																
724956	Initial	1.00	5/25 14:16													X																
724957	Initial	1.00	5/25 14:22													X																
724958	Initial	1.00	5/25 14:29													X																
724959	Initial	1.00	5/25 14:35													X																
724960	Initial	1.00	5/25 14:41													X																
728604	CCV1	1.00	5/25 14:48													X																
728605	CCV2	1.00	5/25 14:53													X																
728606	CCB	1.00	5/25 14:59													X																
724961	Initial	1.00	5/25 15:06													X																
724962	Initial	1.00	5/25 15:12													X																
724963	Initial	1.00	5/25 15:19													X																
724964	Initial	1.00	5/25 15:25													X																
724965	Initial	1.00	5/25 15:32													X																

CT LABORATORIES
delivering more than data from your environmental analyses

14

ANALYSIS RUN LOG

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)

Lab Code: CTL

SDG No.: 119075

Instrument ID Number: TJA

Method Number: P

Start & End Date: 05/25/2016 to 05/26/2016

Analytical Run #: 126342

Sample Number	Analysis or QC Type	DF	Analysis Date/ Time	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Hg	Mo	Li	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	W	V	Zn
724966	Initial	1.00	5/25 15:38													X																
724967	Initial	1.00	5/25 15:45													X																
728607	CCV1	1.00	5/25 16:10													X																
728608	CCV2	1.00	5/25 16:15													X																
728609	CCB	1.00	5/25 16:21													X																
729109	ICV	1.00	5/26 13:06													X																
729110	ICVLL	1.00	5/26 13:12													X																
729111	ICB	1.00	5/26 13:25													X																
729112	ICSA	1.00	5/26 13:39	X							X				X	X	X															
729113	ICSAB	1.00	5/26 13:46	X							X				X	X	X															
724949	Initial	10.00	5/26 14:20													X																
728599	L	5	5/26 14:27													X																
726074	DUP	10.00	5/26 14:33													X																
726075	MSS	10.00	5/26 14:40													X																
726076	MSDS	10.00	5/26 14:46													X																
728600	PDSS	10.00	5/26 14:53													X																
729115	CCV1	1.00	5/26 14:59													X																
729116	CCV2	1.00	5/26 15:05													X																
729117	CCB	1.00	5/26 15:11													X																

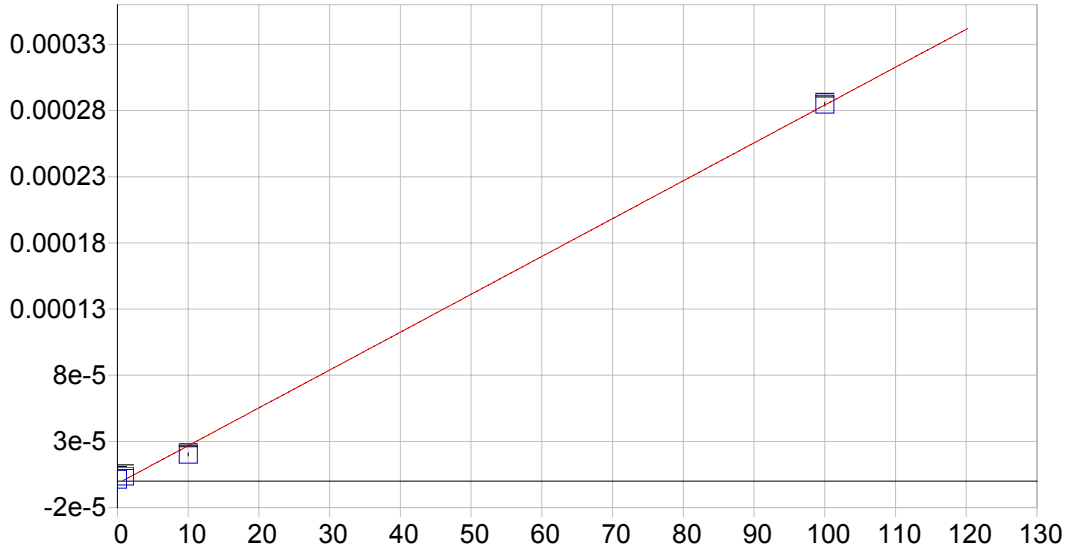
METALS
RAW DATA
DOCUMENTS

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope
														Slope
Ag 328.068 {103}	05/26/2016 08:52:47	05/25/2016 10:51:26	Linear	None	-0.000002	0.000003	0.000000	1.000000	0.999474	0.000005	0.946764	3.155881	OK.	1.000000
Al 309.271 {109}	05/26/2016 08:52:47	05/25/2016 11:16:28	Curvilin	None	0.000276	0.000001	0.000000	1.000000	1.000000	0.000001	20.167423	67.224743	OK.	1.000000
Al 396.152 { 85}	05/26/2016 08:52:47	05/25/2016 11:29:58	Full Fit	1/Var	-0.000015	0.000003	0.000000	1.000000	0.999890	0.000105	9.608848	32.029493	OK.	1.000000
Al 167.079 {502}	05/26/2016 08:52:47	05/25/2016 10:57:16	Linear	1/Var	0.000068	0.000010	0.000000	1.000000	0.999040	0.000060	1.528212	5.094041	OK.	1.000000
As 193.759 {474}	05/26/2016 08:52:47	05/25/2016 11:03:26	Full Fit	1/Conc	-0.040653	0.168811	-0.000000	0.990000	0.999999	0.003258	3.056480	10.188266	OK.	1.000000
As 189.042 {479}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	0.000026	0.000001	0.000000	1.000000	0.999830	0.000000	20.163447	67.211489	OK.	1.000000
Ba 233.527 {445}	05/26/2016 08:52:47	05/25/2016 10:57:16	Linear	1/Conc	0.286207	1.677850	0.000000	1.000000	0.999936	0.023932	0.280357	0.934523	OK.	1.000000
Ba 455.403 { 74}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	None	0.000039	0.000010	0.000000	1.000000	1.000000	0.000016	0.301046	1.003488	OK.	1.000000
Ba 493.409 { 68}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Var	0.001428	0.000009	0.000000	1.000000	0.999999	0.000004	0.642803	2.142676	OK.	1.000000
Be 313.042 {108}	05/26/2016 08:52:47	05/25/2016 10:57:16	Linear	1/Conc	-0.000036	0.000071	0.000000	1.000000	0.999966	0.000000	0.035276	0.117586	OK.	1.000000
Be 234.861 {144}	05/26/2016 08:52:47	05/25/2016 10:57:16	Linear	1/Conc	-0.000000	0.000001	0.000000	1.000000	0.999998	0.000000	0.634288	2.114293	OK.	1.000000
Ca 315.887 {107}	05/26/2016 08:52:47	05/25/2016 11:29:58	Curvilin	1/Conc	0.000040	0.000000	0.000000	1.000000	0.999994	0.000003	14.558587	48.528624	OK.	1.000000
Ca 317.933 {106}	05/26/2016 08:52:47	05/25/2016 11:29:58	Curvilin	1/Conc	0.005552	0.000002	0.000000	1.000000	0.999988	0.000018	4.132772	13.775906	OK.	1.000000
Ca 393.366 { 86}	05/26/2016 08:52:47	05/25/2016 10:57:16	Linear	1/Var	0.000112	0.000032	0.000000	1.000000	0.997235	0.000147	0.058306	0.194352	OK.	1.000000
Ca 396.847 { 85}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	0.000359	0.000134	0.000000	1.000000	0.999796	0.000127	0.131250	0.437501	OK.	1.000000
Cd 226.502 {449}	05/26/2016 08:52:47	05/25/2016 10:57:16	Linear	1/Conc	-0.000007	0.000261	0.000000	1.000000	0.999946	0.000002	0.181950	0.606501	OK.	1.000000
Cd 228.802 {447}	05/26/2016 08:52:47	05/25/2016 10:57:16	Linear	1/Conc	0.000114	0.000006	0.000000	1.000000	0.990712	0.000001	9.669197	32.230657	OK.	1.000000
Co 228.616 {447}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	-0.000092	0.000154	0.000000	1.000000	0.999866	0.000010	0.319216	1.064053	OK.	1.000000
Co 238.892 {141}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	None	0.000017	0.000002	0.000000	1.000000	0.999998	0.000024	1.050202	3.500674	OK.	1.000000
Cr 205.560 {464}	05/26/2016 08:52:47	05/25/2016 11:09:51	Linear	1/Var	0.000058	0.000140	0.000000	1.000000	0.999736	0.000100	0.226846	0.756155	OK.	1.000000
Cr 267.716 {126}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Var	0.000000	0.000003	0.000000	1.000000	0.999949	0.000002	0.847920	2.826402	OK.	1.000000
Cu 224.700 {450}	05/26/2016 08:52:47	05/25/2016 11:03:26	Curvilin	1/Conc	-0.000088	0.000078	-0.000000	1.000000	0.999961	0.000003	0.611265	2.037552	OK.	1.000000
Cu 324.754 {104}	05/26/2016 08:52:47	05/25/2016 11:09:51	Linear	1/Conc	0.000198	0.000000	0.000000	1.000000	0.999993	0.000000	3.716950	12.389832	OK.	1.000000
Cu 327.396 {103}	05/26/2016 08:52:47	05/25/2016 11:09:51	Curvilin	1/Conc	-0.000096	0.000003	0.000000	1.000000	0.999995	0.000001	5.211356	17.371186	Warnin	1.000000
Fe 234.349 {144}	05/26/2016 08:52:47	05/25/2016 11:29:58	Full Fit	1/Conc	0.000028	0.000000	0.000000	1.000000	0.999983	0.000006	1.971570	6.571901	OK.	1.000000
Fe 239.562 {140}	05/26/2016 08:52:47	05/25/2016 11:29:58	Linear	1/Var	0.000001	0.000000	0.000000	1.000000	0.999962	0.000002	7.191553	23.971843	OK.	1.000000
Fe 259.940 {129}	05/26/2016 08:52:47	05/25/2016 11:29:58	Full Fit	None	0.000064	0.000002	0.000000	1.010000	1.000000	0.000743	3.231289	10.770964	OK.	1.000000
Mg 202.582 {466}	05/26/2016 08:52:47	05/25/2016 11:29:58	Curvilin	1/Conc	-0.000068	0.000012	0.000000	1.000000	0.999741	0.000452	3.008073	10.026910	OK.	1.000000
Mg 279.079 {121}	05/26/2016 08:52:47	05/25/2016 11:29:58	Curvilin	1/Conc	0.000002	0.000000	0.000000	1.000000	0.999962	0.000002	40.669997	135.566658	OK.	1.000000
Mg 280.270 {120}	05/26/2016 08:52:47	05/25/2016 11:03:26	Full Fit	1/Conc	0.000090	0.000052	-0.000000	0.990000	1.000000	0.000001	0.029813	0.099375	OK.	1.000000
Mn 257.610 {131}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	None	0.000124	0.000015	0.000000	1.000000	0.999989	0.000261	0.096972	0.323239	OK.	1.000000
Mn 259.373 {130}	05/26/2016 08:52:47	05/25/2016 11:09:51	Linear	1/Var	0.000010	0.000006	0.000000	1.000000	0.999935	0.000014	1.494553	4.981842	OK.	1.000000
Mo 202.030 {466}	05/26/2016 08:52:47	05/25/2016 10:57:16	Linear	1/Conc	0.000051	0.000060	0.000000	1.000000	0.999953	0.000002	0.428554	1.428514	OK.	1.000000
Mo 204.598 {464}	05/26/2016 08:52:47	05/25/2016 11:03:26	Full Fit	1/Conc	0.000001	0.000001	-0.000000	1.010000	0.999992	0.000000	0.794390	2.647968	OK.	1.000000
Mo 204.598 {465}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	0.000000	0.000000	0.000000	1.000000	0.999997	0.000000	0.987138	3.290460	OK.	1.000000
Ni 221.647 {452}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Var	-0.000000	0.000002	0.000000	1.000000	0.999821	0.000004	0.472993	1.576642	OK.	1.000000
Ni 231.604 {445}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	-0.000003	0.000002	0.000000	1.000000	0.999939	0.000000	0.535506	1.785020	OK.	1.000000
Pb 216.999 {455}	05/26/2016 08:52:47	05/25/2016 11:09:51	Curvilin	1/Var	0.000075	0.000010	0.000000	1.000000	0.999876	0.000294	4.858504	16.195013	Warnin	1.000000
Pb 220.353 {453}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Var	0.000221	0.000028	0.000000	1.000000	0.999729	0.000242	2.288887	7.629623	OK.	1.000000
Pb 220.353 {153}	05/26/2016 08:52:47	05/25/2016 11:09:51	Linear	1/Conc	-0.000004	0.000016	0.000000	1.000000	0.999926	0.000026	5.198537	17.328456	OK.	1.000000
Sb 206.833 {463}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	-0.000062	0.000016	0.000000	1.000000	0.999941	0.000002	2.362821	7.876069	OK.	1.000000
Sb 217.581 {455}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	0.000002	0.000017	0.000000	1.000000	0.999921	0.000002	2.564527	8.548422	OK.	1.000000
Se 196.090 {472}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	0.000018	0.000007	0.000000	1.000000	0.999836	0.000002	4.262138	14.207127	OK.	1.000000
Se 206.279 {463}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	0.000029	0.000002	0.000000	1.000000	0.999868	0.000001	22.327320	74.424400	OK.	1.000000
Se 196.090 {471}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	0.000005	0.000005	0.000000	1.000000	0.999896	0.000001	6.051631	20.172104	OK.	1.000000
Tl 190.856 {476}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	0.000020	0.000017	0.000000	1.000000	0.999758	0.000005	2.224213	7.414043	OK.	1.000000

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope
														Slope
Tl 190.856 {477}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Conc	-0.000031	0.000008	0.000000	1.000000	0.999736	0.000003	3.506404	11.688015	OK.	1.000000
V 290.882 {116}	05/26/2016 08:52:47	05/25/2016 11:03:26	Full Fit	1/Conc	0.000003	0.000000	0.000000	0.990000	1.000000	0.000000	3.695863	12.319545	Warnin	1.000000
V 292.402 {115}	05/26/2016 08:52:47	05/25/2016 11:03:26	Linear	1/Var	0.000003	0.000010	0.000000	1.000000	0.999969	0.000006	0.487122	1.623740	OK.	1.000000
Zn 206.200 {463}	05/26/2016 08:52:47	05/25/2016 11:09:51	Curvilin	1/Var	0.000057	0.000133	-0.000000	1.000000	0.999756	0.000857	0.311687	1.038956	OK.	1.000000
Zn 213.856 {458}	05/26/2016 08:52:47	05/25/2016 11:03:27	Curvilin	1/Var	0.000002	0.000003	-0.000000	1.000000	0.999929	0.000001	0.199387	0.664623	OK.	1.000000
Y 324.228 {104}*	05/26/2016 08:52:47	05/25/2016 09:54:48	Linear	1/Conc	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000
Y 371.030 { 91}*	05/26/2016 08:52:47	05/25/2016 09:54:48	Linear	1/Conc	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000
Y 224.306 {451}*	05/26/2016 08:52:47	05/25/2016 09:54:48	Linear	1/Conc	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000
Na 588.995 { 57}	05/26/2016 08:52:47	05/25/2016 11:16:28	Linear	1/Conc	0.000836	0.000002	0.000000	1.000000	0.995035	0.000088	4.622753	15.409175	OK.	1.000000
Si 251.611 {134}	05/26/2016 08:52:47	05/25/2016 11:16:28	Linear	1/Conc	0.000052	0.000001	0.000000	1.000000	0.955613	0.000043	9.490757	31.635856	OK.	1.000000
Ti 334.941 {101}	05/26/2016 08:52:47	05/25/2016 11:03:27	Linear	1/Conc	-0.000000	0.000008	0.000000	1.000000	0.999957	0.000001	1.411696	4.705653	OK.	1.000000
Sr 407.771 { 83}	05/26/2016 08:52:47	05/25/2016 11:03:27	Linear	1/Conc	-0.000714	0.000175	0.000000	1.000000	0.999919	0.000009	0.126349	0.421164	OK.	1.000000
Sn 189.989 {478}	05/26/2016 08:52:47	05/25/2016 11:03:27	Linear	1/Var	0.000051	0.000007	0.000000	1.000000	0.999795	0.000085	2.835177	9.450589	OK.	1.000000
B 249.678 {135}	05/26/2016 08:52:47	05/25/2016 11:03:27	Linear	1/Conc	0.000004	0.000001	0.000000	1.000000	0.999958	0.000000	1.883848	6.279492	OK.	1.000000
B 249.773 {135}	05/26/2016 08:52:47	05/25/2016 11:03:27	Linear	1/Conc	0.000007	0.000003	0.000000	1.000000	0.999989	0.000000	0.875685	2.918949	OK.	1.000000
Li 670.784 { 50}	05/26/2016 08:52:47	05/25/2016 11:03:27	Linear	1/Var	-0.000068	0.000045	0.000000	1.000000	0.999799	0.000068	1.363829	4.546097	OK.	1.000000
K 766.490 { 44}	05/26/2016 08:52:47	05/25/2016 11:16:28	Linear	1/Conc	0.000107	0.000002	0.000000	1.000000	0.994923	0.000096	33.739747	112.465822	OK.	1.000000
P 213.618 {457}	05/26/2016 08:52:47	05/25/2016 11:16:28	Linear	1/Conc	-0.000002	0.000000	0.000000	1.000000	0.697418	0.000000	2859.17700	9530.59001	OK.	1.000000
S 182.034 {485}	05/26/2016 08:52:47	05/25/2016 11:29:58	Linear	1/Conc	0.000035	0.000006	0.000000	1.000000	0.999433	0.000287	4.011975	13.373251	OK.	1.000000
W 239.709 {140}	05/26/2016 08:52:47	05/25/2016 11:16:28	Curvilin	1/Var	0.000000	-0.000000	0.000000	1.000000	1.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000

Element, Wavelength and Order	Reslope		QC Norm	
	Y-int	Slope factor	Offset	
Ag 328.068 {103}	0.000000	1	0	
Al 309.271 {109}	0.000000	1	0	
Al 396.152 { 85}	0.000000	1	0	
Al 167.079 {502}	0.000000	1	0	
As 193.759 {474}	0.000000	1	0	
As 189.042 {479}	0.000000	1	0	
Ba 233.527 {445}	0.000000	1	0	
Ba 455.403 { 74}	0.000000	1	0	
Ba 493.409 { 68}	0.000000	1	0	
Be 313.042 {108}	0.000000	1	0	
Be 234.861 {144}	0.000000	1	0	
Ca 315.887 {107}	0.000000	1	0	
Ca 317.933 {106}	0.000000	1	0	
Ca 393.366 { 86}	0.000000	1	0	
Ca 396.847 { 85}	0.000000	1	0	
Cd 226.502 {449}	0.000000	1	0	
Cd 228.802 {447}	0.000000	1	0	
Co 228.616 {447}	0.000000	1	0	
Co 238.892 {141}	0.000000	1	0	
Cr 205.560 {464}	0.000000	1	0	
Cr 267.716 {126}	0.000000	1	0	
Cu 224.700 {450}	0.000000	1	0	
Cu 324.754 {104}	0.000000	1	0	
Cu 327.396 {103}	0.000000	1	0	
Fe 234.349 {144}	0.000000	1	0	
Fe 239.562 {140}	0.000000	1	0	
Fe 259.940 {129}	0.000000	1	0	
Mg 202.582 {466}	0.000000	1	0	
Mg 279.079 {121}	0.000000	1	0	
Mg 280.270 {120}	0.000000	1	0	
Mn 257.610 {131}	0.000000	1	0	
Mn 259.373 {130}	0.000000	1	0	
Mo 202.030 {466}	0.000000	1	0	
Mo 204.598 {464}	0.000000	1	0	
Mo 204.598 {465}	0.000000	1	0	
Ni 221.647 {452}	0.000000	1	0	
Ni 231.604 {445}	0.000000	1	0	
Pb 216.999 {455}	0.000000	1	0	
Pb 220.353 {453}	0.000000	1	0	
Pb 220.353 {153}	0.000000	1	0	
Sb 206.833 {463}	0.000000	1	0	
Sb 217.581 {455}	0.000000	1	0	
Se 196.090 {472}	0.000000	1	0	
Se 206.279 {463}	0.000000	1	0	
Se 196.090 {471}	0.000000	1	0	
Tl 190.856 {476}	0.000000	1	0	

Element, Wavelength and Order	Reslope	QC Norm	
	Y-int	Slope factor	Offset
Tl 190.856 {477}	0.000000	1	0
V 290.882 {116}	0.000000	1	0
V 292.402 {115}	0.000000	1	0
Zn 206.200 {463}	0.000000	1	0
Zn 213.856 {458}	0.000000	1	0
Y 324.228 {104}*	0.000000	1	0
Y 371.030 { 91}*	0.000000	1	0
Y 224.306 {451}*	0.000000	1	0
Na 588.995 { 57}	0.000000	1	0
Si 251.611 {134}	0.000000	1	0
Ti 334.941 {101}	0.000000	1	0
Sr 407.771 { 83}	0.000000	1	0
Sn 189.989 {478}	0.000000	1	0
B 249.678 {135}	0.000000	1	0
B 249.773 {135}	0.000000	1	0
Li 670.784 { 50}	0.000000	1	0
K 766.490 { 44}	0.000000	1	0
P 213.618 {457}	0.000000	1	0
S 182.034 {485}	0.000000	1	0
W 239.709 {140}	0.000000	1	0

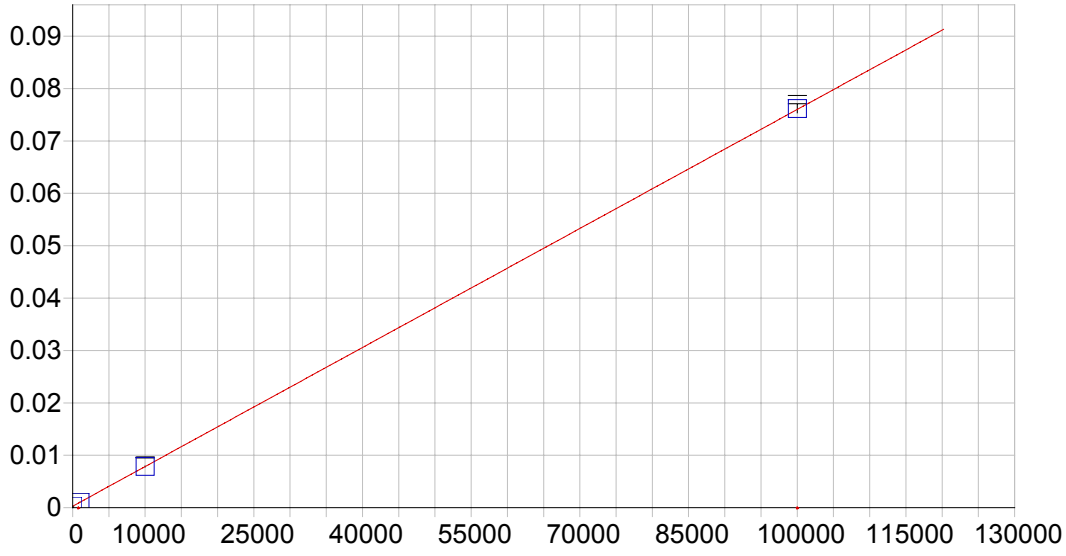


Ag 328.068 {103}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	None

A0 (Offset):	-0.000002	Re-Slope:	1.000000
A1 (Gain):	0.000003	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999474	Status:	OK.
Std Error of Est:	0.000005		
Predicted MDL:	0.946764		
Predicted MQL:	3.155881		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	1.1073	1.11	.000	.00000	.000	1
CalStd5=10	10.000	7.7193	-2.28	-22.8	.00002	.000	1
CalStd8=100	100.00	100.22	.219	.219	.00028	.000	1
CalStd3=1	1.0000	1.9549	.955	95.5	.00000	.000	1

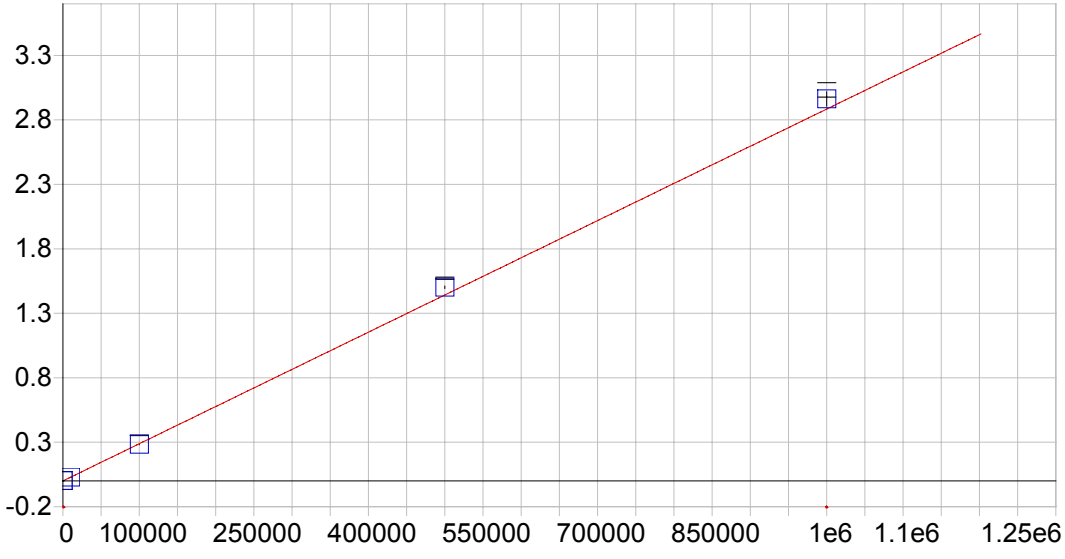


Al 309.271 {109}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Curvilinear	Weighting:	None

A0 (Offset):	0.000276	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	1.000000	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	20.167423		
Predicted MQL:	67.224743		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.82235	-.822	.000	.00028	.000	1
CalStd10=10	10000.	10002.	1.76	.018	.00785	.000	1
CalStd9=100	1000.0	1000.9	.942	.094	.00103	.000	1
CalStd12-100	100000.	100190.	186.	.186	.07616	.001	1

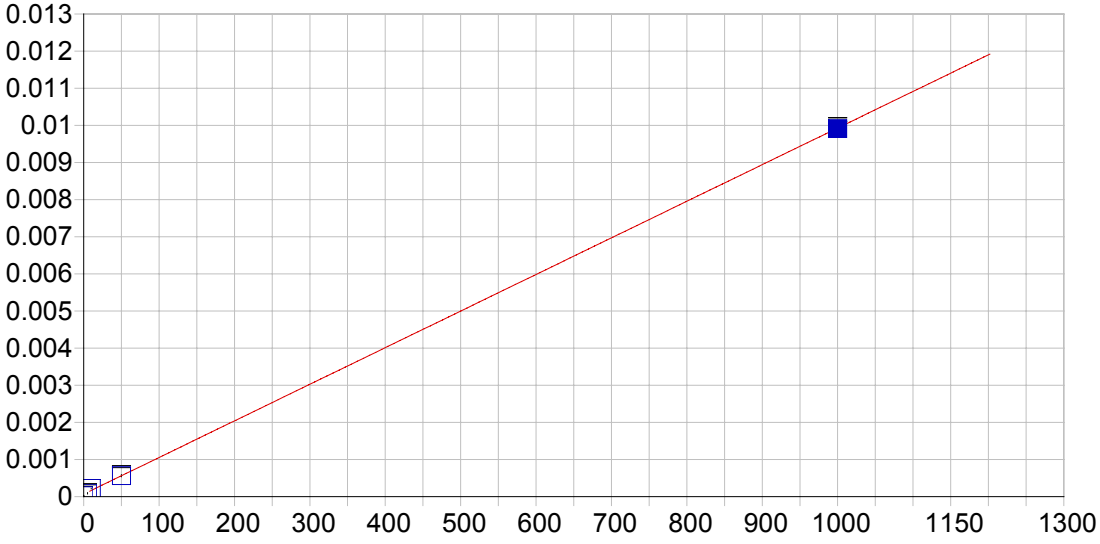


Al 396.152 { 85}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Full Fit Weighting: 1/Var

A0 (Offset):	-0.000015	Re-Slope:	1.000000
A1 (Gain):	0.000003	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999890	Status:	OK.
Std Error of Est:	0.000105		
Predicted MDL:	9.608848		
Predicted MQL:	32.029493		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	-.00004	.000	1
CalStd14-100	1000000.	1027200.	27200.	2.72	2.9625	.056	1
CalStd13=50	500000.	520720.	20700.	4.14	1.5017	.008	1
CalStd10=10	10000.	10023.	23.4	.234	.02889	.000	1
CalStd12-100	100000.	98352.	-1650.	-1.65	.28363	.002	1
CalStd9=100	1000.0	1006.2	6.21	.621	.00289	.000	1

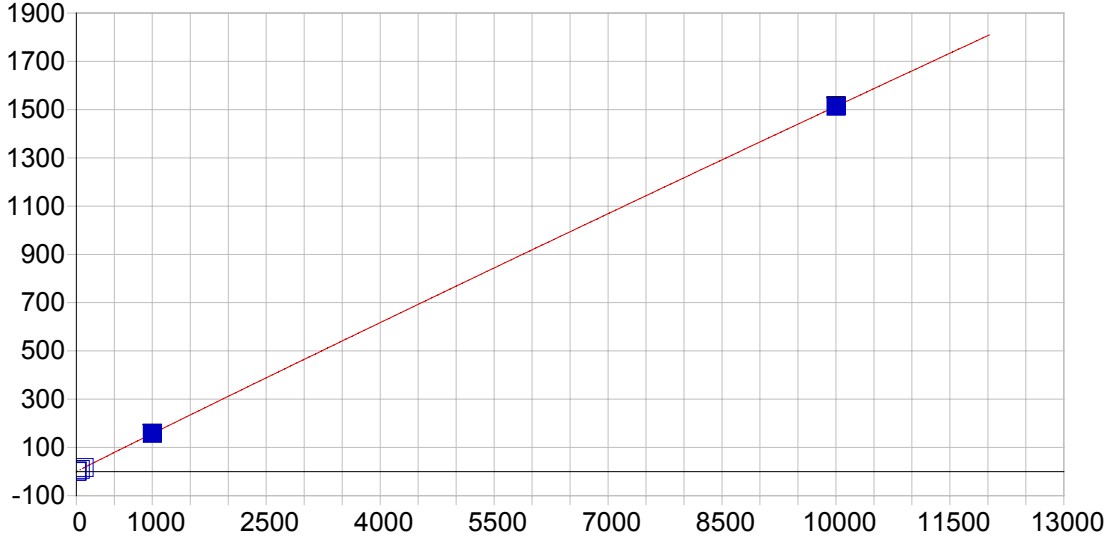


Al 167.079 {502}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Var

A0 (Offset):	0.000068	Re-Slope:	1.000000
A1 (Gain):	0.000010	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999040	Status:	OK.
Std Error of Est:	0.000060		
Predicted MDL:	1.528212		
Predicted MQL:	5.094041		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-4.7412	-4.74	.000	.00002	.000	1
CalStd9=100	1000.0	998.14	-1.86	-.186	.00992	.000	1
CalStd5=10	10.000	15.187	5.19	51.9	.00022	.000	1
CalStd4=5	5.0000	2.1781	-2.82	-56.4	.00009	.000	1
CalStd7=50	50.000	50.213	.213	.426	.00056	.000	1

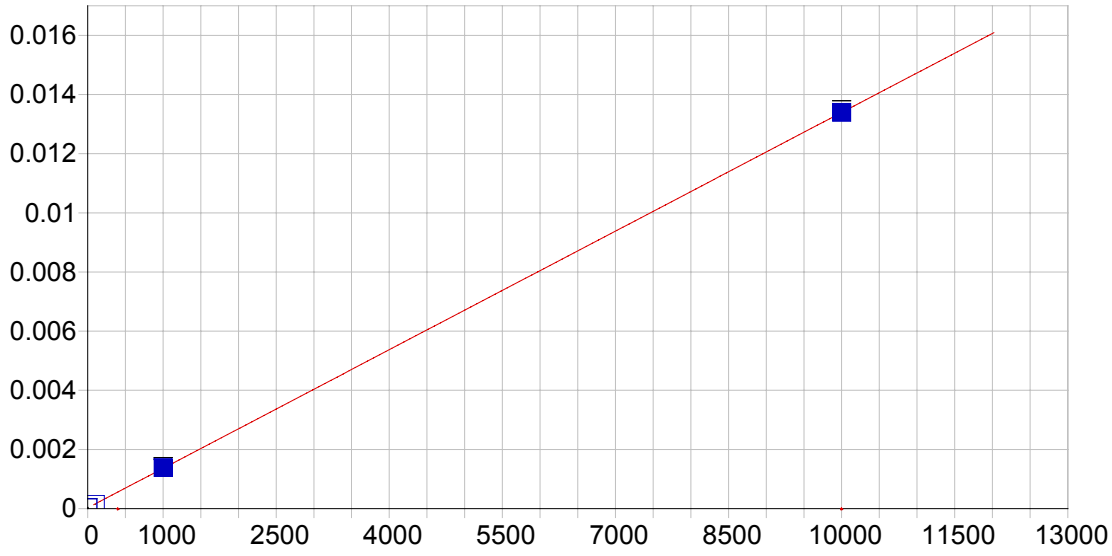


As 193.759 {474}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Full Fit Weighting: 1/Conc

A0 (Offset):	-0.040653	Re-Slope:	1.000000
A1 (Gain):	0.168811	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	0.990000		
Correlation:	0.999999	Status:	OK.
Std Error of Est:	0.003258		
Predicted MDL:	3.056480		
Predicted MQL:	10.188266		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	-.04067	.512	1
CalStd9=100	1000.0	1000.9	.932	.093	157.36	.822	1
CalStd7=50	50.000	50.028	.028	.056	8.0799	.361	1
CalStd5=10	10.000	10.166	.166	1.66	1.6362	.577	1
CalStd8=100	100.00	98.991	-1.01	-1.01	15.917	.234	1
CalStd10=10	10000.	9999.9	-.091	-.001	1513.3	1.69	1

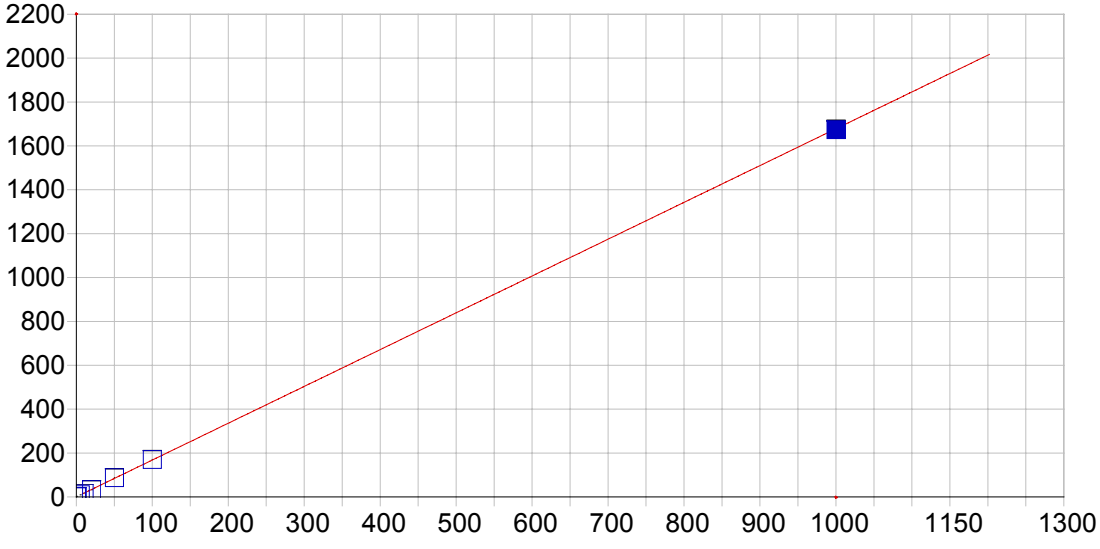


As 189.042 {479}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000026	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999830	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	20.163447		
Predicted MQL:	67.211489		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00354	.004	.000	.00003	.000	1
CalStd9=100	1000.0	1016.9	16.9	1.69	.00139	.000	1
CalStd10=10	10000.	9999.2	-.777	-.008	.01339	.000	1
CalStd8=100	100.00	86.880	-13.1	-13.1	.00014	.000	1
CalStd4=5	5.0000	2.0337	-2.97	-59.3	.00003	.000	1

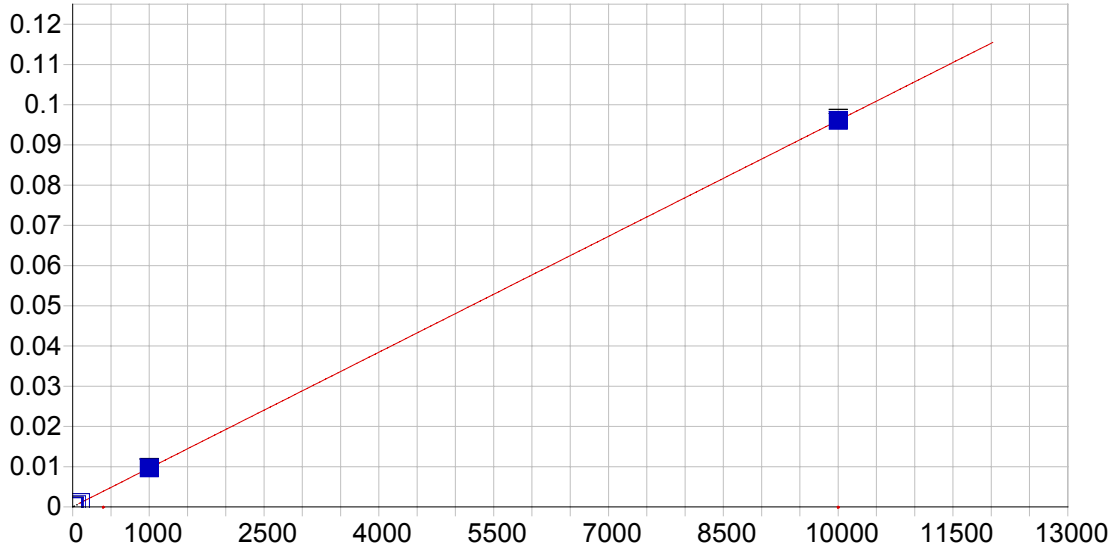


Ba 233.527 {445}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.286207	Re-Slope:	1.000000
A1 (Gain):	1.677850	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999936	Status:	OK.
Std Error of Est:	0.023932		
Predicted MDL:	0.280357		
Predicted MQL:	0.934523		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00020	.000	.000	.28587	.213	1
CalStd7=50	50.000	51.715	1.71	3.43	87.056	.540	1
CalStd5=10	10.000	10.039	.039	.388	17.130	.386	1
CalStd6=20	20.000	19.361	-.639	-3.19	32.772	.244	1
CalStd8=100	100.00	101.17	1.17	1.17	170.03	.953	1
CalStd4=5	5.0000	5.4638	.464	9.28	9.4536	.190	1
CalStd9=100	1000.0	997.16	-2.84	-.284	1673.4	1.97	1
CalStd3=1	1.0000	1.0929	.093	9.29	2.1200	.670	1

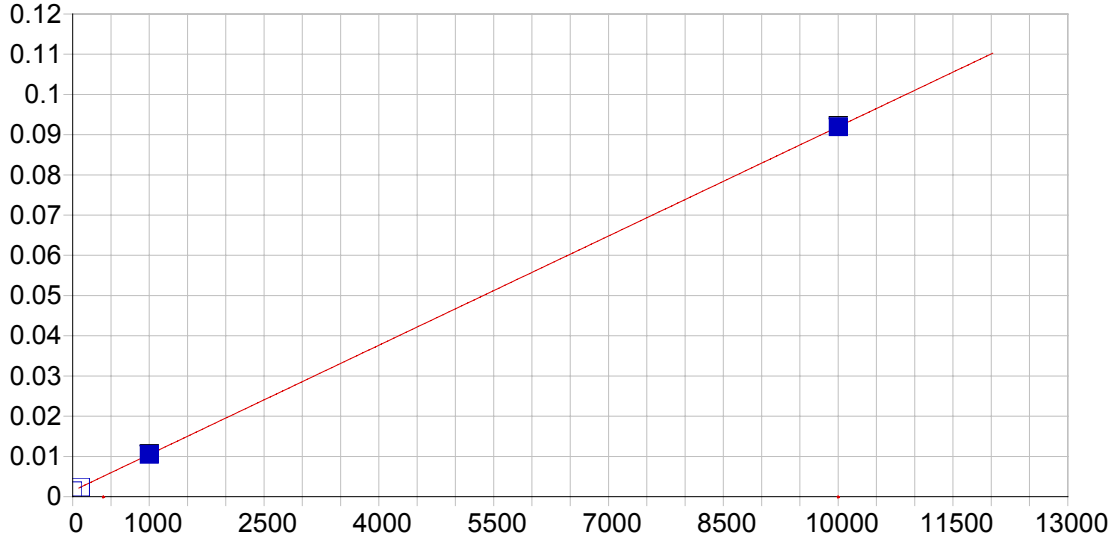


Ba 455.403 { 74}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	None

A0 (Offset):	0.000039	Re-Slope:	1.000000
A1 (Gain):	0.000010	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	1.000000	Status:	OK.
Std Error of Est:	0.000016		
Predicted MDL:	0.301046		
Predicted MQL:	1.003488		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.87278	-.873	.000	.00003	.000	1
CalStd7=50	50.000	50.606	.606	1.21	.00053	.000	1
CalStd5=10	10.000	8.9979	-1.00	-10.0	.00013	.000	1
CalStd6=20	20.000	18.497	-1.50	-7.51	.00022	.000	1
CalStd8=100	100.00	101.17	1.17	1.17	.00101	.000	1
CalStd4=5	5.0000	4.4668	-.533	-10.7	.00008	.000	1
CalStd9=100	1000.0	1003.6	3.63	.363	.00968	.000	1
CalStd3=1	1.0000	-.12002	-1.12	-112.	.00004	.000	1
CalStd10=10	10000.	9999.6	-.373	-.004	.09609	.001	1

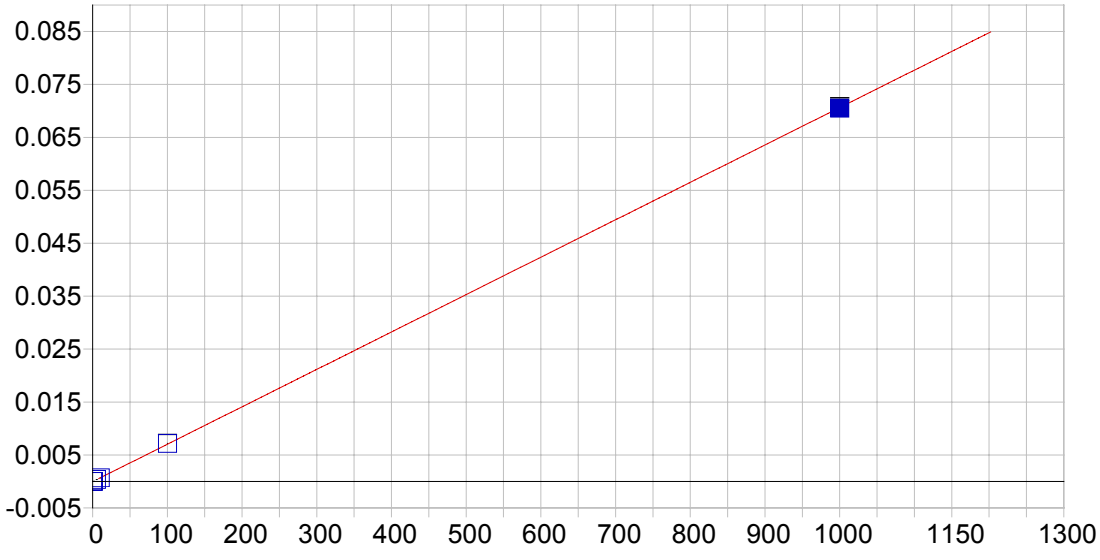


Ba 493.409 { 68}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.001428	Re-Slope:	1.000000
A1 (Gain):	0.000009	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999999	Status:	OK.
Std Error of Est:	0.000004		
Predicted MDL:	0.642803		
Predicted MQL:	2.142676		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.27032	-.270	.000	.00143	.000	1
CalStd9=100	1000.0	1001.8	1.79	.179	.01050	.000	1
CalStd8=100	100.00	100.27	.265	.265	.00234	.000	1
CalStd10=10	10000.	9997.6	-2.41	-.024	.09197	.000	1

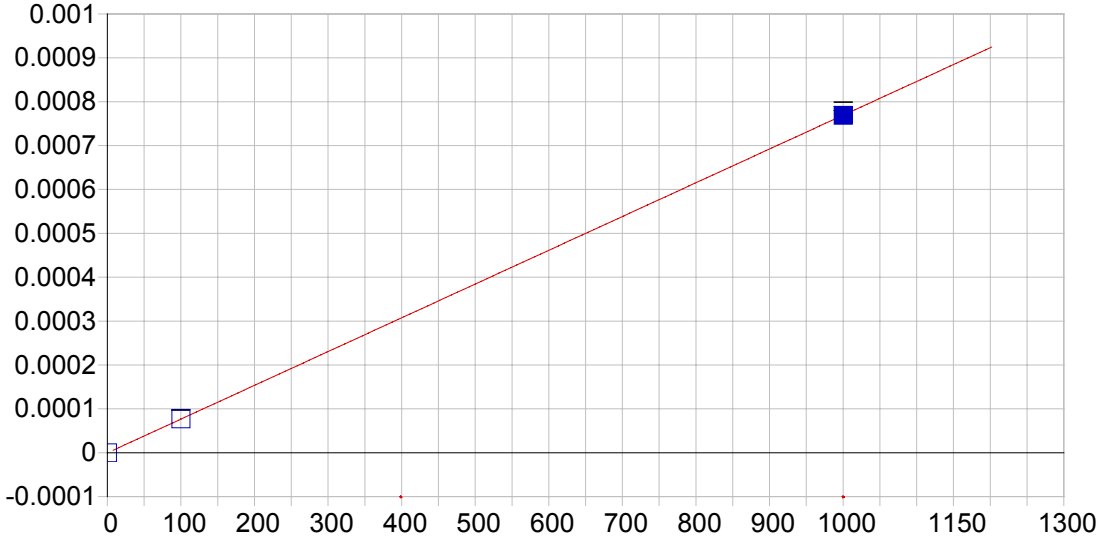


Be 313.042 {108}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000036	Re-Slope:	1.000000
A1 (Gain):	0.000071	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999966	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.035276		
Predicted MQL:	0.117586		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00005	.000	.000	-.00004	.000	1
CalStd5=10	10.000	9.8930	-.107	-1.07	.00066	.000	1
CalStd8=100	100.00	101.69	1.69	1.69	.00715	.000	1
CalStd2=0.5	.50000	.49152	-.008	-1.70	.00000	.000	1
CalStd4=5	5.0000	5.4282	.428	8.56	.00035	.000	1
CalStd1=0.25	.25000	.27869	.029	11.5	-.00002	.000	1
CalStd9=100	1000.0	997.93	-2.07	-.207	.07049	.000	1
CalStd3=1	1.0000	1.0319	.032	3.19	.00004	.000	1

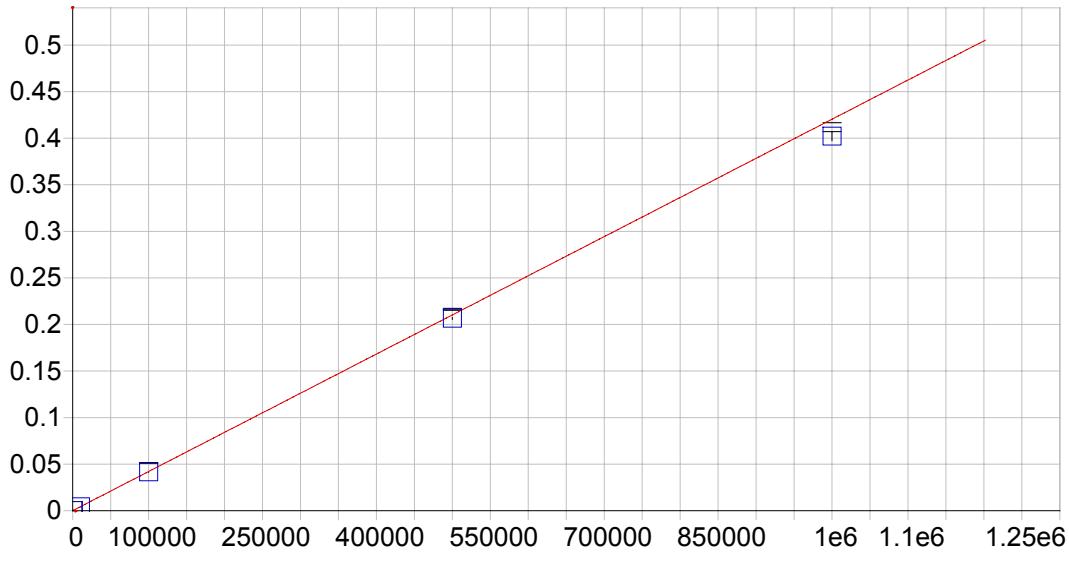


Be 234.861 {144}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999998	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.634288		
Predicted MQL:	2.114293		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00051	-.001	.000	.00000	.000	1
CalStd9=100	1000.0	999.43	-.572	-.057	.00077	.000	1
CalStd8=100	100.00	100.57	.572	.572	.00008	.000	1

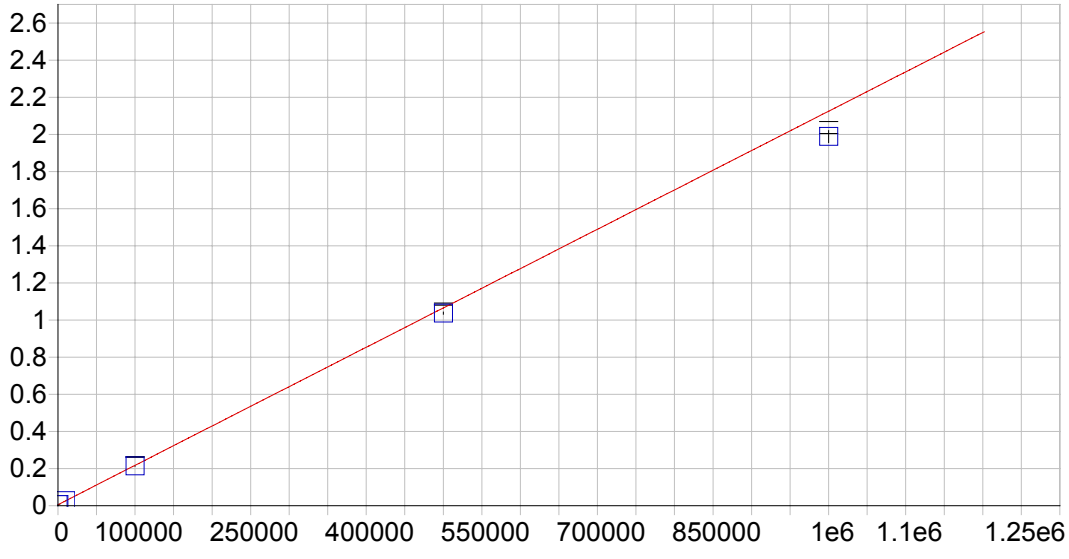


Ca 315.887 {107}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Curvilinear Weighting: 1/Conc

A0 (Offset):	0.000040	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999994	Status:	OK.
Std Error of Est:	0.000003		
Predicted MDL:	14.558587		
Predicted MQL:	48.528624		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.02992	.030	.000	.00004	.000	1
CalStd10=10	10000.	9732.9	-267.	-2.67	.00413	.000	1
CalStd13=50	500000.	491110.	-8890.	-1.78	.20650	.001	1
CalStd14-100	1000000.	956480.	-43500.	-4.35	.40213	.005	1
CalStd9=100	1000.0	1000.6	.608	.061	.00046	.000	1
CalStd12-100	100000.	98869.	-1130.	-1.13	.04160	.000	1

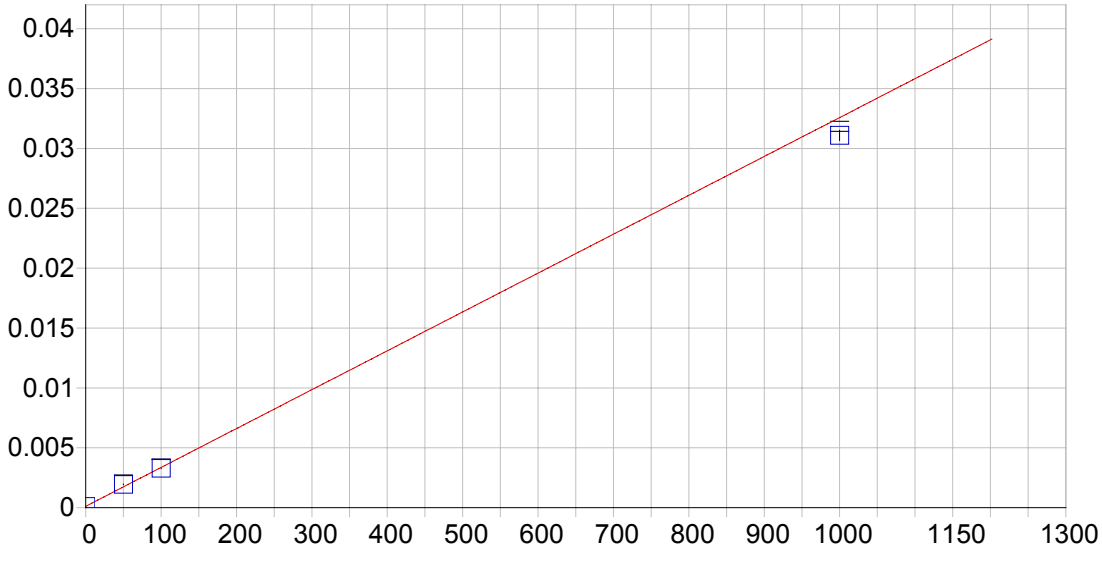


Ca 317.933 {106}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Curvilinear Weighting: 1/Conc

A0 (Offset):	0.005552	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999988	Status:	OK.
Std Error of Est:	0.000018		
Predicted MDL:	4.132772		
Predicted MQL:	13.775906		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.08449	.084	.000	.00555	.000	1
CalStd10=10	10000.	9736.0	-264.	-2.64	.02619	.000	1
CalStd13=50	500000.	486750.	-13300.	-2.65	1.0371	.005	1
CalStd14-100	1000000.	935640.	-64400.	-6.44	1.9884	.032	1
CalStd9=100	1000.0	948.03	-52.0	-5.20	.00756	.000	1
CalStd12-100	100000.	98293.	-1710.	-1.71	.21386	.002	1

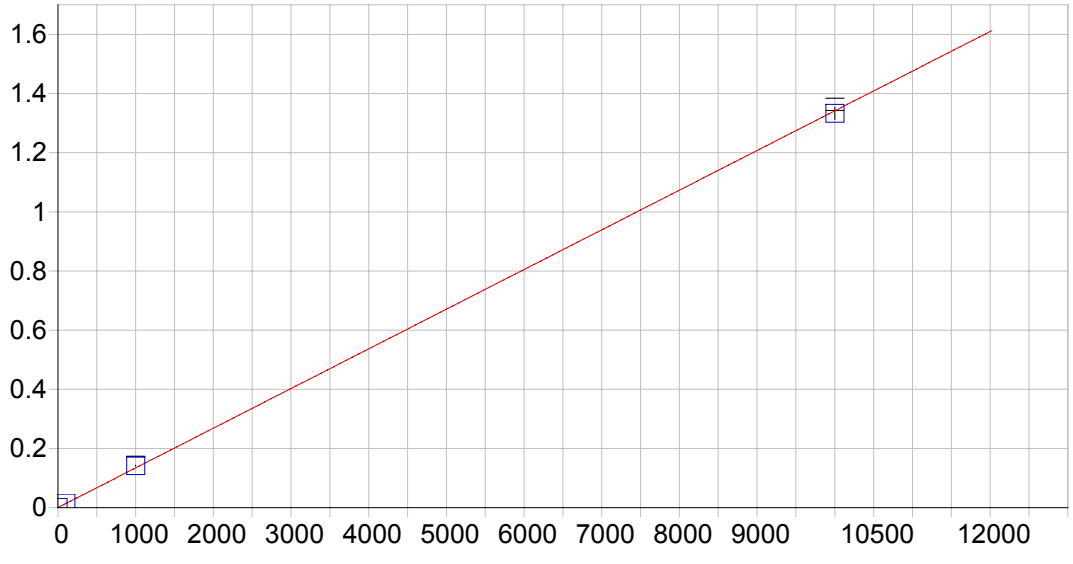


Ca 393.366 { 86}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Var

A0 (Offset):	0.000112	Re-Slope:	1.000000
A1 (Gain):	0.000032	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.997235	Status:	OK.
Std Error of Est:	0.000147		
Predicted MDL:	0.058306		
Predicted MQL:	0.194352		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-1.1667	-1.17	.000	.00007	.000	1
CalStd7=50	50.000	56.400	6.40	12.8	.00194	.000	1
CalStd9=100	1000.0	954.22	-45.8	-4.58	.03109	.000	1
CalStd8=100	100.00	97.596	-2.40	-2.40	.00328	.000	1

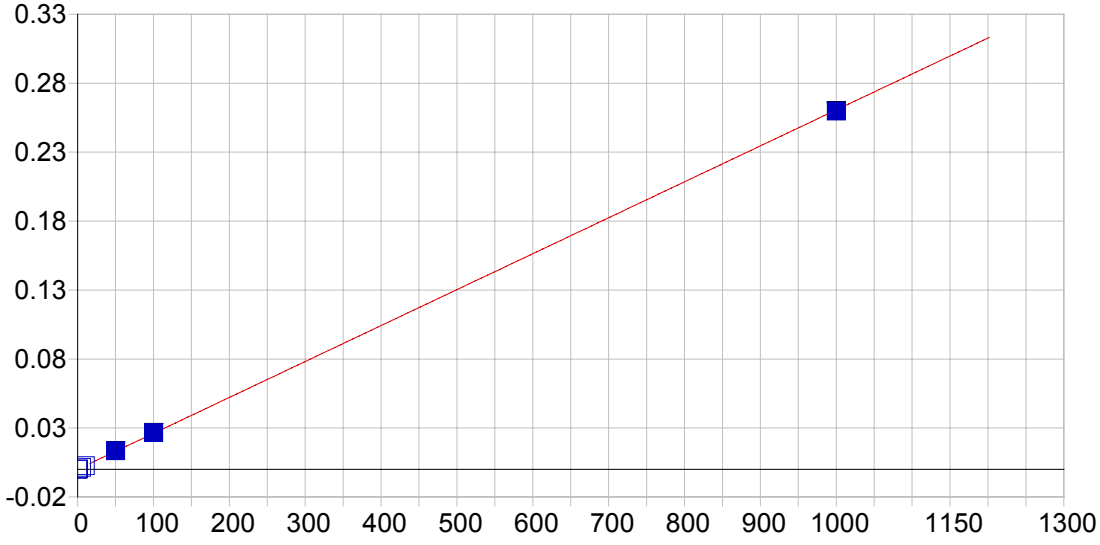


Ca 396.847 { 85}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000359	Re-Slope:	1.000000
A1 (Gain):	0.000134	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999796	Status:	OK.
Std Error of Est:	0.000127		
Predicted MDL:	0.131250		
Predicted MQL:	0.437501		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.01512	-.015	.000	.00036	.000	1
CalStd10=10	10000.	9934.6	-65.4	-.654	1.3329	.021	1
CalStd8=100	100.00	110.26	10.3	10.3	.01515	.000	1
CalStd9=100	1000.0	1055.1	55.1	5.51	.14188	.001	1

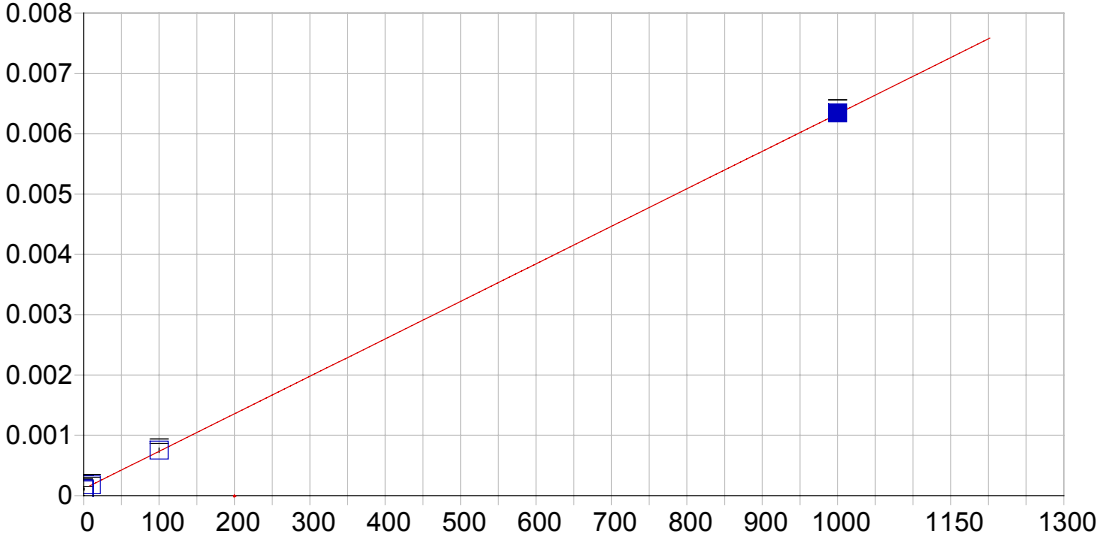


Cd 226.502 {449}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000007	Re-Slope:	1.000000
A1 (Gain):	0.000261	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999946	Status:	OK.
Std Error of Est:	0.000002		
Predicted MDL:	0.181950		
Predicted MQL:	0.606501		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00005	.000	.000	-.00001	.000	1
CalStd7=50	50.000	51.221	1.22	2.44	.01334	.000	1
CalStd3=1	1.0000	.96178	-.038	-3.82	.00024	.000	1
CalStd2=0.5	.50000	.41539	-.085	-16.9	.00010	.000	1
CalStd4=5	5.0000	5.3278	.328	6.56	.00138	.000	1
CalStd8=100	100.00	102.12	2.12	2.12	.02661	.000	1
CalStd5=10	10.000	9.9193	-.081	-.807	.00258	.000	1
CalStd9=100	1000.0	996.53	-3.47	-.347	.25975	.000	1

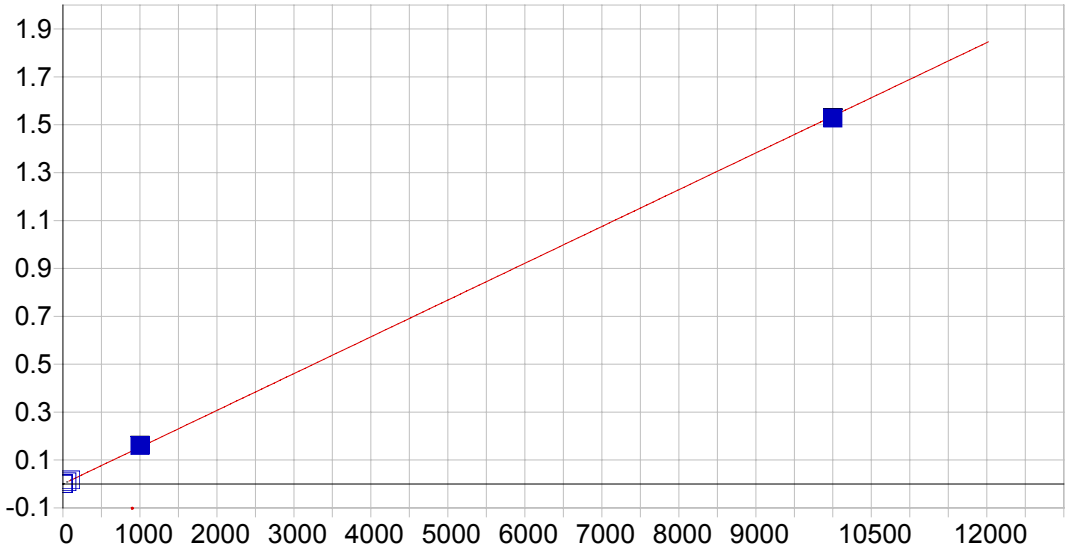


Cd 228.802 {447}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000114	Re-Slope:	1.000000
A1 (Gain):	0.000006	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.990712	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	9.669197		
Predicted MQL:	32.230657		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00339	.003	.000	.00011	.000	1
CalStd9=100	1000.0	1002.3	2.32	.232	.00634	.000	1
CalStd8=100	100.00	102.82	2.82	2.82	.00075	.000	1
CalStd2=0.5	.50000	-.85171	-1.35	-270.	.00011	.000	1
CalStd3=1	1.0000	-3.1426	-4.14	-414.	.00009	.000	1
CalStd5=10	10.000	10.358	.358	3.58	.00018	.000	1

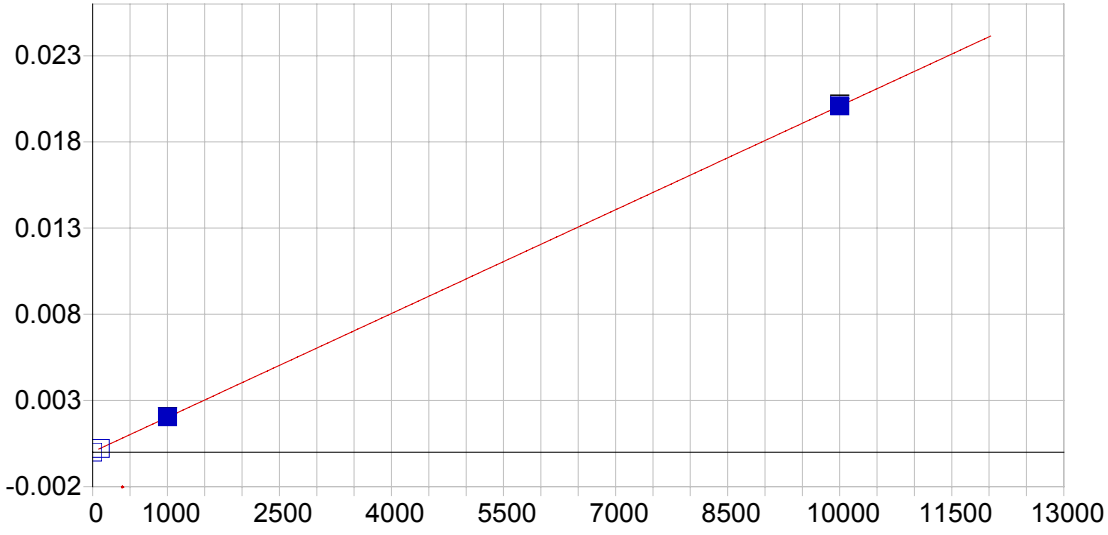


Co 228.616 {447}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000092	Re-Slope:	1.000000
A1 (Gain):	0.000154	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999866	Status:	OK.
Std Error of Est:	0.000010		
Predicted MDL:	0.319216		
Predicted MQL:	1.064053		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00018	.000	.000	-.00009	.000	1
CalStd7=50	50.000	53.789	3.79	7.58	.00817	.000	1
CalStd5=10	10.000	10.097	.097	.972	.00146	.000	1
CalStd4=5	5.0000	5.4466	.447	8.93	.00074	.000	1
CalStd8=100	100.00	106.23	6.23	6.23	.01623	.000	1
CalStd9=100	1000.0	1044.3	44.3	4.43	.16032	.000	1
CalStd3=1	1.0000	.90742	-.093	-9.26	.00005	.000	1
CalStd10=10	10000.	9945.2	-54.8	-.548	1.5276	.001	1

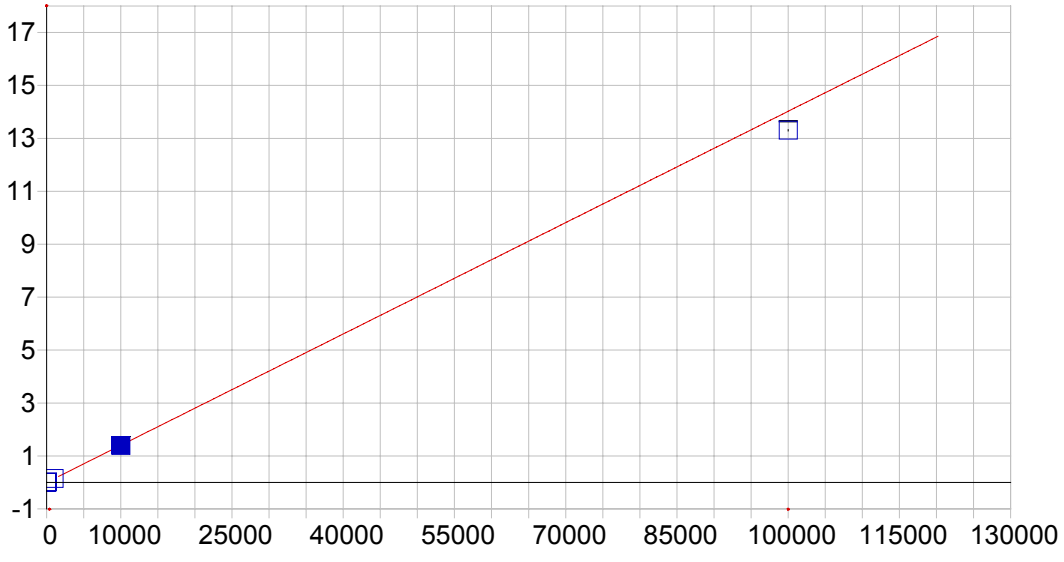


Co 238.892 {141}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	None

A0 (Offset):	0.000017	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999998	Status:	OK.
Std Error of Est:	0.000024		
Predicted MDL:	1.050202		
Predicted MQL:	3.500674		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-8.1864	-8.19	.000	.00000	.000	1
CalStd9=100	1000.0	1014.1	14.1	1.41	.00205	.000	1
CalStd10=10	10000.	9998.6	-1.37	-.014	.02009	.000	1
CalStd8=100	100.00	95.436	-4.56	-4.56	.00021	.000	1

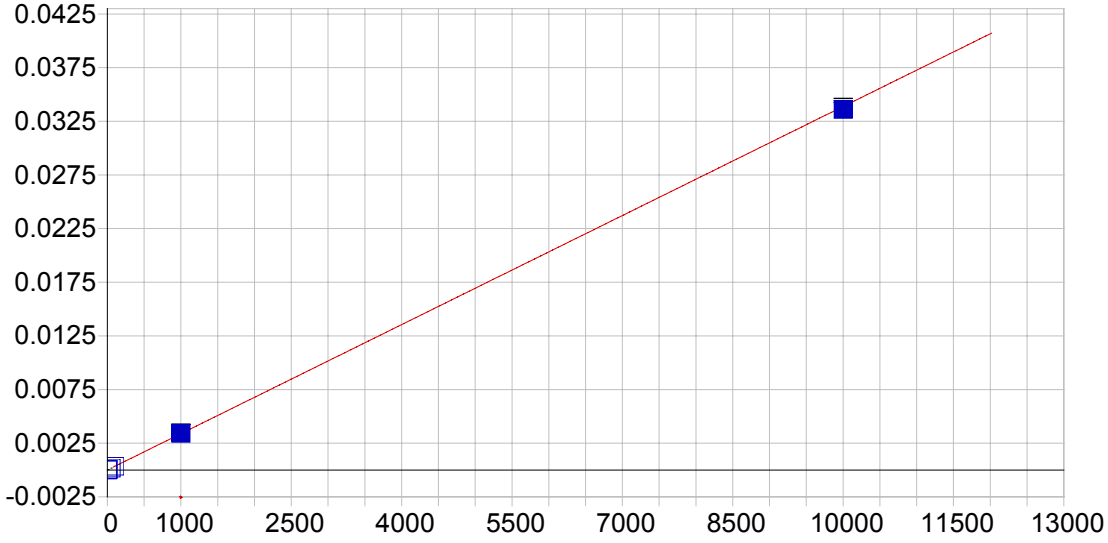


Cr 205.560 {464}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000058	Re-Slope:	1.000000
A1 (Gain):	0.000140	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999736	Status:	OK.
Std Error of Est:	0.000100		
Predicted MDL:	0.226846		
Predicted MQL:	0.756155		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.55493	-.555	.000	-.00002	.000	1
CalStd5=10	10.000	9.6239	-.376	-3.76	.00141	.000	1
CalStd7=50	50.000	52.964	2.96	5.93	.00749	.000	1
CalStd9=100	1000.0	1040.7	40.7	4.07	.14600	.000	1
CalStd8=100	100.00	104.55	4.55	4.55	.01472	.000	1
CalStd4=5	5.0000	4.9931	-.007	-.138	.00076	.000	1
CalStd3=1	1.0000	.71943	-.281	-28.1	.00016	.000	1
CalStd11-100	100000.	94886.	-5110.	-5.11	13.306	.024	1
CalStd10=10	10000.	9909.8	-90.2	-.902	1.3897	.001	1

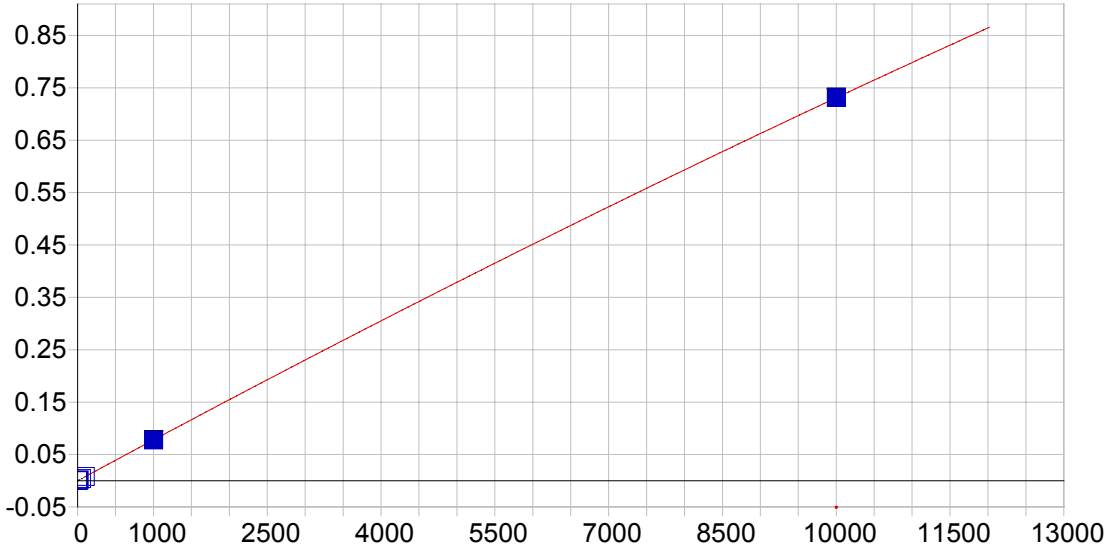


Cr 267.716 {126}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000003	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999949	Status:	OK.
Std Error of Est:	0.000002		
Predicted MDL:	0.847920		
Predicted MQL:	2.826402		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.39377	-.394	.000	.00000	.000	1
CalStd5=10	10.000	9.9313	-.069	-.687	.00003	.000	1
CalStd7=50	50.000	50.819	.819	1.64	.00017	.000	1
CalStd9=100	1000.0	1004.6	4.64	.464	.00340	.000	1
CalStd8=100	100.00	101.99	1.99	1.99	.00035	.000	1
CalStd4=5	5.0000	5.4113	.411	8.23	.00002	.000	1
CalStd10=10	10000.	9919.6	-80.4	-.804	.03361	.000	1

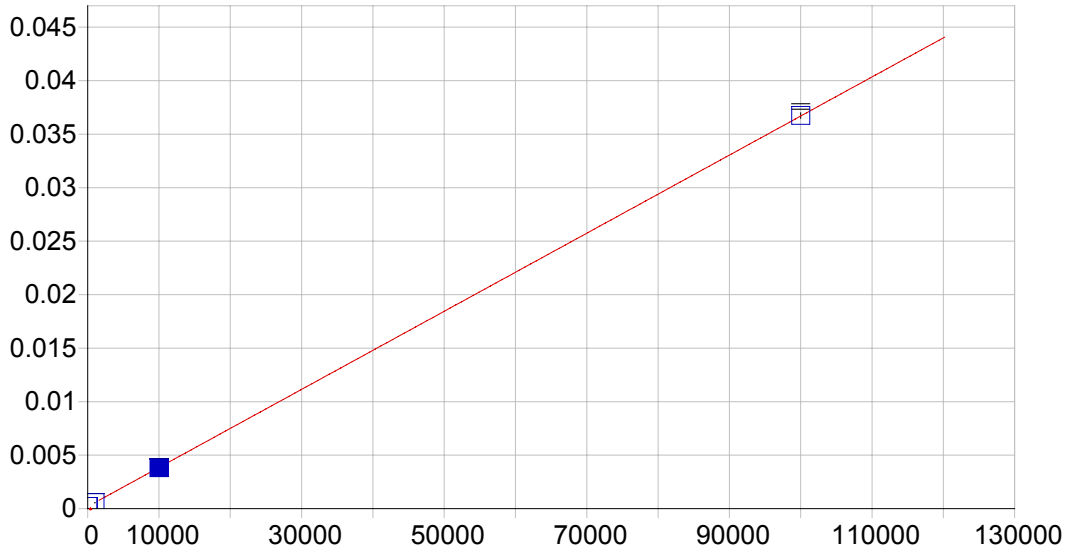


Cu 224.700 {450}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Curvilinear	Weighting:	1/Conc

A0 (Offset):	-0.000088	Re-Slope:	1.000000
A1 (Gain):	0.000078	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999961	Status:	OK.
Std Error of Est:	0.000003		
Predicted MDL:	0.611265		
Predicted MQL:	2.037552		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00094	-.001	.000	-.00009	.000	1
CalStd9=100	1000.0	995.92	-4.08	-.408	.07753	.000	1
CalStd7=50	50.000	50.745	.745	1.49	.00389	.000	1
CalStd8=100	100.00	100.57	.566	.566	.00780	.000	1
CalStd5=10	10.000	10.257	.257	2.57	.00072	.000	1
CalStd10=10	10000.	10000.	.454	.005	.73118	.001	1
CalStd4=5	5.0000	6.2527	1.25	25.1	.00040	.000	1
CalStd6=20	20.000	20.178	.178	.888	.00150	.000	1
CalStd3=1	1.0000	1.6413	.641	64.1	.00004	.000	1

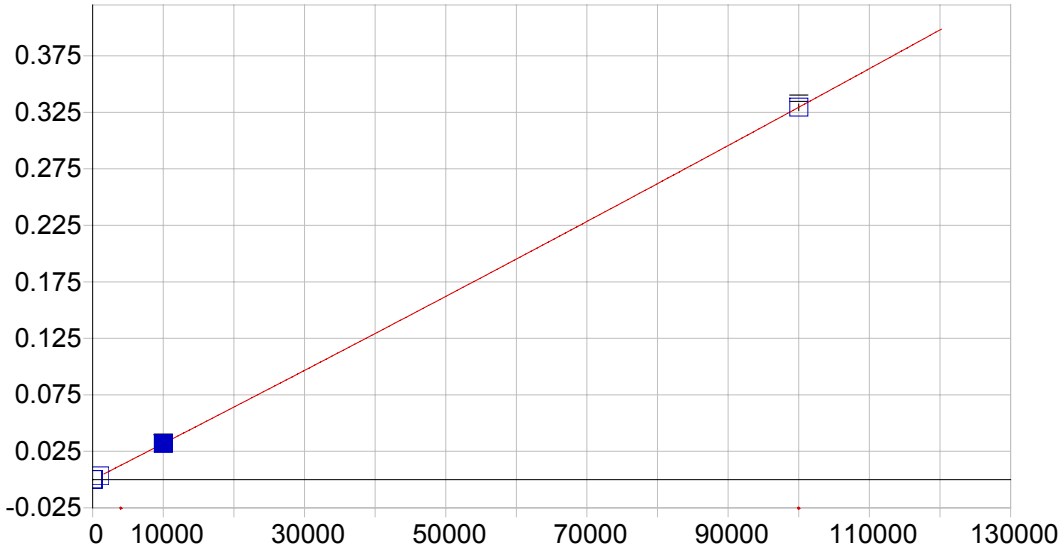


Cu 324.754 {104}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000198	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999993	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	3.716950		
Predicted MQL:	12.389832		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00671	.007	.000	.00020	.000	1
CalStd9=100	1000.0	984.63	-15.4	-1.54	.00056	.000	1
CalStd8=100	100.00	95.733	-4.27	-4.27	.00023	.000	1
CalStd10=10	10000.	9897.1	-103.	-1.03	.00381	.000	1
CalStd11-100	100000.	100120.	123.	.123	.03674	.000	1

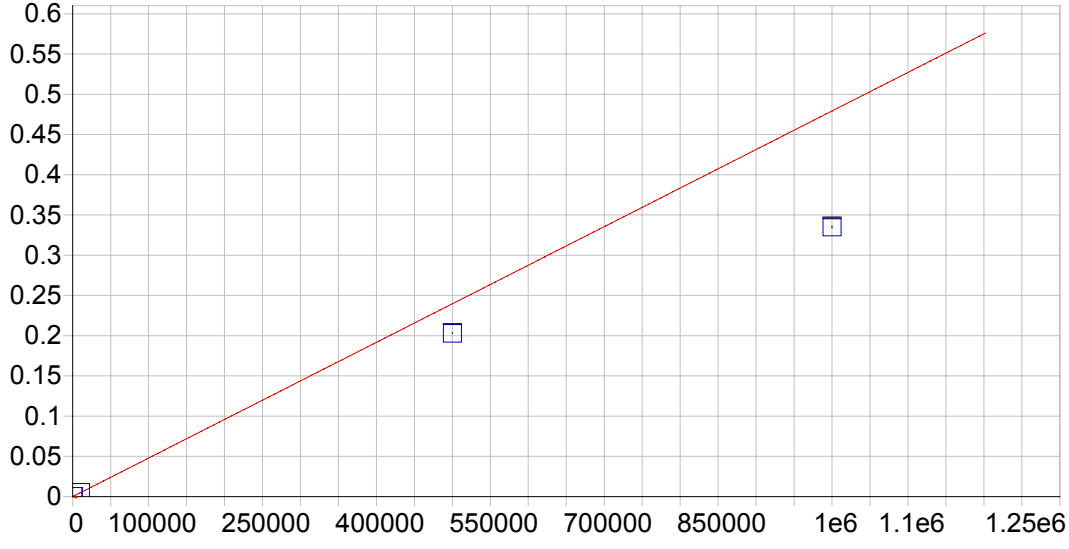


Cu 327.396 {103}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Curvilinear	Weighting:	1/Conc

A0 (Offset):	-0.000096	Re-Slope:	1.000000
A1 (Gain):	0.000003	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999995	Status:	Warning Positive Curvature
Std Error of Est:	0.000001		
Predicted MDL:	5.211356		
Predicted MQL:	17.371186		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00251	-.003	.000	-.00010	.000	1
CalStd6=20	20.000	20.341	.341	1.71	-.00003	.000	1
CalStd7=50	50.000	51.201	1.20	2.40	.00007	.000	1
CalStd8=100	100.00	106.24	6.24	6.24	.00024	.000	1
CalStd9=100	1000.0	1025.6	25.6	2.56	.00318	.000	1
CalStd10=10	10000.	9963.4	-36.6	-.366	.03180	.000	1
CalStd11-100	100000.	100000.	3.21	.003	.32951	.003	1

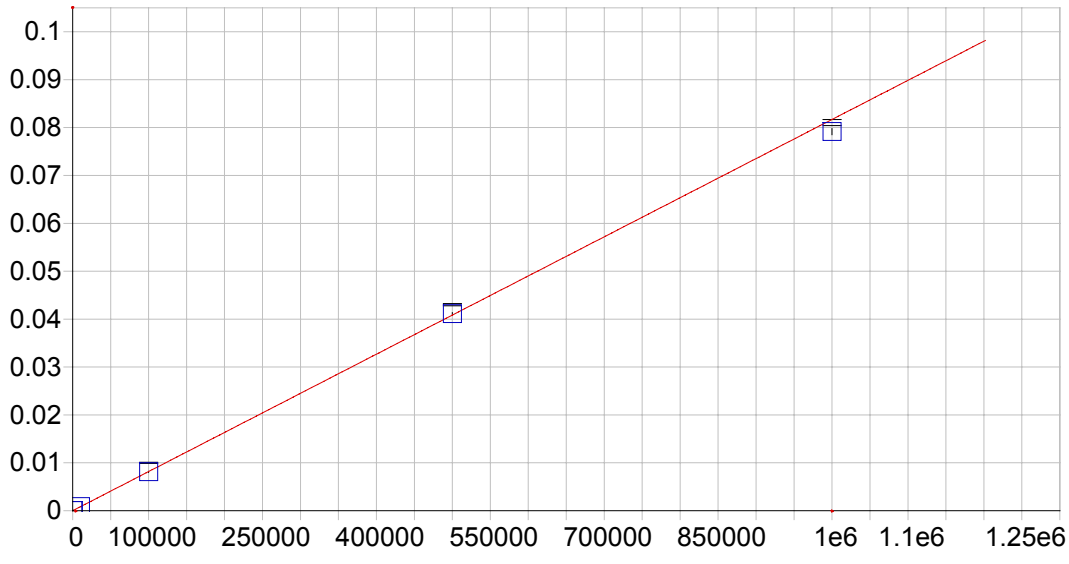


Fe 234.349 {144}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Full Fit	Weighting:	1/Conc

A0 (Offset):	0.000028	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999983	Status:	OK.
Std Error of Est:	0.000006		
Predicted MDL:	1.971570		
Predicted MQL:	6.571901		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.00003	.000	1
CalStd10=10	10000.	10431.	431.	4.31	.00503	.000	1
CalStd13=50	500000.	423610.	-76400.	-15.3	.20303	.000	1
CalStd14-100	1000000.	699190.	-301000.	-30.1	.33508	.001	1
CalStd9=100	1000.0	1069.4	69.4	6.94	.00054	.000	1

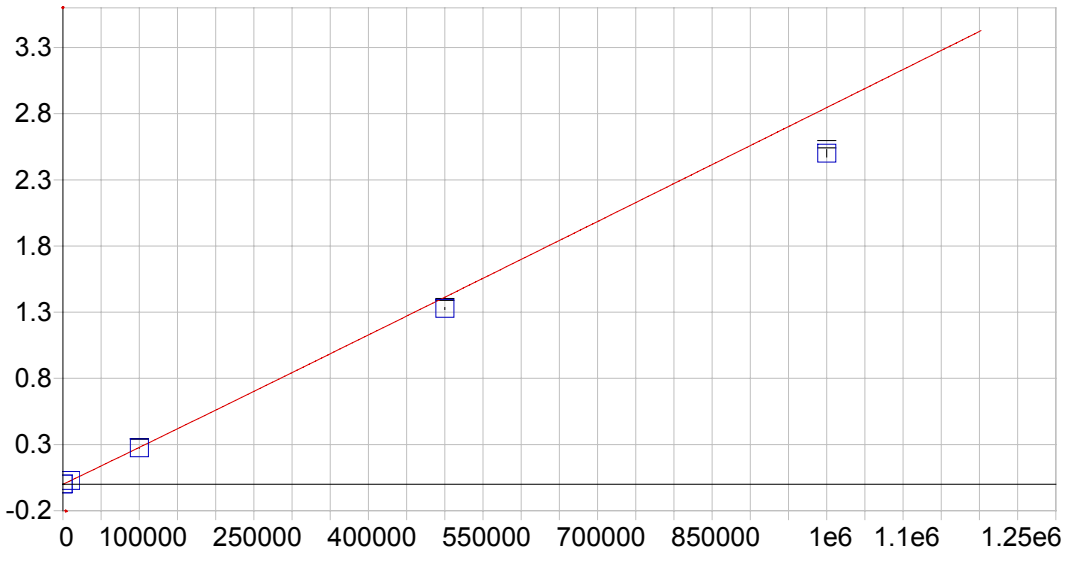


Fe 239.562 {140}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000001	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999962	Status:	OK.
Std Error of Est:	0.000002		
Predicted MDL:	7.191553		
Predicted MQL:	23.971843		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.41463	-.415	.000	.00000	.000	1
CalStd10=10	10000.	10017.	17.3	.173	.00082	.000	1
CalStd13=50	500000.	503410.	3410.	.682	.04113	.000	1
CalStd14-100	1000000.	968790.	-31200.	-3.12	.07914	.001	1
CalStd9=100	1000.0	995.15	-4.85	-.485	.00008	.000	1
CalStd12-100	100000.	99238.	-762.	-.762	.00811	.000	1

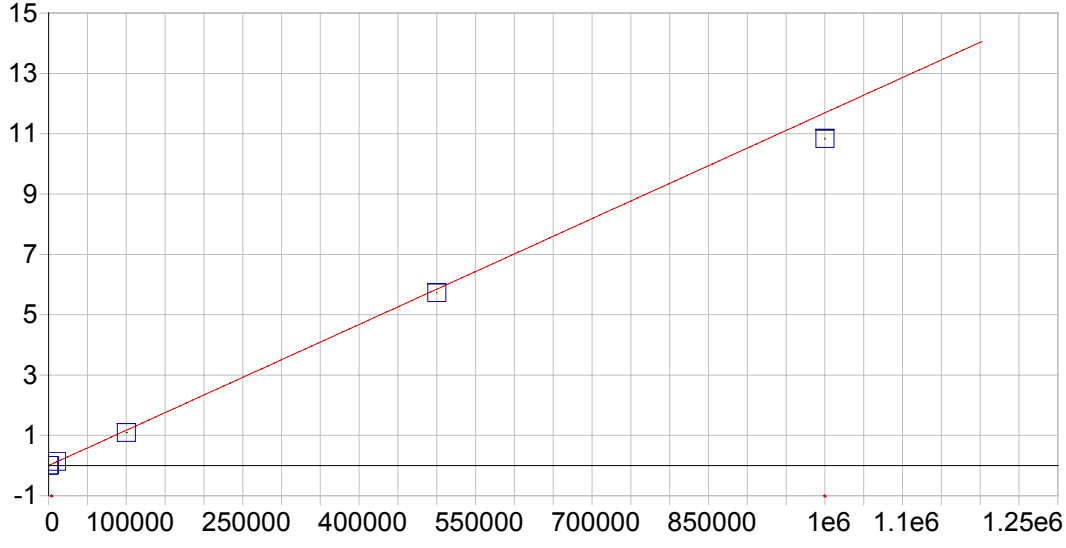


Fe 259.940 {129}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Full Fit	Weighting:	None

A0 (Offset):	0.000064	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.010000		
Correlation:	1.000000	Status:	OK.
Std Error of Est:	0.000743		
Predicted MDL:	3.231289		
Predicted MQL:	10.770964		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.00001	.000	1
CalStd10=10	10000.	10193.	193.	1.93	.02778	.000	1
CalStd13=50	500000.	470250.	-29800.	-5.95	1.3284	.007	1
CalStd14-100	1000000.	879720.	-120000.	-12.0	2.5007	.028	1
CalStd9=100	1000.0	1043.4	43.4	4.34	.00284	.000	1
CalStd12-100	100000.	98529.	-1470.	-1.47	.27407	.002	1

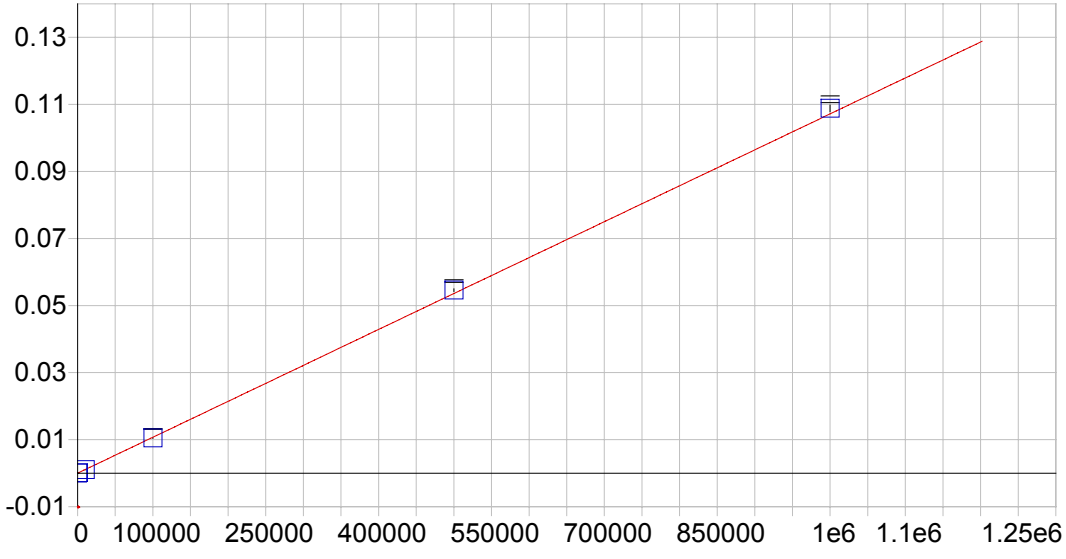


Mg 202.582 {466}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Curvilinear	Weighting:	1/Conc

A0 (Offset):	-0.000068	Re-Slope:	1.000000
A1 (Gain):	0.000012	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999741	Status:	OK.
Std Error of Est:	0.000452		
Predicted MDL:	3.008073		
Predicted MQL:	10.026910		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.32532	-.325	.000	-.00007	.000	1
CalStd13=50	500000.	489810.	-10200.	-2.04	5.7277	.008	1
CalStd10=10	10000.	11477.	1480.	14.8	.13414	.000	1
CalStd14-100	1000000.	926630.	-73400.	-7.34	10.836	.015	1
CalStd12-100	100000.	93317.	-6680.	-6.68	1.0912	.001	1
CalStd9=100	1000.0	1225.1	225.	22.5	.01426	.000	1

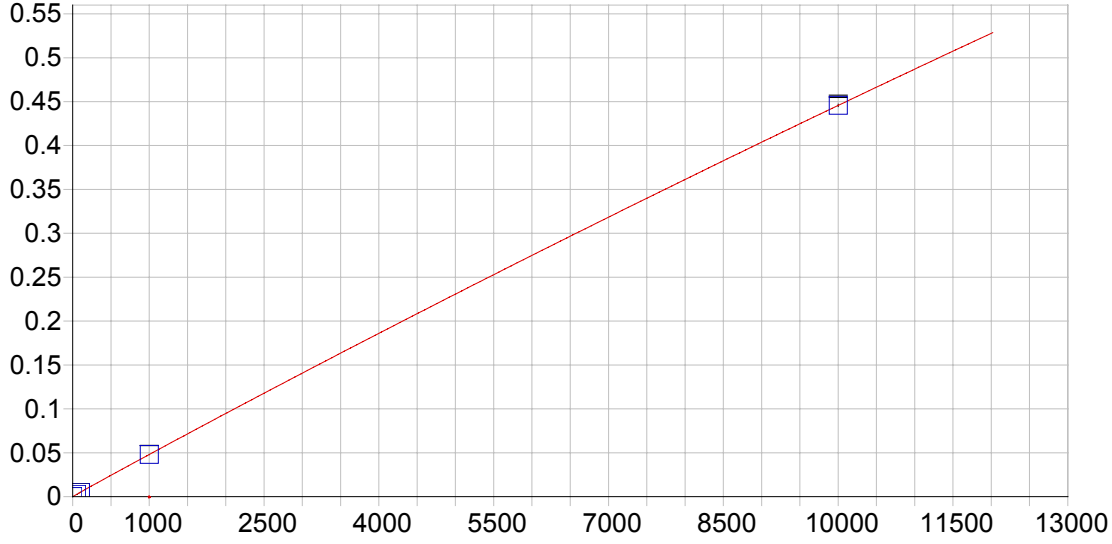


Mg 279.079 {121}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Curvilinear	Weighting:	1/Conc

A0 (Offset):	0.000002	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999962	Status:	OK.
Std Error of Est:	0.000002		
Predicted MDL:	40.669997		
Predicted MQL:	135.566658		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.06865	.069	.000	.00000	.000	1
CalStd13=50	500000.	509480.	9480.	1.90	.05460	.000	1
CalStd10=10	10000.	9633.4	-367.	-3.67	.00103	.000	1
CalStd14-100	1000000.	1015500.	15500.	1.55	.10883	.001	1
CalStd12-100	100000.	97803.	-2200.	-2.20	.01048	.000	1
CalStd9=100	1000.0	984.17	-15.8	-1.58	.00011	.000	1

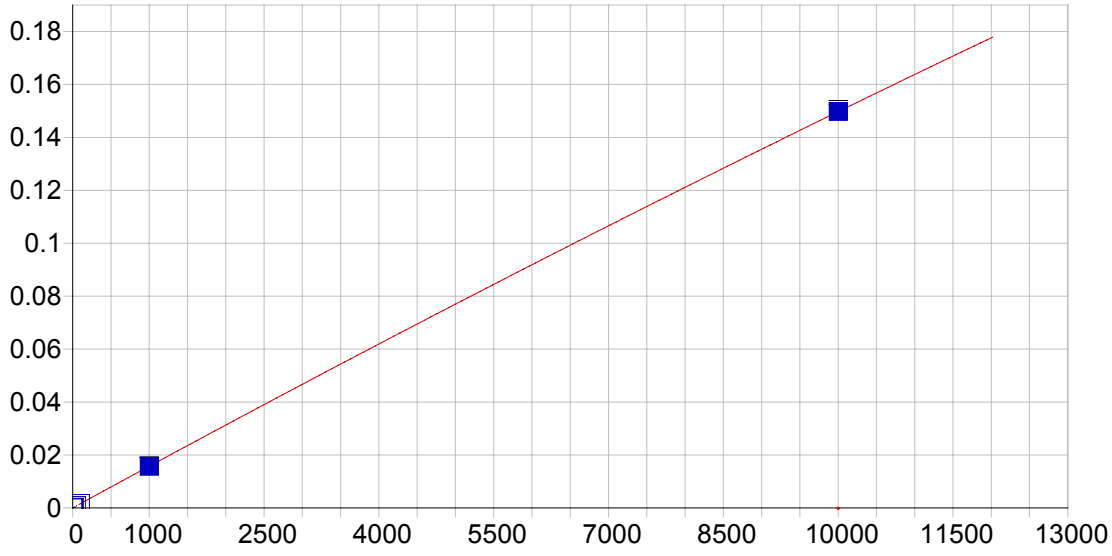


Mg 280.270 {120}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Full Fit	Weighting:	1/Conc

A0 (Offset):	0.000090	Re-Slope:	1.000000
A1 (Gain):	0.000052	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	0.990000		
Correlation:	1.000000	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	0.029813		
Predicted MQL:	0.099375		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.00009	.000	1
CalStd9=100	1000.0	999.92	-.082	-.008	.04800	.000	1
CalStd10=10	10000.	10000.	.010	.000	.44569	.001	1
CalStd8=100	100.00	99.875	-.125	-.125	.00501	.000	1
CalStd7=50	50.000	50.192	.192	.384	.00258	.000	1

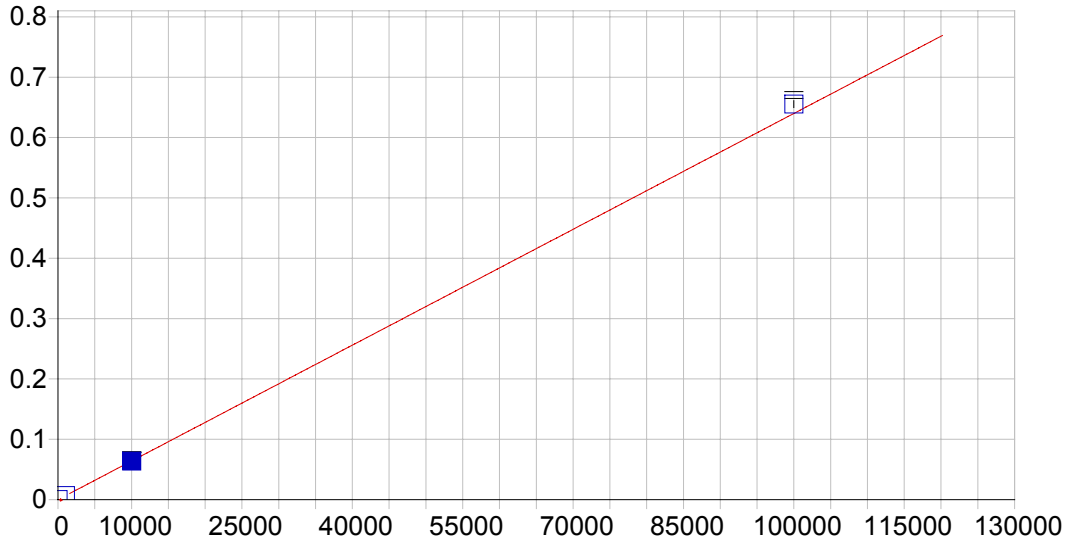


Mn 257.610 {131}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Curvilinear	Weighting:	1/Conc

A0 (Offset):	0.000001	Re-Slope:	1.000000
A1 (Gain):	0.000016	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999992	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	0.091737		
Predicted MQL:	0.305791		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00068	-.001	.000	.00000	.000	1
CalStd5=10	10.000	10.002	.002	.017	.00016	.000	1
CalStd7=50	50.000	51.128	1.13	2.26	.00081	.000	1
CalStd6=20	20.000	19.564	-.436	-2.18	.00031	.000	1
CalStd8=100	100.00	101.90	1.90	1.90	.00161	.000	1
CalStd4=5	5.0000	5.6015	.602	12.0	.00009	.000	1
CalStd9=100	1000.0	996.44	-3.56	-.356	.01568	.000	1
CalStd10=10	10000.	10000.	.367	.004	.14973	.001	1

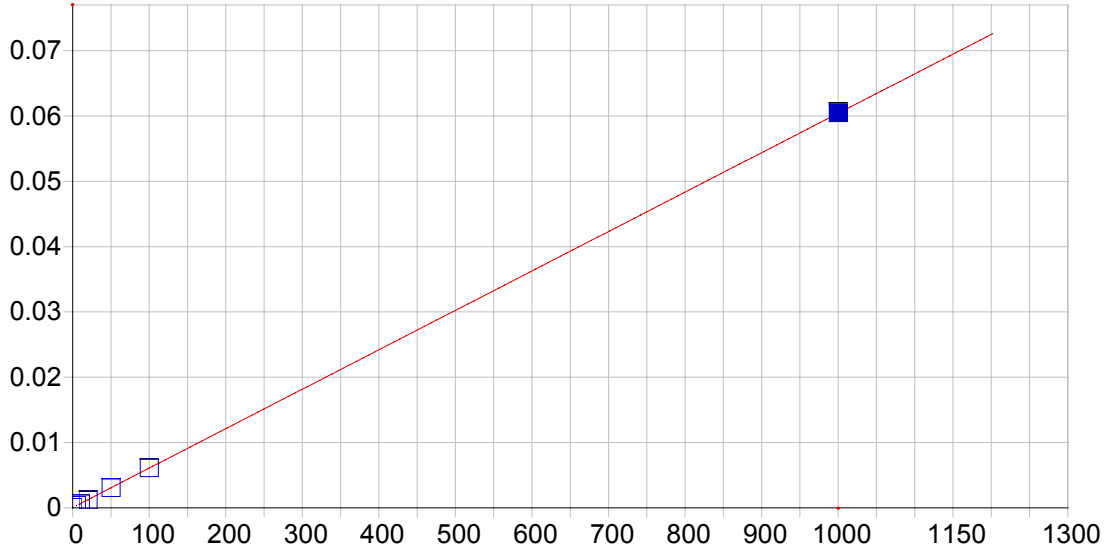


Mn 259.373 {130}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000010	Re-Slope:	1.000000
A1 (Gain):	0.000006	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999935	Status:	OK.
Std Error of Est:	0.000014		
Predicted MDL:	1.494553		
Predicted MQL:	4.981842		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.03035	-.030	.000	.00001	.000	1
CalStd10=10	10000.	9938.5	-61.5	-.615	.06369	.000	1
CalStd11-100	100000.	102420.	2420.	2.42	.65541	.006	1
CalStd9=100	1000.0	1017.9	17.9	1.79	.00653	.000	1

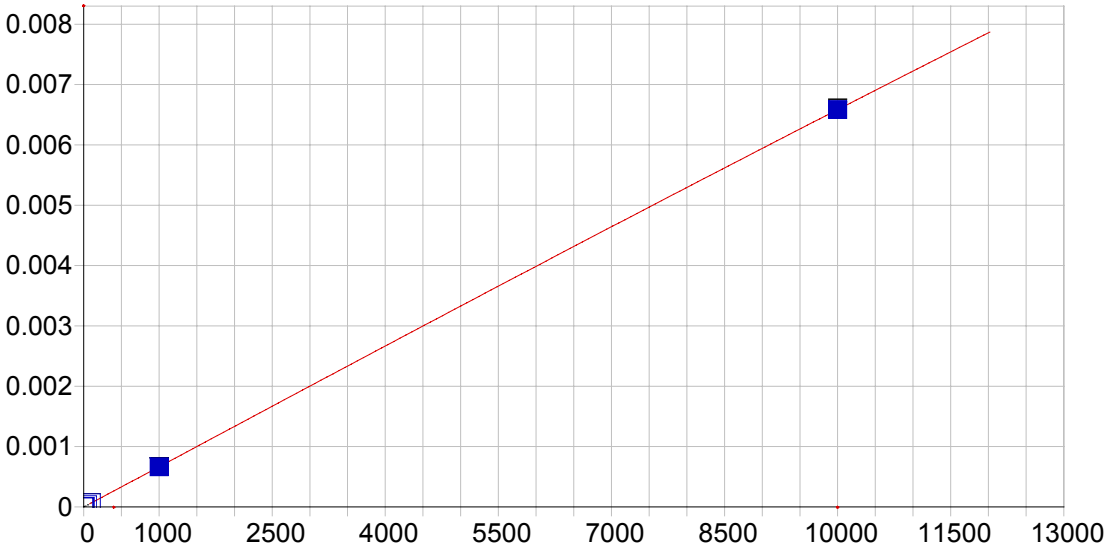


Mo 202.030 {466}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000051	Re-Slope:	1.000000
A1 (Gain):	0.000060	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999953	Status:	OK.
Std Error of Est:	0.000002		
Predicted MDL:	0.428554		
Predicted MQL:	1.428514		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00062	.001	.000	.00005	.000	1
CalStd7=50	50.000	50.223	.223	.446	.00308	.000	1
CalStd6=20	20.000	18.863	-1.14	-5.69	.00119	.000	1
CalStd5=10	10.000	9.3645	-.635	-6.35	.00062	.000	1
CalStd8=100	100.00	100.46	.460	.460	.00611	.000	1
CalStd4=5	5.0000	4.9343	-.066	-1.31	.00035	.000	1
CalStd9=100	1000.0	1001.2	1.16	.116	.06048	.000	1

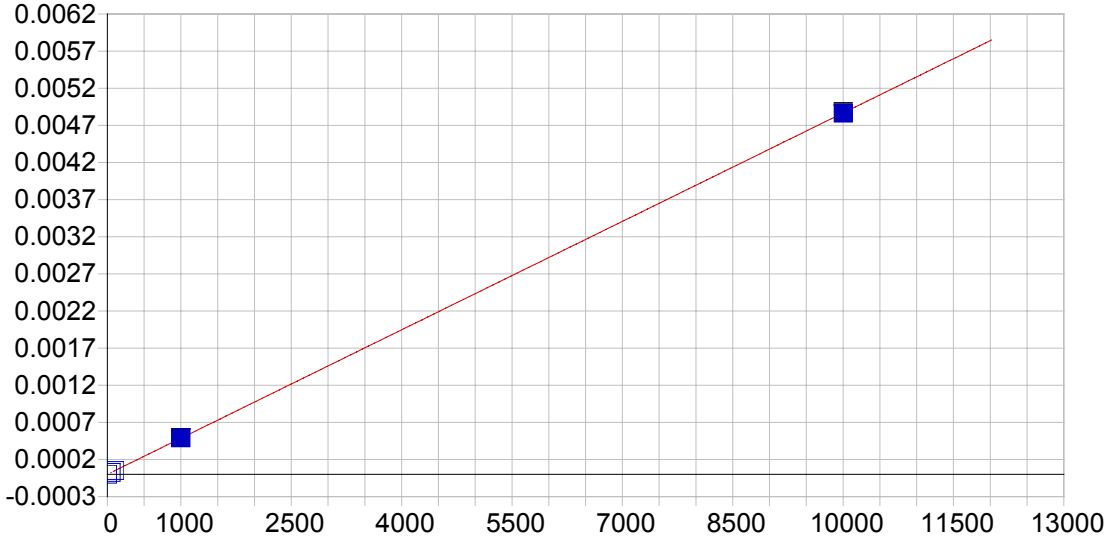


Mo 204.598 {464}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Full Fit	Weighting:	1/Conc

A0 (Offset):	0.000001	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.010000		
Correlation:	0.999992	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.794390		
Predicted MQL:	2.647968		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00057	.001	.000	.00000	.000	1
CalStd7=50	50.000	51.074	1.07	2.15	.00003	.000	1
CalStd6=20	20.000	19.044	-.956	-4.78	.00001	.000	1
CalStd5=10	10.000	9.3457	-.654	-6.54	.00001	.000	1
CalStd8=100	100.00	102.29	2.29	2.29	.00007	.000	1
CalStd4=5	5.0000	4.8378	-.162	-3.24	.00000	.000	1
CalStd9=100	1000.0	998.27	-1.73	-.173	.00066	.000	1
CalStd10=10	10000.	10000.	.148	.001	.00658	.000	1

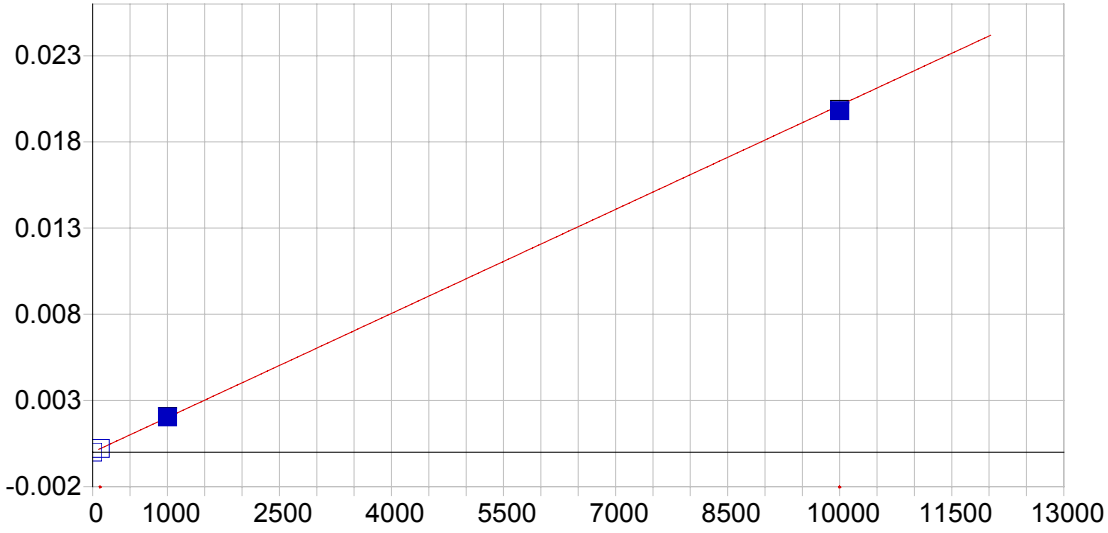


Mo 204.598 {465}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999997	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.987138		
Predicted MQL:	3.290460		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00148	-.001	.000	.00000	.000	1
CalStd9=100	1000.0	1005.6	5.60	.560	.00049	.000	1
CalStd10=10	10000.	9992.7	-7.34	-.073	.00486	.000	1
CalStd7=50	50.000	50.738	.738	1.48	.00002	.000	1
CalStd8=100	100.00	101.01	1.01	1.01	.00005	.000	1

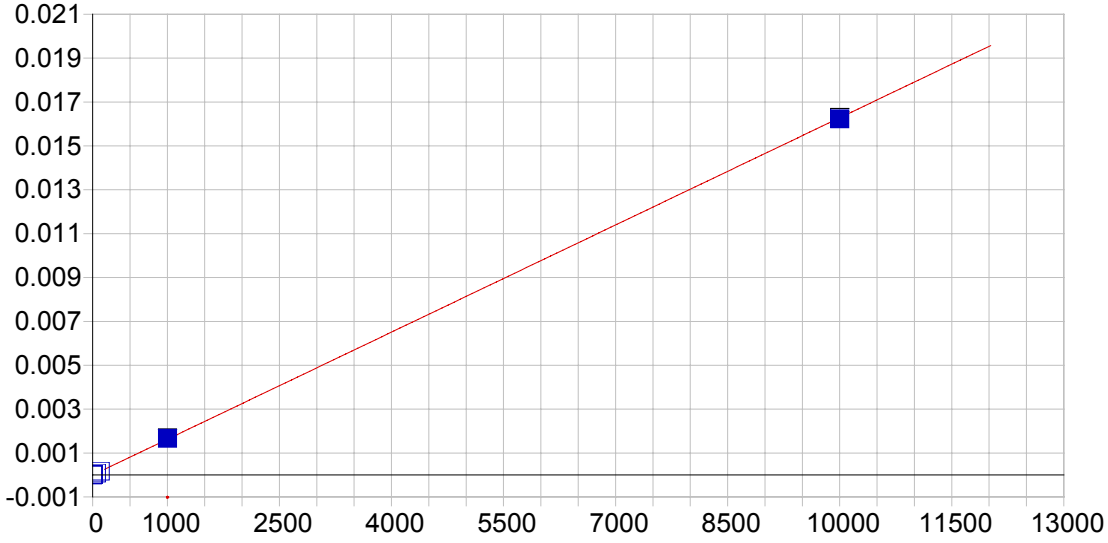


Ni 221.647 {452}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	-0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999821	Status:	OK.
Std Error of Est:	0.000004		
Predicted MDL:	0.472993		
Predicted MQL:	1.576642		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.26196	-.262	.000	.00000	.000	1
CalStd10=10	10000.	9844.0	-156.	-1.56	.01981	.000	1
CalStd8=100	100.00	103.06	3.06	3.06	.00021	.000	1
CalStd9=100	1000.0	1015.4	15.4	1.54	.00204	.000	1

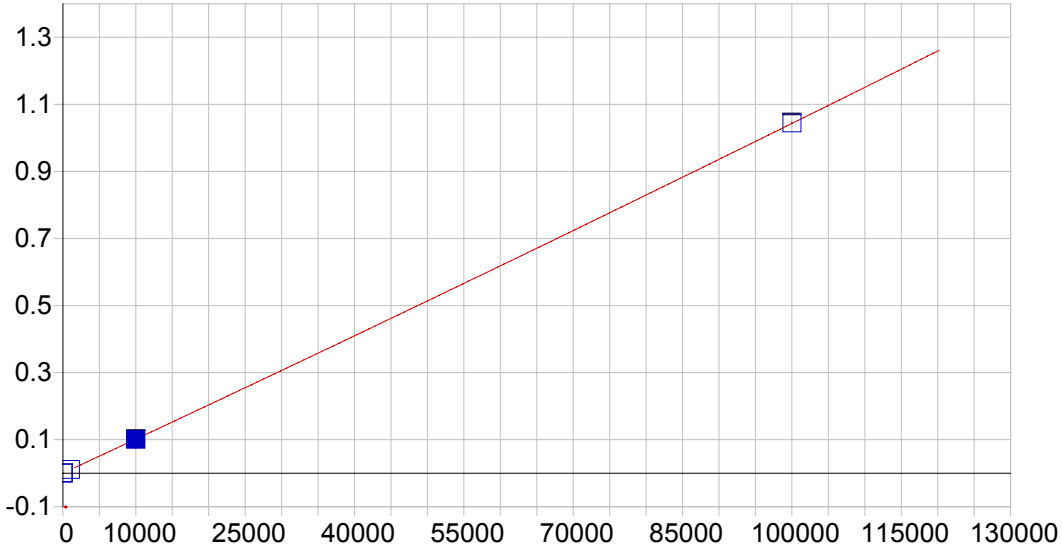


Ni 231.604 {445}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000003	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999939	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.535506		
Predicted MQL:	1.785020		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00054	-.001	.000	.00000	.000	1
CalStd7=50	50.000	52.568	2.57	5.14	.00008	.000	1
CalStd5=10	10.000	10.607	.607	6.07	.00001	.000	1
CalStd8=100	100.00	104.54	4.54	4.54	.00017	.000	1
CalStd4=5	5.0000	6.0075	1.01	20.1	.00001	.000	1
CalStd9=100	1000.0	1025.5	25.5	2.55	.00167	.000	1
CalStd3=1	1.0000	1.1598	.160	16.0	.00000	.000	1
CalStd10=10	10000.	9965.6	-34.4	-.344	.01622	.000	1

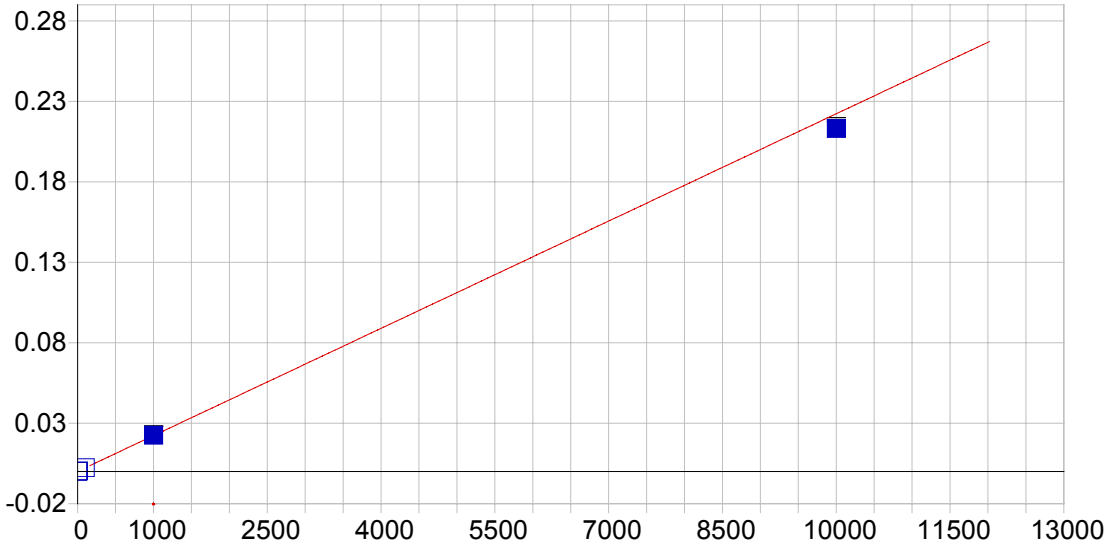


Pb 216.999 {455}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Curvilinear	Weighting:	1/Var

A0 (Offset):	0.000075	Re-Slope:	1.000000
A1 (Gain):	0.000010	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999876	Status:	Warning Positive Curvature
Std Error of Est:	0.000294		
Predicted MDL:	4.858504		
Predicted MQL:	16.195013		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-10.320	-10.3	.000	-.00003	.000	1
CalStd9=100	1000.0	1040.8	40.8	4.08	.01061	.000	1
CalStd10=10	10000.	9923.3	-76.7	-.767	.10082	.000	1
CalStd11-100	100000.	100130.	133.	.133	1.0446	.002	1
CalStd8=100	100.00	94.146	-5.85	-5.85	.00103	.000	1
CalStd5=10	10.000	2.1250	-7.87	-78.7	.00010	.000	1

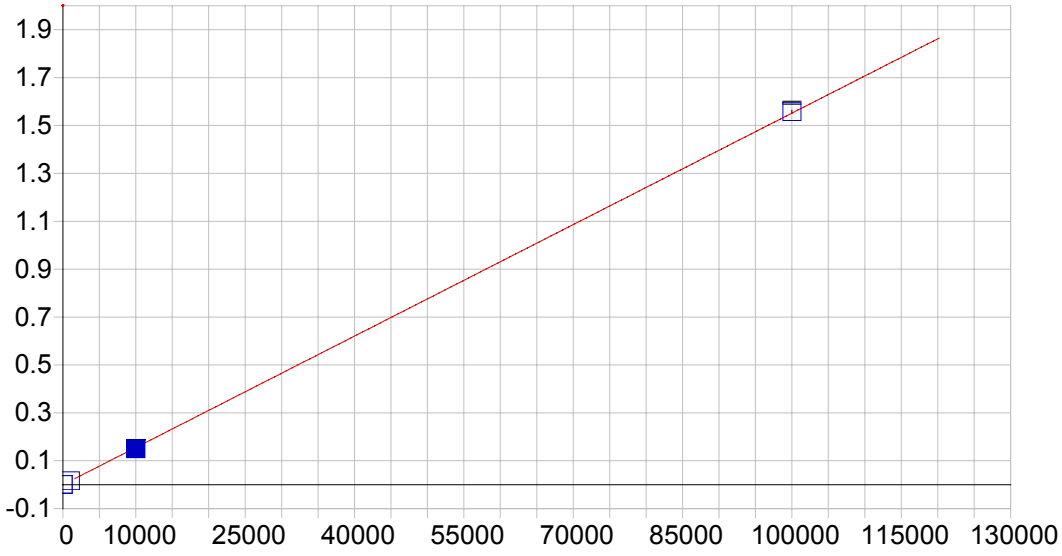


Pb 220.353 {453}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Var

A0 (Offset):	0.000071	Re-Slope:	1.000000
A1 (Gain):	0.000022	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999755	Status:	OK.
Std Error of Est:	0.000165		
Predicted MDL:	2.829850		
Predicted MQL:	9.432834		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-2.2495	-2.25	.000	.00002	.000	1
CalStd5=10	10.000	7.9549	-2.05	-20.5	.00025	.000	1
CalStd8=100	100.00	99.045	-.955	-.955	.00227	.000	1
CalStd4=5	5.0000	5.6531	.653	13.1	.00020	.000	1
CalStd9=100	1000.0	1010.2	10.2	1.02	.02252	.000	1
CalStd10=10	10000.	9583.1	-417.	-4.17	.21303	.001	1

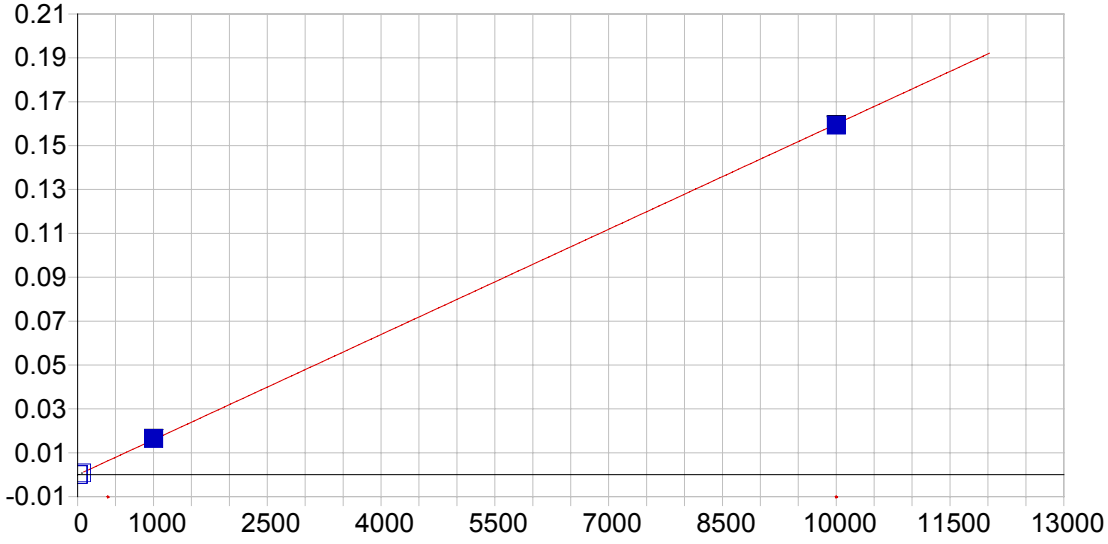


Pb 220.353 {153}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	-0.000004	Re-Slope:	1.000000
A1 (Gain):	0.000016	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999926	Status:	OK.
Std Error of Est:	0.000026		
Predicted MDL:	5.198537		
Predicted MQL:	17.328456		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00305	-.003	.000	.00000	.000	1
CalStd9=100	1000.0	1008.9	8.91	.891	.01565	.000	1
CalStd10=10	10000.	9615.7	-384.	-3.84	.14920	.000	1
CalStd8=100	100.00	105.63	5.63	5.63	.00164	.000	1
CalStd11-100	100000.	100370.	370.	.370	1.5574	.006	1

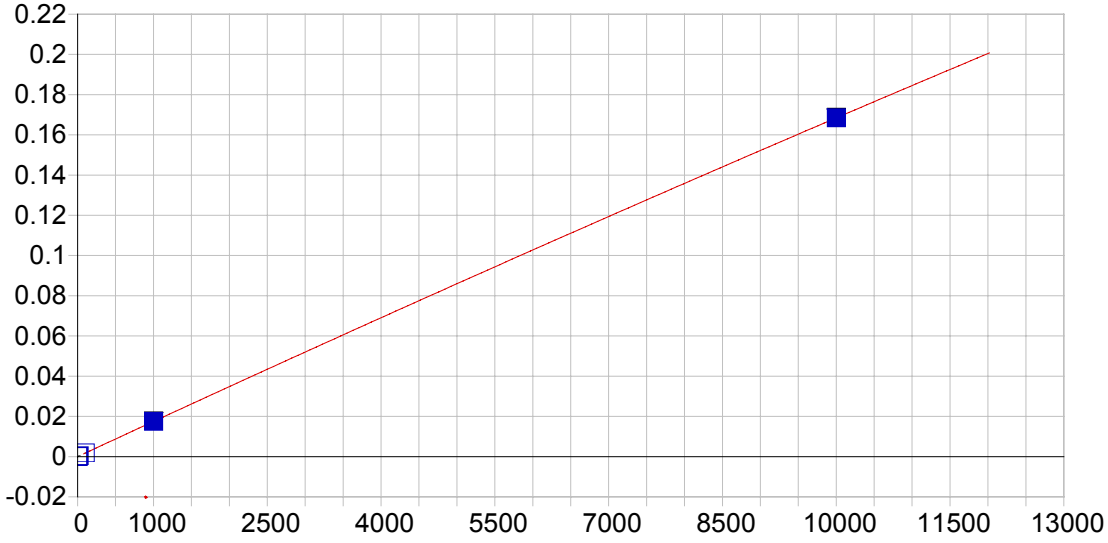


Sb 206.833 {463}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000062	Re-Slope:	1.000000
A1 (Gain):	0.000016	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999941	Status:	OK.
Std Error of Est:	0.000002		
Predicted MDL:	2.362821		
Predicted MQL:	7.876069		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00096	-.001	.000	-.00006	.000	1
CalStd9=100	1000.0	1033.5	33.5	3.35	.01646	.000	1
CalStd5=10	10.000	10.373	.373	3.73	.00010	.000	1
CalStd7=50	50.000	51.435	1.43	2.87	.00076	.000	1
CalStd10=10	10000.	9964.7	-35.3	-.353	.15928	.000	1

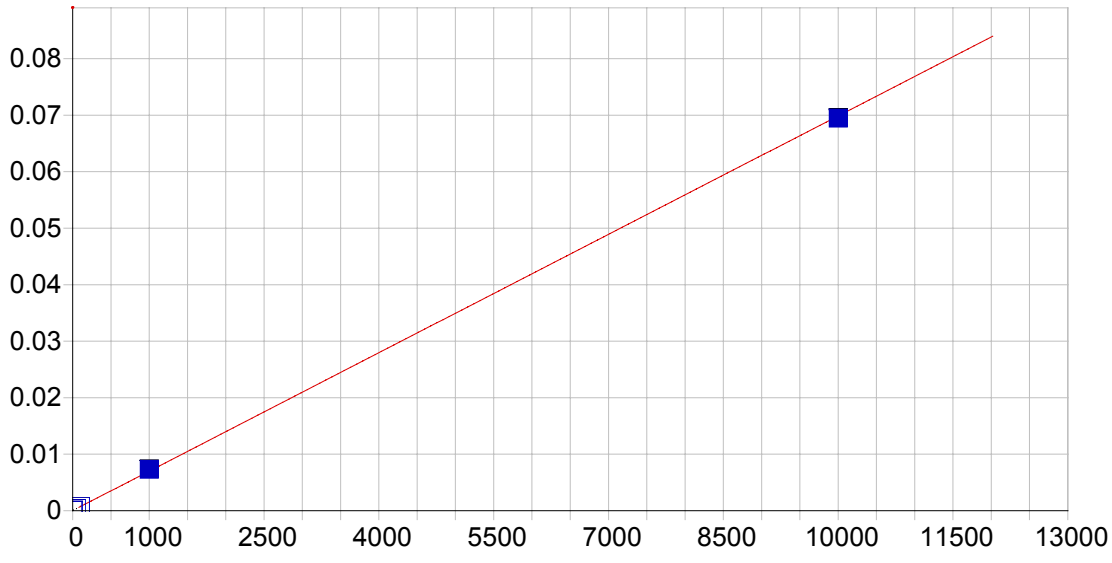


Sb 217.581 {455}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Curvilinear Weighting: None

A0 (Offset):	0.000008	Re-Slope:	1.000000
A1 (Gain):	0.000018	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	1.000000	Status:	OK.
Std Error of Est:	0.000016		
Predicted MDL:	2.472458		
Predicted MQL:	8.241526		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.31601	-.316	.000	.00000	.000	1
CalStd9=100	1000.0	999.88	-.123	-.012	.01747	.000	1
CalStd6=20	20.000	20.913	.913	4.56	.00037	.000	1
CalStd5=10	10.000	9.3560	-.644	-6.44	.00017	.000	1
CalStd8=100	100.00	101.03	1.03	1.03	.00178	.000	1
CalStd4=5	5.0000	4.1385	-.862	-17.2	.00008	.000	1
CalStd10=10	10000.	10000.	.001	.000	.16842	.000	1

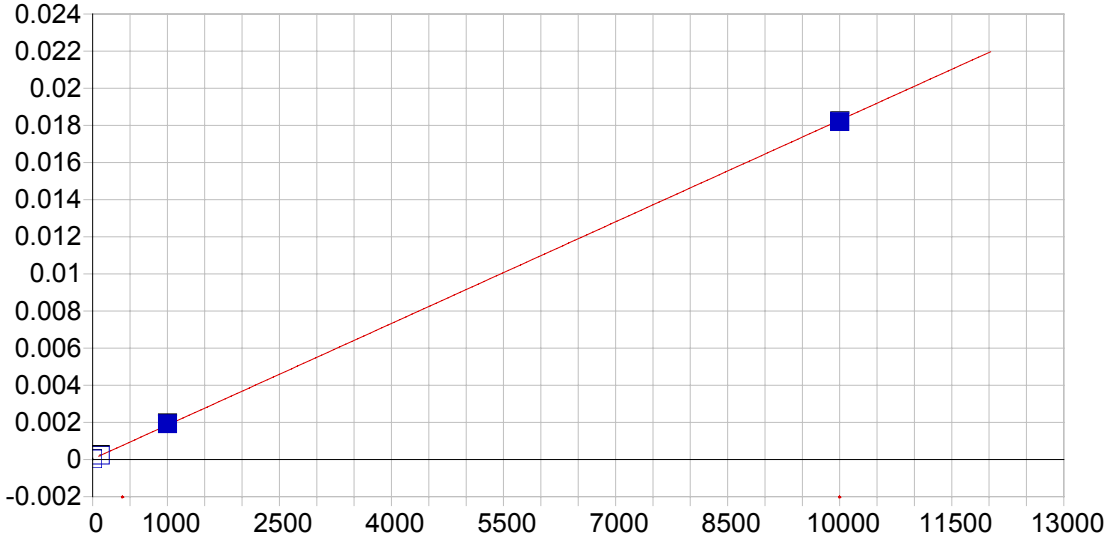


Se 196.090 {472}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000018	Re-Slope:	1.000000
A1 (Gain):	0.000007	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999836	Status:	OK.
Std Error of Est:	0.000002		
Predicted MDL:	4.262138		
Predicted MQL:	14.207127		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00420	-.004	.000	.00002	.000	1
CalStd7=50	50.000	52.673	2.67	5.35	.00039	.000	1
CalStd9=100	1000.0	1043.7	43.7	4.37	.00731	.000	1
CalStd5=10	10.000	12.468	2.47	24.7	.00010	.000	1
CalStd8=100	100.00	108.19	8.19	8.19	.00077	.000	1
CalStd10=10	10000.	9943.0	-57.0	-.570	.06945	.000	1

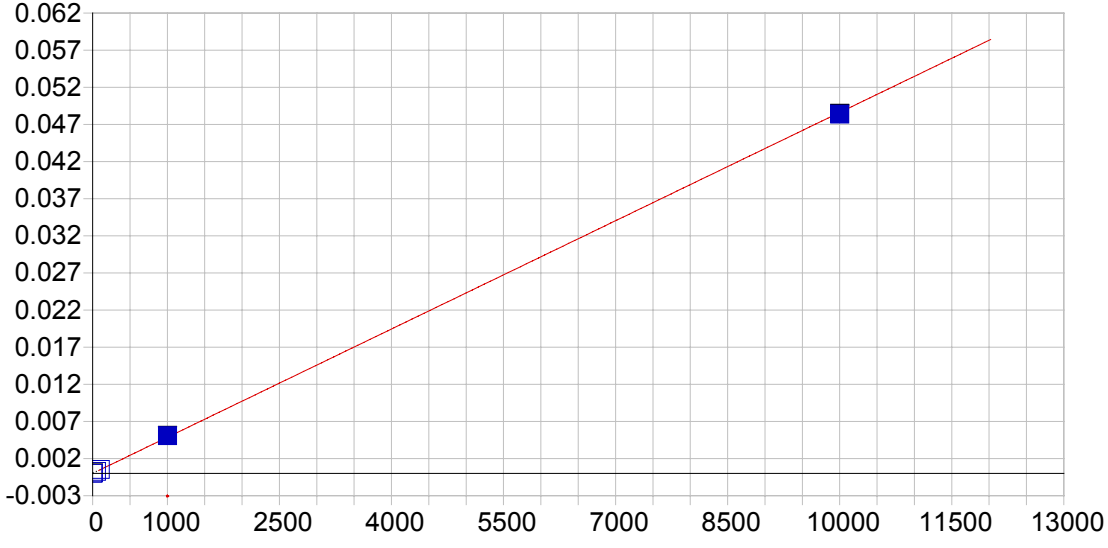


Se 206.279 {463}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000029	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999868	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	22.327320		
Predicted MQL:	74.424400		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.01481	-.015	.000	.00003	.000	1
CalStd9=100	1000.0	1036.9	36.9	3.69	.00192	.000	1
CalStd10=10	10000.	9951.5	-48.5	-.485	.01822	.000	1
CalStd8=100	100.00	111.60	11.6	11.6	.00023	.000	1

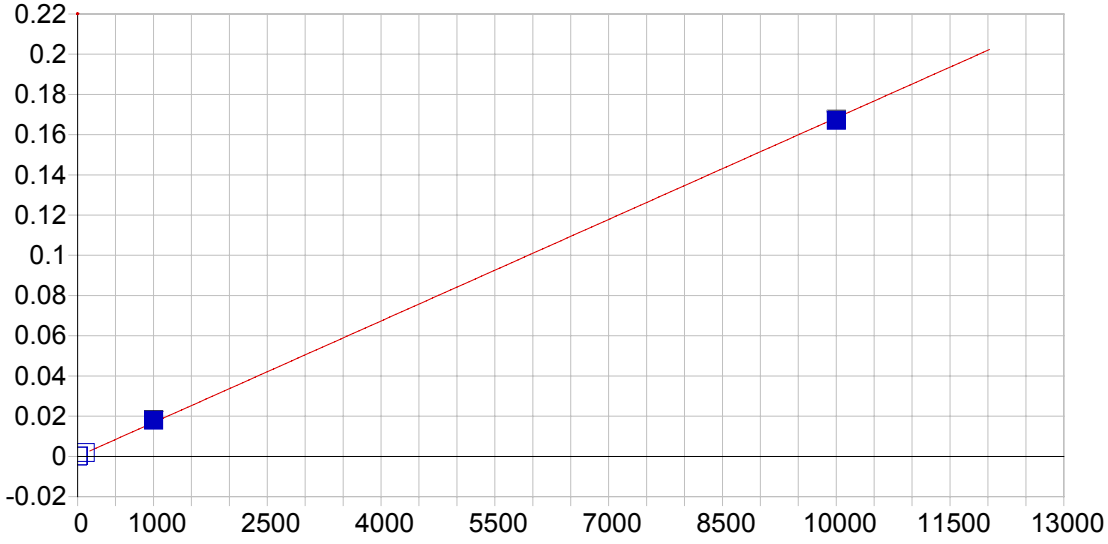


Se 196.090 {471}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000005	Re-Slope:	1.000000
A1 (Gain):	0.000005	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999896	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	6.051631		
Predicted MQL:	20.172104		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00061	-.001	.000	.00001	.000	1
CalStd7=50	50.000	52.303	2.30	4.61	.00026	.000	1
CalStd9=100	1000.0	1042.5	42.5	4.25	.00507	.000	1
CalStd5=10	10.000	9.4041	-.596	-5.96	.00005	.000	1
CalStd8=100	100.00	103.72	3.72	3.72	.00051	.000	1
CalStd10=10	10000.	9952.1	-47.9	-.479	.04837	.000	1

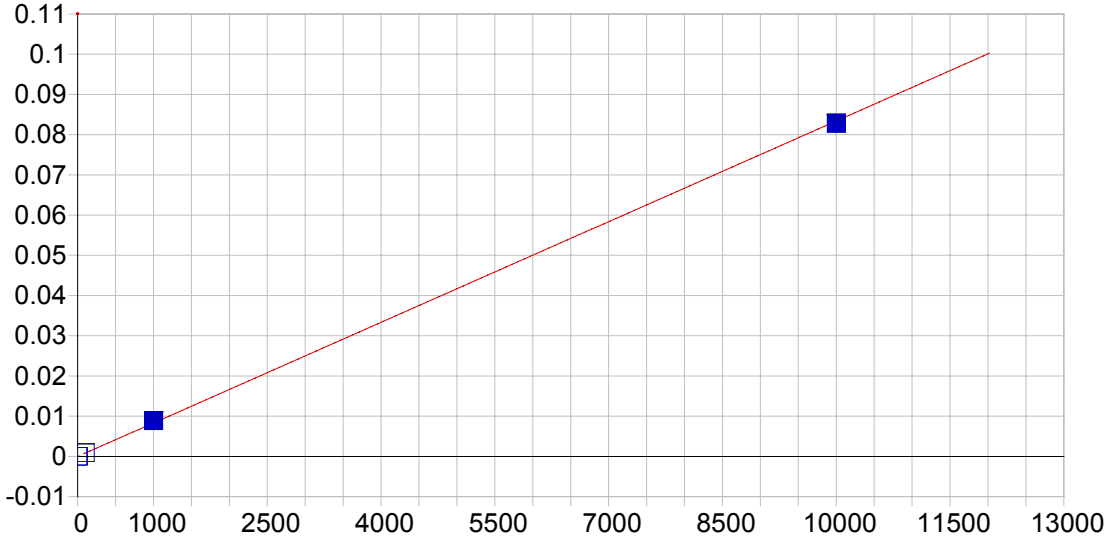


Tl 190.856 {476}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000020	Re-Slope:	1.000000
A1 (Gain):	0.000017	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999758	Status:	OK.
Std Error of Est:	0.000005		
Predicted MDL:	2.224213		
Predicted MQL:	7.414043		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00175	-.002	.000	.00002	.000	1
CalStd9=100	1000.0	1065.0	65.0	6.50	.01796	.000	1
CalStd8=100	100.00	107.75	7.75	7.75	.00183	.000	1
CalStd5=10	10.000	10.396	.396	3.96	.00019	.000	1
CalStd10=10	10000.	9926.8	-73.2	-.732	.16726	.000	1

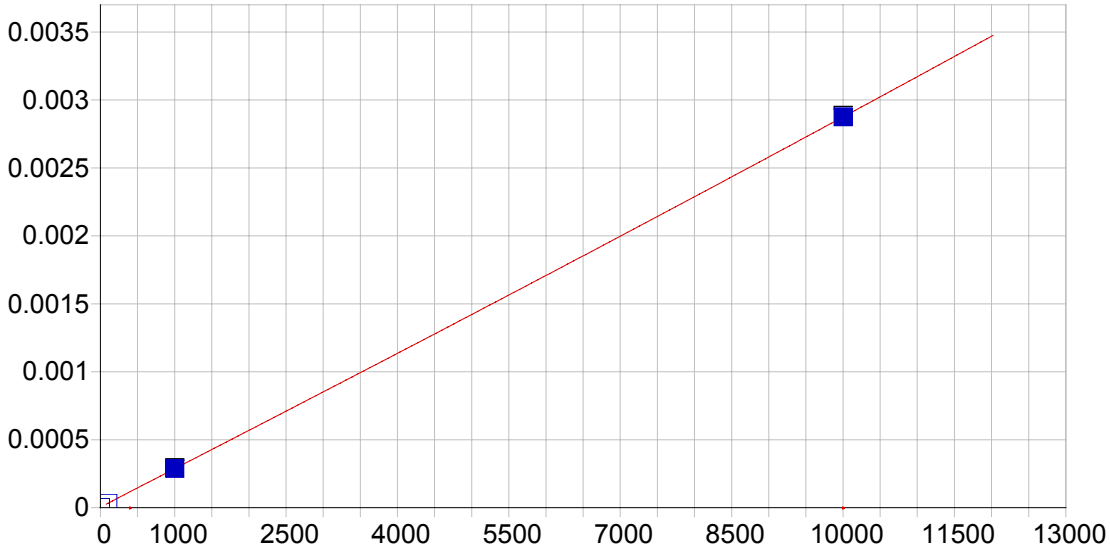


Tl 190.856 {477}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	-0.000031	Re-Slope:	1.000000
A1 (Gain):	0.000008	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999736	Status:	OK.
Std Error of Est:	0.000003		
Predicted MDL:	3.506404		
Predicted MQL:	11.688015		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00224	-.002	.000	-.00003	.000	1
CalStd9=100	1000.0	1066.0	66.0	6.60	.00886	.000	1
CalStd8=100	100.00	109.37	9.37	9.37	.00088	.000	1
CalStd5=10	10.000	10.719	.719	7.19	.00006	.000	1
CalStd10=10	10000.	9924.0	-76.0	-.760	.08274	.000	1



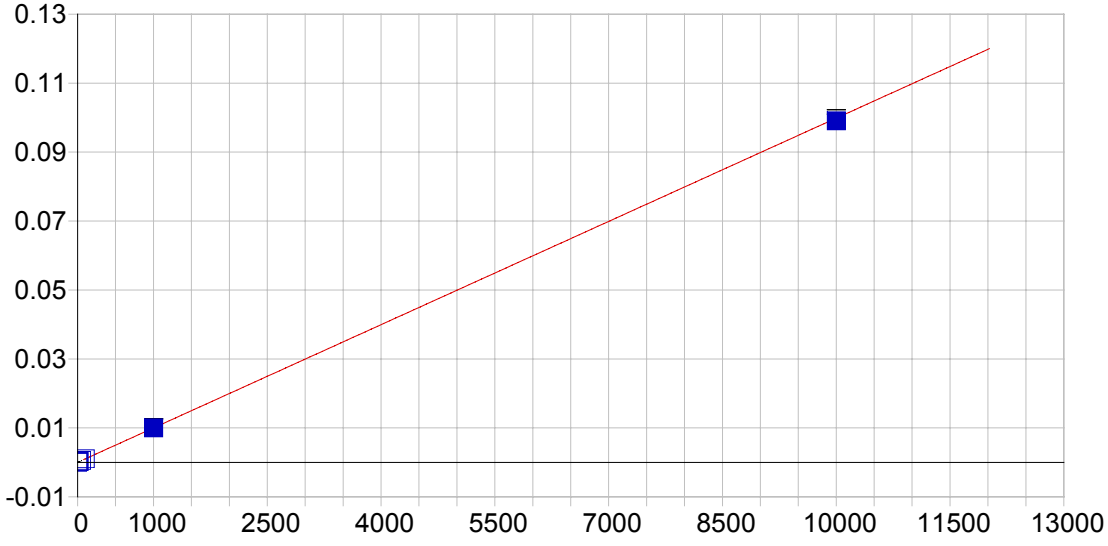
V 290.882 {116}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Full Fit	Weighting:	1/Conc

A0 (Offset):	0.000003	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	0.990000		
Correlation:	1.000000	Status:	Warning
Std Error of Est:	0.000000		
Predicted MDL:	3.695863		
Predicted MQL:	12.319545		

Positive Curvature

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00060	.001	.000	.00000	.000	1
CalStd9=100	1000.0	1000.9	.876	.088	.00029	.000	1
CalStd10=10	10000.	9999.9	-.079	-.001	.00288	.000	1
CalStd8=100	100.00	99.236	-.764	-.764	.00003	.000	1

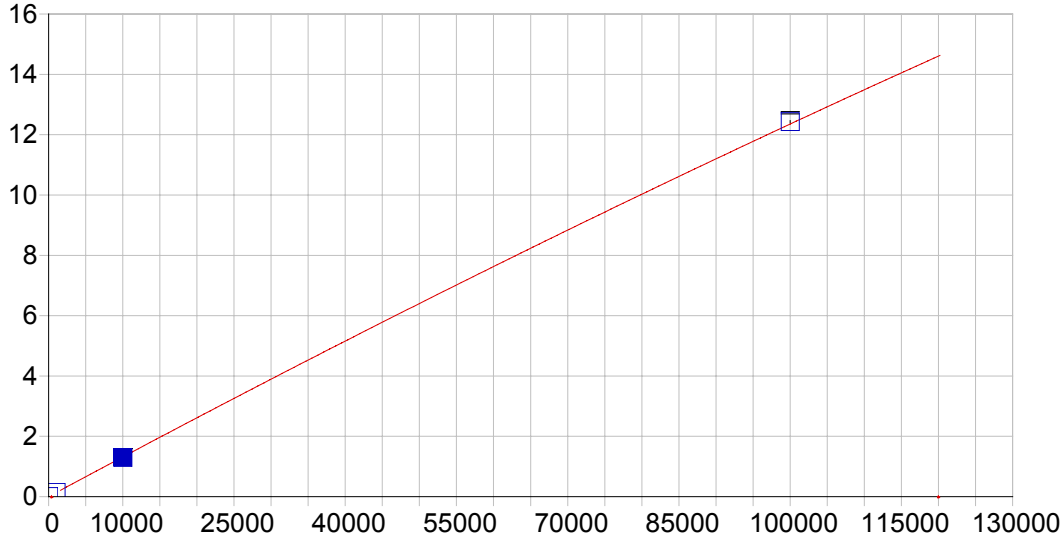


V 292.402 {115}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Var

A0 (Offset):	0.000003	Re-Slope:	1.000000
A1 (Gain):	0.000010	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999969	Status:	OK.
Std Error of Est:	0.000006		
Predicted MDL:	0.487122		
Predicted MQL:	1.623740		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.06613	-.066	.000	.00000	.000	1
CalStd7=50	50.000	51.793	1.79	3.59	.00052	.000	1
CalStd9=100	1000.0	999.24	-.763	-.076	.00998	.000	1
CalStd6=20	20.000	19.415	-.585	-2.93	.00020	.000	1
CalStd5=10	10.000	9.9335	-.067	-.665	.00010	.000	1
CalStd8=100	100.00	100.71	.714	.714	.00101	.000	1
CalStd10=10	10000.	9918.7	-81.3	-.813	.09902	.001	1

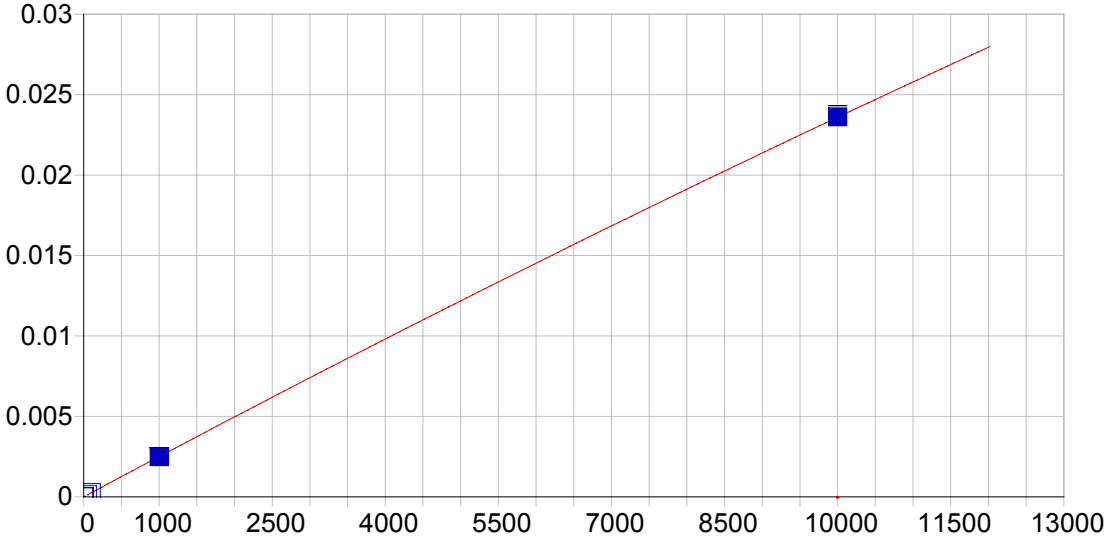


Zn 206.200 {463}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Curvilinear Weighting: 1/Var

A0 (Offset):	0.000057	Re-Slope:	1.000000
A1 (Gain):	0.000133	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999756	Status:	OK.
Std Error of Est:	0.000857		
Predicted MDL:	0.311687		
Predicted MQL:	1.038956		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CalStd10=10	10000.	9810.3	-190.	-1.90	1.2916	.002	1
Blank	.00000	-.18144	-.181	.000	.00003	.000	1
CalStd9=100	1000.0	1030.5	30.5	3.05	.13653	.000	1
CalStd11-100	100000.	100660.	658.	.658	12.428	.040	1

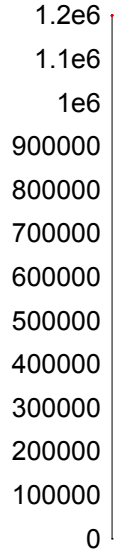


Zn 213.856 {458}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Curvilinear Weighting: 1/Var

A0 (Offset):	0.000002	Re-Slope:	1.000000
A1 (Gain):	0.000003	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999929	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	0.199387		
Predicted MQL:	0.664623		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.38766	-.388	.000	.00000	.000	1
CalStd8=100	100.00	100.40	.401	.401	.00025	.000	1
CalStd7=50	50.000	50.059	.059	.118	.00013	.000	1
CalStd5=10	10.000	9.4762	-.524	-5.24	.00003	.000	1
CalStd9=100	1000.0	994.82	-5.18	-.518	.00249	.000	1
CalStd4=5	5.0000	5.1432	.143	2.86	.00001	.000	1
CalStd10=10	10000.	10006.	5.81	.058	.02361	.000	1

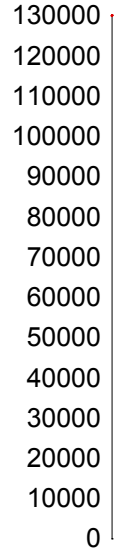


Y 324.228 {104}*

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.000000	Status:	Warning Zero Gain
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	1137900.	4710.	1

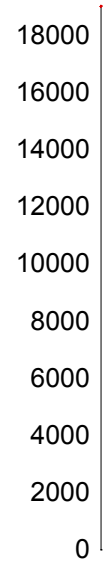


Y 371.030 { 91}*

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.000000	Status:	Warning Zero Gain
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	120400.	658.	1

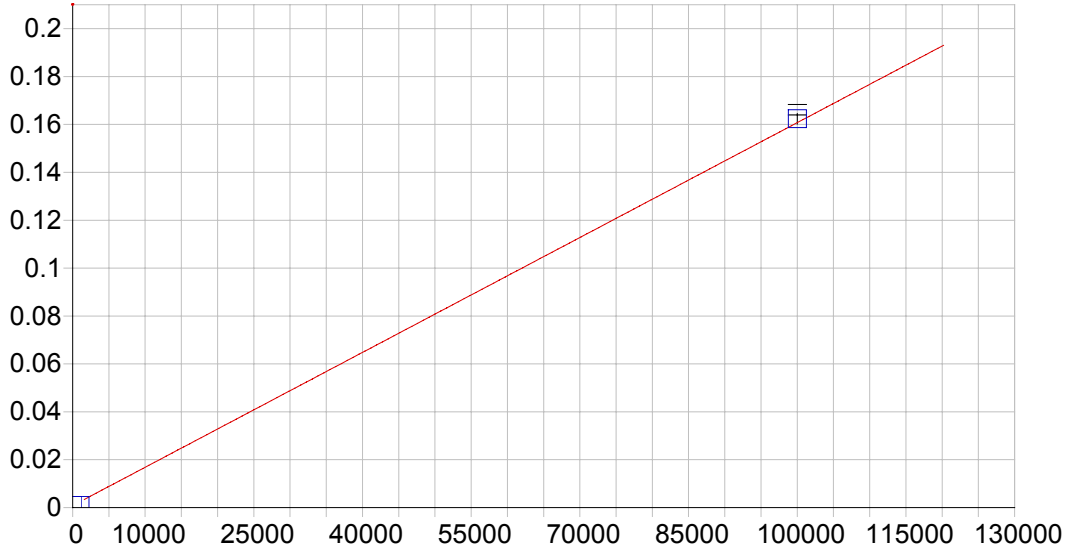


Y 224.306 {451}*

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.000000	Status:	Warning Zero Gain
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	17394.	21.0	1

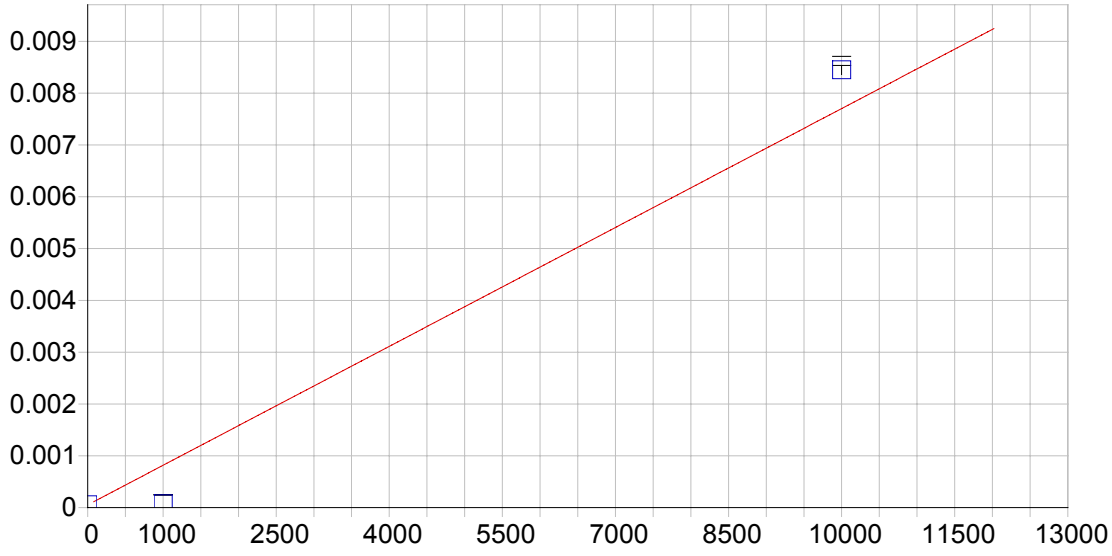


Na 588.995 { 57}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000836	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.995035	Status:	OK.
Std Error of Est:	0.000088		
Predicted MDL:	4.622753		
Predicted MQL:	15.409175		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.98977	.990	.000	.00084	.000	1
CalStd9=100	1000.0	.23551	-1000.	-100.0	.00084	.000	1
CalStd12-100	100000.	101000.	1000.	1.000	.16236	.002	1

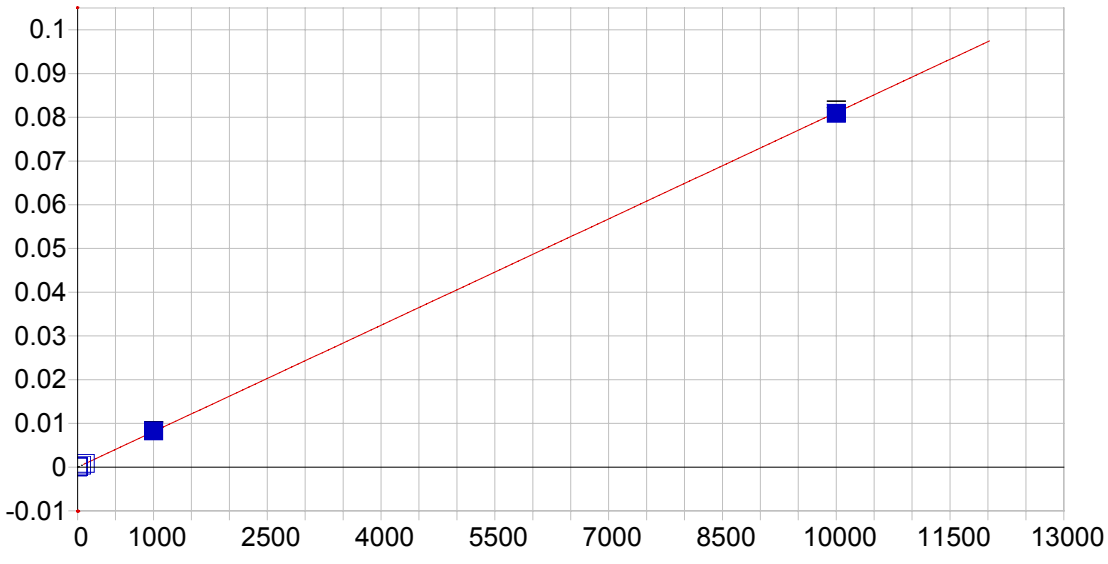


Si 251.611 {134}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000052	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.955613	Status:	OK.
Std Error of Est:	0.000043		
Predicted MDL:	9.490757		
Predicted MQL:	31.635856		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.87699	.877	.000	.00005	.000	1
CalStd9=100	1000.0	25.573	-974.	-97.4	.00007	.000	1
CalStd12-100	10000.	10974.	974.	9.74	.00845	.000	1

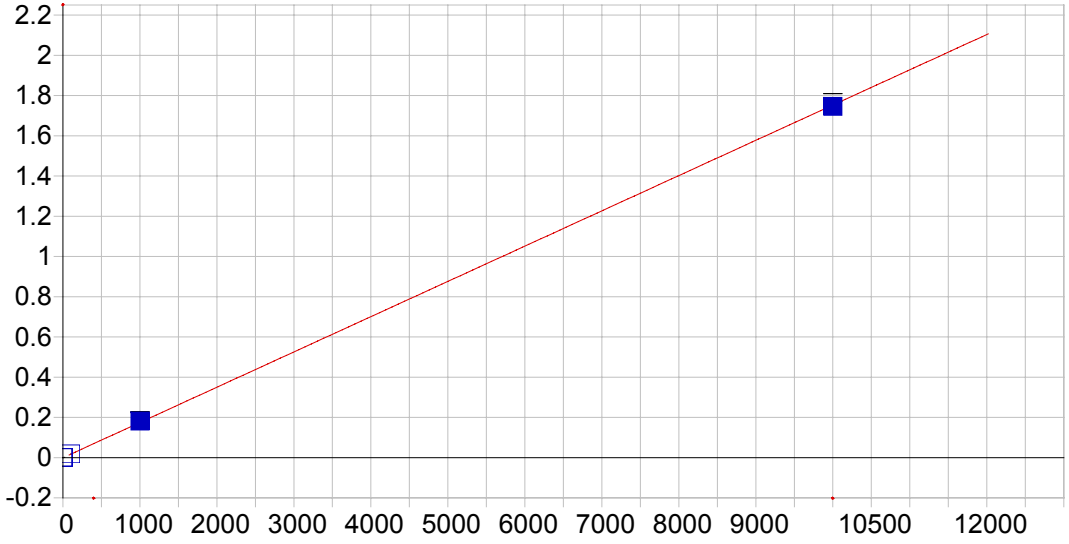


Ti 334.941 {101}

Date of Fit: 05/26/2016 09:09:52 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	-0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000008	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999957	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	1.411696		
Predicted MQL:	4.705653		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00179	-.002	.000	.00000	.000	1
CalStd5=10	10.000	11.385	1.39	13.9	.00009	.000	1
CalStd8=100	100.00	103.60	3.60	3.60	.00084	.000	1
CalStd9=100	1000.0	1019.1	19.1	1.91	.00827	.000	1
CalStd10=10	10000.	9972.8	-27.2	-.272	.08088	.001	1
CalStd7=50	50.000	52.452	2.45	4.90	.00043	.000	1
CalStd4=5	5.0000	5.5861	.586	11.7	.00005	.000	1

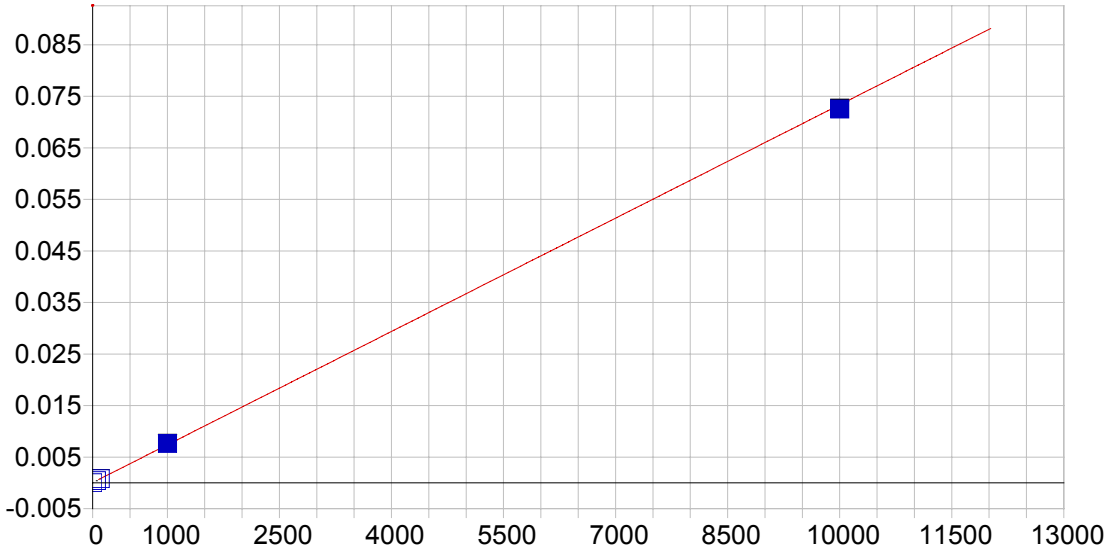


Sr 407.771 { 83}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000714	Re-Slope:	1.000000
A1 (Gain):	0.000175	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999919	Status:	OK.
Std Error of Est:	0.000009		
Predicted MDL:	0.126349		
Predicted MQL:	0.421164		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00031	.000	.000	-.00071	.000	1
CalStd3=1	1.0000	1.0766	.077	7.66	-.00053	.000	1
CalStd4=5	5.0000	5.5826	.583	11.7	.00026	.000	1
CalStd5=10	10.000	10.272	.272	2.72	.00109	.000	1
CalStd8=100	100.00	106.14	6.14	6.14	.01790	.000	1
CalStd9=100	1000.0	1034.1	34.1	3.41	.18062	.002	1
CalStd10=10	10000.	9958.8	-41.2	-.412	1.7455	.019	1

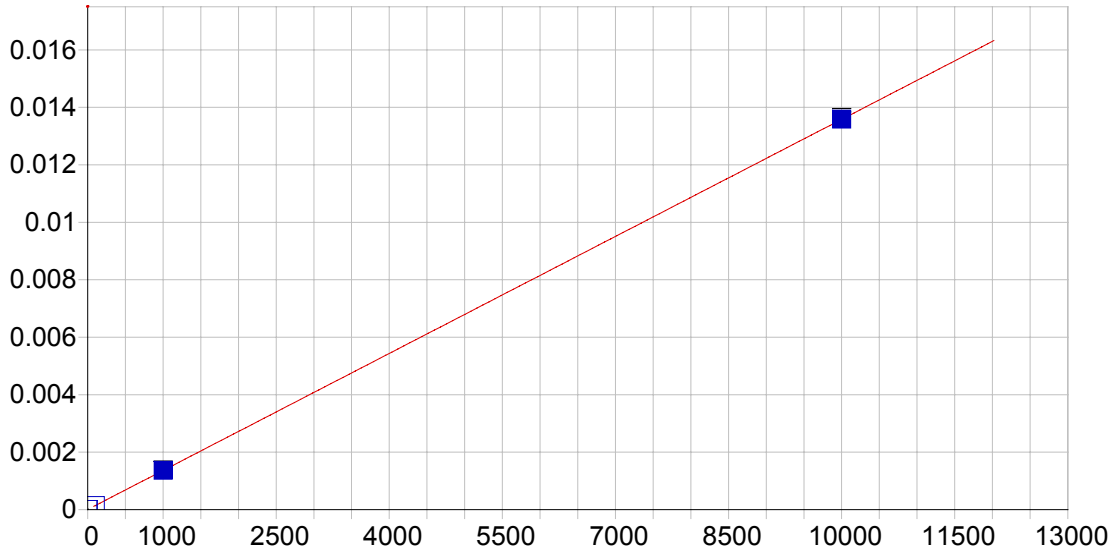


Sn 189.989 {478}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000051	Re-Slope:	1.000000
A1 (Gain):	0.000007	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999795	Status:	OK.
Std Error of Est:	0.000085		
Predicted MDL:	2.835177		
Predicted MQL:	9.450589		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-5.4611	-5.46	.000	.00001	.000	1
CalStd10=10	10000.	9884.1	-116.	-1.16	.07250	.000	1
CalStd9=100	1000.0	1030.7	30.7	3.07	.00761	.000	1
CalStd8=100	100.00	100.73	.728	.728	.00079	.000	1
CalStd7=50	50.000	49.179	-.821	-1.64	.00041	.000	1

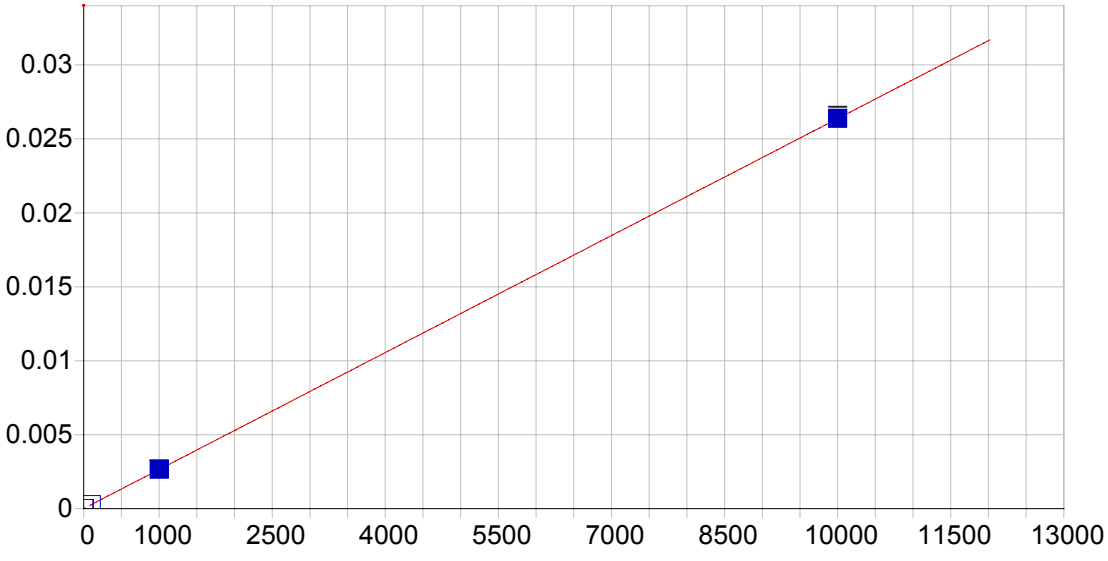


B 249.678 {135}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000004	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999958	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	1.883848		
Predicted MQL:	6.279492		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00316	.003	.000	.00000	.000	1
CalStd8=100	100.00	97.848	-2.15	-2.15	.00014	.000	1
CalStd5=10	10.000	7.0332	-2.97	-29.7	.00001	.000	1
CalStd9=100	1000.0	1001.6	1.60	.160	.00136	.000	1
CalStd10=10	10000.	10004.	3.52	.035	.01358	.000	1

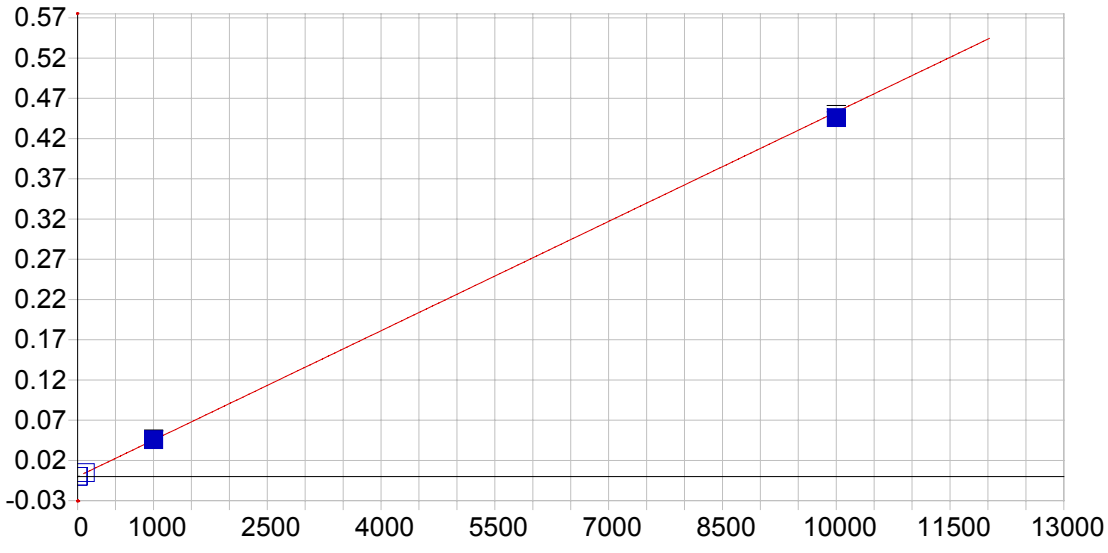


B 249.773 {135}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000007	Re-Slope:	1.000000
A1 (Gain):	0.000003	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999989	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.875685		
Predicted MQL:	2.918949		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00157	.002	.000	.00001	.000	1
CalStd8=100	100.00	99.886	-.114	-.114	.00027	.000	1
CalStd5=10	10.000	8.4264	-1.57	-15.7	.00003	.000	1
CalStd9=100	1000.0	1001.8	1.80	.180	.00266	.000	1
CalStd10=10	10000.	9999.9	-.119	-.001	.02646	.000	1

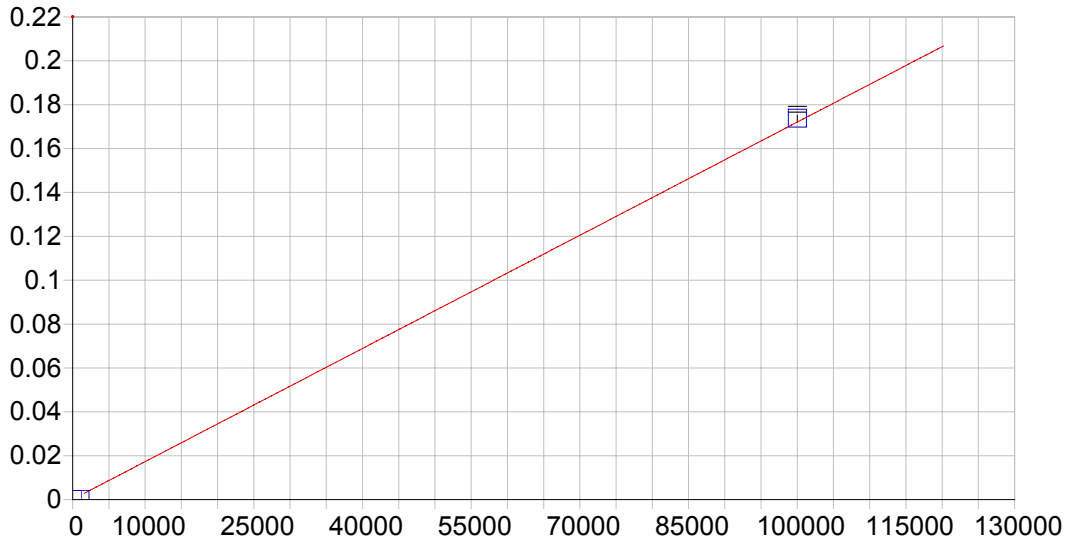


Li 670.784 { 50}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	-0.000068	Re-Slope:	1.000000
A1 (Gain):	0.000045	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999799	Status:	OK.
Std Error of Est:	0.000068		
Predicted MDL:	1.363829		
Predicted MQL:	4.546097		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.06379	.064	.000	-.00007	.000	1
CalStd5=10	10.000	9.1741	-.826	-8.26	.00035	.000	1
CalStd8=100	100.00	103.12	3.12	3.12	.00460	.000	1
CalStd9=100	1000.0	1009.5	9.48	.948	.04567	.001	1
CalStd10=10	10000.	9842.0	-158.	-1.58	.44586	.004	1

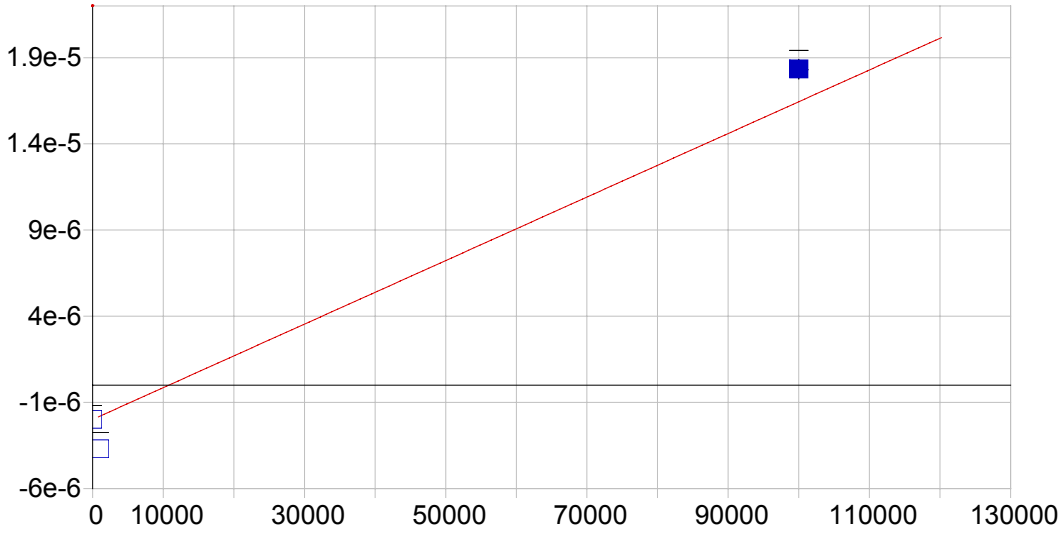


K 766.490 { 44}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000107	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.994923	Status:	OK.
Std Error of Est:	0.000096		
Predicted MDL:	33.739747		
Predicted MQL:	112.465822		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	1.0009	1.00	.000	.00011	.000	1
CalStd9=100	1000.0	-10.970	-1010.	-101.	.00009	.000	1
CalStd12-100	100000.	101010.	1010.	1.01	.17381	.001	1

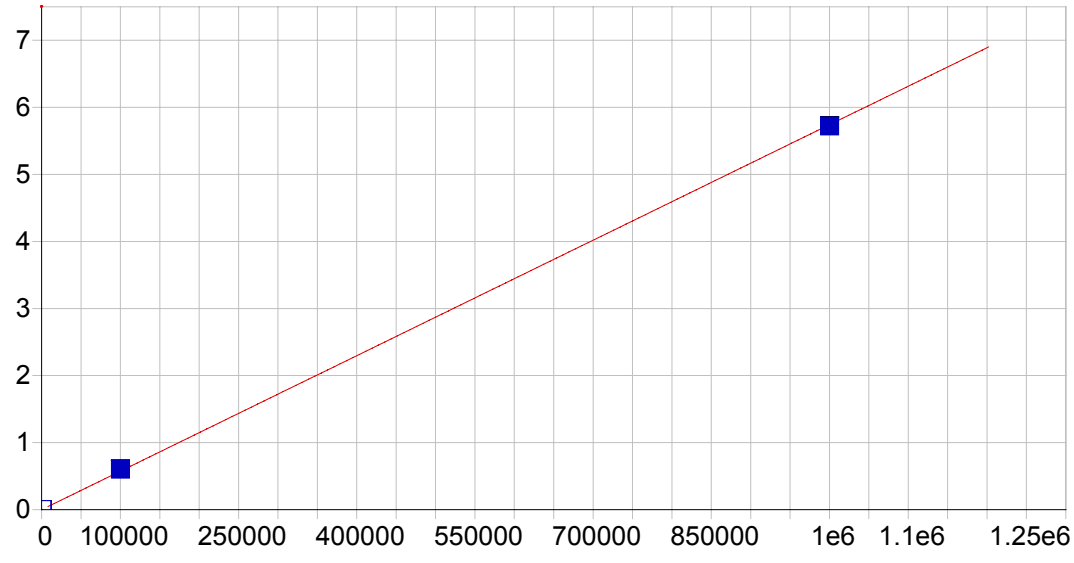


P 213.618 {457}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000002	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.697418	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	2859.177003		
Predicted MQL:	9530.590010		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	10.168	10.2	.000	.00000	.000	1
CalStd9=100	1000.0	-9270.4	-10300.	-1030.	.00000	.000	1
CalStd12-100	100000.	110270.	10300.	10.3	.00002	.000	1

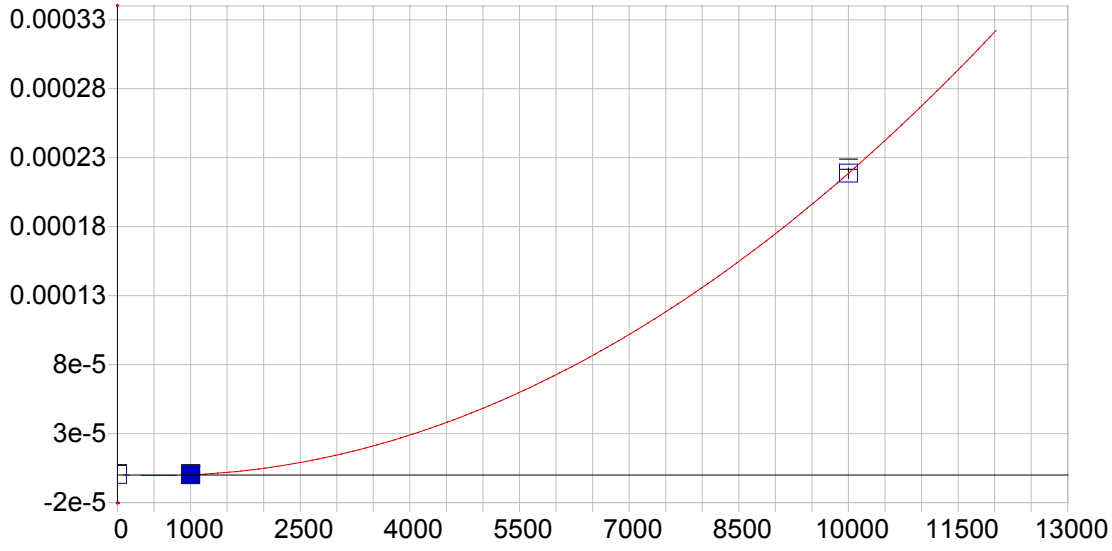


S 182.034 {485}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000035	Re-Slope:	1.000000
A1 (Gain):	0.000006	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999433	Status:	OK.
Std Error of Est:	0.000287		
Predicted MDL:	4.011975		
Predicted MQL:	13.373251		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.95363	.954	.000	.00004	.000	1
CalStd12-100	100000.	104860.	4860.	4.86	.60207	.002	1
CalStd14-100	1000000.	996140.	-3860.	-.386	5.7190	.008	1
CalStd9=100	1000.0	1.6043	-998.	-99.8	.00004	.000	1



W 239.709 {140}

Date of Fit:	05/26/2016 09:09:52	Type of Fit:	Curvilinear	Weighting:	1/Var

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	-0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	1.000000	Status:	Warning Positive Curvature
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.00000	.000	1
CalStd9=100	1000.0	70.459	-930.	-93.0	.00000	.000	1
CalStd12-100	10000.	-8929.5	-18900.	-189.	.00022	.000	1

Sample Name: Blank Acquired: 05/25/2016 09:48:23 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	Al1670	As1937	Ba2335	Ba4934	Be3130	Ca3158	Ca3933	Cd2265	Co2286	Co2388
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.000	-.041	.286	.001	.000	.000	.000	.000	.000	.000
Stddev	.000	.00	.000	.512	.213	.000	.00	.000	.000	.00	.00	.000
%RSD	216.	60.8	36.5	1260.	74.6	.685	4.87	17.0	14.4	345.	16.8	190.

Elem	Cr2055	Cr2677	Cu2247	Cu3247	Fe2395	Fe2599	Mg2790	Mg2802	Mn2576	Mn2593	Mo2020	Mo2045
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Stddev	.00	.00	.00	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	123.	161.	16.6	.307	43.8	103.	113.	1.59	88.0	25.2	53.5	37.3

Elem	Ni2216	Ni2316	Pb2169	Pb2203	Sb2068	Sb2175	Se2062	Se1960	Tl1908	V_2924	Zn2062	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Stddev	.00	.00	.00	.000	.00	.000	.000	.000	.000	.000	.000	.000
%RSD	60.3	32.5	150.	538.	38.2	693.	120.	674.	116.	136.	72.3	72.6

Elem	Sn1899
Units	Cts/S
Avg	.000
Stddev	.000
%RSD	122.

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1137900.	120400.	17394.
Stddev	4710.	658.	21.
%RSD	.41392	.54631	.12066

Sample Name: CalStd1=0.25 Acquired: 05/25/2016 09:54:51 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Be3130
Units	Cts/S
Avg	.000
Stddev	.00
%RSD	8.32

Int. Std.	Y_3242
Units	Cts/S
Avg	1140300.
Stddev	4555.
%RSD	.39946

Sample Name: CalStd2=0.5 Acquired: 05/25/2016 10:01:19 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Be3130	Cd2265
Units	Cts/S	Cts/S
Avg	.000	.000
Stddev	.00	.000
%RSD	94.0	30.9

Int. Std.	Y_3242	Y_2243
Units	Cts/S	Cts/S
Avg	1144500.	17376.
Stddev	3430.	39.
%RSD	.29968	.22162

Sample Name: CalStd3=1 Acquired: 05/25/2016 10:08:11 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Ba2335	Be3130	Cd2265	Co2286	Cr2055	Cu2247	Ni2316
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	2.12	.000	.000	.000	.000	.000	.000
Stddev	.000	.67	.000	.000	.000	.000	.000	.00
%RSD	46.5	31.6	6.72	5.79	31.3	5.55	55.8	146.

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1148500.	122340.	17409.
Stddev	1623.	452.	20.
%RSD	.14128	.36986	.11396

Sample Name: CalStd4=5 Acquired: 05/25/2016 10:14:47 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al1670	Ba2335	Be3130	Cd2265	Co2286	Cr2055	Cr2677	Cu2247	Mn2576	Mo2020	Mo2045	Ni2316
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	9.45	.000	.001	.001	.001	.000	.000	.000	.000	.000	.000
Stddev	.000	.19	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	18.4	2.01	.642	.830	5.21	.166	10.9	4.58	.730	4.62	12.3	9.76

Elem	Pb2203	Sb2175	Zn2138
Units	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.000
Stddev	.000	.000	.000
%RSD	19.7	25.2	1.36

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1140400.	122790.	17366.
Stddev	4817.	190.	16.
%RSD	.42235	.15467	.08942

Sample Name: CalStd5=10 Acquired: 05/25/2016 10:21:20 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Cd2265	Co2286	Cr2055	Cr2677	Cu2247	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	1.64	17.1	.001	.003	.001	.001	.000	.001	.000	.001
Stddev	.000	.000	.58	.4	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	5.46	3.56	35.3	2.25	.841	1.51	4.60	1.12	2.28	9.06	.286	4.64

Elem	Mo2045	Ni2316	Pb2169	Pb2203	Sb2068	Sb2175	Se1960	Tl1908	V_2924	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Stddev	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	2.63	4.06	23.9	35.9	11.9	11.2	52.2	12.7	1.86	1.76

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1142600.	123050.	17387.
Stddev	5851.	689.	37.
%RSD	.51208	.56017	.21012

Sample Name: CalStd6=20 Acquired: 05/25/2016 10:27:52 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ba2335	Cu2247	Mn2576	Mo2020	Mo2045	Sb2175	V_2924
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**32.8**	**.001**	**.000**	**.001**	**.000**	**.000**	**.000**
Stddev	.2	.000	.000	.000	.000	.000	.000
%RSD	.744	3.32	.365	1.44	3.18	2.03	2.39

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1140700.**	**122270.**	**17379.**
Stddev	5519.	1135.	29.
%RSD	.48386	.92855	.16446

Sample Name: CalStd7=50 Acquired: 05/25/2016 10:34:21 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al1670	As1937	Ba2335	Ca3933	Cd2265	Co2286	Cr2055	Cr2677	Cu2247	Mg2802	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.001	8.08	87.1	.002	.013	.008	.007	.000	.004	.003	.001	.003
Stddev	.000	.36	.5	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	5.15	4.46	.621	1.03	.430	.303	.418	2.19	1.61	.739	.837	.892

Elem	Mo2045	Ni2316	Sb2068	Se1960	V_2924	Zn2138	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.001	.000	.001	.000	.000
Stddev	.000	.000	.000	.000	.000	.000	.000
%RSD	1.07	1.07	1.86	9.05	1.51	.783	1.75

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1152500.	122510.	17394.
Stddev	7776.	689.	56.
%RSD	.67469	.56267	.32138

Sample Name: CalStd8=100 Acquired: 05/25/2016 10:45:13 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	As1937	Ba2335	Ba4934	Be3130	Ca3933	Cd2265	Co2286	Co2388	Cr2055	Cr2677	Cu2247
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	15.9	170.	.002	.007	.003	.027	.016	.000	.015	.000	.008
Stddev	.000	.2	1.	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	.482	1.47	.560	.420	.414	.651	.240	.367	.559	.229	1.36	.430

Elem	Cu3247	Mg2802	Mn2576	Mo2020	Mo2045	Ni2216	Ni2316	Pb2169	Pb2203	Sb2175	Se2062	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.005	.002	.006	.000	.000	.000	.001	.002	.002	.000	.001
Stddev	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	1.13	.413	.395	.607	.843	.655	.833	7.11	.831	1.24	13.8	2.85

Elem	Tl1908	V_2924	Zn2138	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.002	.001	.000	.001
Stddev	.000	.000	.000	.000
%RSD	1.16	.565	.445	3.17

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1141700.	121800.	17358.
Stddev	3625.	536.	60.
%RSD	.31746	.44047	.34384

Sample Name: CalStd9=1000 Acquired: 05/25/2016 10:51:31 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	Al1670	As1937	Ba2335	Ba4934	Be3130	Ca3158	Ca3933	Cd2265	Co2286	Co2388	Cr2055
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.003	.010	157.	1670.	.011	.070	.000	.031	.260	.160	.002	.146
Stddev	.000	.000	1.	2.	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	.706	.480	.522	.118	1.16	.415	2.09	1.33	.087	.135	.351	.072

Elem	Cr2677	Cu2247	Cu3247	Fe2395	Fe2599	Mg2790	Mg2802	Mn2576	Mn2593	Mo2020	Mo2045	Ni2216
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.003	.078	.001	.000	.003	.000	.048	.016	.007	.060	.001	.002
Stddev	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	.610	.232	1.04	1.47	1.04	2.17	.364	.454	.800	.277	.667	.465

Elem	Ni2316	Pb2169	Pb2203	Sb2068	Sb2175	Se2062	Se1960	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.002	.011	.023	.016	.017	.002	.005	.018	.010	.137	.002	.008
Stddev	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	.437	.391	.261	.342	.541	1.61	.699	.513	.293	.213	.534	.325

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1142800.	122550.	17325.
Stddev	5040.	172.	27.
%RSD	.44098	.14061	.15432

Sample Name: CalStd10=10000 Acquired: 05/25/2016 10:57:20 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	As1937	Ba4934	Ca3158	Co2286	Co2388	Cr2055	Cr2677	Cu2247	Cu3247	Fe2395	Fe2599
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.029	1510.	.092	.004	1.53	.020	1.39	.034	.731	.004	.001	.028
Stddev	.000	2.	.000	.000	.00	.000	.00	.000	.001	.000	.000	.000
%RSD	.817	.112	.268	.934	.060	.509	.038	.569	.109	.379	.218	.946

Elem	Mg2790	Mg2802	Mn2576	Mn2593	Mo2045	Ni2216	Ni2316	Pb2169	Pb2203	Sb2068	Sb2175	Se2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.001	.446	.150	.064	.007	.020	.016	.101	.213	.159	.168	.018
Stddev	.000	.001	.001	.000	.000	.000	.000	.000	.001	.000	.000	.000
%RSD	.317	.304	.505	.327	.332	.344	.419	.172	.585	.165	.142	.190

Elem	Se1960	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.048	.167	.099	1.29	.024	.073
Stddev	.000	.000	.001	.00	.000	.000
%RSD	.216	.242	.636	.169	.594	.211

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1100600.	121550.	17108.
Stddev	5597.	307.	7.
%RSD	.50849	.25287	.04237

Sample Name: CalStd11-100k Acquired: 05/25/2016 11:03:30 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Cr2055	Cu3247	Mn2593	Pb2169	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**13.3**	**.037**	**.655**	**1.04**	**12.4**
Stddev	.0	.000	.006	.00	.0
%RSD	.179	.707	.860	.235	.320

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1135700.**	**122440.**	**16971.**
Stddev	2946.	310.	63.
%RSD	.25940	.25344	.37256

Sample Name: CalStd12-100000 Acquired: 05/25/2016 11:09:55 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	Ca3158	Fe2395	Fe2599	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.284	.042	.008	.274	.010
Stddev	.002	.000	.000	.002	.000
%RSD	.874	.775	1.55	.900	.728

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1087400.	120970.	16348.
Stddev	6096.	706.	24.
%RSD	.56061	.58350	.14946

Sample Name: CalStd13=500000 Acquired: 05/25/2016 11:16:32 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	Ca3158	Fe2395	Fe2599	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.50	.206	.041	1.33	.055
Stddev	.01	.001	.000	.01	.000
%RSD	.566	.521	.561	.550	.694

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1021200.	118040.	15194.
Stddev	3288.	683.	19.
%RSD	.32195	.57890	.12418

Sample Name: CalStd14-1000k Acquired: 05/25/2016 11:23:09 Type: Cal
Method: DOD Calibration Updated 060614(v1476) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	Ca3158	Fe2395	Fe2599	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2.96**	**.402**	**.079**	**2.50**	**.109**
Stddev	.06	.005	.001	.03	.001
%RSD	1.87	1.19	.800	1.12	.922

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**957000.**	**112960.**	**14210.**
Stddev	3609.	941.	10.
%RSD	.37714	.83274	.07153

Sample Name: icv Acquired: 05/25/2016 11:36:27 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2677	Cu2247	Fe2395	Mg2790
Avg	**51.1**	**12200.**	**2090.**	**2060.**	**49.6**	**10000.**	**49.3**	**537.**	**204.**	**253.**	**5050.**	**9900.**
Stddev	1.0	60.	9.	9.	.2	97.	.2	1.	3.	1.	51.	149.
%RSD	1.89	.489	.452	.440	.369	.968	.359	.223	1.57	.377	1.02	1.50
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Elem	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se2062	Tl1908	V_2924	Zn2138	Sn1899
Avg	**513.**	**503.**	**520.**	**516.**	**523.**	**2140.**	**2170.**	**514.**	**509.**	**518.**
Stddev	3.	.	3.	3.	4.	32.	5.	3.	3.	2.
%RSD	.583	.093	.589	.519	.762	1.49	.222	.614	.578	.324
Check ?	None	None	None	None	None	None	None	None	None	None
Value										
Range										

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1132000.**	**120920.**	**17182.**
Stddev	7005.	524.	16.
%RSD	.61881	.43357	.09476

Sample Name: ICVLL Acquired: 05/25/2016 11:42:48 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	Al1670	As1937	Ba2335	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599
Avg	**47.3**	**1340.**	**1320.**	**66.4**	**32.3**	**13.2**	**1570.**	**16.2**	**33.3**	**34.8**	**33.3**	**769.**
Stddev	.4	8.	9.	2.8	.2	.1	5.	.2	.4	.9	.3	15.
%RSD	.895	.614	.689	4.21	.620	.384	.342	1.13	1.14	2.54	.787	1.90
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Mg2790	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	**1630.**	**34.6**	**32.3**	**33.3**	**32.0**	**69.0**	**77.6**	**68.3**	**32.5**	**34.0**	**63.3**
Stddev	29.	.3	.1	.3	1.1	2.3	3.7	1.7	.6	.2	1.9
%RSD	1.78	.788	.324	1.01	3.30	3.41	4.80	2.41	1.95	.480	2.94
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value											
Range											

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1128600.**	**119660.**	**17124.**
Stddev	3724.	1085.	17.
%RSD	.32999	.90689	.09978

Sample Name: icb Acquired: 05/25/2016 11:55:35 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599	Mg2802
Avg	**1.16**	**.273**	**1.02**	**-.100**	**.008**	**1.68**	**-.156**	**-.118**	**-.119**	**.159**	**-13.5**	**2.15**
Stddev	.40	1.31	3.38	.233	.025	.13	.090	.190	.793	.811	1.4	.14
%RSD	34.8	482.	333.	233.	312.	7.63	57.9	161.	667.	509.	10.2	6.70
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Elem	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	**.058**	**-.035**	**.330**	**-2.36**	**-2.31**	**-4.76**	**-1.68**	**.044**	**-.233**	**-6.19**
Stddev	.099	.282	.314	3.38	3.26	1.68	1.63	.328	.032	1.17
%RSD	171.	813.	95.2	143.	141.	35.4	96.9	738.	13.7	18.9
Check ?	None	None	None	None	None	None	None	None	None	None
Value										
Range										

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1137600.**	**119540.**	**17178.**
Stddev	3053.	275.	21.
%RSD	.26839	.22964	.12285

Sample Name: MRL Acquired: 05/25/2016 12:02:03 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599	Mg2802
Avg	**16.1**	**425.**	**18.3**	**10.2**	**4.19**	**499.**	**5.18**	**10.4**	**10.6**	**13.2**	**329.**	**521.**
Stddev	.4	2.	2.6	.1	.02	6.	.12	.2	.5	.3	8.	2.
%RSD	2.76	.384	14.1	1.45	.512	1.16	2.37	1.71	4.28	2.03	2.31	.314
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Elem	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	**11.2**	**9.85**	**10.9**	**9.54**	**19.3**	**22.9**	**21.7**	**10.3**	**11.0**	**14.9**
Stddev	.1	.40	.5	2.88	1.7	5.5	.9	.2	.2	2.4
%RSD	.886	4.08	4.13	30.2	8.91	24.1	4.34	2.28	1.61	16.2
Check ?	None	None	None	None	None	None	None	None	None	None
Value										
Range										

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1132400.**	**121110.**	**17112.**
Stddev	2610.	876.	18.
%RSD	.23050	.72338	.10451

Sample Name: icsa Acquired: 05/25/2016 12:08:26 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba2335	Be3130	Ca3158	Cd2265	Co2286	Cr2677	Cu2247	Fe2395
Avg	.000	545000.	-.787	.000	-.048	505000.	.000	.000	.198	-.041	500000.
Stddev	1.20	4480.	5.34	.199	.050	5070.	.306	.617	1.26	.698	2740.
%RSD	2154e15	.821	679.	1300000.	103.	1.00	62300.	23e6	635.	1720.	.548
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
High Limit											
Low Limit											

Elem	Mg2790	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	542000.	-.003	.000	.000	.001	-.015	.018	-.946	.002	-.017	.000
Stddev	6180.	.098	.435	.420	.418	6.26	12.9	1.93	.696	.178	2.60
%RSD	1.14	3260.	8240000.	106000.	58700.	41600.	71100.	204.	32900.	1030.	558000.
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit											
Low Limit											

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1014100.	115920.	15000.
Stddev	2004.	374.	39.
%RSD	.19756	.32229	.25696

Sample Name: icsab Acquired: 05/25/2016 12:15:04 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba2335	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055
Avg	**547.**	**536000.**	**484.**	**448.**	**536.**	**517.**	**497000.**	**485.**	**516.**	**489.**	**540.**
Stddev	2.	5480.	9.	.	4.	1.	5450.	1.	1.	2.	.
%RSD	.427	1.02	1.80	.088	.736	.253	1.10	.247	.143	.451	.091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value											
Range											

Elem	Cr2677	Cu2247	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Mo2045	Ni2216	Ni2316	Pb2169
Avg	**515.**	**493.**	**474000.**	**532000.**	**503.**	**520.**	**522.**	**530.**	**492.**	**483.**	**505.**
Stddev	3.	1.	3630.	5660.	1.	4.	1.	2.	3.	1.	18.
%RSD	.538	.300	.765	1.06	.273	.742	.276	.428	.629	.273	3.56
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value											
Range											

Elem	Pb2203	Sb2068	Sb2175	Se1960	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Avg	**484.**	**577.**	**552.**	**533.**	**479.**	**529.**	**527.**	**514.**	**510.**
Stddev	8.	6.	3.	15.	4.	2.	1.	3.	2.
%RSD	1.74	1.09	.551	2.73	.872	.415	.207	.547	.450
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Sample Name: icsab Acquired: 05/25/2016 12:15:04 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1007000.	115040.	14956.
Stddev	1625.	351.	24.
%RSD	.16142	.30503	.16172

Sample Name: ICVLL ag Acquired: 05/25/2016 12:22:12 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599	Mg2802
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**10.6**	**5.82**	**-.634**	**-.109**	**.021**	**20.9**	**-.053**	**.168**	**.015**	**-.314**	**828.**	**7.37**
Stddev	.5	1.47	1.18	.080	.028	14.5	.214	.153	.658	.803	896.	.60
%RSD	4.82	25.2	187.	73.8	133.	69.4	400.	90.9	4320.	256.	108.	8.15

Elem	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**.260**	**-.097**	**.076**	**-3.42**	**-.162**	**2.66**	**-.164**	**.204**	**.241**	**58.2**
Stddev	.061	.368	.379	4.03	1.60	1.91	1.19	.217	.183	2.7
%RSD	23.3	378.	497.	118.	986.	71.9	723.	106.	75.6	4.63

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1127800.**	**119810.**	**16963.**
Stddev	9405.	494.	43.
%RSD	.83392	.41216	.25305

Sample Name: lcss57354 Acquired: 05/25/2016 12:28:39 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3933	Cd2265	Co2388	Cr2055	Cr2677	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**90.8**	**3960.**	**3830.**	**3910.**	**95.8**	**24.8**	**91.0**	**985.**	**408.**	**385.**	**477.**	**457.**
Stddev	.5	39.	11.	5.	.4	8.9	.2	9.	.	2.	1.	8.
%RSD	.533	.984	.288	.125	.445	35.8	.217	.882	.121	.521	.249	1.66

Elem	Fe2599	Mg2802	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Pb2203	Sb2068	Se2062	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**2290.**	**9.02**	**976.**	**997.**	**-.035**	**961.**	**974.**	**1010.**	**977.**	**998.**	**3710.**	**4020.**
Stddev	8.	.15	6.	13.	.270	7.	6.	7.	2.	6.	42.	17.
%RSD	.342	1.69	.601	1.31	781.	.759	.643	.694	.228	.576	1.12	.411

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**987.**	**963.**	**909.**	**29.3**
Stddev	3.	3.	6.	1.3
%RSD	.330	.303	.649	4.30

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1125200.**	**118370.**	**16892.**
Stddev	8789.	431.	76.
%RSD	.78113	.36381	.45138

Sample Name: mbs57354 Acquired: 05/25/2016 12:34:32 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599	Mg2802
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	.770	29.6	-2.24	.806	.034	17.9	-.029	-.209	2.88	-.137	89.6	9.75
Stddev	.775	.8	1.66	.219	.042	.3	.109	.231	.44	.446	6.8	.06
%RSD	101.	2.82	74.2	27.2	125.	1.48	375.	111.	15.2	325.	7.63	.607

Elem	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	3.59	.227	-.023	8.44	.703	1.30	-3.00	.354	1.27	26.0
Stddev	.01	.393	.183	1.36	2.46	5.59	1.96	.324	.06	2.8
%RSD	.288	174.	784.	16.1	350.	431.	65.4	91.3	4.78	10.7

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1122200.	117640.	16928.
Stddev	3760.	390.	30.
%RSD	.33508	.33120	.17845

Sample Name: 724949 Acquired: 05/25/2016 12:40:58 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba2335	Be3130	Ca3158	Cd2265	Co2388	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**4.64**	**91200.**	**246.**	**10400.**	**12.5**	**100000.**	**40.4**	**1330.**	**56500.**	**5710.**	**5580.**
Stddev	1.17	418.	3.	13.	.1	1170.	.2	6.	32.	7.	29.
%RSD	25.2	.459	1.36	.126	.710	1.17	.569	.478	.057	.117	.526

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2175	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**385000.**	**91300.**	**3900.**	**4320.**	**45.3**	**316.**	**283.**	**258000.**	**.000**	**58.7**	**-18.3**
Stddev	2090.	875.	19.	21.	.9	2.	1.	437.	.000	7.0	3.4
%RSD	.542	.958	.476	.493	1.93	.588	.430	.169	.000	11.9	18.7

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**213.**	**8990.**	**9040.**	**1710.**
Stddev	2.	12.	39.	5.
%RSD	.770	.137	.428	.278

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1056000.**	**117400.**	**15823.**
Stddev	4997.	188.	20.
%RSD	.47320	.15990	.12439

Sample Name: I724949 Acquired: 05/25/2016 12:47:33 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**5.27**	**27600.**	**206.**	**3750.**	**7.49**	**29500.**	**11.2**	**365.**	**14500.**	**1520.**	**1730.**
Stddev	.74	420.	17.	66.	.20	457.	1.2	23.	940.	96.	31.
%RSD	14.1	1.52	8.47	1.76	2.67	1.55	10.7	6.38	6.48	6.36	1.79

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**119000.**	**28200.**	**1110.**	**1350.**	**12.9**	**122.**	**116.**	**68900.**	**18800.**	**159.**	**142.**
Stddev	2320.	467.	27.	23.	.9	8.	8.	4000.	1140.	5.	9.
%RSD	1.95	1.66	2.42	1.71	7.13	6.52	6.77	5.81	6.05	3.08	6.04

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**101.**	**2410.**	**2350.**	**394.**
Stddev	2.	157.	158.	30.
%RSD	2.40	6.52	6.76	7.64

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1113500.**	**119970.**	**16749.**
Stddev	4135.	566.	34.
%RSD	.37136	.47216	.20299

Sample Name: dup724949 Acquired: 05/25/2016 12:53:46 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba2335	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**3.87**	**82800.**	**227.**	**9830.**	**7.89**	**92600.**	**42.4**	**741.**	**704.**	**56800.**	**8560.**
Stddev	1.21	760.	4.	18.	.03	1450.	.3	1.	3.	11.	24.
%RSD	31.3	.918	1.97	.185	.341	1.57	.725	.148	.445	.019	.283

Elem	Cu3247	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**8460.**	**354000.**	**75100.**	**3030.**	**3450.**	**70.7**	**308.**	**281.**	**228000.**	**64000.**	**72.1**
Stddev	58.	3560.	1050.	12.	24.	.7	1.	1.	346.	272.	11.6
%RSD	.684	1.01	1.40	.410	.704	.977	.421	.428	.151	.425	16.1

Elem	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-14.7**	**189.**	**9560.**	**9570.**	**797.**
Stddev	1.2	1.	38.	19.	2.
%RSD	7.94	.286	.395	.201	.306

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1058700.**	**116170.**	**15786.**
Stddev	1796.	392.	30.
%RSD	.16964	.33725	.19021

Sample Name: mss724949 Acquired: 05/25/2016 13:00:23 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba2335	Be3130	Ca3158	Cd2265	Co2388	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**90.6**	**92500.**	**3690.**	**14700.**	**99.3**	**60400.**	**139.**	**1890.**	**39000.**	**9060.**	**8980.**
Stddev	1.1	511.	8.	39.	.2	539.	1.	8.	53.	20.	66.
%RSD	1.16	.553	.208	.266	.192	.892	.458	.405	.137	.218	.737

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Pb2169	Sb2175	Se2062	Tl1908	V_2924
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**319000.**	**153000.**	**4080.**	**4410.**	**48.0**	**1080.**	**187000.**	**.000**	**3180.**	**3400.**	**1130.**
Stddev	2230.	1870.	17.	35.	.6	3.	258.	.000	39.	10.	5.
%RSD	.699	1.23	.423	.783	1.31	.300	.138	.000	1.22	.305	.443

Elem	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L
Avg	**9560.**	**9540.**	**617.**
Stddev	6.	23.	4.
%RSD	.067	.240	.693

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1066400.**	**117070.**	**15813.**
Stddev	4547.	395.	53.
%RSD	.42641	.33708	.33771

Sample Name: msds724949 Acquired: 05/25/2016 13:06:51 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba2335	Be3130	Ca3158	Cd2265	Co2388	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**96.9**	**99500.**	**3920.**	**13200.**	**106.**	**77600.**	**134.**	**1850.**	**58800.**	**8790.**	**8610.**
Stddev	.9	366.	13.	18.	.	652.	.	11.	50.	16.	24.
%RSD	.931	.367	.342	.134	.233	.840	.261	.598	.085	.177	.281

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Pb2169	Sb2175	Se2062	Tl1908	V_2924
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**461000.**	**107000.**	**4200.**	**4760.**	**111.**	**1370.**	**247000.**	**.000**	**3420.**	**3620.**	**1180.**
Stddev	3470.	811.	17.	49.	.	4.	222.	.000	41.	6.	3.
%RSD	.752	.760	.407	1.03	.426	.309	.090	.000	1.20	.173	.237

Elem	Zn2062	Sn1899
Units	ug/L	ug/L
Avg	**11200.**	**827.**
Stddev	21.	4.
%RSD	.191	.504

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1057000.**	**117460.**	**15721.**
Stddev	1566.	321.	14.
%RSD	.14814	.27346	.08724

Sample Name: pdss724949 Acquired: 05/25/2016 13:13:23 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba2335	Be3130	Ca3158	Cd2265	Co2388	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**91.8**	**91700.**	**3620.**	**12100.**	**104.**	**436000.**	**120.**	**2110.**	**53800.**	**5860.**	**5940.**
Stddev	.9	409.	6.	44.	.	4160.	.	9.	61.	16.	24.
%RSD	.997	.446	.160	.361	.205	.954	.391	.440	.112	.276	.395

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2045	Ni2216	Pb2169	Sb2175	Se2062	Tl1908	V_2924
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**369000.**	**268000.**	**4530.**	**4760.**	**1750.**	**1130.**	**254000.**	**.000**	**3610.**	**3290.**	**1130.**
Stddev	2860.	2410.	12.	40.	6.	3.	465.	.000	12.	10.	3.
%RSD	.774	.901	.253	.848	.337	.257	.183	.000	.338	.292	.308

Elem	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L
Avg	**9110.**	**9550.**	**3290.**
Stddev	11.	47.	6.
%RSD	.125	.489	.193

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1005200.**	**115630.**	**14814.**
Stddev	1427.	613.	55.
%RSD	.14192	.53050	.37252

Sample Name: 724950 Acquired: 05/25/2016 13:19:47 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	.536	166000.	307.	1970.	10.8	77700.	27.4	398.	4430.	2870.	2790.
Stddev	1.49	1500.	8.	12.	.1	1060.	.5	1.	7.	7.	16.
%RSD	279.	.906	2.59	.623	.553	1.36	1.73	.226	.150	.232	.577

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	566000.	41700.	8310.	9130.	27.6	414.	397.	36700.	3590.	73.1	-18.3
Stddev	5060.	633.	32.	67.	1.0	2.	3.	49.	11.	9.8	3.4
%RSD	.895	1.52	.380	.733	3.72	.369	.814	.133	.319	13.4	18.4

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	363.	5640.	5570.	120.
Stddev	2.	15.	23.	3.
%RSD	.490	.264	.417	2.18

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1059800.	117910.	15962.
Stddev	4522.	581.	26.
%RSD	.42666	.49256	.16442

Sample Name: ccv1 Acquired: 05/25/2016 13:26:04 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2388	Cr2055	Cu2247	Cu3247	Fe2395
Avg	**492.**	**5160.**	**5030.**	**5120.**	**494.**	**5060.**	**495.**	**5080.**	**5140.**	**5050.**	**5070.**	**5470.**
Stddev	3.	59.	10.	68.	2.	23.	1.	23.	5.	3.	77.	469.
%RSD	.546	1.14	.192	1.33	.413	.456	.190	.442	.098	.052	1.51	8.58
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Mg2790	Mn2576	Mn2593	Mo2045	Ni2216	Pb2169	Sb2068	Se2062	Tl1908	V_2924	Zn2062	Zn2138
Avg	**4900.**	**5020.**	**5030.**	**4970.**	**4960.**	**5230.**	**5150.**	**5220.**	**5210.**	**5030.**	**5080.**	**5020.**
Stddev	19.	23.	49.	20.	19.	10.	10.	24.	7.	24.	6.	19.
%RSD	.379	.455	.978	.404	.387	.198	.200	.456	.138	.480	.121	.374
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Sn1899
Avg	**5130.**
Stddev	8.
%RSD	.153
Check ?	None
Value	
Range	

Sample Name: ccv1 Acquired: 05/25/2016 13:26:04 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1106900.□	119420.□	16845.□
Stddev	4300.	321.	29.
%RSD	.38845	.26905	.17212

Sample Name: ccv2 Acquired: 05/25/2016 13:31:45 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Ba4934	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Cu3247
Avg	**53.2**	**496.**	**494.**	**490.**	**520.**	**50.7**	**498.**	**51.7**	**529.**	**510.**	**505.**	**497.**
Stddev	.7	3.	3.	1.	2.	.1	2.	.3	.	4.	1.	7.
%RSD	1.27	.504	.527	.221	.417	.188	.357	.557	.051	.757	.164	1.40
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Fe2599	Mg2802	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	F **563.**	**499.**	**503.**	**505.**	**515.**	**502.**	**512.**	**545.**	**538.**	**505.**	**503.**	**524.**
Stddev	11.	2.	2.	1.	1.	6.	2.	8.	3.	1.	1.	2.
%RSD	1.87	.393	.355	.186	.265	1.11	.328	1.41	.613	.203	.246	.476
Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	500.											
Range	10.4%											

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1110800.**	**118390.**	**16791.**
Stddev	3139.	235.	5.
%RSD	.28255	.19833	.02793

Sample Name: ccb Acquired: 05/25/2016 13:37:45 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599	Mg2802
Avg	.737	-2.70	.646	-.228	-.007	4.29	-.122	.014	-.152	.581	-14.0	1.25
Stddev	.663	.33	1.25	.101	.017	1.17	.092	.261	.332	.561	3.5	.01
%RSD	90.0	12.1	193.	44.1	232.	27.3	76.0	1820.	219.	96.6	25.0	1.18
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Elem	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	.235	.581	-.097	-1.68	3.20	4.26	-.616	.351	.043	-6.09
Stddev	.141	.453	.438	3.05	1.07	8.47	1.05	.517	.110	.98
%RSD	60.3	78.0	453.	182.	33.5	199.	171.	147.	254.	16.1
Check ?	None	None	None	None	None	None	None	None	None	None
Value										
Range										

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1109400.	118000.	16698.
Stddev	5830.	788.	46.
%RSD	.52547	.66800	.27257

Sample Name: 724951 Acquired: 05/25/2016 13:44:15 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-2.77**	**352000.**	**329.**	**3290.**	**20.0**	**57800.**	**24.4**	**586.**	**564.**	**5730.**	**2190.**
Stddev	.50	3420.	7.	16.	.1	722.	.5	.	5.	6.	2.
%RSD	18.1	.971	2.00	.496	.428	1.25	2.11	.084	.965	.098	.114

Elem	Cu3247	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Pb2169	Sb2068	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**2050.**	**813000.**	**90700.**	**7420.**	**8490.**	**25.7**	**1020.**	**34000.**	**5240.**	**-4.72**	**-21.4**
Stddev	13.	6620.	927.	27.	59.	.4	3.	27.	6.	6.72	3.7
%RSD	.625	.814	1.02	.362	.690	1.51	.338	.081	.108	142.	17.3

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**562.**	**4650.**	**4660.**	**107.**
Stddev	3.	3.	24.	4.
%RSD	.558	.066	.515	4.17

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1033600.**	**115030.**	**15666.**
Stddev	6314.	329.	34.
%RSD	.61087	.28560	.21557

Sample Name: 724952 Acquired: 05/25/2016 13:50:27 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-4.83**	**192000.**	**107.**	**1820.**	**14.1**	**40300.**	**9.10**	**363.**	**1650.**	**1330.**	**1120.**
Stddev	.48	1460.	1.	14.	.1	366.	.77	1.	1.	4.	17.
%RSD	10.0	.759	1.34	.784	.428	.908	8.50	.231	.065	.305	1.50

Elem	Fe2395	Mg2790	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908	V_2924
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**585000.**	**66600.**	**13700.**	**8.82**	**780.**	**773.**	**7960.**	**1300.**	**7.22**	**-21.8**	**345.**
Stddev	3660.	553.	64.	.88	2.	2.	41.	6.	7.25	2.4	1.
%RSD	.626	.830	.465	9.95	.227	.274	.514	.433	100.	11.1	.233

Elem	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L
Avg	**3080.**	**2970.**	**50.8**
Stddev	3.	3.	3.1
%RSD	.088	.089	6.07

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1071900.**	**115880.**	**16039.**
Stddev	2135.	418.	39.
%RSD	.19919	.36031	.24546

Sample Name: 724953 Acquired: 05/25/2016 13:56:58 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cr2677	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-6.05**	**292000.**	**165.**	**1660.**	**18.3**	**50300.**	**14.7**	**163.**	**965.**	**931.**	**774.**
Stddev	.66	1880.	6.	10.	.1	444.	1.1	1.	1.	2.	2.
%RSD	11.0	.643	3.78	.580	.388	.882	7.43	.569	.072	.220	.260

Elem	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2175	Se1960	Tl1908	V_2924
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**66400.**	**3760.**	**5230.**	**-1.47**	**604.**	**586.**	**2410.**	**56.5**	**-31.3**	**-31.7**	**460.**
Stddev	499.	10.	47.	.87	1.	2.	4.	2.5	10.0	4.0	2.
%RSD	.752	.266	.896	59.4	.090	.417	.163	4.37	31.9	12.5	.325

Elem	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L
Avg	**1630.**	**1560.**	**46.5**
Stddev	4.	6.	2.9
%RSD	.226	.357	6.20

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1050800.**	**115360.**	**15826.**
Stddev	4538.	438.	19.
%RSD	.43180	.37990	.12279

Sample Name: 724954 Acquired: 05/25/2016 14:03:30 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-3.48**	**213000.**	**258.**	**1590.**	**18.9**	**56000.**	**17.0**	**254.**	**2510.**	**1930.**	**1670.**
Stddev	.38	1670.	5.	11.	.1	804.	.8	1.	3.	4.	15.
%RSD	10.9	.784	2.04	.698	.461	1.44	4.43	.217	.117	.207	.883

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**795000.**	**46600.**	**4940.**	**6060.**	**14.1**	**634.**	**618.**	**15200.**	**1340.**	**2.19**	**-25.5**
Stddev	6500.	609.	16.	55.	.5	3.	2.	38.	5.	12.9	4.0
%RSD	.817	1.31	.318	.908	3.83	.469	.382	.247	.379	592.	15.5

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**486.**	**2930.**	**2820.**	**76.1**
Stddev	2.	5.	9.	6.2
%RSD	.489	.176	.309	8.19

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1067500.**	**115750.**	**15894.**
Stddev	3058.	407.	10.
%RSD	.28642	.35197	.06418

Sample Name: 724955 Acquired: 05/25/2016 14:09:50 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cr2677	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-6.24**	**259000.**	**127.**	**2060.**	**16.6**	**53200.**	**6.60**	**170.**	**915.**	**857.**	**538.**
Stddev	.96	2330.	3.	4.	.1	727.	.52	1.	1.	4.	1.
%RSD	15.3	.900	2.56	.216	.783	1.37	7.81	.298	.109	.515	.205

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2175	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**781000.**	**55500.**	**5840.**	**7050.**	**1.47**	**639.**	**623.**	**1950.**	**74.0**	**-9.67**	**-26.2**
Stddev	4420.	746.	18.	49.	.54	1.	.	10.	6.3	14.9	1.6
%RSD	.566	1.34	.306	.687	36.3	.177	.078	.510	8.55	154.	6.22

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**394.**	**1830.**	**1730.**	**45.0**
Stddev	1.	2.	3.	2.8
%RSD	.283	.124	.189	6.34

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1073400.**	**118300.**	**15972.**
Stddev	3112.	419.	35.
%RSD	.28992	.35394	.21933

Sample Name: 724956 Acquired: 05/25/2016 14:16:15 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-6.23**	**250000.**	**404.**	**2350.**	**23.1**	**25700.**	**9.84**	**675.**	**655.**	**1090.**	**711.**
Stddev	.55	2040.	5.	23.	.1	305.	.44	1.	6.	3.	4.
%RSD	8.81	.817	1.30	.961	.444	1.18	4.49	.216	.919	.273	.621

Elem	Fe2395	Mg2790	Mn2593	Mo2020	Ni2216	Pb2169	Sb2175	Se1960	Tl1908	V_2924	Zn2062
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**856000.**	**77300.**	**27700.**	**5.17**	**1110.**	**3160.**	**189.**	**-6.14**	**-29.8**	**514.**	**4060.**
Stddev	8980.	842.	235.	.45	5.	15.	2.	6.51	2.5	1.	3.
%RSD	1.05	1.09	.846	8.67	.445	.477	1.02	106.	8.38	.264	.082

Elem	Zn2138	Sn1899
Units	ug/L	ug/L
Avg	**3940.**	**50.1**
Stddev	15.	4.9
%RSD	.385	9.74

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1072900.**	**119040.**	**15969.**
Stddev	3545.	675.	27.
%RSD	.33044	.56670	.16907

Sample Name: 724957 Acquired: 05/25/2016 14:22:46 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Fe2395
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-4.76**	**285000.**	**243.**	**4610.**	**26.6**	**365000.**	**20.2**	**295.**	**1310.**	**599.**	**597000.**
Stddev	.48	2920.	8.	35.	.1	5030.	.2	1.	1.	2.	4040.
%RSD	10.1	1.02	3.27	.756	.257	1.38	.988	.198	.060	.281	.676

Elem	Mg2790	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908	V_2924	Zn2062
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**95100.**	**25000.**	**23.3**	**656.**	**632.**	**8400.**	**1080.**	**25.4**	**-24.3**	**420.**	**3240.**
Stddev	1180.	122.	.6	4.	2.	12.	3.	9.8	4.8	1.	7.
%RSD	1.24	.487	2.72	.646	.321	.148	.297	38.5	19.7	.334	.206

Elem	Zn2138	Sn1899
Units	ug/L	ug/L
Avg	**3230.**	**56.9**
Stddev	17.	4.0
%RSD	.531	6.98

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1041000.**	**119310.**	**15419.**
Stddev	5711.	370.	39.
%RSD	.54865	.30974	.25308

Sample Name: 724958 Acquired: 05/25/2016 14:29:03 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Fe2395
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-3.56**	**253000.**	**249.**	**3960.**	**22.0**	**259000.**	**17.2**	**296.**	**1220.**	**592.**	**559000.**
Stddev	.68	2110.	5.	15.	.1	3360.	.1	1.	1.	2.	3080.
%RSD	19.0	.834	2.18	.381	.311	1.30	.852	.192	.116	.335	.552

Elem	Mg2790	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908	V_2924	Zn2062
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**76900.**	**20800.**	**23.9**	**645.**	**625.**	**7470.**	**972.**	**19.8**	**-24.7**	**410.**	**2870.**
Stddev	917.	142.	1.1	1.	1.	19.	4.	15.0	2.5	1.	2.
%RSD	1.19	.682	4.70	.215	.135	.247	.388	75.5	9.98	.325	.069

Elem	Zn2138	Sn1899
Units	ug/L	ug/L
Avg	**2840.**	**57.3**
Stddev	6.	4.5
%RSD	.200	7.85

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1046800.**	**118200.**	**15661.**
Stddev	3317.	258.	20.
%RSD	.31692	.21822	.12623

Sample Name: 724959 Acquired: 05/25/2016 14:35:19 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-1.94**	**174000.**	**232.**	**1440.**	**14.5**	**58300.**	**13.7**	**293.**	**3570.**	**2860.**	**2680.**
Stddev	.96	1500.	6.	10.	.1	840.	.3	.	2.	6.	24.
%RSD	49.5	.862	2.62	.676	.671	1.44	2.40	.160	.062	.194	.909

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**619000.**	**39600.**	**6060.**	**7080.**	**19.7**	**648.**	**634.**	**19100.**	**2330.**	**28.2**	**-22.4**
Stddev	3900.	485.	16.	63.	.8	3.	2.	61.	6.	4.4	1.0
%RSD	.630	1.23	.262	.892	4.03	.420	.273	.320	.253	15.4	4.39

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**438.**	**4680.**	**4500.**	**77.7**
Stddev	2.	17.	14.	3.5
%RSD	.470	.356	.299	4.50

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1088400.**	**119770.**	**16144.**
Stddev	3711.	766.	29.
%RSD	.34094	.63981	.18196

Sample Name: 724960 Acquired: 05/25/2016 14:41:37 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-4.71**	**295000.**	**452.**	**2220.**	**23.7**	**58800.**	**26.7**	**623.**	**623.**	**2350.**	**1720.**
Stddev	.95	818.	9.	22.	.1	384.	.8	1.	3.	3.	4.
%RSD	20.3	.278	1.95	.969	.310	.652	2.84	.093	.537	.121	.227

Elem	Cu3247	Mg2790	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908	V_2924
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**1340.**	**61600.**	**20500.**	**20.2**	**894.**	**874.**	**13700.**	**1140.**	**-26.0**	**-33.0**	**607.**
Stddev	20.	454.	143.	.8	1.	3.	21.	5.	7.0	3.3	3.
%RSD	1.49	.737	.698	4.03	.143	.320	.152	.402	27.0	9.89	.414

Elem	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L
Avg	**5180.**	**5070.**	**72.0**
Stddev	12.	16.	3.8
%RSD	.235	.308	5.31

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1067400.**	**119410.**	**15979.**
Stddev	2234.	965.	34.
%RSD	.20923	.80824	.21351

Sample Name: ccv1 Acquired: 05/25/2016 14:48:15 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2388	Cr2055	Cu2247	Cu3247	Fe2395
Avg	**488.▯**	**5080.▯**	**5120.▯**	**5030.▯**	**495.▯**	**5030.▯**	**496.▯**	**5120.▯**	**5150.▯**	**5050.▯**	**4930.▯**	**5390.▯**
Stddev	4.	15.	7.	37.	2.	23.	1.	32.	5.	8.	34.	370.
%RSD	.921	.287	.138	.738	.502	.457	.155	.630	.100	.158	.690	6.88
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Mg2790	Mn2576	Mn2593	Mo2045	Ni2216	Pb2169	Sb2068	Se2062	Tl1908	V_2924	Zn2062	Zn2138
Avg	**4980.▯**	**5020.▯**	**5100.▯**	**5020.▯**	**5020.▯**	**5190.▯**	**5160.▯**	**5180.▯**	**5220.▯**	**5030.▯**	**5100.▯**	**5000.▯**
Stddev	14.	26.	21.	33.	34.	4.	13.	26.	12.	27.	1.	28.
%RSD	.284	.517	.417	.659	.669	.073	.249	.508	.232	.536	.026	.567
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Sn1899
Avg	**5140.▯**
Stddev	13.
%RSD	.252
Check ?	None
Value	
Range	

Sample Name: ccv1 Acquired: 05/25/2016 14:48:15 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1131500.[]	121000.[]	17198.[]
Stddev	6140.	571.	17.
%RSD	.54263	.47226	.10146

Sample Name: ccv2 Acquired: 05/25/2016 14:53:55 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Ba4934	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599
Avg	**53.0**	**517.**	**501.**	**504.**	**512.**	**51.3**	**484.**	**51.7**	**532.**	**512.**	**505.**	F **571.**
Stddev	.3	1.	2.	2.	5.	.2	4.	.4	1.	3.	1.	11.
%RSD	.540	.173	.423	.375	1.06	.443	.863	.743	.140	.616	.141	1.95
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value												500.
Range												10.4%

Elem	Mg2802	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	**505.**	**507.**	**509.**	**522.**	**514.**	**508.**	**536.**	**540.**	**508.**	**504.**	**523.**
Stddev	2.	2.	1.	2.	5.	3.	7.	6.	3.	1.	1.
%RSD	.420	.346	.208	.378	.918	.641	1.30	1.04	.502	.128	.184
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value											
Range											

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1134200.**	**120370.**	**17208.**
Stddev	4416.	514.	31.
%RSD	.38929	.42667	.18045

Sample Name: ccb Acquired: 05/25/2016 14:59:53 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599	Mg2802
Avg	**.978**	**-2.09**	**.233**	**.196**	**.002**	**3.80**	**-.117**	**-.142**	**.081**	**.389**	**-10.4**	**1.38**
Stddev	.608	1.44	1.68	.219	.024	1.06	.157	.165	.679	.785	2.6	.06
%RSD	62.1	68.9	720.	111.	1550.	28.0	133.	116.	835.	202.	25.4	4.14
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Elem	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	**.291**	**.845**	**-.559**	**-3.66**	**-.361**	**1.96**	**-1.44**	**.297**	**.473**	**-5.99**
Stddev	.019	.543	.164	1.43	.383	2.92	2.93	.168	.109	2.66
%RSD	6.56	64.3	29.4	39.0	106.	149.	203.	56.6	23.0	44.4
Check ?	None	None	None	None	None	None	None	None	None	None
Value										
Range										

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1137000.**	**121020.**	**17179.**
Stddev	1283.	599.	39.
%RSD	.11284	.49488	.22433

Sample Name: 724961 Acquired: 05/25/2016 15:06:23 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-1.90**	**277000.**	**423.**	**2770.**	**19.7**	**77800.**	**26.3**	**738.**	**714.**	**3710.**	**2700.**
Stddev	.94	1960.	6.	26.	.1	798.	1.1	1.	2.	4.	5.
%RSD	49.5	.707	1.45	.937	.460	1.03	4.08	.151	.230	.095	.198

Elem	Cu3247	Fe2395	Mg2790	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**2540.**	**751000.**	**48600.**	**32500.**	**31.5**	**679.**	**661.**	**23300.**	**2010.**	**33.4**	**-23.5**
Stddev	22.	8900.	456.	349.	.4	1.	2.	53.	9.	6.0	3.6
%RSD	.858	1.18	.940	1.07	1.19	.095	.228	.229	.440	18.1	15.3

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**670.**	**5370.**	**5290.**	**111.**
Stddev	.	17.	22.	4.
%RSD	.026	.325	.410	3.29

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1065600.**	**118300.**	**16085.**
Stddev	3749.	1036.	15.
%RSD	.35180	.87578	.09018

Sample Name: 724962 Acquired: 05/25/2016 15:12:51 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-4.06**	**222000.**	**285.**	**2280.**	**23.6**	**55700.**	**19.5**	**624.**	**610.**	**2440.**	**2270.**
Stddev	.79	1840.	6.	19.	.2	646.	.7	1.	6.	2.	1.
%RSD	19.4	.828	2.14	.819	.899	1.16	3.76	.134	.936	.092	.026

Elem	Cu3247	Fe2395	Mg2790	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**2010.**	**800000.**	**60000.**	**27000.**	**25.3**	**978.**	**959.**	**11400.**	**1040.**	**8.40**	**-25.1**
Stddev	15.	6780.	781.	248.	.6	7.	8.	30.	4.	4.39	2.7
%RSD	.725	.847	1.30	.919	2.18	.761	.869	.262	.350	52.3	10.7

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**489.**	**4410.**	**4270.**	**51.1**
Stddev	3.	4.	36.	2.7
%RSD	.683	.082	.838	5.30

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1080000.**	**118640.**	**16188.**
Stddev	9374.	247.	25.
%RSD	.86798	.20845	.15585

Sample Name: 724963 Acquired: 05/25/2016 15:19:19 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cr2677	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	-9.10	307000.	193.	2710.	26.9	55600.	-1.10	227.	796.	745.	753.
Stddev	1.05	2340.	6.	38.	.1	402.	.75	1.	3.	3.	4.
%RSD	11.5	.763	3.15	1.40	.312	.724	67.8	.309	.328	.355	.528

Elem	Cu3247	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2175	Se1960
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	451.	671000.	87900.	6090.	7140.	12.9	830.	812.	1810.	68.9	1.33
Stddev	13.	7750.	809.	9.	70.	.4	4.	4.	4.	3.6	2.41
%RSD	2.94	1.16	.920	.151	.985	3.13	.475	.494	.249	5.25	181.

Elem	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	-27.3	616.	1700.	1610.	43.1
Stddev	3.2	1.	3.	6.	1.7
%RSD	11.7	.219	.176	.371	4.05

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1084900.	119830.	16193.
Stddev	4482.	1119.	27.
%RSD	.41311	.93365	.16532

Sample Name: 724964 Acquired: 05/25/2016 15:25:41 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cr2677	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-10.6**	**259000.**	**50.5**	**2290.**	**27.3**	**31800.**	**-3.45**	**252.**	**862.**	**811.**	**736.**
Stddev	1.5	1960.	4.0	18.	.1	277.	.42	1.	2.	2.	1.
%RSD	13.8	.756	7.88	.766	.259	.872	12.1	.264	.267	.243	.170

Elem	Cu3247	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2175	Se1960
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**517.**	**482000.**	**96000.**	**4690.**	**5410.**	**3.65**	**913.**	**900.**	**1300.**	**67.6**	**4.78**
Stddev	8.	4130.	1110.	9.	59.	.55	4.	2.	11.	1.8	3.47
%RSD	1.60	.858	1.15	.183	1.09	15.0	.430	.223	.860	2.68	72.6

Elem	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-25.4**	**444.**	**1590.**	**1500.**	**43.7**
Stddev	2.4	1.	4.	4.	2.7
%RSD	9.63	.321	.229	.284	6.12

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1093500.**	**119150.**	**16380.**
Stddev	866.	299.	19.
%RSD	.07918	.25055	.11879

Sample Name: 724965 Acquired: 05/25/2016 15:32:05 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cr2677	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-5.34**	**196000.**	**202.**	**1980.**	**18.2**	**95000.**	**-1.41**	**234.**	**409.**	**372.**	**436.**
Stddev	.51	2040.	4.	14.	.1	1350.	.36	1.	1.	2.	1.
%RSD	9.53	1.04	1.96	.710	.540	1.42	25.9	.249	.358	.510	.253

Elem	Fe2395	Mg2790	Mn2593	Mo2020	Ni2216	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**451000.**	**43700.**	**14200.**	**11.3**	**525.**	**507.**	**589.**	**14.2**	**18.3**	**-17.9**	**392.**
Stddev	4060.	536.	119.	.5	2.	1.	5.	5.0	4.1	1.6	.
%RSD	.900	1.23	.836	4.74	.386	.106	.821	35.4	22.3	9.05	.030

Elem	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L
Avg	**1380.**	**1280.**	**37.8**
Stddev	3.	4.	2.7
%RSD	.212	.295	7.03

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1101400.**	**123390.**	**16123.**
Stddev	3789.	674.	23.
%RSD	.34398	.54601	.14565

Sample Name: 724966 Acquired: 05/25/2016 15:38:46 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cr2677	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-2.96**	**386000.**	**272.**	**2540.**	**16.3**	**84100.**	**8.84**	**326.**	**752.**	**678.**	**589.**
Stddev	.39	3380.	5.	19.	.0	918.	.45	.	1.	5.	3.
%RSD	13.0	.877	1.78	.761	.255	1.09	5.07	.102	.158	.711	.484

Elem	Fe2395	Mg2790	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2175	Se1960	Tl1908	V_2924
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**767000.**	**88900.**	**12900.**	**20.5**	**707.**	**683.**	**3180.**	**324.**	**-4.46**	**-21.6**	**604.**
Stddev	6790.	1040.	102.	.7	3.	2.	26.	1.	1.78	2.1	2.
%RSD	.884	1.17	.788	3.28	.389	.301	.830	.308	39.9	9.76	.266

Elem	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L
Avg	**2660.**	**2520.**	**58.1**
Stddev	10.	6.	1.8
%RSD	.375	.238	3.11

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1088100.**	**123270.**	**15816.**
Stddev	3442.	429.	37.
%RSD	.31631	.34777	.23149

Sample Name: 724967 Acquired: 05/25/2016 15:45:15 Type: Unk
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2677	Cu2247	Fe2395
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**-1.34**	**259000.**	**181.**	**1930.**	**14.8**	**122000.**	**2.40**	**168.**	**301.**	**310.**	**427000.**
Stddev	.31	2110.	7.	19.	.1	1310.	.17	.	2.	1.	3320.
%RSD	23.3	.814	3.86	.999	.461	1.08	7.15	.277	.590	.271	.778

Elem	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**64600.**	**8120.**	**8980.**	**22.0**	**487.**	**468.**	**550.**	**11.7**	**18.9**	**-15.0**	**419.**
Stddev	673.	12.	61.	.5	2.	2.	2.	3.8	11.8	3.6	2.
%RSD	1.04	.142	.681	2.47	.344	.328	.450	32.4	62.4	24.2	.386

Elem	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L
Avg	**1710.**	**1620.**	**39.7**
Stddev	1.	5.	2.2
%RSD	.069	.312	5.46

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1091800.**	**123610.**	**15989.**
Stddev	3836.	708.	40.
%RSD	.35138	.57264	.24782

Sample Name: ccv1 Acquired: 05/25/2016 16:10:06 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2388	Cr2055	Cu2247	Cu3247	Fe2395
Avg	**474.▯**	**5010.▯**	**5130.▯**	**5000.▯**	**491.▯**	**4830.▯**	**497.▯**	**5150.▯**	**5180.▯**	**5140.▯**	**4800.▯**	**5410.▯**
Stddev	2.	138.	9.	50.	2.	11.	.	35.	6.	6.	35.	584.
%RSD	.393	2.75	.170	.995	.449	.220	.089	.686	.107	.108	.719	10.8
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Mg2790	Mn2576	Mn2593	Mo2045	Ni2216	Pb2169	Sb2068	Se2062	Tl1908	V_2924	Zn2062	Zn2138
Avg	**4830.▯**	**4950.▯**	**5220.▯**	**5000.▯**	**4980.▯**	**5180.▯**	**5280.▯**	**5250.▯**	**5380.▯**	**5010.▯**	**5070.▯**	**4840.▯**
Stddev	46.	21.	57.	14.	25.	6.	18.	16.	8.	16.	10.	24.
%RSD	.947	.415	1.10	.285	.498	.116	.333	.297	.156	.325	.200	.496
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Sn1899
Avg	**5130.▯**
Stddev	6.
%RSD	.126
Check ?	None
Value	
Range	

Sample Name: ccv1 Acquired: 05/25/2016 16:10:06 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1156500.[]	125840.[]	16980.[]
Stddev	4873.	799.	22.
%RSD	.42136	.63456	.13059

Sample Name: ccv2 Acquired: 05/25/2016 16:15:47 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Ba4934	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599
Avg	**50.5**	**547.**	**503.**	**498.**	**503.**	**50.8**	**477.**	**52.0**	**538.**	**483.**	**515.**	**549.**
Stddev	.3	3.	3.	.	1.	.2	2.	.2	.	4.	2.	16.
%RSD	.658	.516	.568	.091	.240	.337	.377	.369	.061	.774	.299	2.90
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Mg2802	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	**495.**	**500.**	**518.**	**511.**	**536.**	**517.**	**531.**	F **554.**	**505.**	**487.**	**524.**
Stddev	1.	1.	1.	2.	1.	3.	9.	3.	3.	1.	5.
%RSD	.245	.270	.247	.318	.244	.549	1.64	.571	.672	.237	.931
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
Value								500.			
Range								10.4%			

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1159800.**	**123280.**	**16930.**
Stddev	3013.	118.	10.
%RSD	.25977	.09547	.05705

Sample Name: ccb Acquired: 05/25/2016 16:21:46 Type: QC
Method: DOD Calibration Updated 060614(v1476) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599	Mg2802
Avg	**1.36**	**-2.19**	**2.29**	**.358**	**.019**	**3.84**	**-.007**	**.028**	**.056**	**.413**	**-11.6**	**1.39**
Stddev	.40	1.21	2.39	.106	.013	1.04	.197	.154	.197	.210	2.9	.05
%RSD	29.1	55.1	104.	29.6	67.8	27.0	2780.	539.	351.	50.8	25.2	3.88
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Elem	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	**.420**	**1.25**	**.652**	**-3.92**	**-.059**	**5.98**	**.799**	**.364**	**.367**	**-3.54**
Stddev	.100	.54	.322	2.03	1.24	3.64	2.12	.407	.144	2.16
%RSD	23.7	43.3	49.3	51.8	2100.	60.8	265.	112.	39.2	61.0
Check ?	None	None	None	None	None	None	None	None	None	None
Value										
Range										

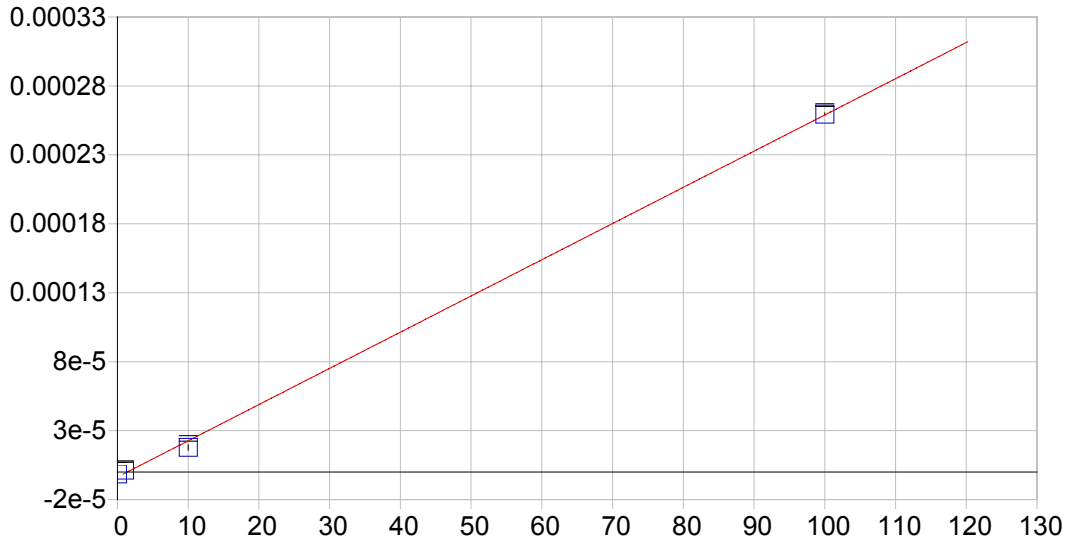
Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1164200.**	**122450.**	**16959.**
Stddev	5121.	458.	47.
%RSD	.43987	.37390	.27988

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope
														Slope
Ag 328.068 {103}	05/27/2016 08:21:22	05/26/2016 12:18:26	Linear	None	-0.000004	0.000003	0.000000	1.000000	0.999657	0.000004	0.924571	3.081902	OK.	1.000000
Al 309.271 {109}	05/27/2016 08:21:22	05/26/2016 12:44:39	Curvilin	None	0.000237	0.000000	0.000000	1.000000	1.000000	0.000011	14.458858	48.196193	OK.	1.000000
Al 396.152 { 85}	05/27/2016 08:21:22	05/26/2016 12:59:43	Full Fit	1/Var	-0.000026	0.000001	0.000000	1.000000	0.999988	0.000019	7.509949	25.033163	OK.	1.000000
Al 167.079 {502}	05/27/2016 08:21:22	05/26/2016 12:24:21	Linear	1/Var	0.000267	0.000032	0.000000	1.000000	0.999191	0.000147	0.926270	3.087567	OK.	1.000000
As 193.759 {474}	05/27/2016 08:21:22	05/26/2016 12:31:04	Full Fit	1/Conc	0.199075	0.094025	0.000001	0.960000	0.999973	0.009415	5.474282	18.247606	Warnin	1.000000
As 189.042 {479}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Conc	0.000007	0.000005	0.000000	1.000000	0.999901	0.000001	10.319078	34.396927	OK.	1.000000
Ba 233.527 {445}	05/27/2016 08:21:22	05/26/2016 12:24:21	Linear	1/Conc	0.255374	0.568595	0.000000	1.000000	0.999752	0.015900	0.840734	2.802445	OK.	1.000000
Ba 455.403 { 74}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	None	128.329559	16.349961	0.000000	1.000000	0.999993	213.254439	0.254822	0.849407	OK.	1.000000
Ba 493.409 { 68}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Var	2945.07173	17.195576	0.000000	1.000000	0.999825	60.281266	0.467151	1.557169	OK.	1.000000
Be 313.042 {108}	05/27/2016 08:21:22	05/26/2016 12:24:21	Linear	1/Conc	-0.000034	0.000064	0.000000	1.000000	0.999970	0.000000	0.034735	0.115783	OK.	1.000000
Be 234.861 {144}	05/27/2016 08:21:22	05/26/2016 12:24:21	Linear	1/Conc	-0.000000	0.000002	0.000000	1.000000	0.999998	0.000000	0.277755	0.925851	OK.	1.000000
Ca 315.887 {107}	05/27/2016 08:21:22	05/26/2016 12:59:43	Curvilin	1/Conc	10.736016	0.103826	-0.000000	1.000000	0.999996	0.473366	10.129115	33.763716	OK.	1.000000
Ca 317.933 {106}	05/27/2016 08:21:22	05/26/2016 12:59:43	Curvilin	1/Conc	0.003082	0.000001	0.000000	1.000000	0.999994	0.000008	2.973608	9.912026	OK.	1.000000
Ca 393.366 { 86}	05/27/2016 08:21:22	05/26/2016 12:24:21	Linear	1/Var	559.825042	63.722894	0.000000	1.000000	0.989257	749.860516	0.045452	0.151506	OK.	1.000000
Ca 396.847 { 85}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Conc	0.000225	0.000066	0.000000	1.000000	0.999746	0.000070	0.104951	0.349837	OK.	1.000000
Cd 226.502 {449}	05/27/2016 08:21:22	05/26/2016 12:24:21	Linear	1/Conc	-0.000121	0.000490	0.000000	1.000000	0.999923	0.000005	0.192369	0.641230	OK.	1.000000
Cd 228.802 {447}	05/27/2016 08:21:22	05/26/2016 12:24:21	Linear	1/Conc	0.000272	0.000776	0.000000	1.000000	0.999952	0.000007	0.154351	0.514503	OK.	1.000000
Co 228.616 {447}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Conc	-0.000293	0.000298	0.000000	1.000000	0.999834	0.000021	0.327832	1.092773	OK.	1.000000
Co 238.892 {141}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	None	0.000041	0.000002	0.000000	1.000000	0.999987	0.000062	0.903392	3.011305	OK.	1.000000
Cr 205.560 {464}	05/27/2016 08:21:22	05/26/2016 12:37:53	Linear	1/Var	0.000460	0.000264	0.000000	1.000000	0.999370	0.001730	0.236517	0.788391	OK.	1.000000
Cr 267.716 {126}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Var	0.000003	0.000003	0.000000	1.000000	0.999561	0.000006	0.876423	2.921411	OK.	1.000000
Cu 224.700 {450}	05/27/2016 08:21:22	05/26/2016 12:31:04	Curvilin	1/Conc	-0.000178	0.000155	-0.000000	1.000000	0.999908	0.000008	0.613789	2.045964	OK.	1.000000
Cu 324.754 {104}	05/27/2016 08:21:22	05/26/2016 12:37:53	Linear	1/Conc	0.000261	0.000001	0.000000	1.000000	0.999898	0.000002	2.106370	7.021233	OK.	1.000000
Cu 327.396 {103}	05/27/2016 08:21:22	05/26/2016 12:37:53	Curvilin	1/Conc	-0.000016	0.000002	0.000000	1.000000	0.999989	0.000001	3.644126	12.147086	OK.	1.000000
Fe 234.349 {144}	05/27/2016 08:21:22	05/26/2016 12:59:43	Full Fit	1/Conc	0.000032	0.000001	0.000000	0.980000	0.999999	0.000001	1.493784	4.979280	OK.	1.000000
Fe 239.562 {140}	05/27/2016 08:21:22	05/26/2016 12:59:43	Linear	1/Var	0.000002	0.000000	0.000000	1.000000	0.999833	0.000003	3.643540	12.145133	OK.	1.000000
Fe 259.940 {129}	05/27/2016 08:21:22	05/26/2016 12:59:43	Full Fit	None	0.000079	0.000002	0.000000	1.000000	1.000000	0.000483	1.760734	5.869114	OK.	1.000000
Mg 202.582 {466}	05/27/2016 08:21:22	05/26/2016 12:59:43	Curvilin	1/Conc	-0.000087	0.000017	-0.000000	1.000000	0.999545	0.000826	4.137060	13.790201	OK.	1.000000
Mg 279.079 {121}	05/27/2016 08:21:22	05/26/2016 12:59:43	Curvilin	1/Conc	-0.000001	0.000000	0.000000	1.000000	0.999971	0.000001	24.757864	82.526212	OK.	1.000000
Mg 280.270 {120}	05/27/2016 08:21:22	05/26/2016 12:31:04	Full Fit	1/Conc	0.000057	0.000036	0.000000	0.940000	0.999974	0.000008	0.038679	0.128929	Warnin	1.000000
Mn 257.610 {131}	05/27/2016 08:21:22	05/26/2016 12:31:04	Curvilin	1/Conc	0.000002	0.000015	-0.000000	1.000000	0.999991	0.000001	0.088155	0.293850	OK.	1.000000
Mn 259.373 {130}	05/27/2016 08:21:22	05/26/2016 12:37:53	Linear	1/Var	0.000004	0.000012	0.000000	1.000000	0.999849	0.000021	0.378593	1.261977	OK.	1.000000
Mo 202.030 {466}	05/27/2016 08:21:22	05/26/2016 12:24:22	Linear	1/Conc	0.000044	0.000120	0.000000	1.000000	0.999970	0.000003	0.423391	1.411303	OK.	1.000000
Mo 204.598 {464}	05/27/2016 08:21:22	05/26/2016 12:31:04	Full Fit	1/Conc	-0.000000	0.000001	-0.000000	1.000000	0.999994	0.000000	0.684927	2.283089	OK.	1.000000
Mo 204.598 {465}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Conc	-0.000000	0.000000	0.000000	1.000000	0.999941	0.000000	0.968602	3.228675	OK.	1.000000
Ni 221.647 {452}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Var	0.000001	0.000002	0.000000	1.000000	0.999523	0.000007	0.462870	1.542900	OK.	1.000000
Ni 231.604 {445}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Conc	-0.000003	0.000002	0.000000	1.000000	0.999842	0.000000	0.562209	1.874030	OK.	1.000000
Pb 216.999 {455}	05/27/2016 08:21:22	05/26/2016 12:37:53	Curvilin	1/Var	1.985892	0.171763	0.000000	1.000000	0.999892	6.735656	4.961457	16.538189	Warnin	1.000000
Pb 220.353 {453}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Var	3.920070	0.472996	0.000000	1.000000	0.999157	9.686661	2.325403	7.751344	OK.	1.000000
Pb 220.353 {153}	05/27/2016 08:21:22	05/26/2016 12:37:53	Linear	1/Conc	2.014797	0.271484	0.000000	1.000000	0.999941	0.400636	5.081751	16.939169	OK.	1.000000
Sb 206.833 {463}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Conc	0.000002	0.000033	0.000000	1.000000	0.999925	0.000005	2.237702	7.459007	OK.	1.000000
Sb 217.581 {455}	05/27/2016 08:21:22	05/26/2016 12:31:04	Curvilin	None	-0.000013	0.000036	-0.000000	1.000000	1.000000	0.000038	2.379685	7.932285	OK.	1.000000
Se 196.090 {472}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Conc	-0.000002	0.000013	0.000000	1.000000	0.999733	0.000004	4.573247	15.244155	OK.	1.000000
Se 206.279 {463}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Conc	0.000022	0.000004	0.000000	1.000000	0.999907	0.000002	22.076548	73.588492	OK.	1.000000
Se 196.090 {471}	05/27/2016 08:21:22	05/26/2016 12:31:04	Linear	1/Conc	0.000047	0.000009	0.000000	1.000000	0.999757	0.000003	6.274504	20.915012	OK.	1.000000
Tl 190.856 {476}	05/27/2016 08:21:22	05/26/2016 12:31:05	Linear	1/Conc	-0.000046	0.000034	0.000000	1.000000	0.999586	0.000013	2.166520	7.221733	OK.	1.000000

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope
														Slope
Tl 190.856 {477}	05/27/2016 08:21:22	05/26/2016 12:31:05	Linear	1/Conc	-0.000041	0.000017	0.000000	1.000000	0.999576	0.000007	3.436738	11.455793	OK.	1.000000
V 290.882 {116}	05/27/2016 08:21:22	05/26/2016 12:31:05	Full Fit	1/Conc	0.000005	0.000001	0.000000	0.990000	1.000000	0.000000	2.727984	9.093280	Warnin	1.000000
V 292.402 {115}	05/27/2016 08:21:22	05/26/2016 12:31:05	Linear	1/Var	0.000007	0.000009	0.000000	1.000000	0.999536	0.000011	0.457677	1.525591	OK.	1.000000
Zn 206.200 {463}	05/27/2016 08:21:22	05/26/2016 12:37:53	Curvilin	1/Var	0.000215	0.000238	-0.000000	1.000000	0.999922	0.001683	0.338959	1.129863	OK.	1.000000
Zn 213.856 {458}	05/27/2016 08:21:22	05/26/2016 12:31:05	Curvilin	1/Var	0.000002	0.000002	-0.000000	1.000000	0.999921	0.000001	0.208841	0.696138	OK.	1.000000
Y 324.228 {104}*	05/27/2016 08:21:22	05/26/2016 11:25:48	Linear	1/Conc	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000
Y 371.030 { 91}*	05/27/2016 08:21:22	05/26/2016 11:25:48	Linear	1/Conc	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000
Y 224.306 {451}*	05/27/2016 08:21:22	05/26/2016 11:25:48	Linear	1/Conc	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000
Na 588.995 { 57}	05/27/2016 08:21:22	05/26/2016 12:44:39	Linear	1/Conc	0.001651	0.000002	0.000000	1.000000	0.995089	0.000113	3.858859	12.862864	OK.	1.000000
Si 251.611 {134}	05/27/2016 08:21:22	05/26/2016 12:44:39	Linear	1/Conc	0.000044	0.000001	0.000000	1.000000	0.955661	0.000035	5.511769	18.372562	OK.	1.000000
Ti 334.941 {101}	05/27/2016 08:21:22	05/26/2016 12:31:05	Linear	1/Conc	0.000001	0.000005	0.000000	1.000000	0.999955	0.000000	1.039048	3.463495	OK.	1.000000
Sr 407.771 { 83}	05/27/2016 08:21:22	05/26/2016 12:31:05	Linear	1/Conc	-0.000417	0.000084	0.000000	1.000000	0.999823	0.000006	0.104990	0.349966	OK.	1.000000
Sn 189.989 {478}	05/27/2016 08:21:22	05/26/2016 12:31:05	Linear	1/Var	0.000082	0.000014	0.000000	1.000000	0.999645	0.000149	2.990195	9.967318	OK.	1.000000
B 249.678 {135}	05/27/2016 08:21:22	05/26/2016 12:31:05	Linear	1/Conc	-0.000000	0.000002	0.000000	1.000000	0.999963	0.000000	1.257682	4.192272	OK.	1.000000
B 249.773 {135}	05/27/2016 08:21:22	05/26/2016 12:31:05	Linear	1/Conc	0.000003	0.000003	0.000000	1.000000	0.999953	0.000000	0.753166	2.510555	OK.	1.000000
Li 670.784 { 50}	05/27/2016 08:21:22	05/26/2016 12:31:05	Linear	1/Var	-0.000034	0.000020	0.000000	1.000000	0.999923	0.000024	1.030019	3.433396	OK.	1.000000
K 766.490 { 44}	05/27/2016 08:21:22	05/26/2016 12:44:39	Linear	1/Conc	0.000013	0.000001	0.000000	1.000000	0.995196	0.000036	28.274995	94.249983	OK.	1.000000
P 213.618 {457}	05/27/2016 08:21:22	05/26/2016 12:44:39	Linear	1/Conc	-0.000001	0.000000	0.000000	1.000000	0.046844	0.000001	4172.93659	13909.7886	OK.	1.000000
S 182.034 {485}	05/27/2016 08:21:22	05/26/2016 12:59:44	Linear	1/Conc	0.000166	0.000011	0.000000	1.000000	0.999202	0.000668	4.017990	13.393301	OK.	1.000000
W 239.709 {140}	05/27/2016 08:21:22	05/26/2016 12:44:39	Curvilin	1/Var	0.000001	-0.000000	0.000000	1.000000	1.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000

Element, Wavelength and Order	Reslope		QC Norm	
	Y-int	Slope factor	Offset	
Ag 328.068 {103}	0.000000	1	0	
Al 309.271 {109}	0.000000	1	0	
Al 396.152 { 85}	0.000000	1	0	
Al 167.079 {502}	0.000000	1	0	
As 193.759 {474}	0.000000	1	0	
As 189.042 {479}	0.000000	1	0	
Ba 233.527 {445}	0.000000	1	0	
Ba 455.403 { 74}	0.000000	1	0	
Ba 493.409 { 68}	0.000000	1	0	
Be 313.042 {108}	0.000000	1	0	
Be 234.861 {144}	0.000000	1	0	
Ca 315.887 {107}	0.000000	1	0	
Ca 317.933 {106}	0.000000	1	0	
Ca 393.366 { 86}	0.000000	1	0	
Ca 396.847 { 85}	0.000000	1	0	
Cd 226.502 {449}	0.000000	1	0	
Cd 228.802 {447}	0.000000	1	0	
Co 228.616 {447}	0.000000	1	0	
Co 238.892 {141}	0.000000	1	0	
Cr 205.560 {464}	0.000000	1	0	
Cr 267.716 {126}	0.000000	1	0	
Cu 224.700 {450}	0.000000	1	0	
Cu 324.754 {104}	0.000000	1	0	
Cu 327.396 {103}	0.000000	1	0	
Fe 234.349 {144}	0.000000	1	0	
Fe 239.562 {140}	0.000000	1	0	
Fe 259.940 {129}	0.000000	1	0	
Mg 202.582 {466}	0.000000	1	0	
Mg 279.079 {121}	0.000000	1	0	
Mg 280.270 {120}	0.000000	1	0	
Mn 257.610 {131}	0.000000	1	0	
Mn 259.373 {130}	0.000000	1	0	
Mo 202.030 {466}	0.000000	1	0	
Mo 204.598 {464}	0.000000	1	0	
Mo 204.598 {465}	0.000000	1	0	
Ni 221.647 {452}	0.000000	1	0	
Ni 231.604 {445}	0.000000	1	0	
Pb 216.999 {455}	0.000000	1	0	
Pb 220.353 {453}	0.000000	1	0	
Pb 220.353 {153}	0.000000	1	0	
Sb 206.833 {463}	0.000000	1	0	
Sb 217.581 {455}	0.000000	1	0	
Se 196.090 {472}	0.000000	1	0	
Se 206.279 {463}	0.000000	1	0	
Se 196.090 {471}	0.000000	1	0	
Tl 190.856 {476}	0.000000	1	0	

	Element, Wavelength and Order	Reslope	QC Norm	
		Y-int	Slope factor	Offset
	Tl 190.856 {477}	0.000000	1	0
	V 290.882 {116}	0.000000	1	0
	V 292.402 {115}	0.000000	1	0
	Zn 206.200 {463}	0.000000	1	0
	Zn 213.856 {458}	0.000000	1	0
	Y 324.228 {104}*	0.000000	1	0
	Y 371.030 { 91}*	0.000000	1	0
	Y 224.306 {451}*	0.000000	1	0
	Na 588.995 { 57}	0.000000	1	0
	Si 251.611 {134}	0.000000	1	0
	Ti 334.941 {101}	0.000000	1	0
	Sr 407.771 { 83}	0.000000	1	0
	Sn 189.989 {478}	0.000000	1	0
	B 249.678 {135}	0.000000	1	0
	B 249.773 {135}	0.000000	1	0
	Li 670.784 { 50}	0.000000	1	0
	K 766.490 { 44}	0.000000	1	0
	P 213.618 {457}	0.000000	1	0
	S 182.034 {485}	0.000000	1	0
	W 239.709 {140}	0.000000	1	0

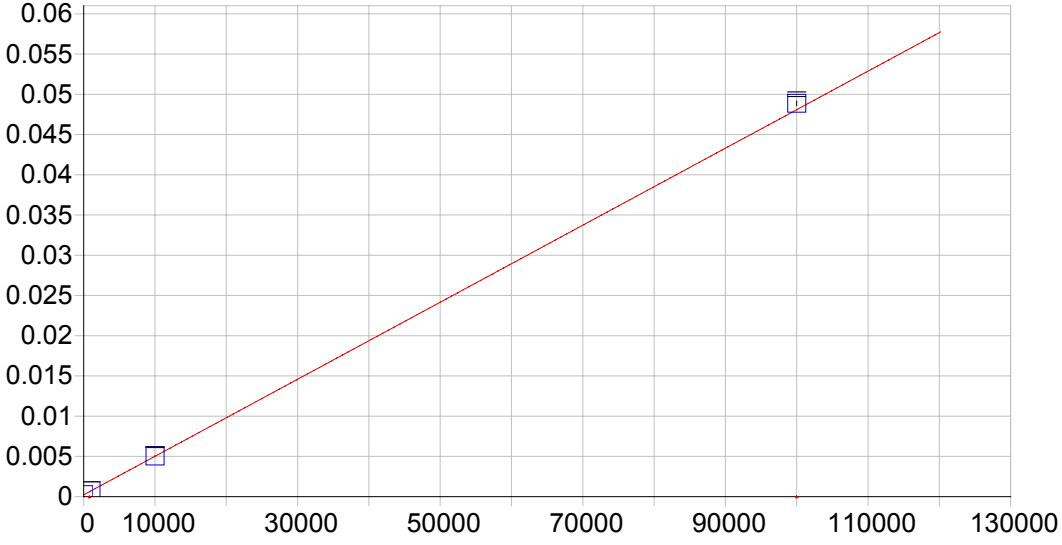


Ag 328.068 {103}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	None

A0 (Offset):	-0.000004	Re-Slope:	1.000000
A1 (Gain):	0.000003	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999657	Status:	OK.
Std Error of Est:	0.000004		
Predicted MDL:	0.924571		
Predicted MQL:	3.081902		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.80714	.807	.000	.00000	.000	1
CalStd5=10	10.000	8.1577	-1.84	-18.4	.00002	.000	1
CalStd8=100	100.00	100.18	.176	.176	.00026	.000	1
CalStd3=1	1.0000	1.8595	.860	86.0	.00000	.000	1

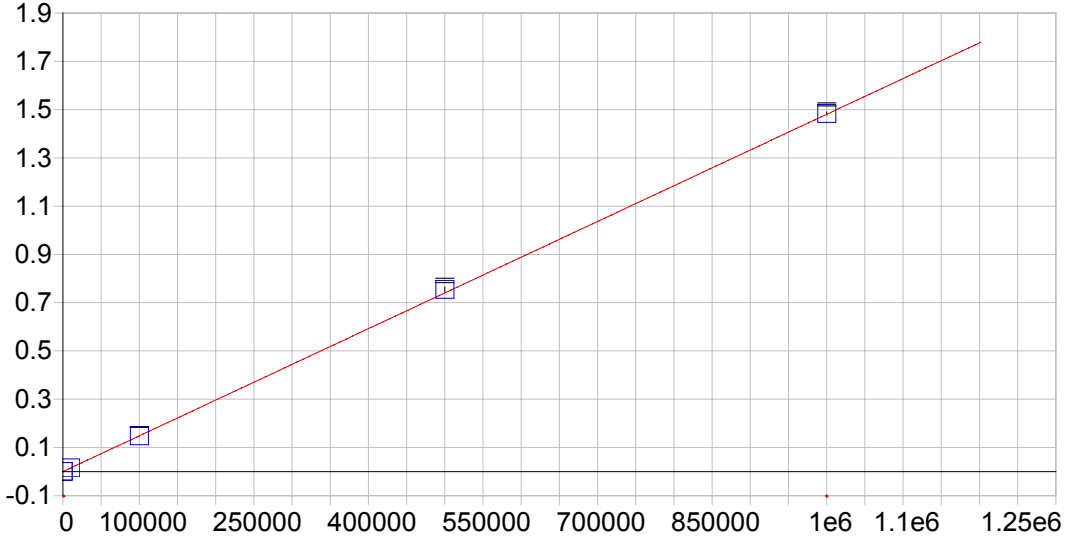


Al 309.271 {109}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Curvilinear	Weighting:	None

A0 (Offset):	0.000237	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	1.000000	Status:	OK.
Std Error of Est:	0.000011		
Predicted MDL:	14.458858		
Predicted MQL:	48.196193		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-15.302	-15.3	.000	.00023	.000	1
CalStd10=10	10000.	10014.	14.5	.145	.00503	.000	1
CalStd9=100	1000.0	1017.3	17.3	1.73	.00072	.000	1
CalStd12-100	100000.	101630.	1630.	1.63	.04887	.000	1

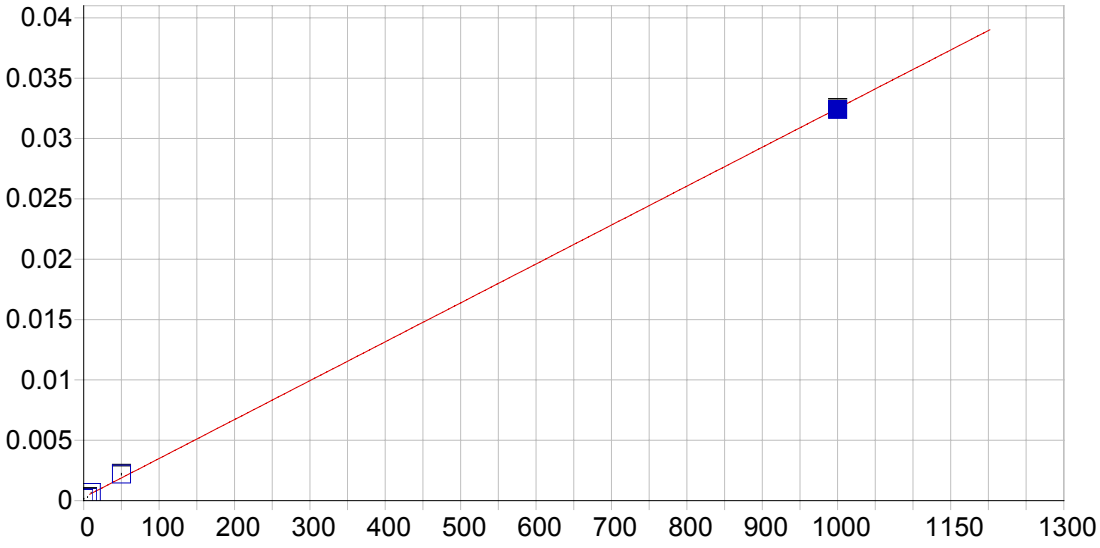


Al 396.152 { 85}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Full Fit	Weighting:	1/Var

A0 (Offset):	-0.000026	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999988	Status:	OK.
Std Error of Est:	0.000019		
Predicted MDL:	7.509949		
Predicted MQL:	25.033163		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	-.00003	.000	1
CalStd14-100	1000000.	1002000.	2010.	.201	1.4835	.006	1
CalStd13=50	500000.	509620.	9620.	1.92	.75451	.009	1
CalStd10=10	10000.	9986.2	-13.8	-.138	.01476	.000	1
CalStd12-100	100000.	99660.	-340.	-.340	.14753	.001	1
CalStd9=100	1000.0	1001.1	1.07	.107	.00146	.000	1

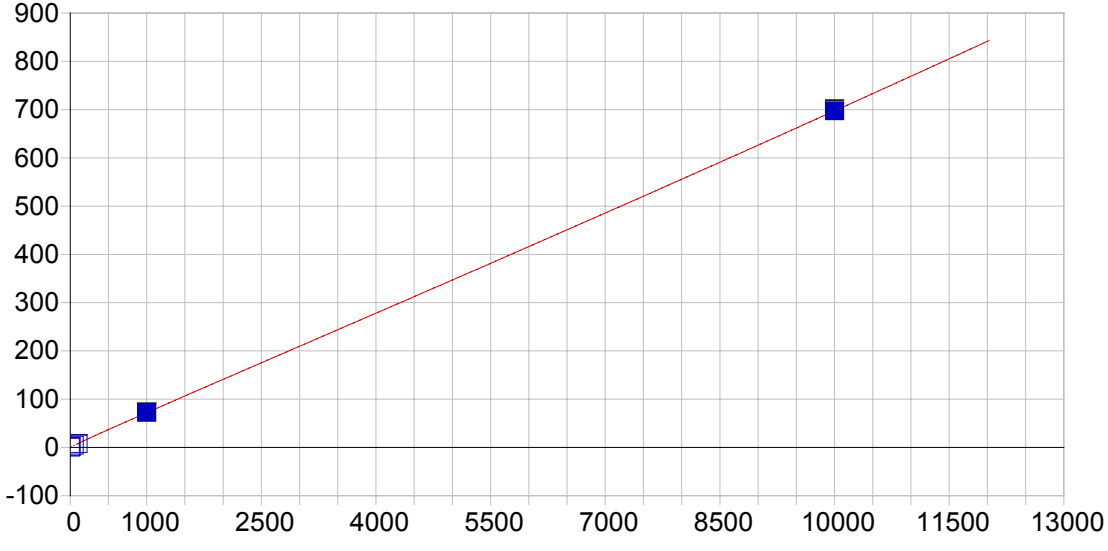


Al 167.079 {502}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000267	Re-Slope:	1.000000
A1 (Gain):	0.000032	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999191	Status:	OK.
Std Error of Est:	0.000147		
Predicted MDL:	0.926270		
Predicted MQL:	3.087567		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-3.1150	-3.12	.000	.00017	.000	1
CalStd9=100	1000.0	996.60	-3.40	-.340	.03241	.000	1
CalStd5=10	10.000	12.658	2.66	26.6	.00067	.000	1
CalStd4=5	5.0000	.81770	-4.18	-83.6	.00029	.000	1
CalStd7=50	50.000	59.648	9.65	19.3	.00219	.000	1



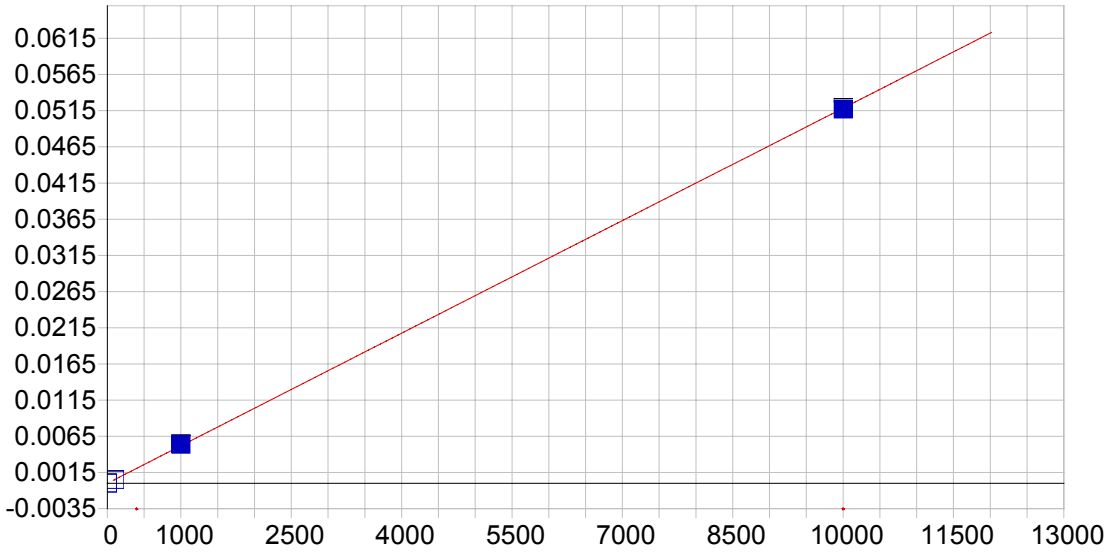
As 193.759 {474}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Full Fit	Weighting:	1/Conc

A0 (Offset):	0.199075	Re-Slope:	1.000000
A1 (Gain):	0.094025	Y-int:	0.000000
A2 (Curvature):	0.000001		
n (Exponent):	0.960000		
Correlation:	0.999973	Status:	Warning
Std Error of Est:	0.009415		
Predicted MDL:	5.474282		
Predicted MQL:	18.247606		

Positive Curvature

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.19899	.315	1
CalStd9=100	1000.0	1004.7	4.66	.466	72.406	.591	1
CalStd7=50	50.000	49.791	-.209	-.417	4.2050	.157	1
CalStd5=10	10.000	11.440	1.44	14.4	1.1749	.502	1
CalStd8=100	100.00	94.942	-5.06	-5.06	7.6457	.535	1
CalStd10=10	10000.	9999.5	-.470	-.005	697.34	3.59	1

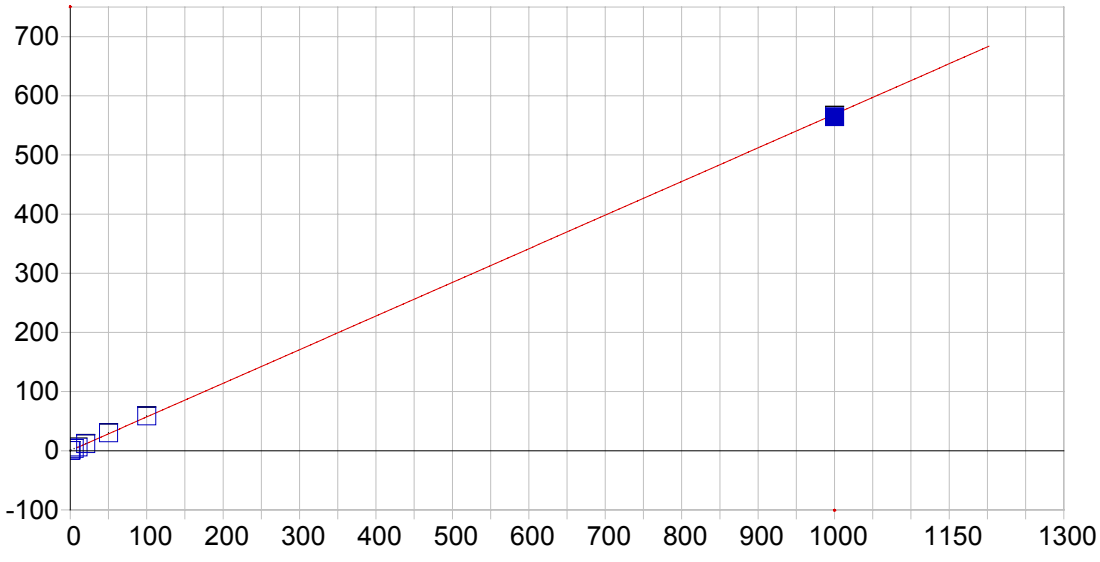


As 189.042 {479}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000007	Re-Slope:	1.000000
A1 (Gain):	0.000005	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999901	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	10.319078		
Predicted MQL:	34.396927		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00180	.002	.000	.00001	.000	1
CalStd9=100	1000.0	1035.7	35.7	3.57	.00538	.000	1
CalStd10=10	10000.	9970.8	-29.2	-.292	.05171	.000	1
CalStd8=100	100.00	95.194	-4.81	-4.81	.00050	.000	1
CalStd4=5	5.0000	3.2727	-1.73	-34.5	.00002	.000	1

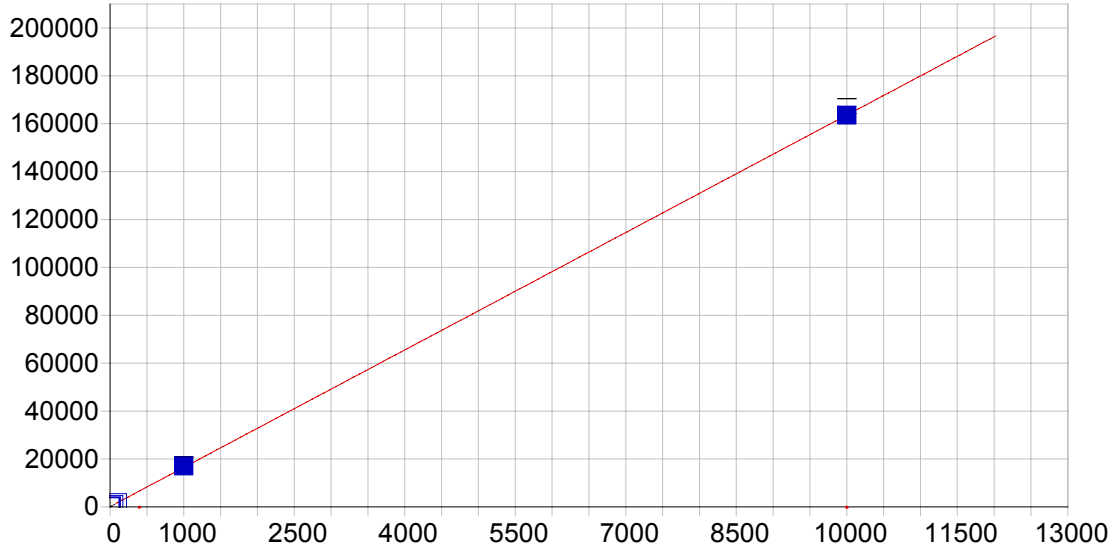


Ba 233.527 {445}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.255374	Re-Slope:	1.000000
A1 (Gain):	0.568595	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999752	Status:	OK.
Std Error of Est:	0.015900		
Predicted MDL:	0.840734		
Predicted MQL:	2.802445		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00057	-.001	.000	.25505	.643	1
CalStd7=50	50.000	52.665	2.67	5.33	30.200	.424	1
CalStd5=10	10.000	10.451	.451	4.51	6.1976	.097	1
CalStd6=20	20.000	20.437	.437	2.19	11.876	.314	1
CalStd8=100	100.00	102.76	2.76	2.76	58.685	.462	1
CalStd4=5	5.0000	6.0885	1.09	21.8	3.7173	.377	1
CalStd9=100	1000.0	992.39	-7.61	-.761	564.50	2.41	1
CalStd3=1	1.0000	1.2092	.209	20.9	.94294	.199	1

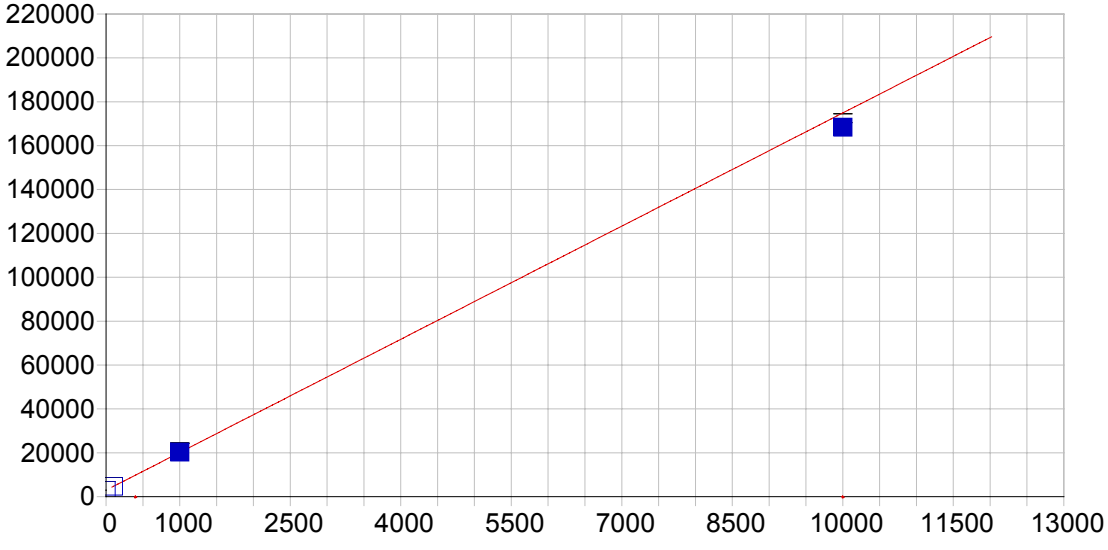


Ba 455.403 { 74}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	None

A0 (Offset):	128.329559	Re-Slope:	1.000000
A1 (Gain):	16.349961	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999993	Status:	OK.
Std Error of Est:	213.254439		
Predicted MDL:	0.254822		
Predicted MQL:	0.849407		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-5.7944	-5.79	.000	33.592	2.11	1
CalStd7=50	50.000	48.221	-1.78	-3.56	916.74	6.55	1
CalStd5=10	10.000	4.6598	-5.34	-53.4	204.52	4.22	1
CalStd6=20	20.000	14.833	-5.17	-25.8	370.85	2.13	1
CalStd8=100	100.00	99.680	-.320	-.320	1758.1	15.5	1
CalStd4=5	5.0000	-.10497	-5.10	-102.	126.61	1.54	1
CalStd9=100	1000.0	1032.1	32.1	3.21	17004.	117.	1
CalStd3=1	1.0000	-4.4503	-5.45	-545.	55.567	1.26	1
CalStd10=10	10000.	9996.8	-3.18	-.032	163580.	3080.	1

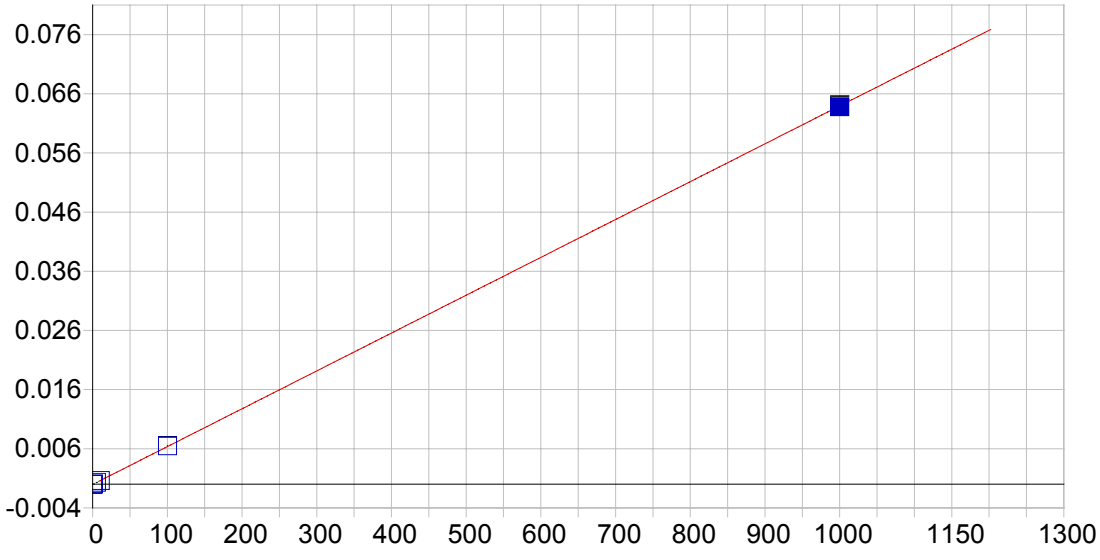


Ba 493.409 { 68}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	2945.071738	Re-Slope:	1.000000
A1 (Gain):	17.195576	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999825	Status:	OK.
Std Error of Est:	60.281266		
Predicted MDL:	0.467151		
Predicted MQL:	1.557169		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.58452	-.585	.000	2935.0	12.5	1
CalStd9=100	1000.0	1005.7	5.67	.567	20241.	96.1	1
CalStd8=100	100.00	102.29	2.29	2.29	4704.0	26.6	1
CalStd10=10	10000.	9619.5	-381.	-3.81	168390.	2020.	1

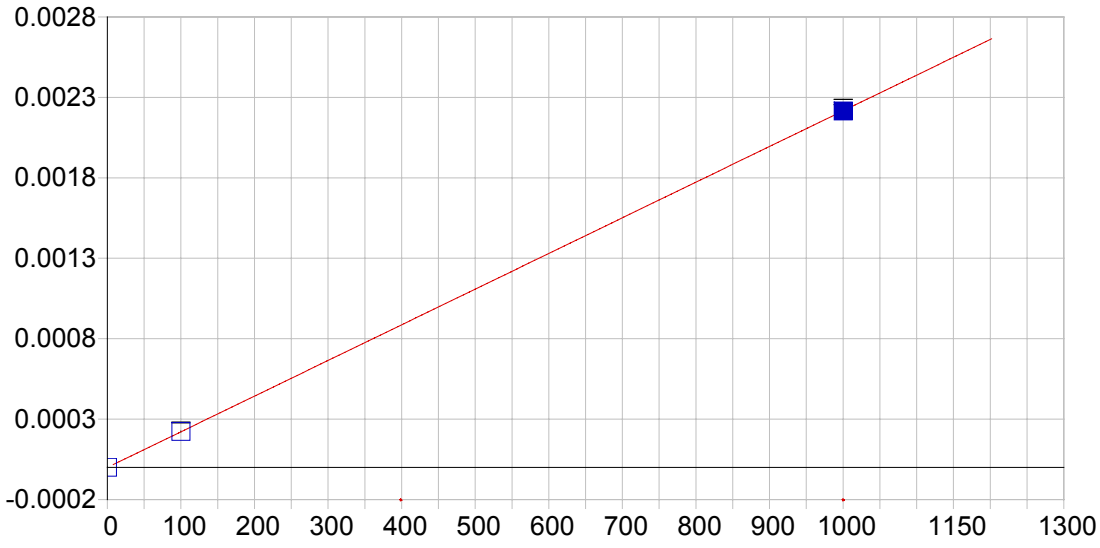


Be 313.042 {108}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000034	Re-Slope:	1.000000
A1 (Gain):	0.000064	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999970	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.034735		
Predicted MQL:	0.115783		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00007	.000	.000	-.00003	.000	1
CalStd5=10	10.000	9.9667	-.033	-.333	.00060	.000	1
CalStd8=100	100.00	101.95	1.95	1.95	.00649	.000	1
CalStd2=0.5	.50000	.49503	-.005	-.993	.00000	.000	1
CalStd4=5	5.0000	5.2605	.261	5.21	.00030	.000	1
CalStd1=0.25	.25000	.28912	.039	15.6	-.00002	.000	1
CalStd9=100	1000.0	997.73	-2.27	-.227	.06380	.000	1
CalStd3=1	1.0000	1.0538	.054	5.38	.00003	.000	1

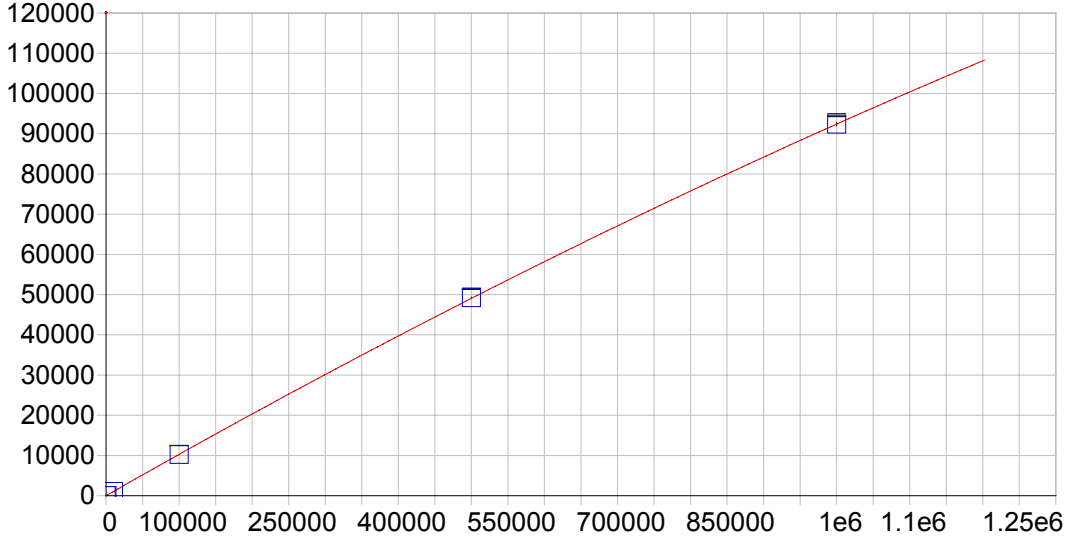


Be 234.861 {144}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999998	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.277755		
Predicted MQL:	0.925851		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00059	-.001	.000	.00000	.000	1
CalStd9=100	1000.0	999.34	-.656	-.066	.00222	.000	1
CalStd8=100	100.00	100.66	.656	.656	.00022	.000	1

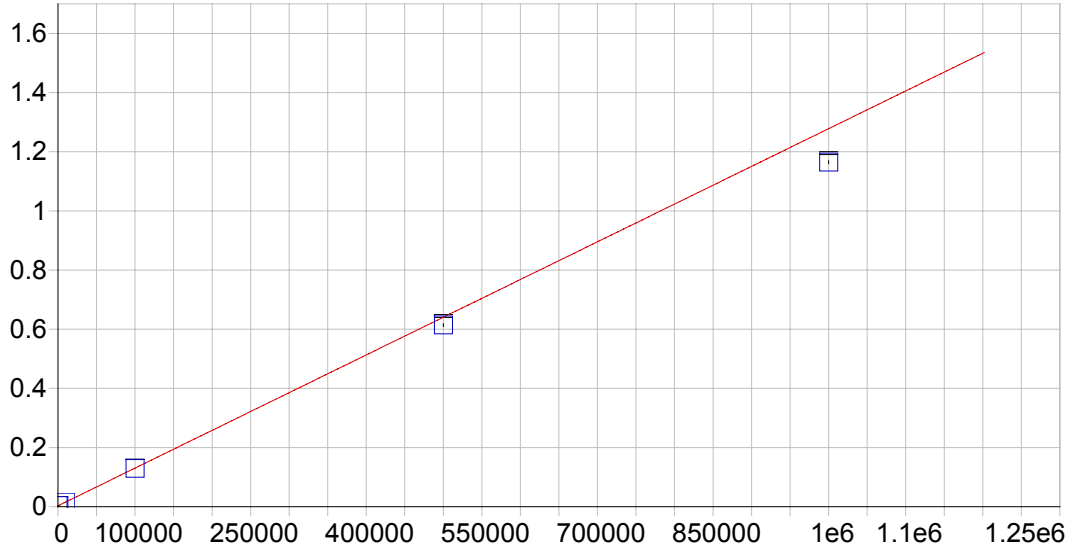


Ca 315.887 {107}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Curvilinear Weighting: 1/Conc

A0 (Offset):	10.736016	Re-Slope:	1.000000
A1 (Gain):	0.103826	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999996	Status:	OK.
Std Error of Est:	0.473366		
Predicted MDL:	10.129115		
Predicted MQL:	33.763716		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00519	-.005	.000	10.735	.361	1
CalStd10=10	10000.	9831.2	-169.	-1.69	1030.4	.861	1
CalStd13=50	500000.	501460.	1460.	.292	49200.	158.	1
CalStd14-100	1000000.	999240.	-758.	-.076	92340.	355.	1
CalStd9=100	1000.0	1025.7	25.7	2.57	117.22	1.16	1
CalStd12-100	100000.	99423.	-577.	-.577	10220.	43.7	1

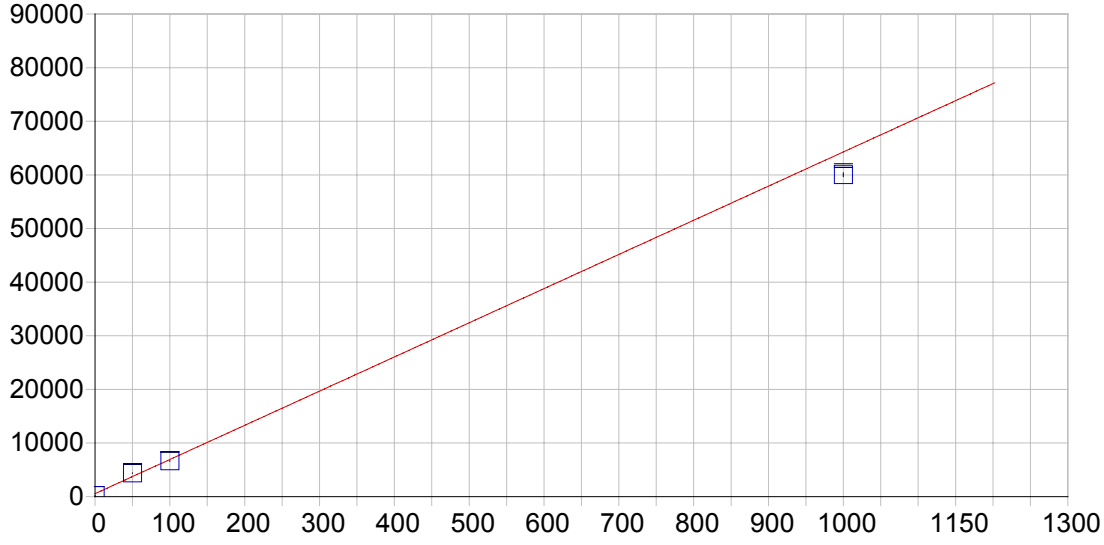


Ca 317.933 {106}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Curvilinear Weighting: 1/Conc

A0 (Offset):	0.003082	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999994	Status:	OK.
Std Error of Est:	0.000008		
Predicted MDL:	2.973608		
Predicted MQL:	9.912026		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.05783	.058	.000	.00308	.000	1
CalStd10=10	10000.	9622.6	-377.	-3.77	.01535	.000	1
CalStd13=50	500000.	479120.	-20900.	-4.18	.61390	.005	1
CalStd14-100	1000000.	910990.	-89000.	-8.90	1.1645	.005	1
CalStd9=100	1000.0	979.58	-20.4	-2.04	.00433	.000	1
CalStd12-100	100000.	98865.	-1140.	-1.14	.12912	.001	1

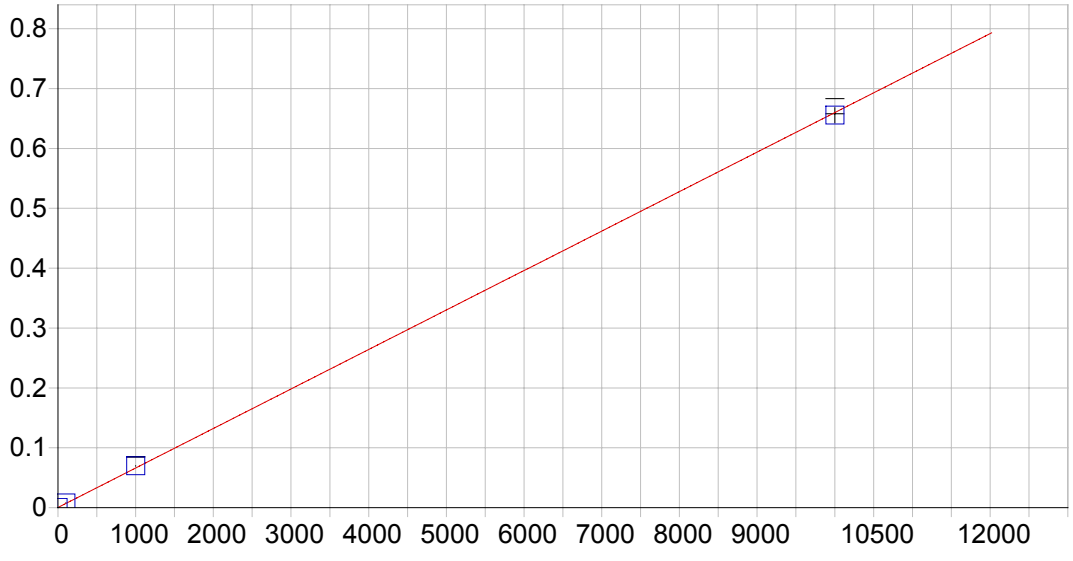


Ca 393.366 { 86}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	559.825042	Re-Slope:	1.000000
A1 (Gain):	63.722894	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.989257	Status:	OK.
Std Error of Est:	749.860516		
Predicted MDL:	0.045452		
Predicted MQL:	0.151506		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-5.8350	-5.83	.000	188.00	21.9	1
CalStd7=50	50.000	60.396	10.4	20.8	4408.4	27.1	1
CalStd9=100	1000.0	933.16	-66.8	-6.68	60023.	343.	1
CalStd8=100	100.00	95.705	-4.30	-4.30	6658.4	55.1	1

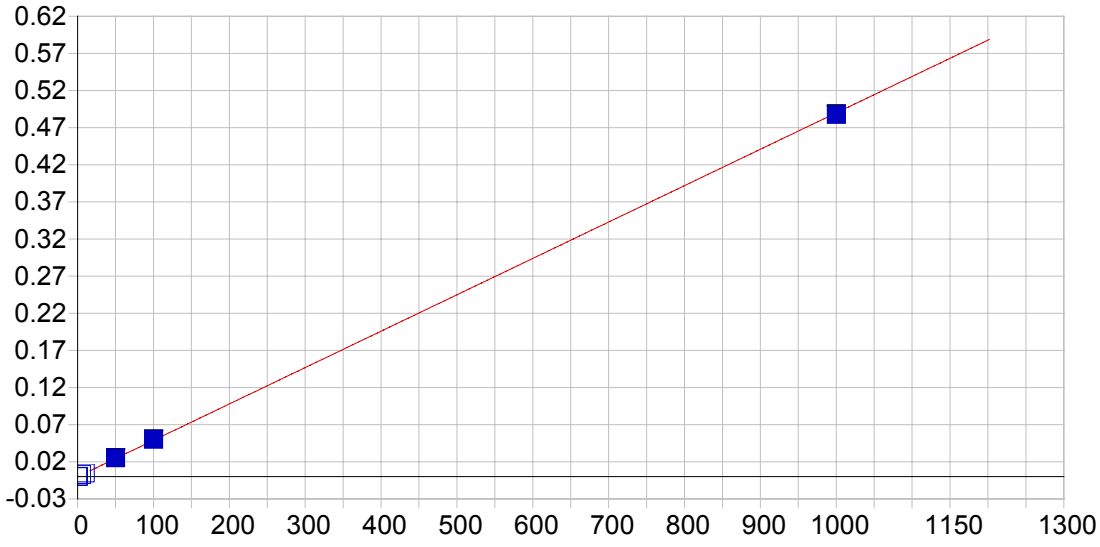


Ca 396.847 { 85}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000225	Re-Slope:	1.000000
A1 (Gain):	0.000066	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999746	Status:	OK.
Std Error of Est:	0.000070		
Predicted MDL:	0.104951		
Predicted MQL:	0.349837		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.01998	-.020	.000	.00022	.000	1
CalStd10=10	10000.	9931.6	-68.4	-.684	.65546	.013	1
CalStd8=100	100.00	115.36	15.4	15.4	.00784	.000	1
CalStd9=100	1000.0	1053.0	53.0	5.30	.06970	.000	1

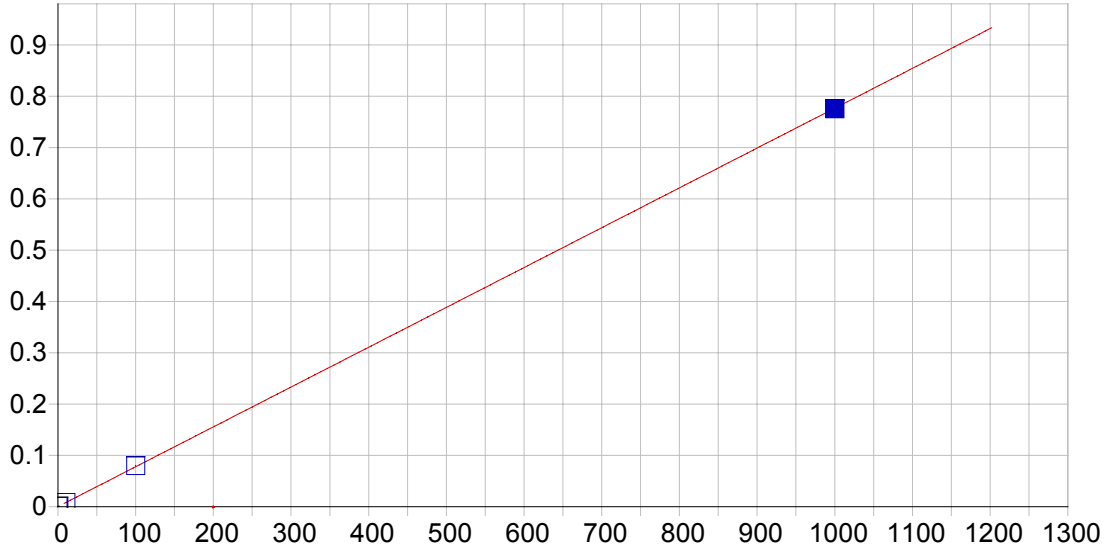


Cd 226.502 {449}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000121	Re-Slope:	1.000000
A1 (Gain):	0.000490	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999923	Status:	OK.
Std Error of Est:	0.000005		
Predicted MDL:	0.192369		
Predicted MQL:	0.641230		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00015	.000	.000	-.00012	.000	1
CalStd7=50	50.000	51.485	1.48	2.97	.02511	.000	1
CalStd3=1	1.0000	1.0816	.082	8.16	.00041	.000	1
CalStd2=0.5	.50000	.54644	.046	9.29	.00015	.000	1
CalStd4=5	5.0000	5.4282	.428	8.56	.00254	.000	1
CalStd8=100	100.00	102.57	2.57	2.57	.05014	.000	1
CalStd5=10	10.000	9.9758	-.024	-.242	.00477	.000	1
CalStd9=100	1000.0	995.42	-4.58	-.458	.48770	.001	1

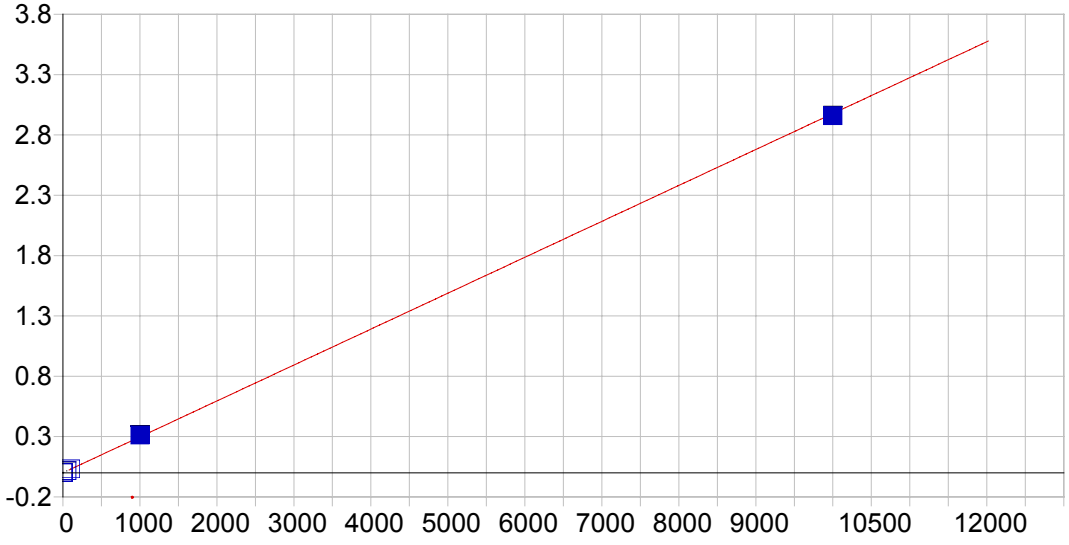


Cd 228.802 {447}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000272	Re-Slope:	1.000000
A1 (Gain):	0.000776	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999952	Status:	OK.
Std Error of Est:	0.000007		
Predicted MDL:	0.154351		
Predicted MQL:	0.514503		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00017	.000	.000	.00027	.000	1
CalStd9=100	1000.0	997.93	-2.07	-.207	.77496	.001	1
CalStd8=100	100.00	102.30	2.30	2.30	.07969	.000	1
CalStd2=0.5	.50000	.34653	-.153	-30.7	.00054	.000	1
CalStd3=1	1.0000	.94562	-.054	-5.44	.00101	.000	1
CalStd5=10	10.000	9.9752	-.025	-.248	.00802	.000	1

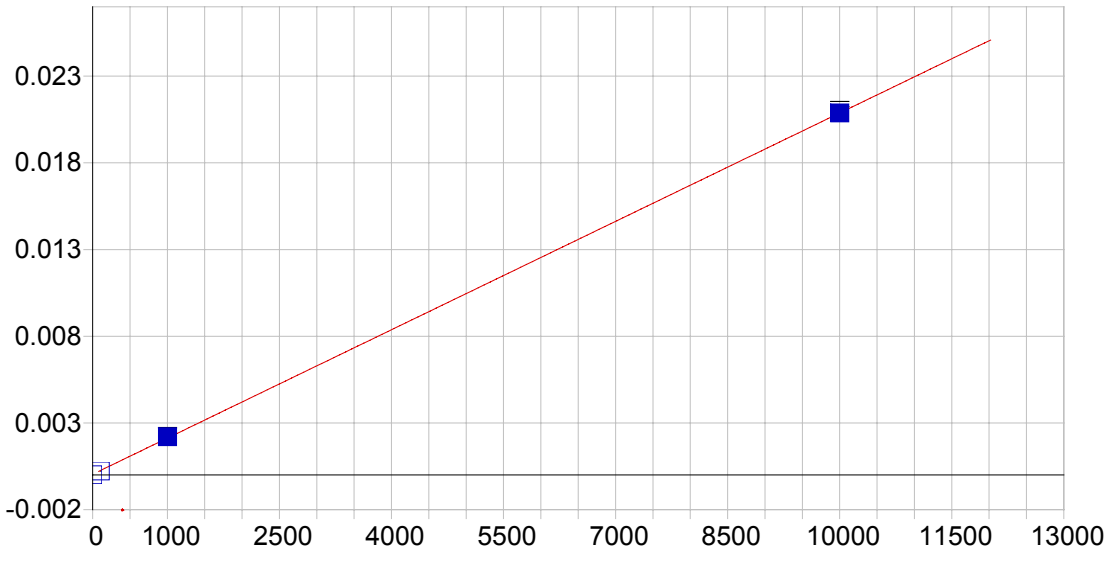


Co 228.616 {447}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000293	Re-Slope:	1.000000
A1 (Gain):	0.000298	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999834	Status:	OK.
Std Error of Est:	0.000021		
Predicted MDL:	0.327832		
Predicted MQL:	1.092773		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00062	-.001	.000	-.00029	.000	1
CalStd7=50	50.000	54.448	4.45	8.90	.01592	.000	1
CalStd5=10	10.000	10.364	.364	3.64	.00279	.000	1
CalStd4=5	5.0000	5.6464	.646	12.9	.00139	.000	1
CalStd8=100	100.00	106.57	6.57	6.57	.03143	.000	1
CalStd9=100	1000.0	1048.5	48.5	4.85	.31188	.000	1
CalStd3=1	1.0000	1.2531	.253	25.3	.00008	.000	1
CalStd10=10	10000.	9939.2	-60.8	-.608	2.9589	.002	1

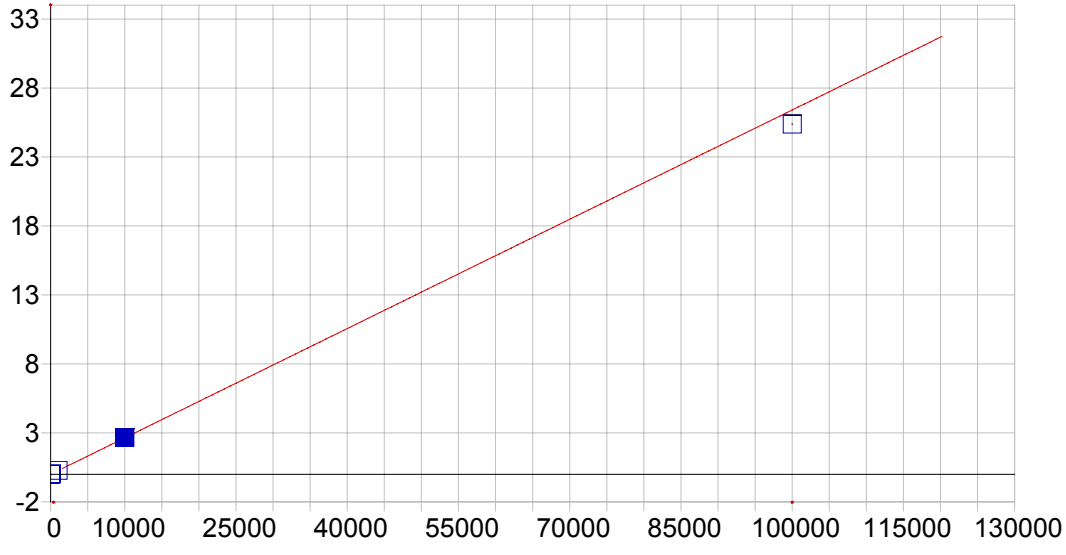


Co 238.892 {141}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	None

A0 (Offset):	0.000041	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999987	Status:	OK.
Std Error of Est:	0.000062		
Predicted MDL:	0.903392		
Predicted MQL:	3.011305		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-19.944	-19.9	.000	.00000	.000	1
CalStd9=100	1000.0	1035.1	35.1	3.51	.00220	.000	1
CalStd10=10	10000.	9996.6	-3.39	-.034	.02087	.000	1
CalStd8=100	100.00	88.266	-11.7	-11.7	.00022	.000	1

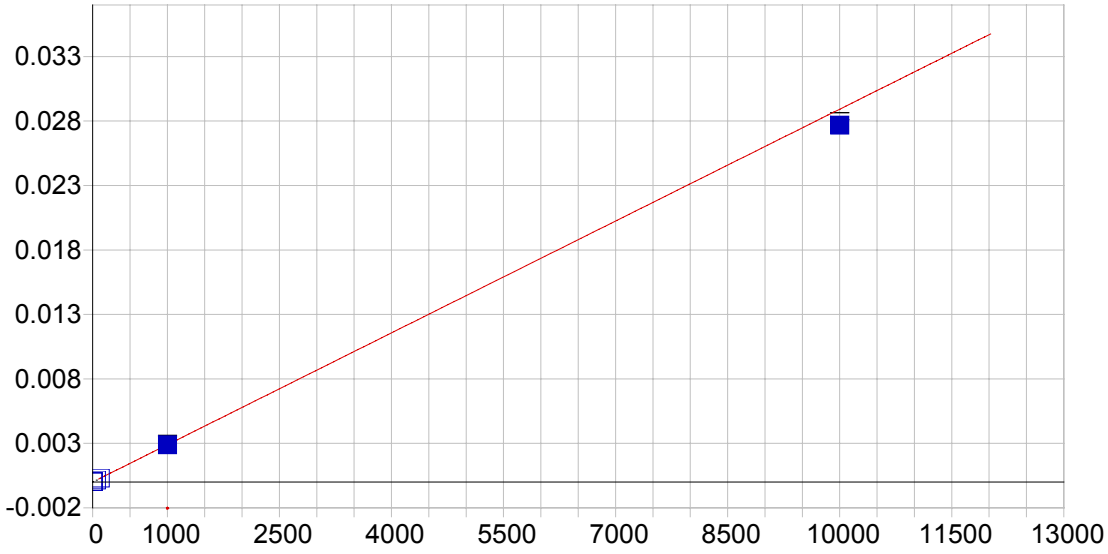


Cr 205.560 {464}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000460	Re-Slope:	1.000000
A1 (Gain):	0.000264	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999370	Status:	OK.
Std Error of Est:	0.001730		
Predicted MDL:	0.236517		
Predicted MQL:	0.788391		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-2.1972	-2.20	.000	-.00012	.000	1
CalStd5=10	10.000	8.3507	-1.65	-16.5	.00266	.000	1
CalStd7=50	50.000	52.497	2.50	4.99	.01432	.000	1
CalStd9=100	1000.0	1052.6	52.6	5.26	.27841	.000	1
CalStd8=100	100.00	105.21	5.21	5.21	.02824	.000	1
CalStd4=5	5.0000	3.6544	-1.35	-26.9	.00142	.000	1
CalStd3=1	1.0000	-.62597	-1.63	-163.	.00029	.000	1
CalStd11-100	100000.	96066.	-3930.	-3.93	25.368	.023	1
CalStd10=10	10000.	10047.	47.1	.471	2.6535	.002	1

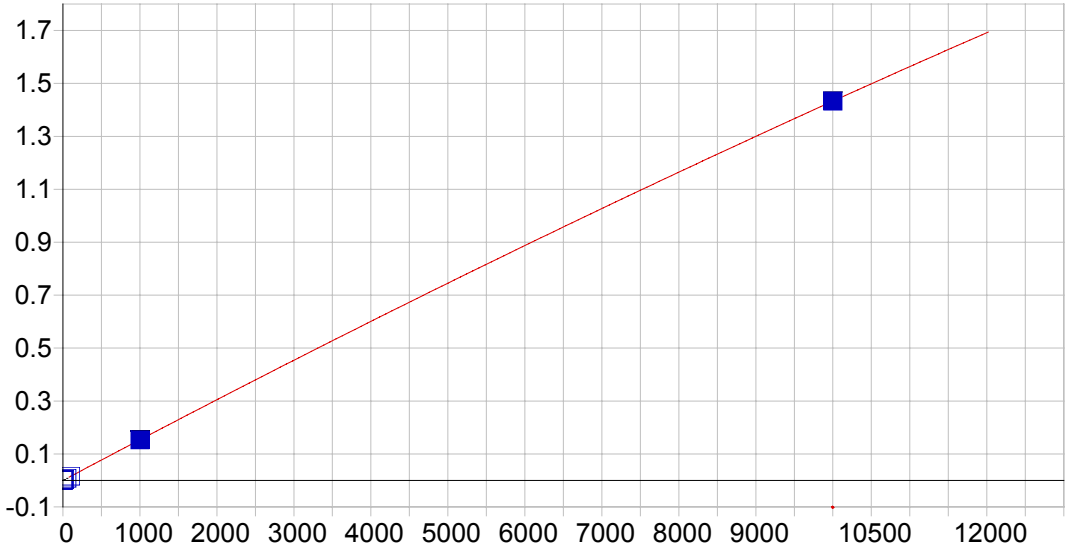


Cr 267.716 {126}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Linear Weighting: 1/Var

A0 (Offset):	0.000003	Re-Slope:	1.000000
A1 (Gain):	0.000003	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999561	Status:	OK.
Std Error of Est:	0.000006		
Predicted MDL:	0.876423		
Predicted MQL:	2.921411		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.86371	-.864	.000	.00000	.000	1
CalStd5=10	10.000	9.1604	-.840	-8.40	.00003	.000	1
CalStd7=50	50.000	50.917	.917	1.83	.00015	.000	1
CalStd9=100	1000.0	995.19	-4.81	-.481	.00288	.000	1
CalStd8=100	100.00	101.49	1.49	1.49	.00030	.000	1
CalStd4=5	5.0000	4.0689	-.931	-18.6	.00001	.000	1
CalStd10=10	10000.	9570.5	-430.	-4.30	.02767	.000	1

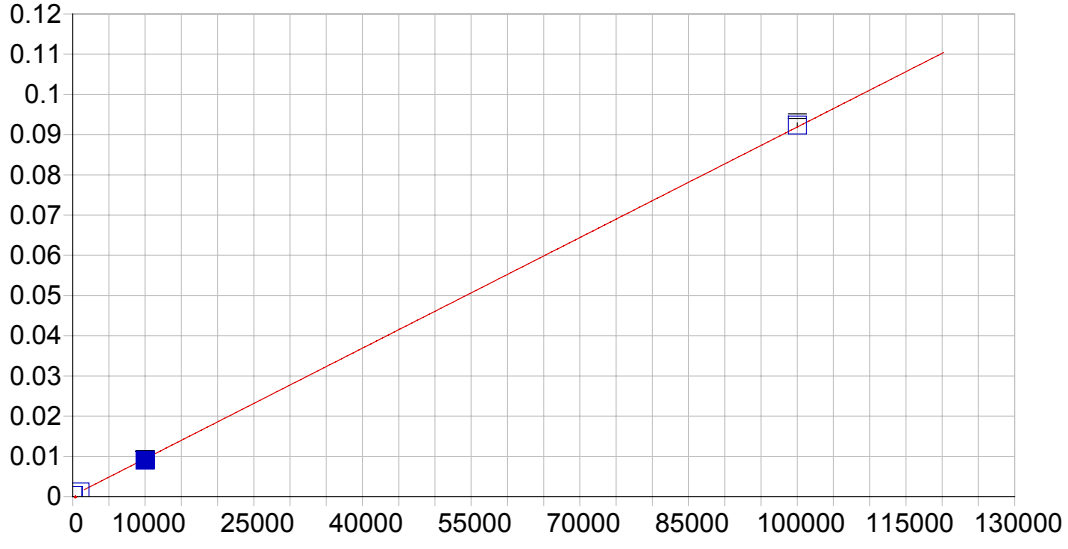


Cu 224.700 {450}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Curvilinear	Weighting:	1/Conc

A0 (Offset):	-0.000178	Re-Slope:	1.000000
A1 (Gain):	0.000155	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999908	Status:	OK.
Std Error of Est:	0.000008		
Predicted MDL:	0.613789		
Predicted MQL:	2.045964		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00149	-.001	.000	-.00018	.000	1
CalStd9=100	1000.0	994.10	-5.90	-.590	.15266	.000	1
CalStd7=50	50.000	51.428	1.43	2.86	.00778	.000	1
CalStd8=100	100.00	100.80	.800	.800	.01542	.000	1
CalStd5=10	10.000	10.201	.201	2.01	.00140	.000	1
CalStd10=10	10000.	10001.	.664	.007	1.4334	.001	1
CalStd4=5	5.0000	6.4111	1.41	28.2	.00082	.000	1
CalStd6=20	20.000	20.275	.275	1.37	.00296	.000	1
CalStd3=1	1.0000	2.1398	1.14	114.	.00015	.000	1

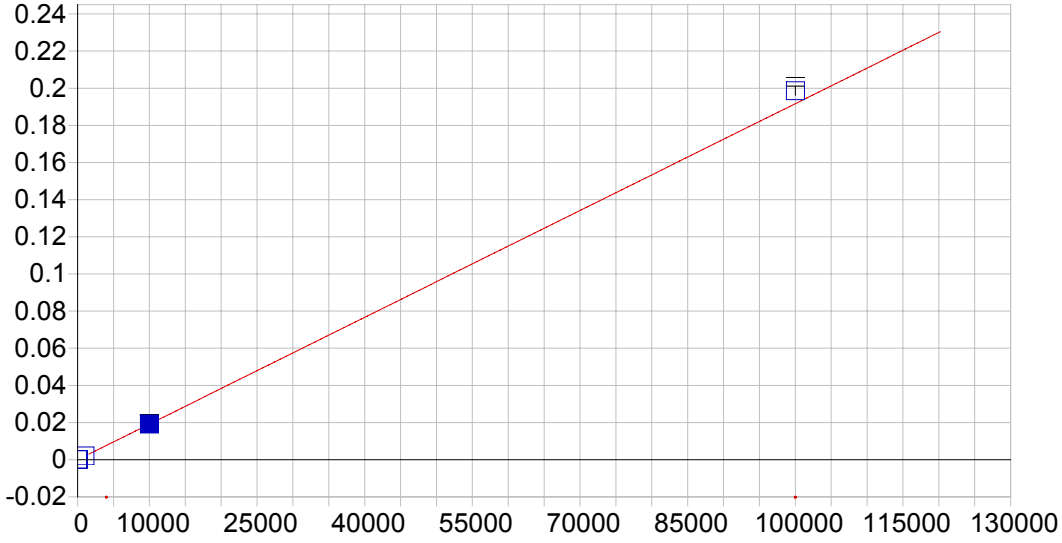


Cu 324.754 {104}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000261	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999898	Status:	OK.
Std Error of Est:	0.000002		
Predicted MDL:	2.106370		
Predicted MQL:	7.021233		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.01447	.014	.000	.00026	.000	1
CalStd9=100	1000.0	961.94	-38.1	-3.81	.00114	.000	1
CalStd8=100	100.00	93.162	-6.84	-6.84	.00035	.000	1
CalStd10=10	10000.	9570.4	-430.	-4.30	.00904	.000	1
CalStd11-100	100000.	100470.	475.	.475	.09234	.001	1

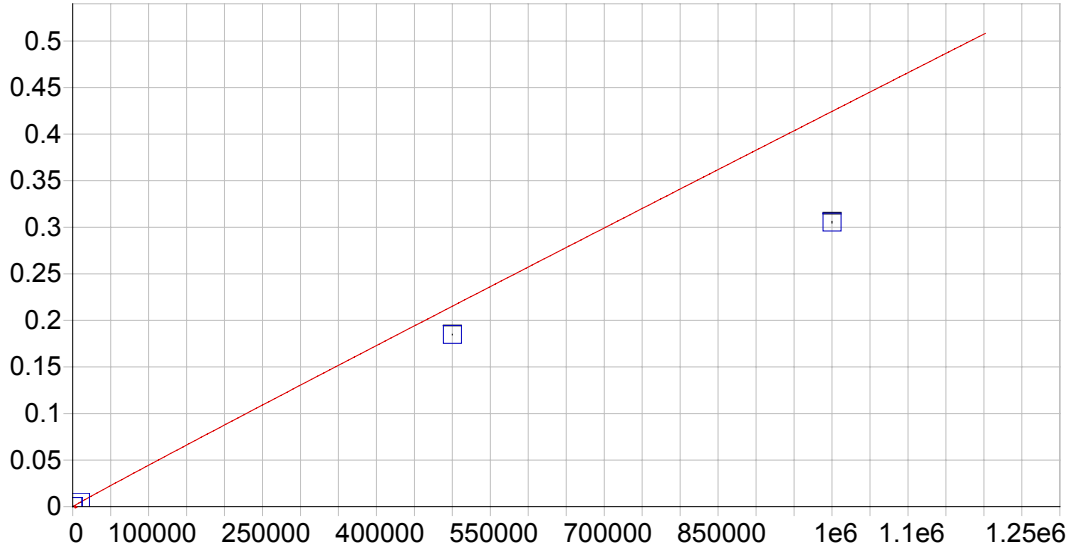


Cu 327.396 {103}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Curvilinear Weighting: 1/Conc

A0 (Offset):	-0.000016	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999989	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	3.644126		
Predicted MQL:	12.147086		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00580	-.006	.000	-.00002	.000	1
CalStd6=20	20.000	21.747	1.75	8.74	.00003	.000	1
CalStd7=50	50.000	55.842	5.84	11.7	.00009	.000	1
CalStd8=100	100.00	105.70	5.70	5.70	.00019	.000	1
CalStd9=100	1000.0	1034.3	34.3	3.43	.00197	.000	1
CalStd10=10	10000.	9984.0	-16.0	-.160	.01912	.000	1
CalStd11-100	100000.	103610.	3610.	3.61	.19860	.002	1

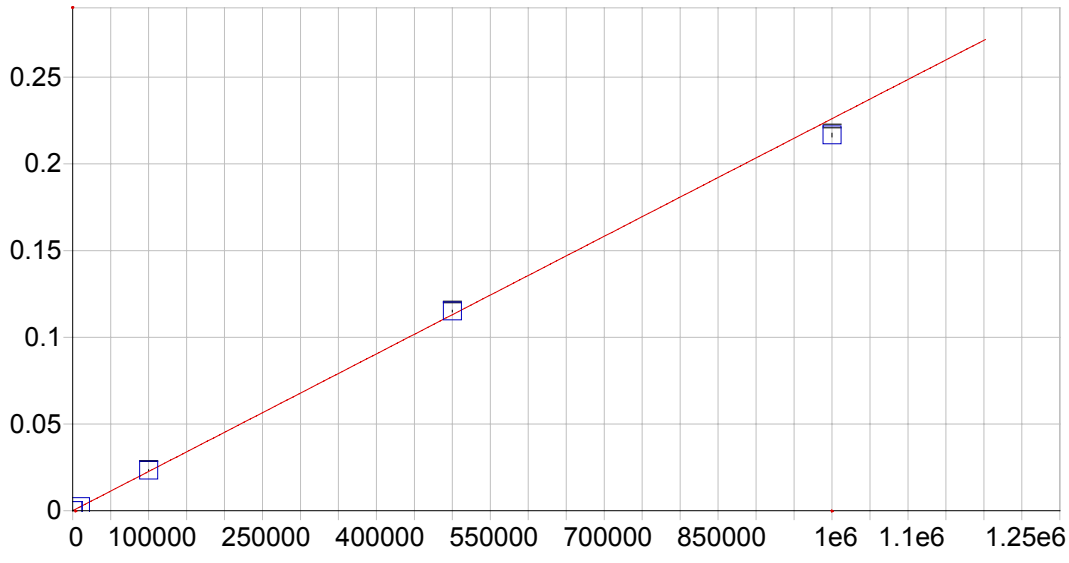


Fe 234.349 {144}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Full Fit	Weighting:	1/Conc

A0 (Offset):	0.000032	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	0.980000		
Correlation:	0.999999	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	1.493784		
Predicted MQL:	4.979280		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.01950	.020	.000	.00003	.000	1
CalStd10=10	10000.	9862.0	-138.	-1.38	.00462	.000	1
CalStd13=50	500000.	427890.	-72100.	-14.4	.18473	.000	1
CalStd14-100	1000000.	714720.	-285000.	-28.5	.30540	.001	1
CalStd9=100	1000.0	984.76	-15.2	-1.52	.00051	.000	1

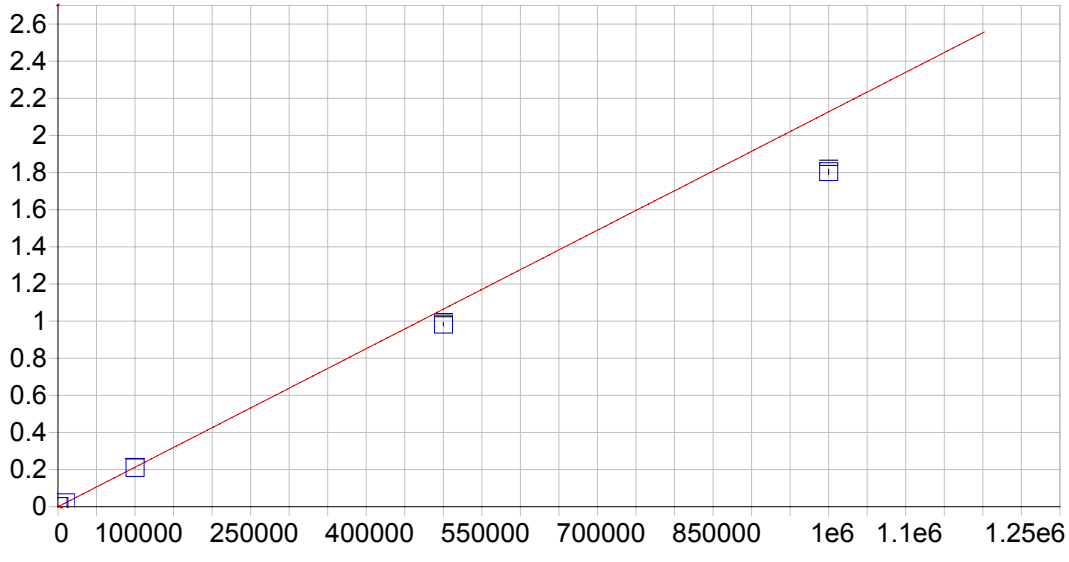


Fe 239.562 {140}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000002	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999833	Status:	OK.
Std Error of Est:	0.000003		
Predicted MDL:	3.643540		
Predicted MQL:	12.145133		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.12176	-.122	.000	.00000	.000	1
CalStd10=10	10000.	10025.	25.5	.255	.00227	.000	1
CalStd13=50	500000.	509160.	9160.	1.83	.11511	.000	1
CalStd14-100	1000000.	958330.	-41700.	-4.17	.21665	.001	1
CalStd9=100	1000.0	1007.2	7.24	.724	.00023	.000	1
CalStd12-100	100000.	103300.	3300.	3.30	.02336	.000	1

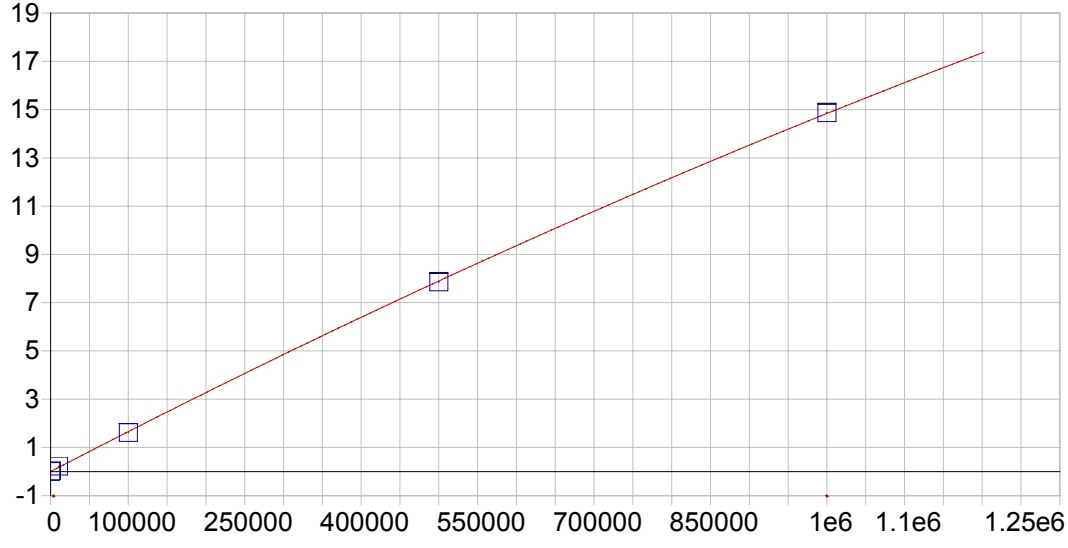


Fe 259.940 {129}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Full Fit Weighting: None

A0 (Offset):	0.000079	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	1.000000	Status:	OK.
Std Error of Est:	0.000483		
Predicted MDL:	1.760734		
Predicted MQL:	5.869114		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.00002	.000	1
CalStd10=10	10000.	9834.2	-166.	-1.66	.02100	.000	1
CalStd13=50	500000.	461900.	-38100.	-7.62	.98264	.009	1
CalStd14-100	1000000.	847990.	-152000.	-15.2	1.8039	.014	1
CalStd9=100	1000.0	984.00	-16.0	-1.60	.00217	.000	1
CalStd12-100	100000.	98746.	-1250.	-1.25	.21013	.001	1

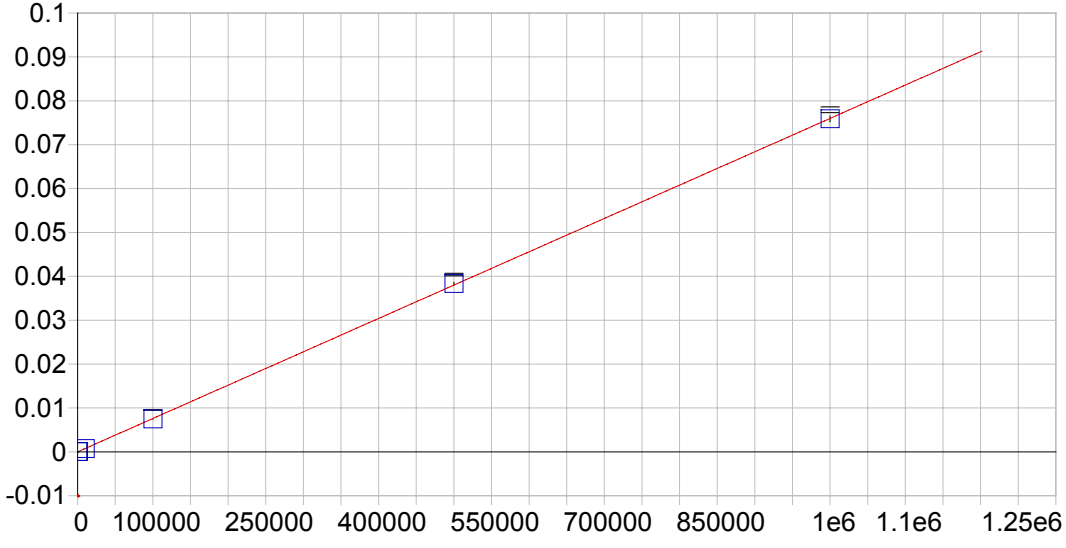


Mg 202.582 {466}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Curvilinear Weighting: 1/Conc

A0 (Offset):	-0.000087	Re-Slope:	1.000000
A1 (Gain):	0.000017	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999545	Status:	OK.
Std Error of Est:	0.000826		
Predicted MDL:	4.137060		
Predicted MQL:	13.790201		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.69693	-.697	.000	-.00010	.000	1
CalStd13=50	500000.	497250.	-2750.	-.550	7.8544	.021	1
CalStd10=10	10000.	13122.	3120.	31.2	.21926	.000	1
CalStd14-100	1000000.	1001900.	1860.	.186	14.864	.019	1
CalStd12-100	100000.	97411.	-2590.	-2.59	1.6126	.003	1
CalStd9=100	1000.0	1414.4	414.	41.4	.02359	.000	1

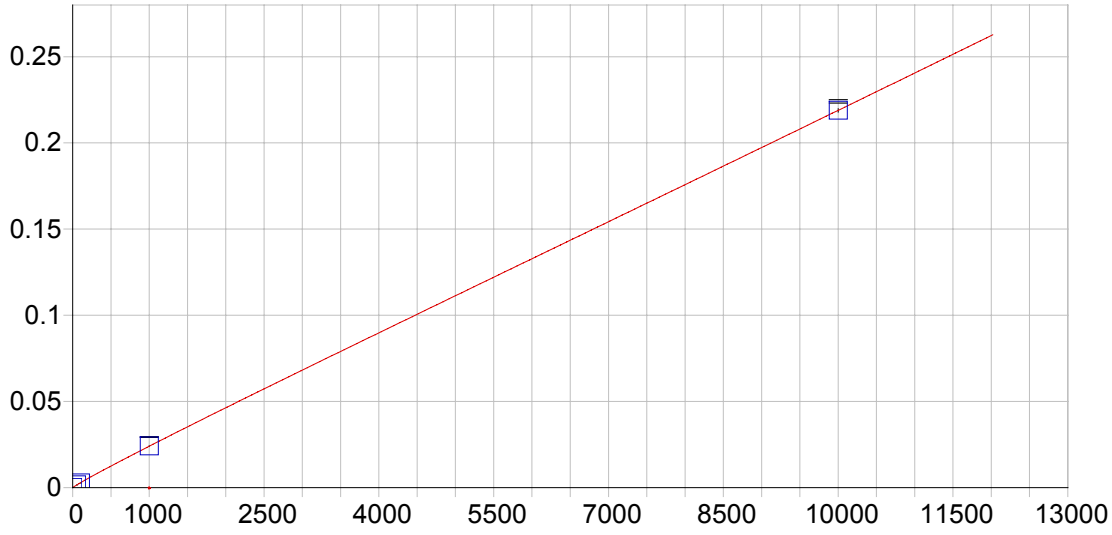


Mg 279.079 {121}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Curvilinear Weighting: 1/Conc

A0 (Offset):	-0.000001	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999971	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	24.757864		
Predicted MQL:	82.526212		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.07055	.071	.000	.00000	.000	1
CalStd13=50	500000.	504390.	4390.	.878	.03833	.000	1
CalStd10=10	10000.	9602.1	-398.	-3.98	.00073	.000	1
CalStd14-100	1000000.	998610.	-1390.	-.139	.07588	.001	1
CalStd12-100	100000.	98099.	-1900.	-1.90	.00745	.000	1
CalStd9=100	1000.0	981.74	-18.3	-1.83	.00007	.000	1

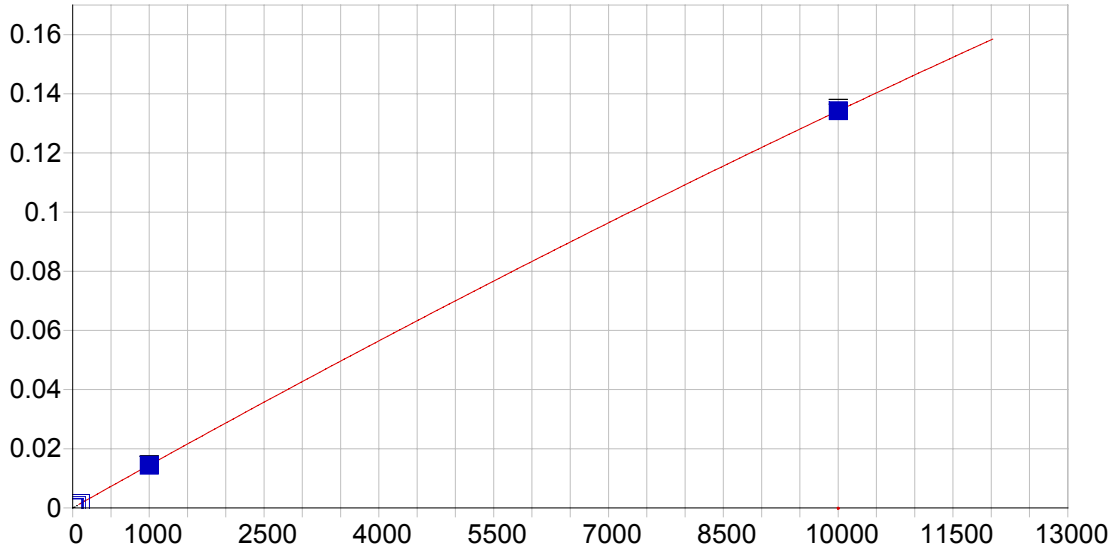


Mg 280.270 {120}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Full Fit	Weighting:	1/Conc

A0 (Offset):	0.000057	Re-Slope:	1.000000
A1 (Gain):	0.000036	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	0.940000		
Correlation:	0.999974	Status:	Warning Positive Curvature
Std Error of Est:	0.000008		
Predicted MDL:	0.038679		
Predicted MQL:	0.128929		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.00006	.000	1
CalStd9=100	1000.0	1002.2	2.17	.217	.02409	.000	1
CalStd10=10	10000.	9999.8	-.236	-.002	.21888	.001	1
CalStd8=100	100.00	95.196	-4.80	-4.80	.00267	.000	1
CalStd7=50	50.000	53.039	3.04	6.08	.00157	.000	1

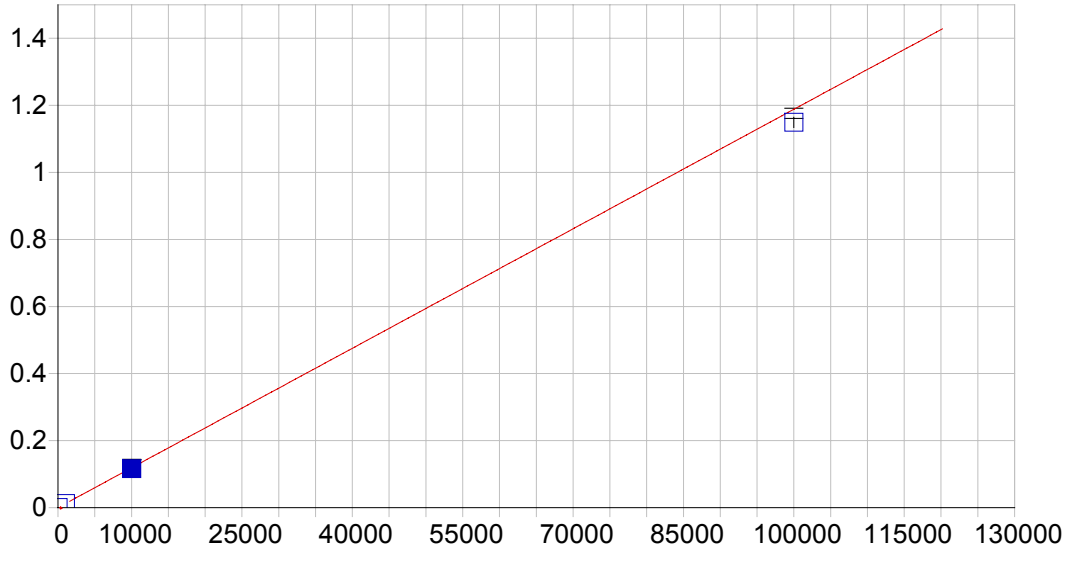


Mn 257.610 {131}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Curvilinear	Weighting:	1/Conc

A0 (Offset):	0.000002	Re-Slope:	1.000000
A1 (Gain):	0.000015	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999991	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	0.088155		
Predicted MQL:	0.293850		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00064	-.001	.000	.00000	.000	1
CalStd5=10	10.000	9.9949	-.005	-.051	.00015	.000	1
CalStd7=50	50.000	51.985	1.98	3.97	.00076	.000	1
CalStd6=20	20.000	19.822	-.178	-.889	.00029	.000	1
CalStd8=100	100.00	101.97	1.97	1.97	.00149	.000	1
CalStd4=5	5.0000	5.4120	.412	8.24	.00008	.000	1
CalStd9=100	1000.0	995.32	-4.68	-.468	.01440	.000	1
CalStd10=10	10000.	10001.	.513	.005	.13423	.001	1

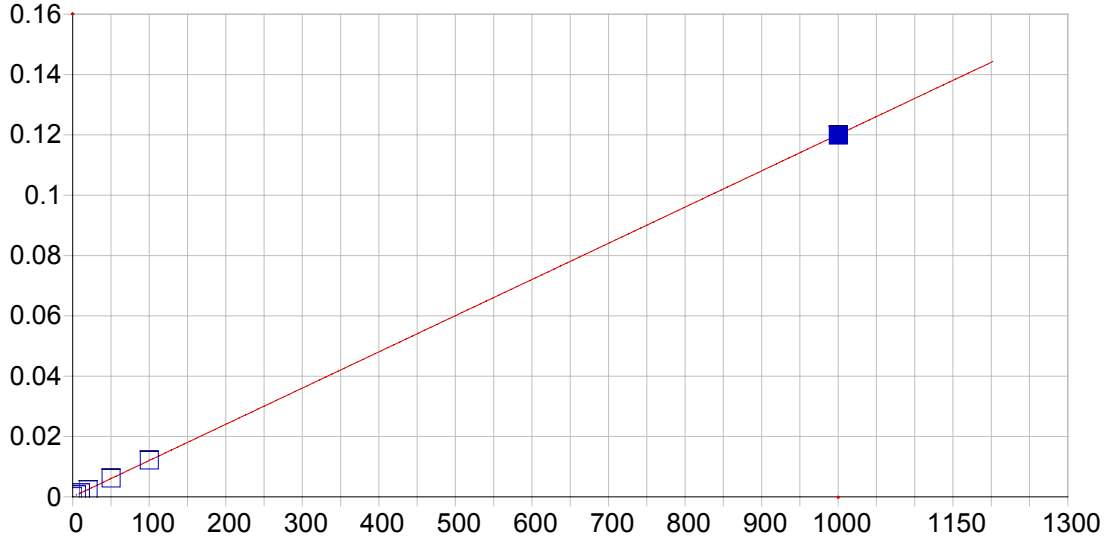


Mn 259.373 {130}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000004	Re-Slope:	1.000000
A1 (Gain):	0.000012	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999849	Status:	OK.
Std Error of Est:	0.000021		
Predicted MDL:	0.378593		
Predicted MQL:	1.261977		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.03886	-.039	.000	.00000	.000	1
CalStd10=10	10000.	9764.1	-236.	-2.36	.11618	.001	1
CalStd11-100	100000.	96709.	-3290.	-3.29	1.1491	.015	1
CalStd9=100	1000.0	1011.7	11.7	1.17	.01204	.000	1

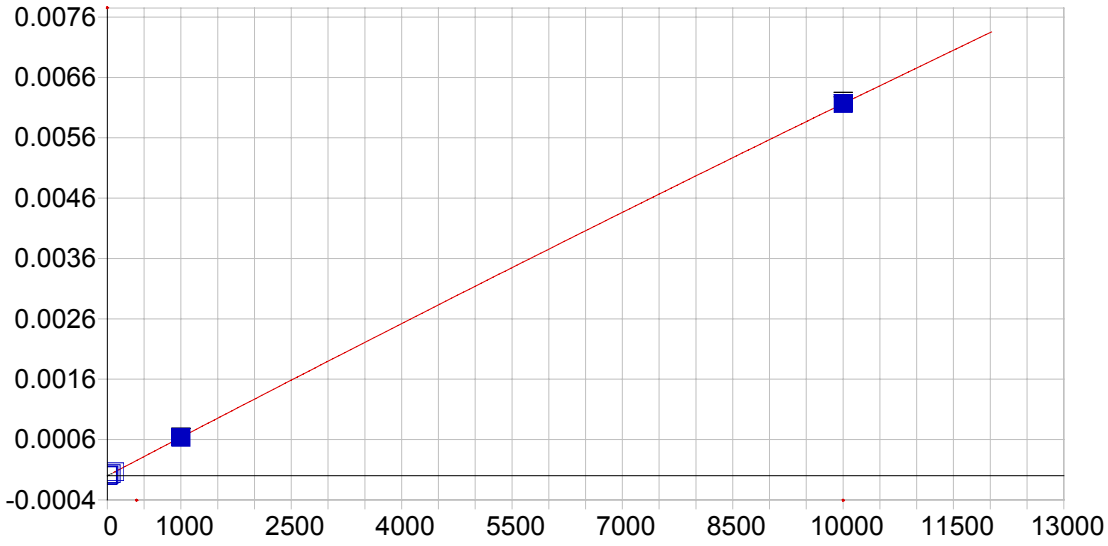


Mo 202.030 {466}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	0.000044	Re-Slope:	1.000000
A1 (Gain):	0.000120	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999970	Status:	OK.
Std Error of Est:	0.000003		
Predicted MDL:	0.423391		
Predicted MQL:	1.411303		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00013	.000	.000	.00004	.000	1
CalStd7=50	50.000	51.155	1.15	2.31	.00618	.000	1
CalStd6=20	20.000	19.233	-.767	-3.84	.00235	.000	1
CalStd5=10	10.000	10.153	.153	1.53	.00126	.000	1
CalStd8=100	100.00	100.92	.923	.923	.01216	.000	1
CalStd4=5	5.0000	5.0921	.092	1.84	.00066	.000	1
CalStd9=100	1000.0	998.44	-1.56	-.156	.11988	.000	1

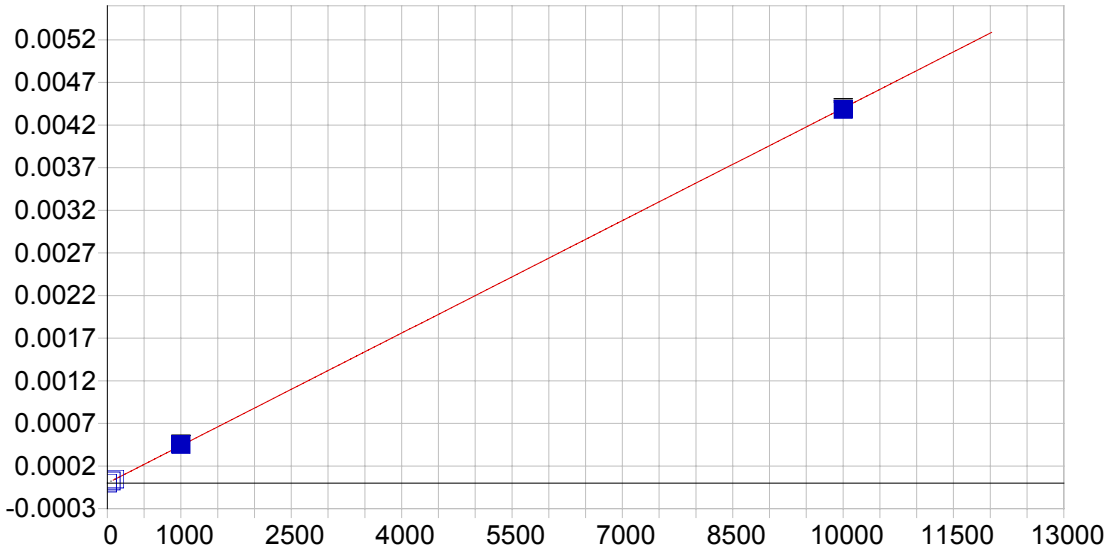


Mo 204.598 {464}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Full Fit	Weighting:	1/Conc

A0 (Offset):	-0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999994	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.684927		
Predicted MQL:	2.283089		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.00000	.000	1
CalStd7=50	50.000	51.673	1.67	3.35	.00003	.000	1
CalStd6=20	20.000	19.772	-.228	-1.14	.00001	.000	1
CalStd5=10	10.000	10.064	.064	.641	.00001	.000	1
CalStd8=100	100.00	100.58	.580	.580	.00006	.000	1
CalStd4=5	5.0000	5.4968	.497	9.94	.00000	.000	1
CalStd9=100	1000.0	997.12	-2.88	-.288	.00064	.000	1
CalStd10=10	10000.	10000.	.293	.003	.00617	.000	1

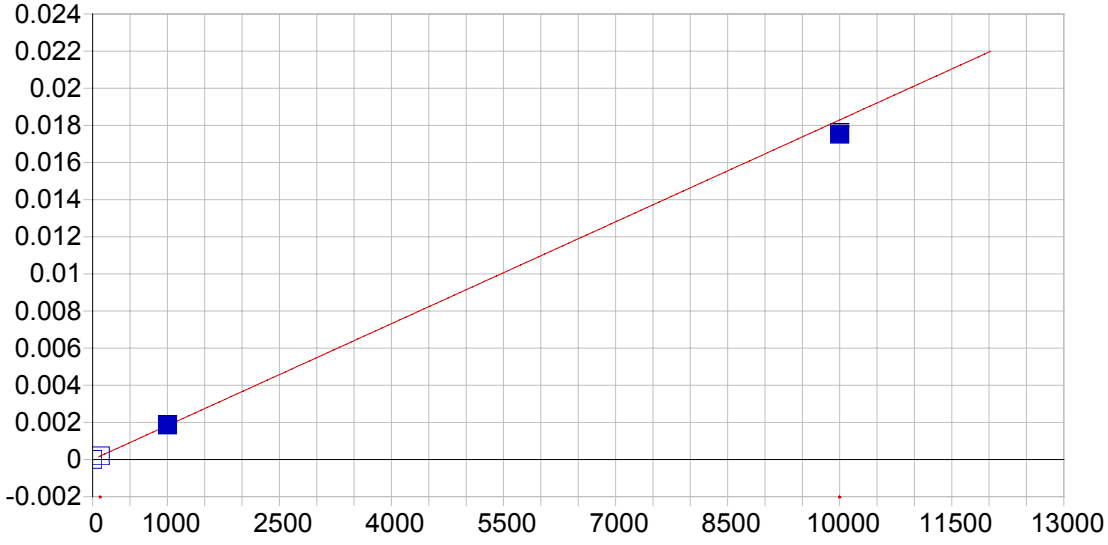


Mo 204.598 {465}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999941	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.968602		
Predicted MQL:	3.228675		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00627	-.006	.000	.00000	.000	1
CalStd9=100	1000.0	1028.5	28.5	2.85	.00045	.000	1
CalStd10=10	10000.	9964.0	-36.0	-.360	.00438	.000	1
CalStd7=50	50.000	52.541	2.54	5.08	.00002	.000	1
CalStd8=100	100.00	104.97	4.97	4.97	.00005	.000	1

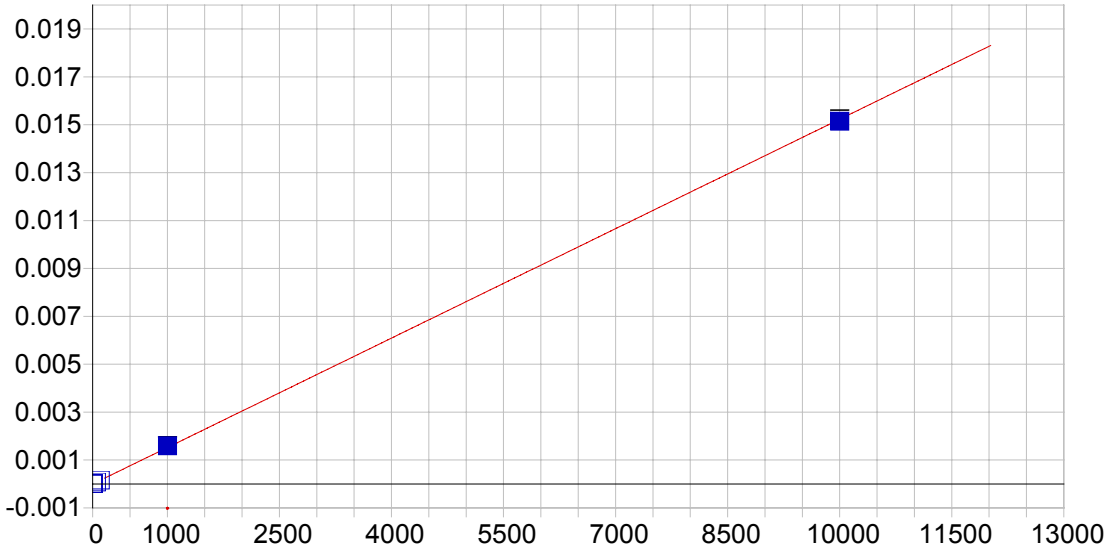


Ni 221.647 {452}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000001	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999523	Status:	OK.
Std Error of Est:	0.000007		
Predicted MDL:	0.462870		
Predicted MQL:	1.542900		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-1.0755	-1.08	.000	.00000	.000	1
CalStd10=10	10000.	9576.1	-424.	-4.24	.01752	.000	1
CalStd8=100	100.00	102.27	2.27	2.27	.00019	.000	1
CalStd9=100	1000.0	1010.7	10.7	1.07	.00185	.000	1

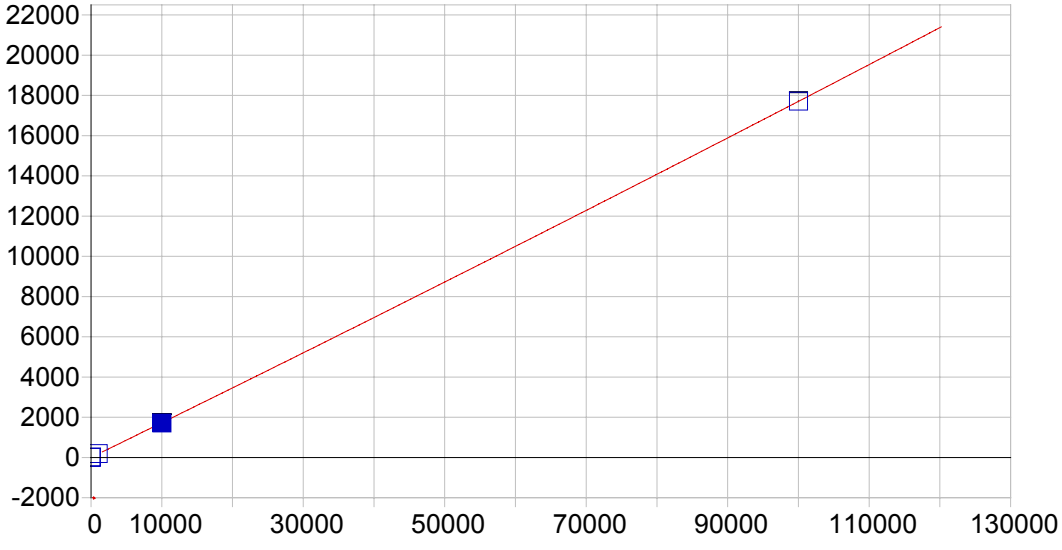


Ni 231.604 {445}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000003	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999842	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.562209		
Predicted MQL:	1.874030		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00092	-.001	.000	.00000	.000	1
CalStd7=50	50.000	54.120	4.12	8.24	.00008	.000	1
CalStd5=10	10.000	10.423	.423	4.23	.00001	.000	1
CalStd8=100	100.00	107.17	7.17	7.17	.00016	.000	1
CalStd4=5	5.0000	5.7476	.748	15.0	.00001	.000	1
CalStd9=100	1000.0	1043.9	43.9	4.39	.00159	.000	1
CalStd3=1	1.0000	1.5377	.538	53.8	.00000	.000	1
CalStd10=10	10000.	9943.1	-56.9	-.569	.01514	.000	1

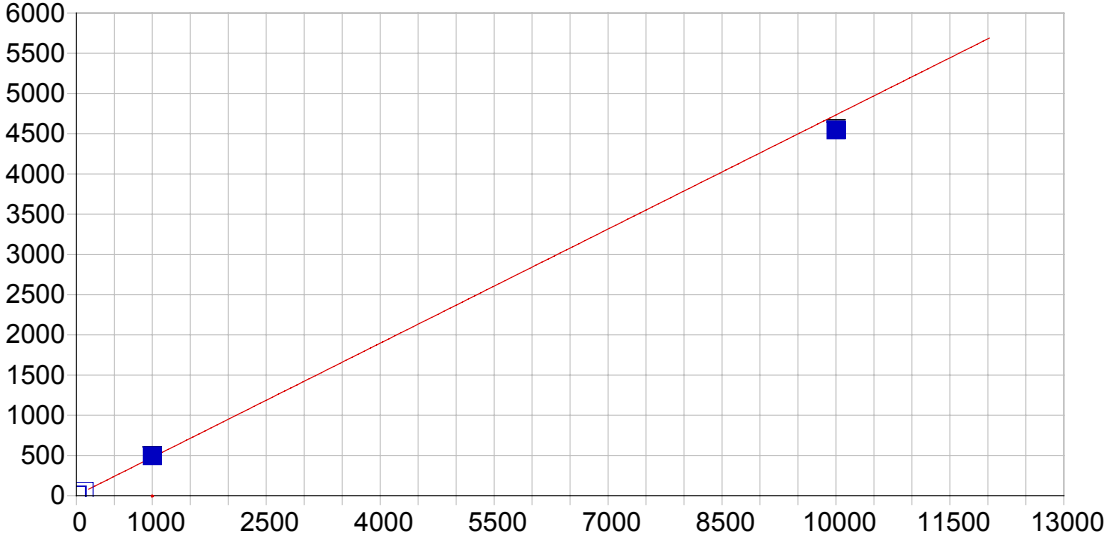


Pb 216.999 {455}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Curvilinear	Weighting:	1/Var

A0 (Offset):	1.985892	Re-Slope:	1.000000
A1 (Gain):	0.171763	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999892	Status:	Warning Positive Curvature
Std Error of Est:	6.735656		
Predicted MDL:	4.961457		
Predicted MQL:	16.538189		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-15.197	-15.2	.000	-.62433	.818	1
CalStd9=100	1000.0	1062.2	62.2	6.22	184.79	.937	1
CalStd10=10	10000.	9891.2	-109.	-1.09	1709.0	3.81	1
CalStd11-100	100000.	100030.	33.2	.033	17708.	22.7	1
CalStd8=100	100.00	94.377	-5.62	-5.62	18.197	.490	1
CalStd5=10	10.000	-7.9189	-17.9	-179.	.62572	1.02	1

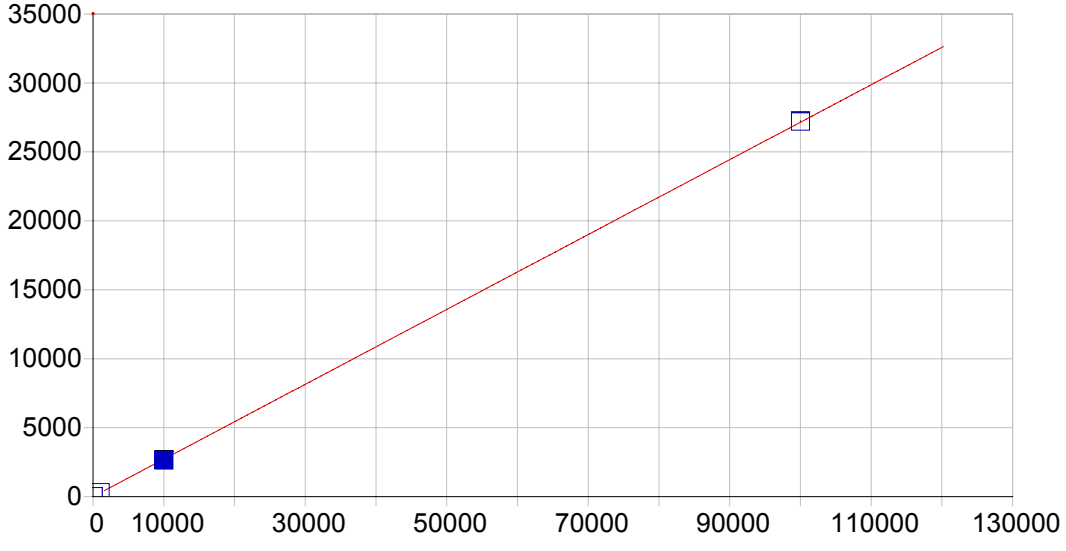


Pb 220.353 {453}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	3.920070	Re-Slope:	1.000000
A1 (Gain):	0.472996	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999157	Status:	OK.
Std Error of Est:	9.686661		
Predicted MDL:	2.325403		
Predicted MQL:	7.751344		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-5.5348	-5.53	.000	1.3022	.593	1
CalStd5=10	10.000	6.4736	-3.53	-35.3	6.9821	1.26	1
CalStd8=100	100.00	103.49	3.49	3.49	52.872	1.20	1
CalStd4=5	5.0000	3.4308	-1.57	-31.4	5.5428	1.07	1
CalStd9=100	1000.0	1036.8	36.8	3.68	494.34	1.40	1
CalStd10=10	10000.	9601.5	-399.	-3.99	4545.5	14.5	1

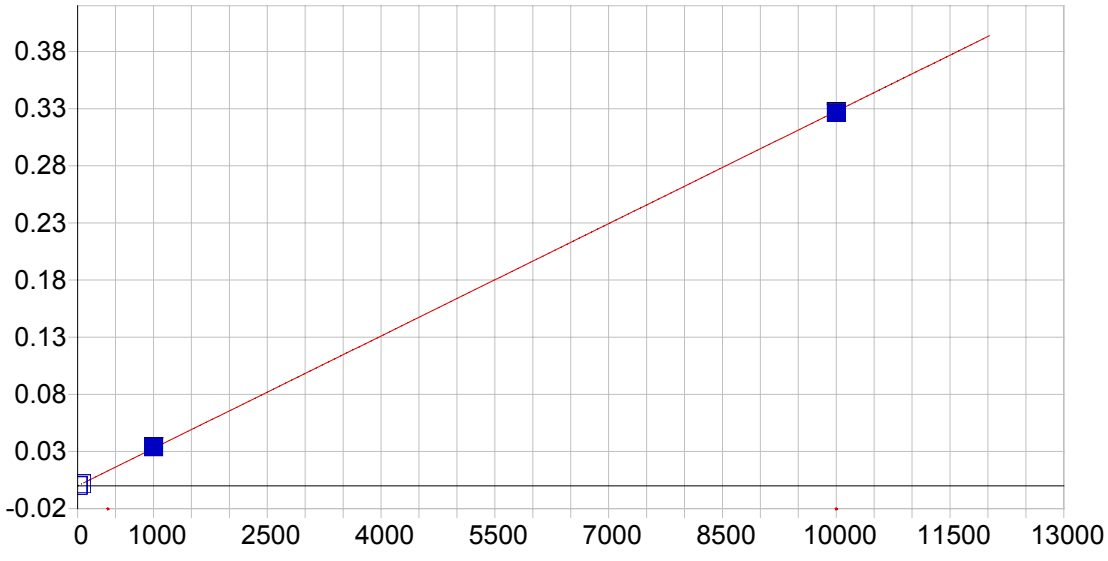


Pb 220.353 {153}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	2.014797	Re-Slope:	1.000000
A1 (Gain):	0.271484	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999941	Status:	OK.
Std Error of Est:	0.400636		
Predicted MDL:	5.081751		
Predicted MQL:	16.939169		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.01358	-.014	.000	2.0111	1.55	1
CalStd9=100	1000.0	1052.6	52.6	5.26	287.77	2.21	1
CalStd10=10	10000.	9707.2	-293.	-2.93	2637.4	13.5	1
CalStd8=100	100.00	111.02	11.0	11.0	32.154	1.11	1
CalStd11-100	100000.	100230.	229.	.229	27213.	38.3	1

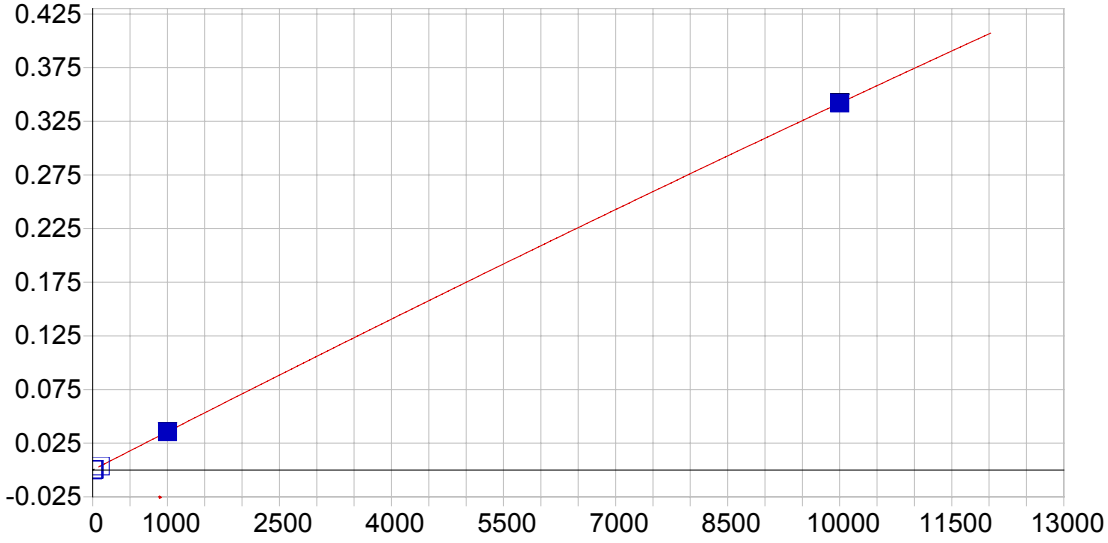


Sb 206.833 {463}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000002	Re-Slope:	1.000000
A1 (Gain):	0.000033	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999925	Status:	OK.
Std Error of Est:	0.000005		
Predicted MDL:	2.237702		
Predicted MQL:	7.459007		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00076	.001	.000	.00000	.000	1
CalStd9=100	1000.0	1036.4	36.4	3.64	.03396	.000	1
CalStd5=10	10.000	8.6957	-1.30	-13.0	.00029	.000	1
CalStd7=50	50.000	51.104	1.10	2.21	.00168	.000	1
CalStd10=10	10000.	9963.8	-36.2	-.362	.32645	.001	1

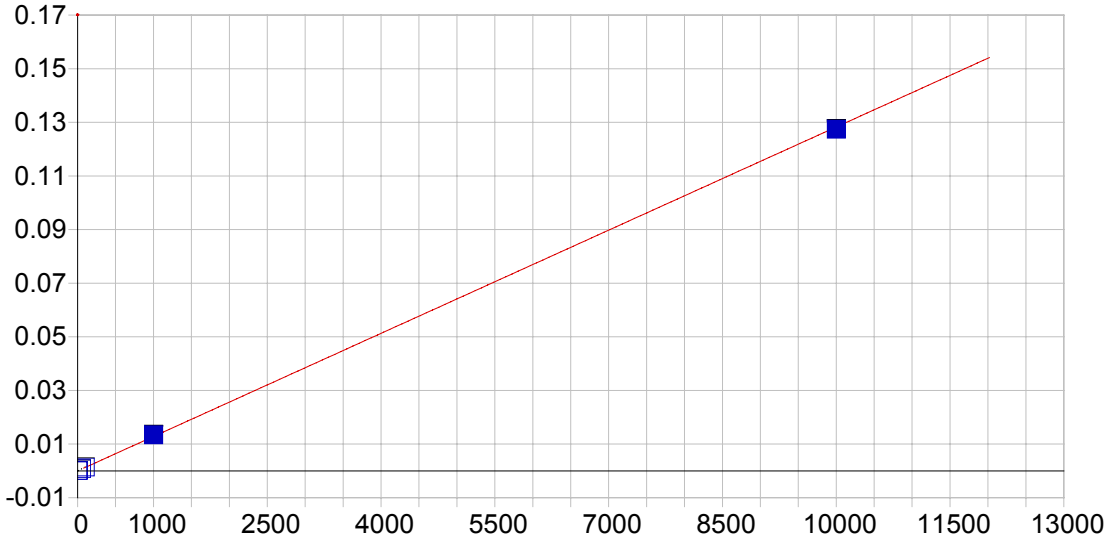


Sb 217.581 {455}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Curvilinear	Weighting:	None

A0 (Offset):	-0.000013	Re-Slope:	1.000000
A1 (Gain):	0.000036	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	1.000000	Status:	OK.
Std Error of Est:	0.000038		
Predicted MDL:	2.379685		
Predicted MQL:	7.932285		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-1.0161	-1.02	.000	-.00005	.000	1
CalStd9=100	1000.0	999.87	-.129	-.013	.03561	.000	1
CalStd6=20	20.000	18.939	-1.06	-5.30	.00066	.000	1
CalStd5=10	10.000	10.118	.118	1.18	.00035	.000	1
CalStd8=100	100.00	101.33	1.33	1.33	.00361	.000	1
CalStd4=5	5.0000	5.7591	.759	15.2	.00019	.000	1
CalStd10=10	10000.	10000.	.001	.000	.34194	.000	1

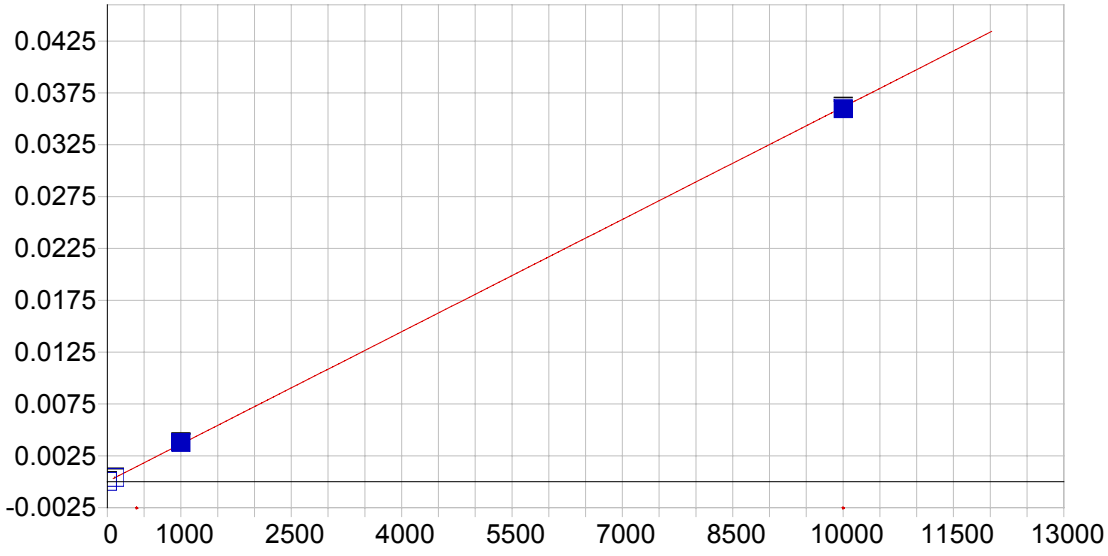


Se 196.090 {472}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000002	Re-Slope:	1.000000
A1 (Gain):	0.000013	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999733	Status:	OK.
Std Error of Est:	0.000004		
Predicted MDL:	4.573247		
Predicted MQL:	15.244155		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00537	-.005	.000	.00000	.000	1
CalStd7=50	50.000	58.463	8.46	16.9	.00075	.000	1
CalStd9=100	1000.0	1047.5	47.5	4.75	.01343	.000	1
CalStd5=10	10.000	12.122	2.12	21.2	.00015	.000	1
CalStd8=100	100.00	111.54	11.5	11.5	.00143	.000	1
CalStd10=10	10000.	9930.4	-69.6	-.696	.12733	.000	1

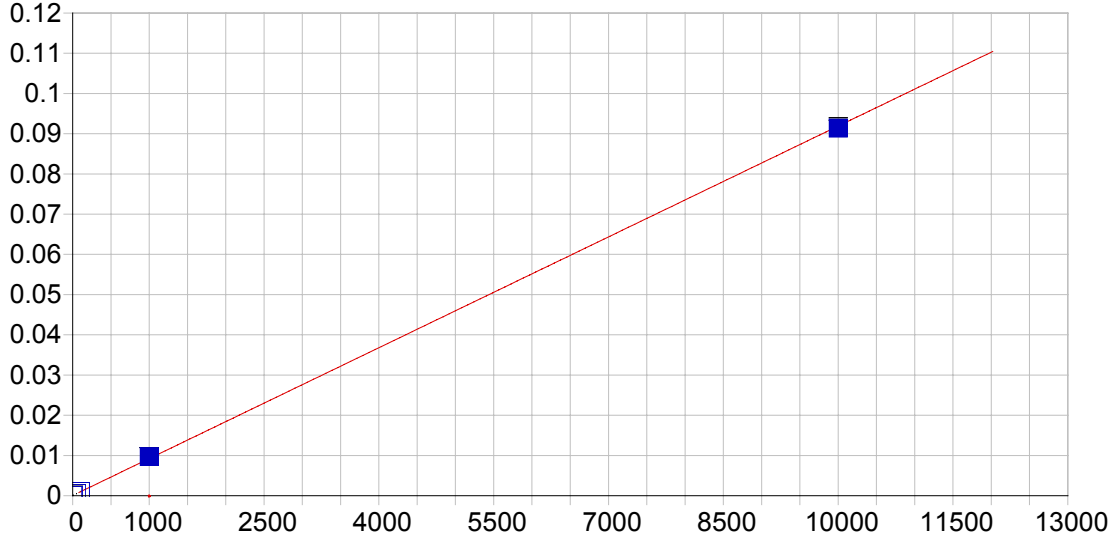


Se 206.279 {463}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000022	Re-Slope:	1.000000
A1 (Gain):	0.000004	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999907	Status:	OK.
Std Error of Est:	0.000002		
Predicted MDL:	22.076548		
Predicted MQL:	73.588492		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00977	-.010	.000	.00002	.000	1
CalStd9=100	1000.0	1038.3	38.3	3.83	.00378	.000	1
CalStd10=10	10000.	9955.3	-44.7	-.447	.03603	.000	1
CalStd8=100	100.00	106.39	6.39	6.39	.00041	.000	1

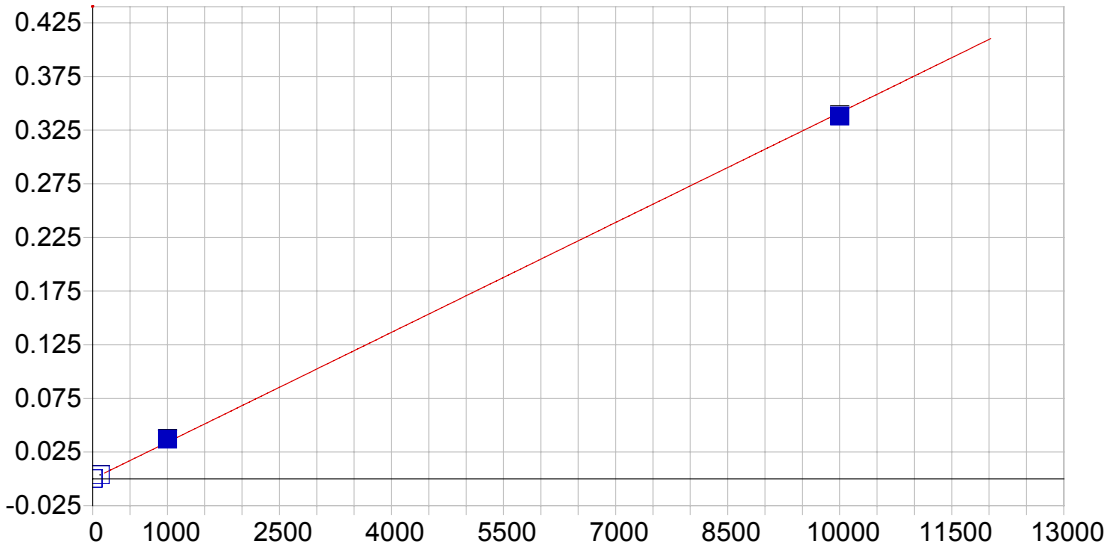


Se 196.090 {471}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000047	Re-Slope:	1.000000
A1 (Gain):	0.000009	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999757	Status:	OK.
Std Error of Est:	0.000003		
Predicted MDL:	6.274504		
Predicted MQL:	20.915012		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00235	.002	.000	.00005	.000	1
CalStd7=50	50.000	51.662	1.66	3.32	.00052	.000	1
CalStd9=100	1000.0	1052.3	52.3	5.23	.00971	.000	1
CalStd5=10	10.000	6.0171	-3.98	-39.8	.00010	.000	1
CalStd8=100	100.00	108.40	8.40	8.40	.00104	.000	1
CalStd10=10	10000.	9941.6	-58.4	-.584	.09136	.000	1

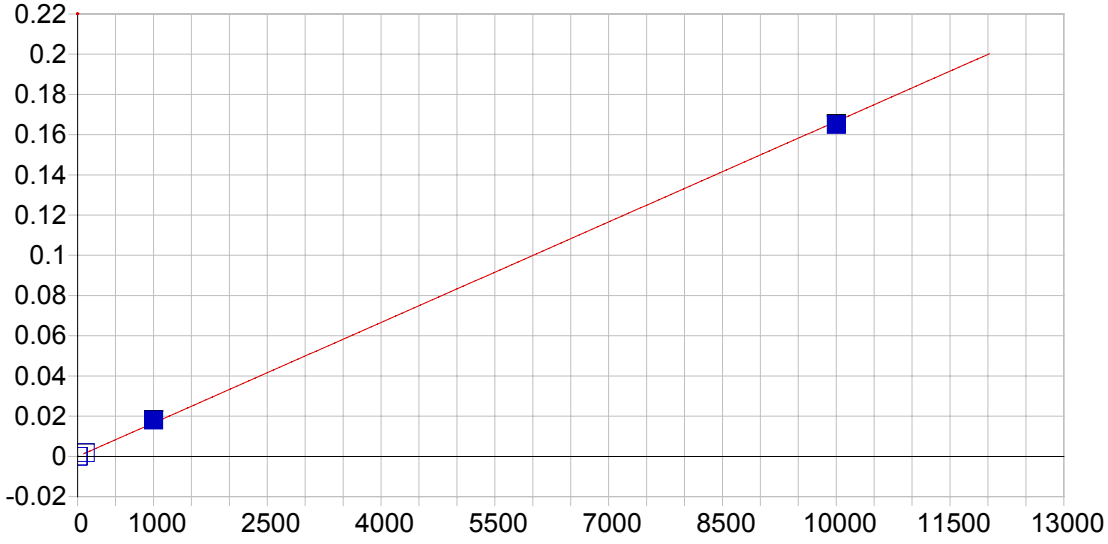


Tl 190.856 {476}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000046	Re-Slope:	1.000000
A1 (Gain):	0.000034	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999586	Status:	OK.
Std Error of Est:	0.000013		
Predicted MDL:	2.166520		
Predicted MQL:	7.221733		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00264	-.003	.000	-.00005	.000	1
CalStd9=100	1000.0	1084.6	84.6	8.46	.03701	.000	1
CalStd8=100	100.00	110.42	10.4	10.4	.00373	.000	1
CalStd5=10	10.000	10.848	.848	8.48	.00032	.000	1
CalStd10=10	10000.	9904.1	-95.9	-.959	.33835	.001	1

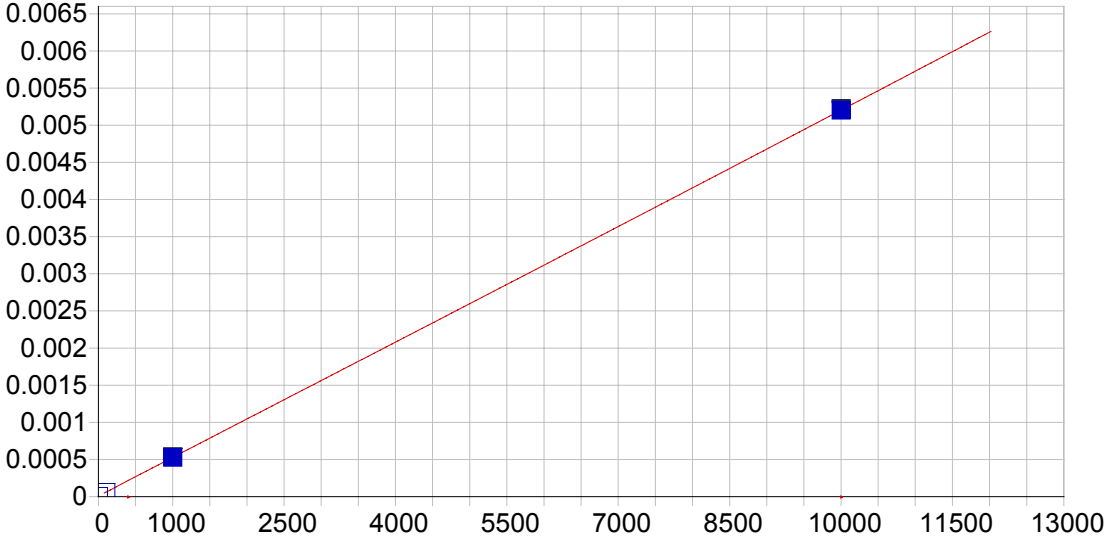


Tl 190.856 {477}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	-0.000041	Re-Slope:	1.000000
A1 (Gain):	0.000017	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999576	Status:	OK.
Std Error of Est:	0.000007		
Predicted MDL:	3.436738		
Predicted MQL:	11.455793		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00019	.000	.000	-.00004	.000	1
CalStd9=100	1000.0	1085.3	85.3	8.53	.01804	.000	1
CalStd8=100	100.00	110.11	10.1	10.1	.00179	.000	1
CalStd5=10	10.000	8.4204	-1.58	-15.8	.00010	.000	1
CalStd10=10	10000.	9906.2	-93.8	-.938	.16498	.000	1



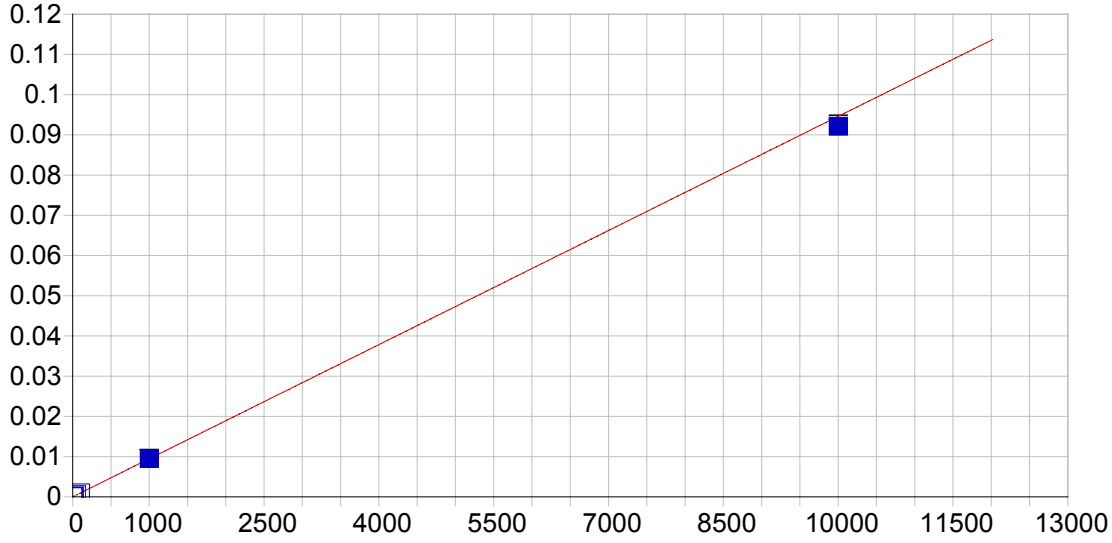
V 290.882 {116}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Full Fit	Weighting:	1/Conc

A0 (Offset):	0.000005	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	0.990000		
Correlation:	1.000000	Status:	Warning
Std Error of Est:	0.000000		
Predicted MDL:	2.727984		
Predicted MQL:	9.093280		

Positive Curvature

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.00001	.000	1
CalStd9=100	1000.0	999.48	-.521	-.052	.00053	.000	1
CalStd10=10	10000.	10000.	.049	.000	.00520	.000	1
CalStd8=100	100.00	100.45	.453	.453	.00006	.000	1

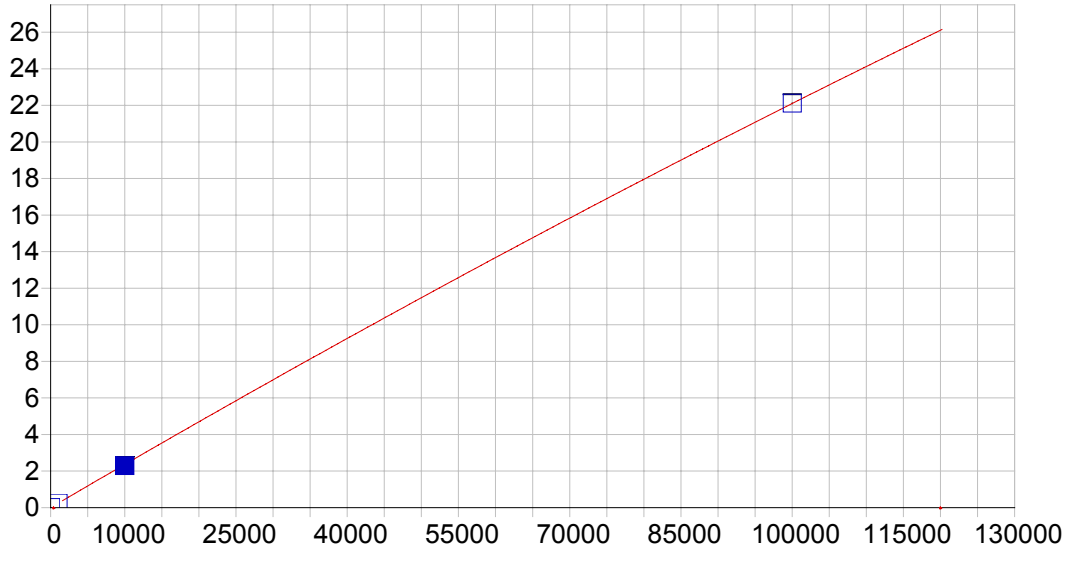


V 292.402 {115}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000007	Re-Slope:	1.000000
A1 (Gain):	0.000009	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999536	Status:	OK.
Std Error of Est:	0.000011		
Predicted MDL:	0.457677		
Predicted MQL:	1.525591		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.04299	.043	.000	.00001	.000	1
CalStd7=50	50.000	52.006	2.01	4.01	.00050	.000	1
CalStd9=100	1000.0	1000.7	.702	.070	.00947	.000	1
CalStd6=20	20.000	19.269	-.731	-3.65	.00019	.000	1
CalStd5=10	10.000	9.5345	-.465	-4.65	.00010	.000	1
CalStd8=100	100.00	100.94	.944	.944	.00096	.000	1
CalStd10=10	10000.	9736.0	-264.	-2.64	.09209	.001	1

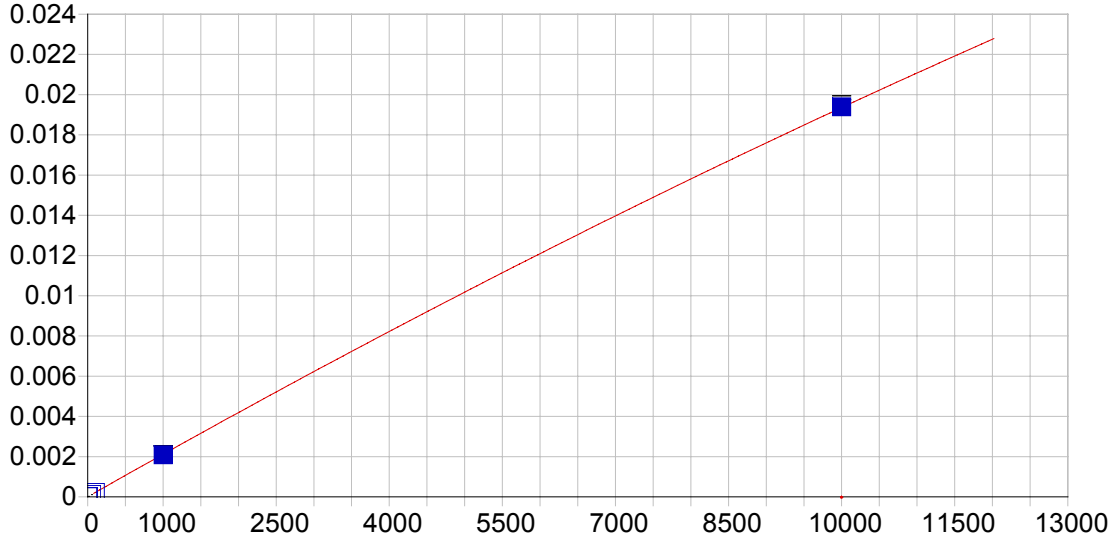


Zn 206.200 {463}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Curvilinear	Weighting:	1/Var

A0 (Offset):	0.000215	Re-Slope:	1.000000
A1 (Gain):	0.000238	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999922	Status:	OK.
Std Error of Est:	0.001683		
Predicted MDL:	0.338959		
Predicted MQL:	1.129863		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CalStd10=10	10000.	9676.1	-324.	-3.24	2.2890	.006	1
Blank	.00000	-.24007	-.240	.000	.00016	.000	1
CalStd9=100	1000.0	1012.0	12.0	1.20	.24110	.000	1
CalStd11-100	100000.	100050.	53.6	.054	22.113	.022	1

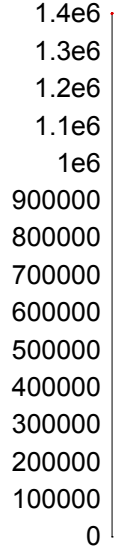


Zn 213.856 {458}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Curvilinear Weighting: 1/Var

A0 (Offset):	0.000002	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	-0.000000		
n (Exponent):	1.000000		
Correlation:	0.999921	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	0.208841		
Predicted MQL:	0.696138		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.21908	-.219	.000	.00000	.000	1
CalStd8=100	100.00	99.716	-.284	-.284	.00021	.000	1
CalStd7=50	50.000	51.059	1.06	2.12	.00011	.000	1
CalStd5=10	10.000	9.6122	-.388	-3.88	.00002	.000	1
CalStd9=100	1000.0	983.76	-16.2	-1.62	.00208	.000	1
CalStd4=5	5.0000	5.1402	.140	2.80	.00001	.000	1
CalStd10=10	10000.	10019.	18.7	.187	.01939	.000	1

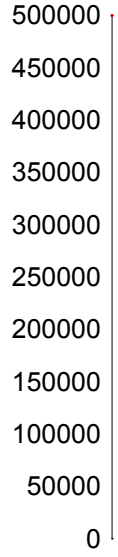


Y 324.228 {104}*

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.000000	Status:	Warning Zero Gain
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	1283900.	4720.	1

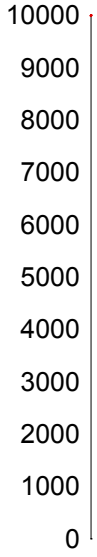


Y 371.030 { 91}*

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.000000	Status:	Warning Zero Gain
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	406440.	3630.	1

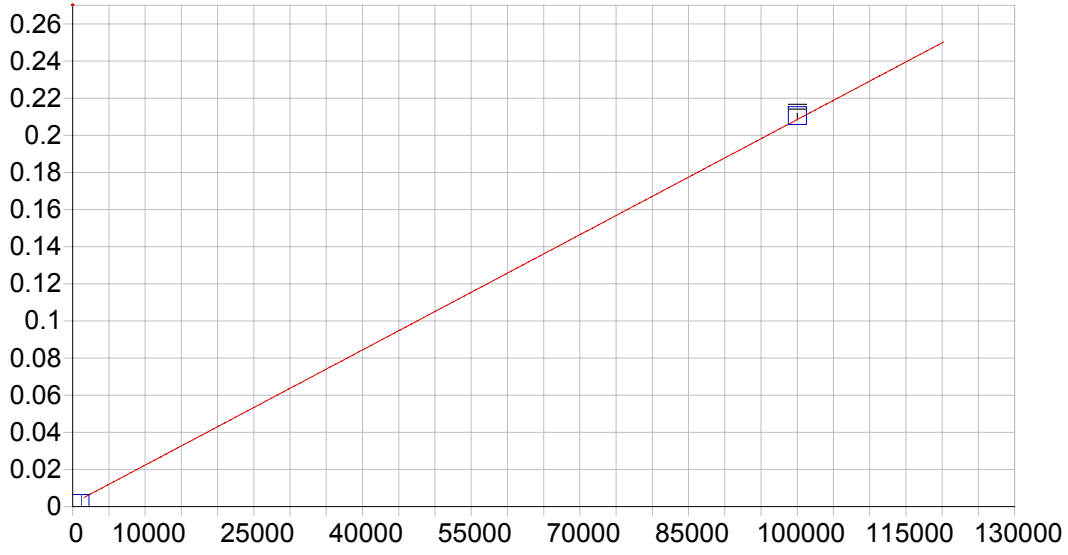


Y 224.306 {451}*

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.000000	Status:	Warning Zero Gain
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	8809.4	13.1	1

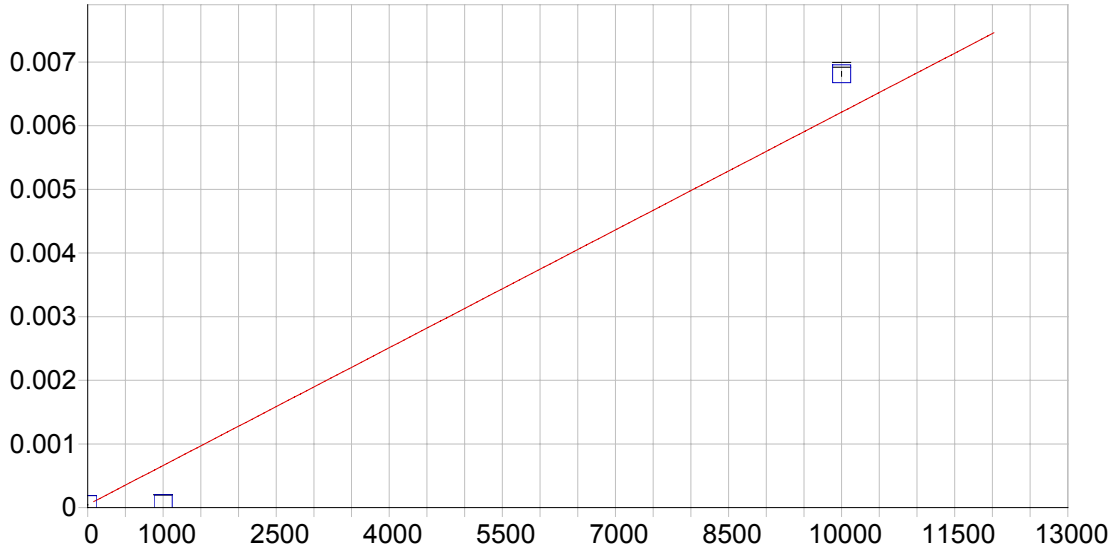


Na 588.995 { 57}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.001651	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.995089	Status:	OK.
Std Error of Est:	0.000113		
Predicted MDL:	3.858859		
Predicted MQL:	12.862864		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.98429	.984	.000	.00165	.000	1
CalStd9=100	1000.0	5.7686	-994.	-99.4	.00166	.000	1
CalStd12-100	100000.	100990.	994.	.994	.21054	.001	1

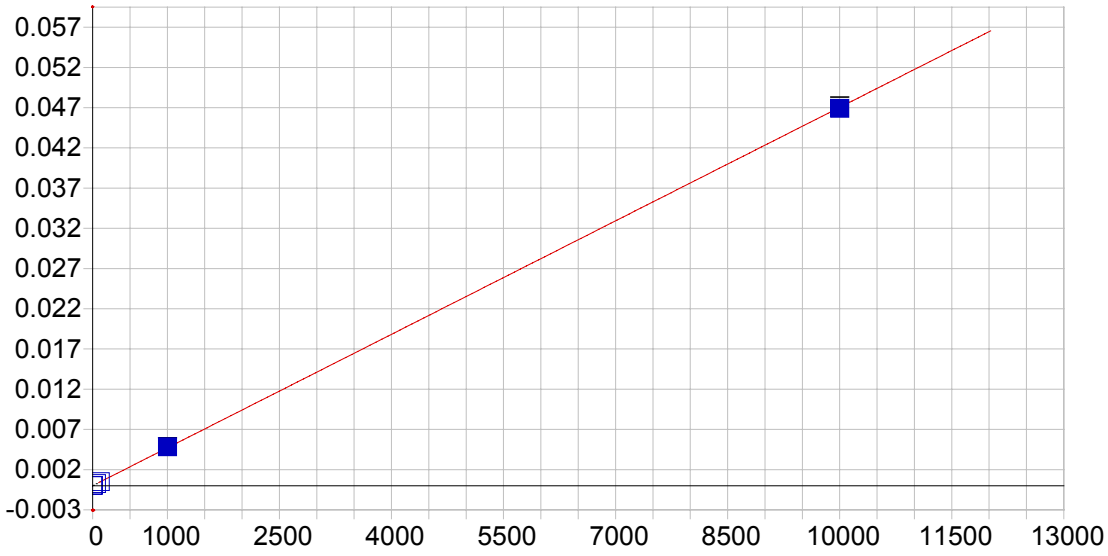


Si 251.611 {134}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000044	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.955661	Status:	OK.
Std Error of Est:	0.000035		
Predicted MDL:	5.511769		
Predicted MQL:	18.372562		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.87649	.876	.000	.00004	.000	1
CalStd9=100	1000.0	26.138	-974.	-97.4	.00006	.000	1
CalStd12-100	10000.	10974.	974.	9.74	.00681	.000	1

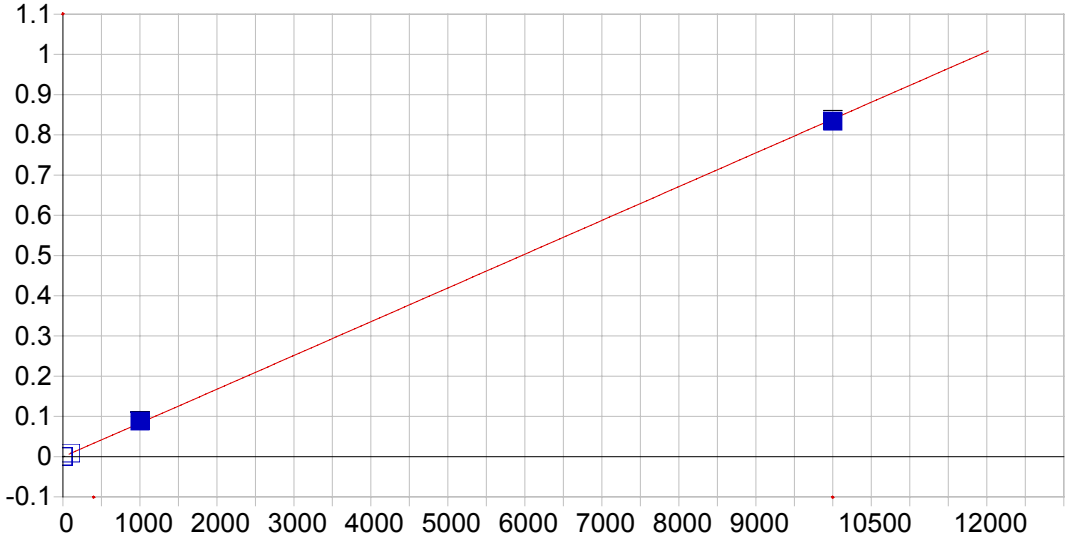


Ti 334.941 {101}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000001	Re-Slope:	1.000000
A1 (Gain):	0.000005	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999955	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	1.039048		
Predicted MQL:	3.463495		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00034	.000	.000	.00000	.000	1
CalStd5=10	10.000	9.8540	-.146	-1.46	.00005	.000	1
CalStd8=100	100.00	103.93	3.93	3.93	.00049	.000	1
CalStd9=100	1000.0	1024.2	24.2	2.42	.00482	.000	1
CalStd10=10	10000.	9969.3	-30.7	-.307	.04691	.000	1
CalStd7=50	50.000	52.867	2.87	5.73	.00025	.000	1
CalStd4=5	5.0000	4.8224	-.178	-3.55	.00002	.000	1

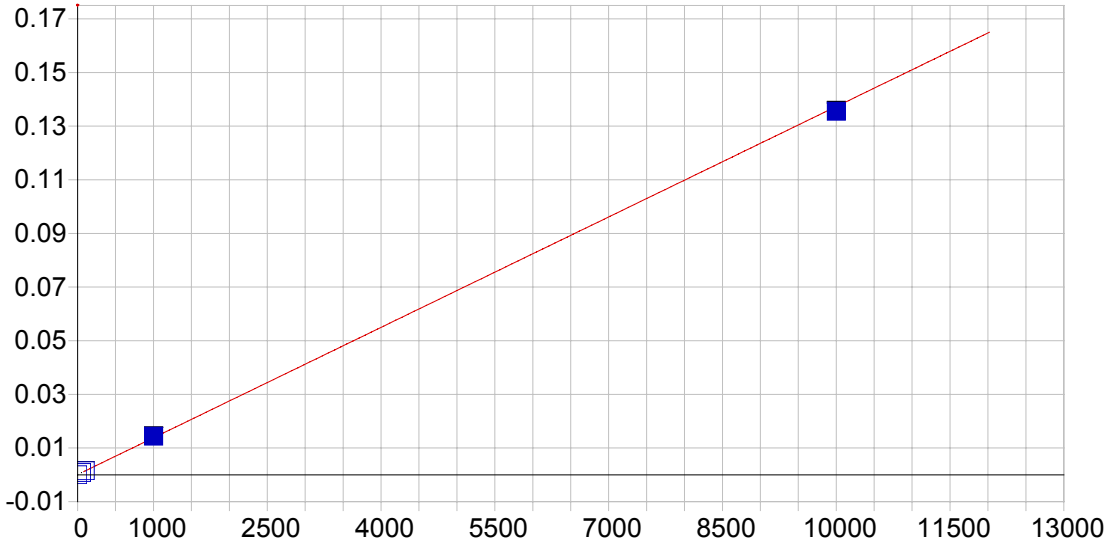


Sr 407.771 { 83}

Date of Fit: 05/27/2016 08:21:22 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset):	-0.000417	Re-Slope:	1.000000
A1 (Gain):	0.000084	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999823	Status:	OK.
Std Error of Est:	0.000006		
Predicted MDL:	0.104990		
Predicted MQL:	0.349966		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00034	.000	.000	-.00042	.000	1
CalStd3=1	1.0000	1.0656	.066	6.56	-.00033	.000	1
CalStd4=5	5.0000	5.5371	.537	10.7	.00005	.000	1
CalStd5=10	10.000	10.396	.396	3.96	.00046	.000	1
CalStd8=100	100.00	107.77	7.77	7.77	.00863	.000	1
CalStd9=100	1000.0	1053.5	53.5	5.35	.08803	.000	1
CalStd10=10	10000.	9937.7	-62.3	-.623	.83390	.004	1

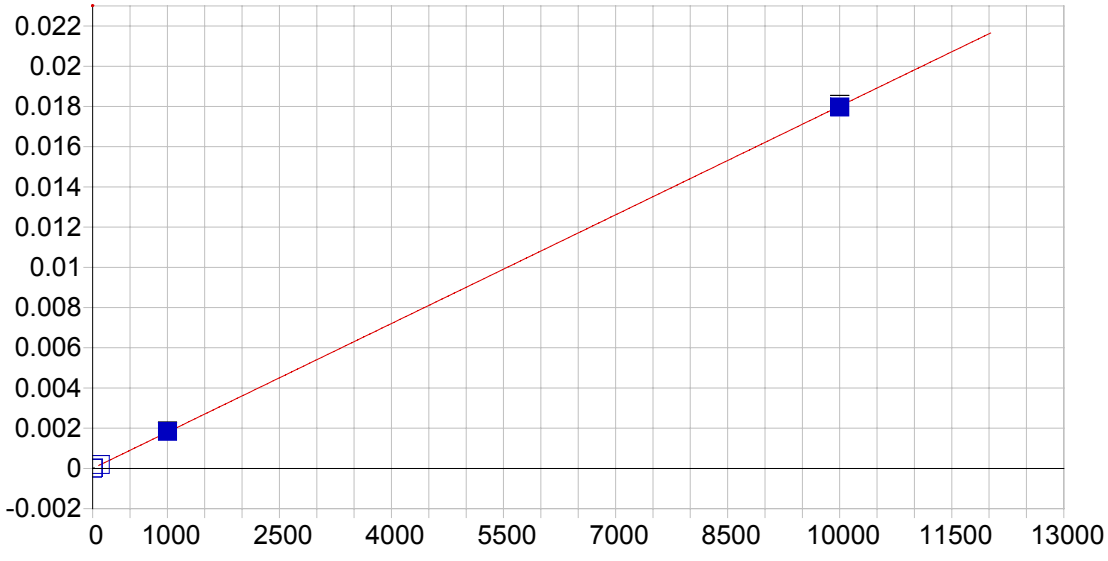


Sn 189.989 {478}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	0.000082	Re-Slope:	1.000000
A1 (Gain):	0.000014	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999645	Status:	OK.
Std Error of Est:	0.000149		
Predicted MDL:	2.990195		
Predicted MQL:	9.967318		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-6.8566	-6.86	.000	-.00001	.000	1
CalStd10=10	10000.	9869.0	-131.	-1.31	.13551	.000	1
CalStd9=100	1000.0	1040.0	40.0	4.00	.01435	.000	1
CalStd8=100	100.00	102.52	2.52	2.52	.00149	.000	1
CalStd7=50	50.000	53.550	3.55	7.10	.00082	.000	1

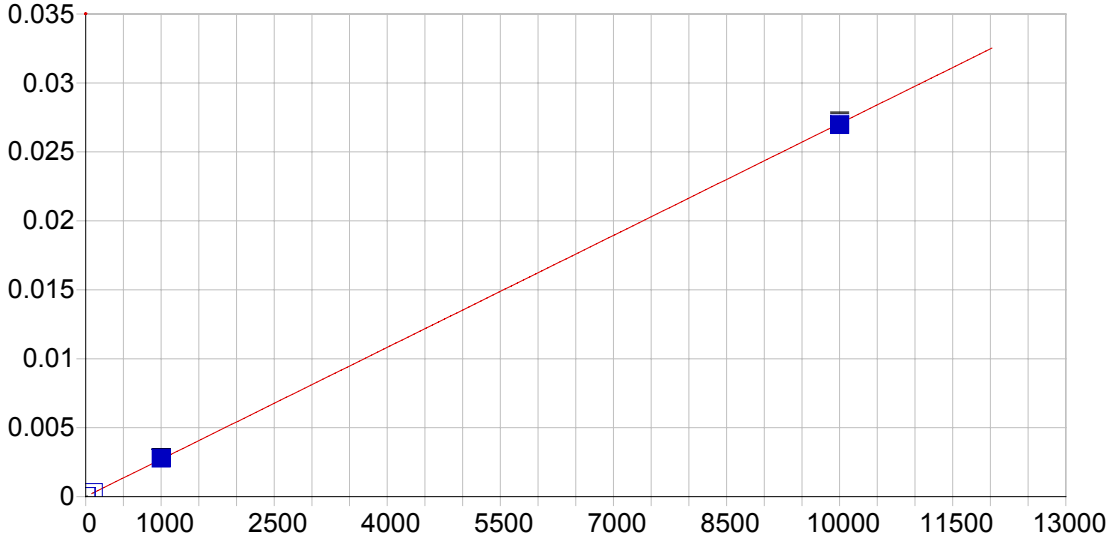


B 249.678 {135}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000000	Re-Slope:	1.000000
A1 (Gain):	0.000002	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999963	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	1.257682		
Predicted MQL:	4.192272		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00126	-.001	.000	.00000	.000	1
CalStd8=100	100.00	105.75	5.75	5.75	.00019	.000	1
CalStd5=10	10.000	10.516	.516	5.16	.00002	.000	1
CalStd9=100	1000.0	1019.8	19.8	1.98	.00184	.000	1
CalStd10=10	10000.	9973.9	-26.1	-.261	.01796	.000	1

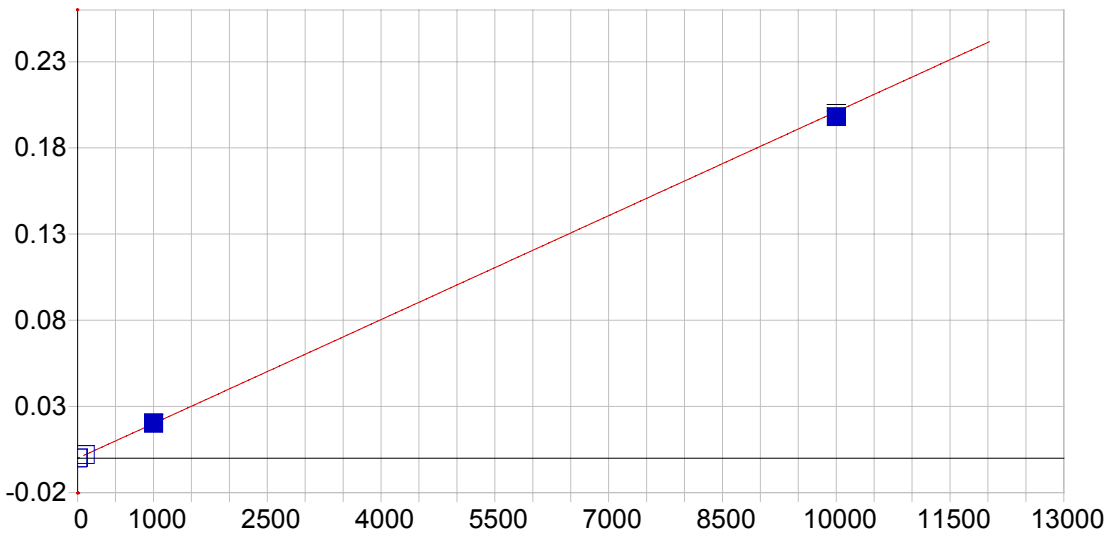


B 249.773 {135}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000003	Re-Slope:	1.000000
A1 (Gain):	0.000003	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999953	Status:	OK.
Std Error of Est:	0.000000		
Predicted MDL:	0.753166		
Predicted MQL:	2.510555		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.00090	-.001	.000	.00000	.000	1
CalStd8=100	100.00	104.48	4.48	4.48	.00029	.000	1
CalStd5=10	10.000	10.207	.207	2.07	.00003	.000	1
CalStd9=100	1000.0	1027.3	27.3	2.73	.00279	.000	1
CalStd10=10	10000.	9968.1	-31.9	-.319	.02707	.000	1

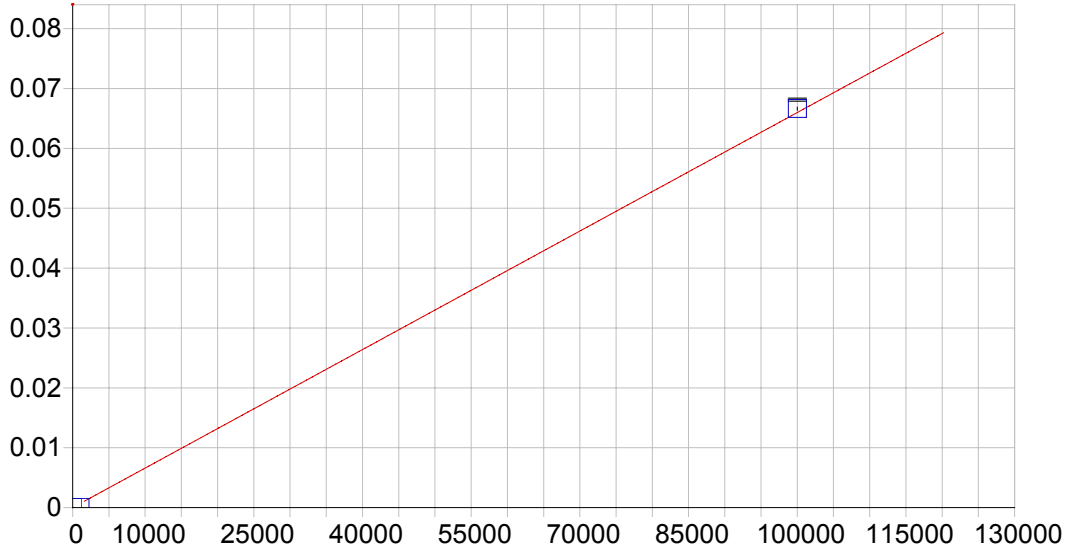


Li 670.784 { 50}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Var

A0 (Offset):	-0.000034	Re-Slope:	1.000000
A1 (Gain):	0.000020	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999923	Status:	OK.
Std Error of Est:	0.000024		
Predicted MDL:	1.030019		
Predicted MQL:	3.433396		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	-.44789	-.448	.000	-.00004	.000	1
CalStd5=10	10.000	9.9753	-.025	-.247	.00017	.000	1
CalStd8=100	100.00	102.33	2.33	2.33	.00202	.000	1
CalStd9=100	1000.0	1004.3	4.26	.426	.02015	.000	1
CalStd10=10	10000.	9854.2	-146.	-1.46	.19807	.002	1

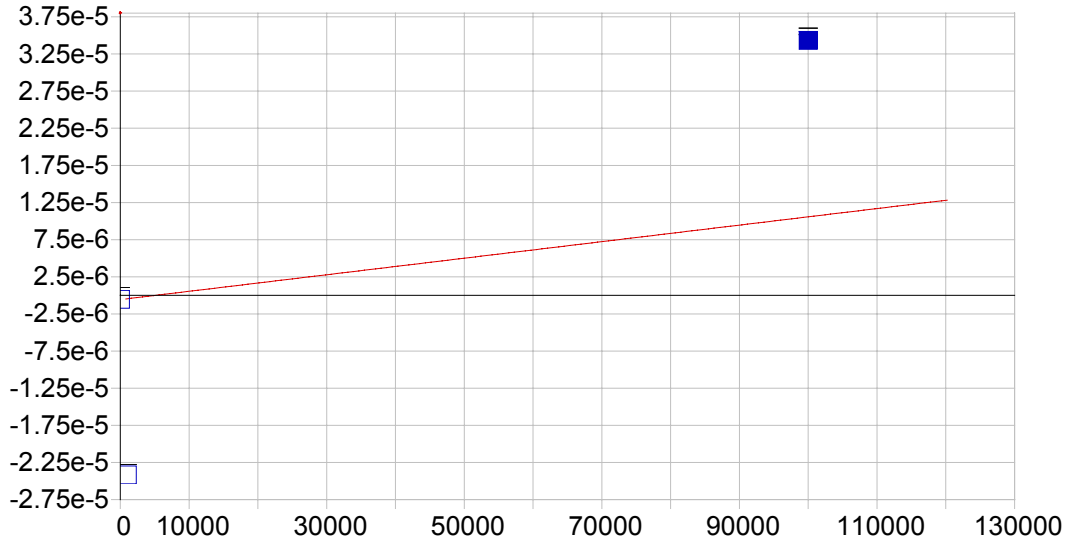


K 766.490 { 44}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000013	Re-Slope:	1.000000
A1 (Gain):	0.000001	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.995196	Status:	OK.
Std Error of Est:	0.000036		
Predicted MDL:	28.274995		
Predicted MQL:	94.249983		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.97343	.973	.000	.00001	.000	1
CalStd9=100	1000.0	16.748	-983.	-98.3	.00002	.000	1
CalStd12-100	100000.	100980.	983.	.983	.06664	.000	1

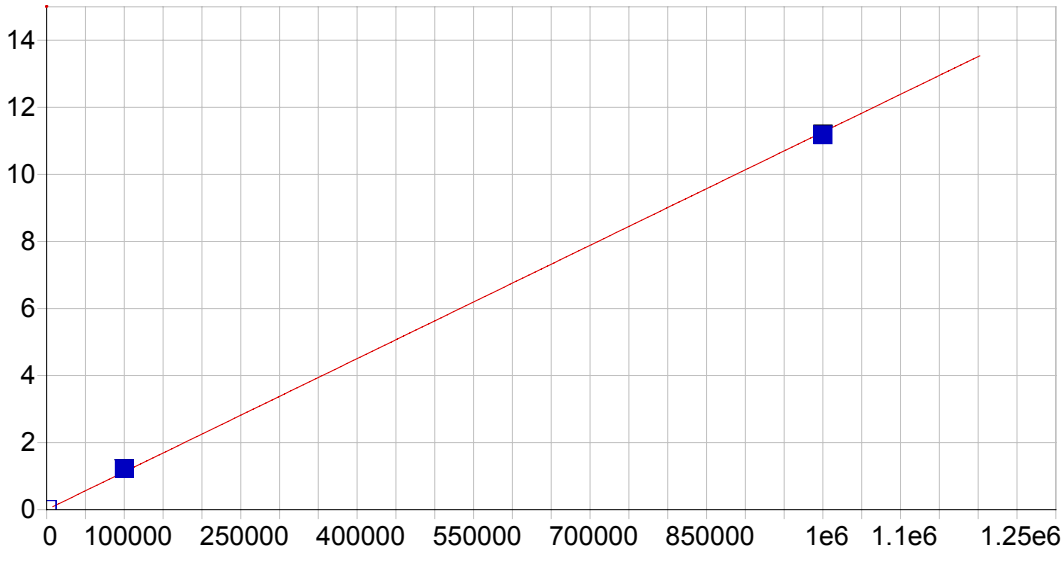


P 213.618 {457}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	-0.000001	Re-Slope:	1.000000
A1 (Gain):	0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.046844	Status:	OK.
Std Error of Est:	0.000001		
Predicted MDL:	4172.936590		
Predicted MQL:	13909.78863		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	210.99	211.	.000	.00000	.000	1
CalStd9=100	1000.0	-212130.	-213000.	-21300.	-.00002	.000	1
CalStd12-100	100000.	313080.	213000.	213.	.00003	.000	1

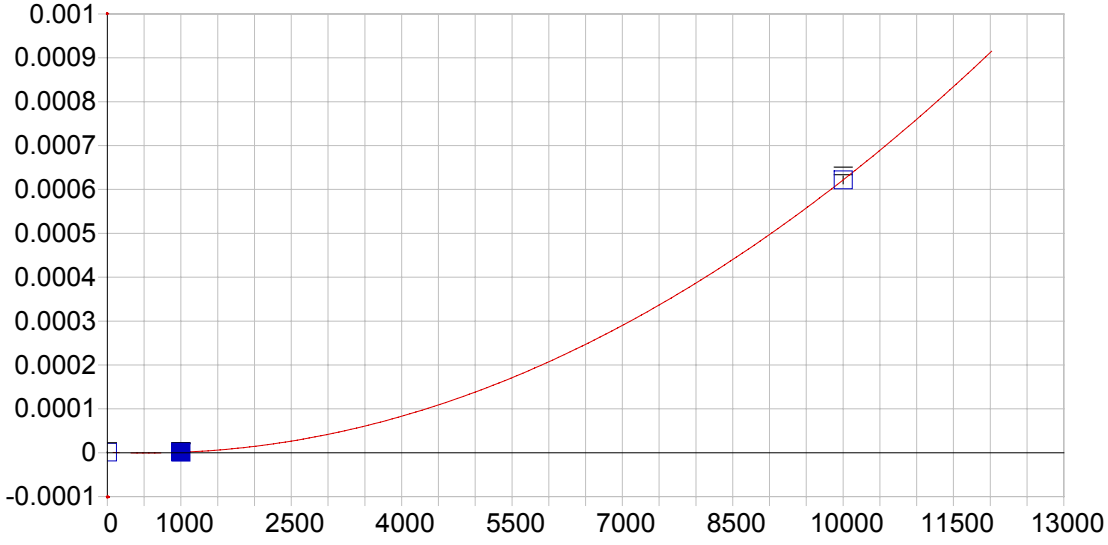


S 182.034 {485}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Linear	Weighting:	1/Conc

A0 (Offset):	0.000166	Re-Slope:	1.000000
A1 (Gain):	0.000011	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999202	Status:	OK.
Std Error of Est:	0.000668		
Predicted MDL:	4.017990		
Predicted MQL:	13.393301		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.92746	.927	.000	.00018	.000	1
CalStd12-100	100000.	108350.	8350.	8.35	1.2205	.001	1
CalStd14-100	1000000.	992650.	-7350.	-.735	11.180	.018	1
CalStd9=100	1000.0	-3.6032	-1000.	-100.	.00013	.000	1



W 239.709 {140}

Date of Fit:	05/27/2016 08:21:22	Type of Fit:	Curvilinear	Weighting:	1/Var

A0 (Offset):	0.000001	Re-Slope:	1.000000
A1 (Gain):	-0.000000	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	1.000000	Status:	Warning Positive Curvature
Std Error of Est:	0.000000		
Predicted MDL:	n/a		
Predicted MQL:	n/a		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
Blank	.00000	.00000	.000	.000	.00000	.000	1
CalStd9=100	1000.0	47.151	-953.	-95.3	.00000	.000	1
CalStd12-100	10000.	-8952.8	-19000.	-190.	.00062	.000	1

Sample Name: Blank Acquired: 05/26/2016 11:19:14 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	Al1670	As1937	Ba2335	Ba4934	Be3130	Ca3158	Ca3933	Cd2265	Co2286	Co2388
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.000	.199	.255	2940.	.000	10.7	188.	.000	.000	.000
Stddev	.00	.00	.000	.315	.643	13.	.00	.4	22.	.00	.00	.00
%RSD	110.	46.0	13.3	158.	252.	.426	5.03	3.36	11.6	35.8	33.2	133.

Elem	Cr2055	Cr2677	Cu2247	Cu3247	Fe2395	Fe2599	Mg2790	Mg2802	Mn2576	Mn2593	Mo2020	Mo2045
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Stddev	.00	.000	.00	.000	.000	.000	.00	.000	.000	.000	.000	.00
%RSD	44.0	181.	40.5	1.29	12.3	29.3	320.	4.44	4.43	70.0	68.9	149.

Elem	Ni2216	Ni2316	Pb2169	Pb2203	Sb2068	Sb2175	Se2062	Se1960	Tl1908	V_2924	Zn2062	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	-.624	1.30	.000	.000	.000	.000	.000	.000	.000	.000
Stddev	.00	.00	.818	.59	.000	.00	.000	.000	.00	.000	.000	.000
%RSD	71.1	19.4	131.	45.5	935.	155.	531.	63.6	115.	26.0	34.1	13.4

Elem	Sn1899
Units	Cts/S
Avg	.000
Stddev	.00
%RSD	134.

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1283900.	406440.	8809.4
Stddev	4724.	3632.	13.1
%RSD	.36795	.89365	.14852

Sample Name: CalStd1=0.25 Acquired: 05/26/2016 11:25:51 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Be3130
Units	Cts/S
Avg	.000
Stddev	.00
%RSD	5.83

Int. Std.	Y_3242
Units	Cts/S
Avg	1293900.
Stddev	1895.
%RSD	.14647

Sample Name: CalStd2=0.5 Acquired: 05/26/2016 11:32:28 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Be3130	Cd2265
Units	Cts/S	Cts/S
Avg	.000	.000
Stddev	.00	.000
%RSD	88.3	90.7

Int. Std.	Y_3242	Y_2243
Units	Cts/S	Cts/S
Avg	1299300.	8807.5
Stddev	9691.	11.8
%RSD	.74591	.13346

Sample Name: CalStd3=1 Acquired: 05/26/2016 11:39:03 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Ba2335	Be3130	Cd2265	Co2286	Cr2055	Cu2247	Ni2316
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.943	.000	.000	.000	.000	.000	.000
Stddev	.000	.199	.000	.000	.000	.000	.000	.00
%RSD	62.0	21.1	4.93	24.7	124.	17.4	51.1	95.8

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1284800.	402820.	8801.9
Stddev	6558.	2474.	22.8
%RSD	.51039	.61424	.25922

Sample Name: CalStd4=5 Acquired: 05/26/2016 11:45:41 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al1670	Ba2335	Be3130	Cd2265	Co2286	Cr2055	Cr2677	Cu2247	Mn2576	Mo2020	Mo2045	Ni2316
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	3.72	.000	.003	.001	.001	.000	.001	.000	.001	.000	.000
Stddev	.000	.38	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	10.8	10.1	.845	1.18	7.12	4.70	18.0	13.7	.755	6.29	7.20	9.24

Elem	Pb2203	Sb2175	Zn2138
Units	Cts/S	Cts/S	Cts/S
Avg	5.54	.000	.000
Stddev	1.07	.000	.000
%RSD	19.3	21.1	2.86

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1293500.	406520.	8826.2
Stddev	3371.	2981.	20.7
%RSD	.26063	.73334	.23445

Sample Name: CalStd5=10 Acquired: 05/26/2016 11:52:19 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Cd2265	Co2286	Cr2055	Cr2677	Cu2247	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.001	1.17	6.20	.001	.005	.003	.003	.000	.001	.000	.001
Stddev	.000	.000	.50	.10	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	10.9	2.61	42.7	1.57	.147	1.77	3.47	1.71	12.6	7.89	.916	2.57

Elem	Mo2045	Ni2316	Pb2169	Pb2203	Sb2068	Sb2175	Se1960	Tl1908	V_2924	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.626	6.98	.000	.000	.000	.000	.000	.000
Stddev	.000	.000	1.02	1.26	.000	.000	.000	.000	.000	.000
%RSD	7.27	3.85	162.	18.0	15.2	17.8	61.3	12.0	2.14	1.91

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1297500.	401990.	8852.2
Stddev	6209.	2449.	10.8
%RSD	.47852	.60922	.12220

Sample Name: CalStd6=20 Acquired: 05/26/2016 11:58:57 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ba2335	Cu2247	Mn2576	Mo2020	Mo2045	Sb2175	V_2924
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	11.9	.003	.000	.002	.000	.001	.000
Stddev	.3	.000	.000	.000	.000	.000	.000
%RSD	2.64	2.93	.664	1.84	2.59	12.4	1.23

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1278600.	405860.	8773.0
Stddev	5514.	3838.	9.4
%RSD	.43123	.94574	.10677

Sample Name: CalStd7=50 Acquired: 05/26/2016 12:05:30 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al1670	As1937	Ba2335	Ca3933	Cd2265	Co2286	Cr2055	Cr2677	Cu2247	Mg2802	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.002	4.20	30.2	4410.	.025	.016	.014	.000	.008	.002	.001	.006
Stddev	.000	.16	.4	27.	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	3.04	3.73	1.40	.614	.524	.581	.407	1.35	.196	.235	.651	.828

Elem	Mo2045	Ni2316	Sb2068	Se1960	V_2924	Zn2138	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.000	.002	.001	.000	.000	.001
Stddev	.000	.000	.000	.000	.000	.000	.000
%RSD	.672	.830	4.43	7.89	.612	.329	3.70

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1283700.	403100.	8783.9
Stddev	3984.	652.	10.3
%RSD	.31031	.16175	.11705

Sample Name: CalStd8=100 Acquired: 05/26/2016 12:12:02 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	As1937	Ba2335	Ba4934	Be3130	Ca3933	Cd2265	Co2286	Co2388	Cr2055	Cr2677	Cu2247
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	7.65	58.7	4700.	.006	6660.	.050	.031	.000	.028	.000	.015
Stddev	.000	.54	.5	27.	.000	55.	.000	.000	.000	.000	.000	.000
%RSD	.376	6.99	.787	.566	.485	.827	.167	.497	1.29	.224	.568	1.10

Elem	Cu3247	Mg2802	Mn2576	Mo2020	Mo2045	Ni2216	Ni2316	Pb2169	Pb2203	Sb2175	Se2062	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.000	.003	.001	.012	.000	.000	.000	18.2	52.9	.004	.000	.001
Stddev	.000	.000	.000	.000	.000	.000	.000	.5	1.2	.000	.000	.000
%RSD	1.55	.275	.532	.423	.510	.395	.912	2.69	2.26	2.07	12.7	3.50

Elem	Tl1908	V_2924	Zn2138	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.004	.001	.000	.001
Stddev	.000	.000	.000	.000
%RSD	2.31	.753	.161	.859

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1291600.	404370.	8811.2
Stddev	5003.	3057.	18.7
%RSD	.38733	.75599	.21237

Sample Name: CalStd9=1000 Acquired: 05/26/2016 12:18:30 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	Al1670	As1937	Ba2335	Ba4934	Be3130	Ca3158	Ca3933	Cd2265	Co2286	Co2388
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.001	.032	72.4	565.	20200.	.064	117.	60000.	.488	.312	.002
Stddev	.000	.000	.6	2.	96.	.000	1.	343.	.001	.000	.000
%RSD	.519	.432	.816	.426	.475	.442	.988	.572	.137	.097	.700

Elem	Cr2055	Cr2677	Cu2247	Cu3247	Fe2395	Fe2599	Mg2790	Mg2802	Mn2576	Mn2593	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.278	.003	.153	.001	.000	.002	.000	.024	.014	.012	.120
Stddev	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
%RSD	.121	1.13	.203	.956	1.30	.602	1.39	.842	.588	.375	.069

Elem	Mo2045	Ni2216	Ni2316	Pb2169	Pb2203	Sb2068	Sb2175	Se2062	Se1960	Tl1908	V_2924
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.001	.002	.002	185.	494.	.034	.036	.004	.010	.037	.009
Stddev	.000	.000	.000	1.	1.	.000	.000	.000	.000	.000	.000
%RSD	.417	.401	.550	.507	.283	.207	.270	1.27	.102	.148	.700

Elem	Zn2062	Zn2138	Sn1899
Units	Cts/S	Cts/S	Cts/S
Avg	.241	.002	.014
Stddev	.000	.000	.000
%RSD	.149	.479	.434

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1296200.	405320.	8817.6
Stddev	6466.	4027.	13.8
%RSD	.49882	.99343	.15669

Sample Name: CalStd10=10000 Acquired: 05/26/2016 12:24:26 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	As1937	Ba4934	Ca3158	Co2286	Co2388	Cr2055	Cr2677	Cu2247	Cu3247
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.015	697.	168000.	1030.	2.96	.021	2.65	.028	1.43	.009
Stddev	.000	4.	2020.	1.	.00	.000	.00	.000	.00	.000
%RSD	.723	.515	1.20	.084	.084	.695	.077	.985	.098	.267

Elem	Fe2395	Fe2599	Mg2790	Mg2802	Mn2576	Mn2593	Mo2045	Ni2216	Ni2316	Pb2169
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.002	.021	.001	.219	.134	.116	.006	.018	.015	1710.
Stddev	.000	.000	.000	.001	.001	.001	.000	.000	.000	4.
%RSD	.215	.754	.788	.453	.597	.637	.613	.478	.585	.223

Elem	Pb2203	Sb2068	Sb2175	Se2062	Se1960	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	4550.	.326	.342	.036	.091	.338	.092	2.29	.019	.136
Stddev	14.	.001	.000	.000	.000	.001	.001	.01	.000	.000
%RSD	.318	.242	.144	.491	.365	.244	.591	.245	.497	.243

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1271100.	403720.	8693.4
Stddev	5890.	2535.	20.4
%RSD	.46336	.62786	.23483

Sample Name: CalStd11-100k Acquired: 05/26/2016 12:31:09 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Cr2055	Cu3247	Mn2593	Pb2169	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**25.4**	**.092**	**1.15**	**17700.**	**22.1**
Stddev	.0	.001	.01	23.	.0
%RSD	.091	.616	1.32	.128	.101

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1261600.**	**406110.**	**8574.8**
Stddev	3681.	6718.	9.5
%RSD	.29180	1.6543	.11118

Sample Name: CalStd12-100000 Acquired: 05/26/2016 12:37:57 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	Ca3158	Fe2395	Fe2599	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.148	10200.	.023	.210	.007
Stddev	.001	44.	.000	.001	.000
%RSD	.677	.428	1.04	.599	.460

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1211800.	397340.	8296.6
Stddev	6512.	730.	15.7
%RSD	.53737	.18379	.18882

Sample Name: CalStd13=500000 Acquired: 05/26/2016 12:44:44 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	Ca3158	Fe2395	Fe2599	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.755	49200.	.115	.983	.038
Stddev	.009	158.	.000	.009	.000
%RSD	1.20	.321	.409	.912	.762

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1146200.	389750.	7821.7
Stddev	5299.	3160.	12.1
%RSD	.46227	.81081	.15470

Sample Name: CalStd14-1000k Acquired: 05/26/2016 12:52:06 Type: Cal
Method: DOD Calibration Updated 060614(v1480) Mode: IR Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Al3961	Ca3158	Fe2395	Fe2599	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.48	92300.	.217	1.80	.076
Stddev	.01	355.	.001	.01	.001
%RSD	.433	.384	.485	.785	.856

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1082100.	378490.	7327.2
Stddev	3543.	2929.	4.0
%RSD	.32744	.77396	.05394

Sample Name: icv Acquired: 05/26/2016 13:06:20 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2677	Cu2247	Fe2395
Avg	**49.8**	**12100.**	**2180.**	**2080.**	**51.4**	**10100.**	**49.7**	**545.**	**528.**	**202.**	**256.**	**5230.**
Stddev	.4	46.	18.	12.	.3	61.	.3	3.	4.	1.	2.	35.
%RSD	.790	.377	.829	.594	.519	.608	.696	.533	.732	.727	.673	.673
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Elem	Mg2790	Mn2576	Mo2020	Ni2316	Pb2203	Sb2068	Sb2175	Se2062	Tl1908	V_2924	Zn2138	Sn1899
Avg	**9860.**	**520.**	**510.**	**538.**	**526.**	**541.**	**535.**	**2200.**	**2240.**	**524.**	**508.**	**522.**
Stddev	32.	3.	3.	2.	4.	6.	4.	23.	12.	1.	2.	6.
%RSD	.327	.536	.511	.281	.752	1.07	.774	1.02	.548	.256	.440	1.06
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1281600.**	**406170.**	**8741.7**
Stddev	6829.	1865.	16.7
%RSD	.53283	.45905	.19094

Sample Name: ICVLL Acquired: 05/26/2016 13:12:52 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	Al1670	As1937	Ba2335	Be3130	Ca3158	Ca3933	Cd2265	Co2286	Cr2677	Cu2247
Avg	**42.5**	**1210.**	**1230.**	**61.1**	**30.0**	**12.3**	**1520.**	**1390.**	**14.9**	**30.8**	**30.0**	**30.6**
Stddev	.7	21.	2.	4.7	.8	.0	13.	7.	.2	.1	.2	.3
%RSD	1.64	1.71	.138	7.68	2.68	.325	.852	.469	1.25	.448	.785	1.05
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Fe2599	Mg2790	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	**925.**	**1480.**	**32.1**	**29.5**	**31.6**	**28.5**	**62.5**	**63.1**	**66.6**	**29.7**	**30.9**	**59.2**
Stddev	18.	15.	.1	.3	.5	1.3	2.0	4.4	.9	.2	.1	3.3
%RSD	1.92	1.01	.403	.965	1.72	4.72	3.21	7.03	1.39	.663	.301	5.55
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**1285800.**	**404520.**	**8788.8**
Stddev	4177.	3556.	12.1
%RSD	.32484	.87912	.13786

Sample Name: icb Acquired: 05/26/2016 13:25:59 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3158	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599
Avg	.847	-2.72	-2.70	.392	-.019	10.6	-3.56	.065	-.141	-1.07	1.75	-26.9
Stddev	1.00	.63	5.49	.419	.029	5.6	.21	.134	.225	.33	.63	1.9
%RSD	119.	23.1	203.	107.	154.	53.0	5.95	205.	160.	31.1	35.9	7.06
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Elem	Mg2802	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	1.67	.097	.244	-.211	-4.27	.989	2.65	-.100	.115	-.045	-4.43
Stddev	.16	.053	.199	.254	1.73	.986	2.81	1.35	.195	.136	2.52
%RSD	9.43	54.3	81.6	120.	40.6	99.7	106.	1360.	170.	301.	56.9
Check ?	None	None	None	None	None	None	None	None	None	None	None
Value											
Range											

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1287600.	403950.	8866.9
Stddev	1626.	1755.	21.7
%RSD	.12625	.43441	.24461

Sample Name: icsa Acquired: 05/26/2016 13:39:07 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba2335	Be3130	Ca3158	Cd2265	Co2286	Cr2677	Cu2247	Fe2395
Avg	-.095	526000.	.642	.000	-.016	508000.	.000	.795	.000	-.054	507000.
Stddev	.700	10600.	14.7	1.06	.029	2070.	.44	.397	.850	.955	995.
%RSD	737.	2.02	2300.	245000.	182.	.407	169000.	49.9	241000.	1760.	.196
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
High Limit											
Low Limit											

Elem	Mg2790	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Avg	532000.	-.168	.426	.002	.000	-.008	-.006	.000	-.001	-.025	.000
Stddev	6800.	.482	.967	.520	2.71	1.71	7.65	1.18	.465	.184	3.27
%RSD	1.28	287.	227.	34600.	95e6	22700.	131000.	577000.	38600.	740.	1720000.
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit											
Low Limit											

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1152000.	389940.	7817.1
Stddev	2744.	3268.	19.0
%RSD	.23818	.83812	.24296

Sample Name: icsab Acquired: 05/26/2016 13:46:30 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba2335	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055
Avg	**531.**	**524000.**	**470.**	**450.**	**456.**	**523.**	**508000.**	**479.**	**506.**	**501.**	**538.**
Stddev	5.	5440.	13.	2.	2.	3.	1920.	1.	1.	3.	1.
%RSD	.944	1.04	2.77	.537	.489	.616	.378	.177	.148	.669	.209
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value											
Range											

Elem	Cr2677	Cu2247	Fe2395	Mg2790	Mn2576	Mo2020	Mo2045	Ni2216	Ni2316	Pb2169	Pb2203
Avg	**509.**	**478.**	**487000.**	**535000.**	**498.**	**510.**	**527.**	**493.**	**490.**	**485.**	**423.**
Stddev	2.	1.	1980.	1500.	4.	2.	2.	3.	3.	17.	4.
%RSD	.367	.163	.406	.281	.806	.331	.301	.509	.545	3.46	.993
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value											
Range											

Elem	Sb2068	Sb2175	Se1960	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Avg	**553.**	**529.**	**525.**	**456.**	**523.**	**497.**	**514.**	**502.**
Stddev	6.	4.	8.	5.	3.	1.	3.	2.
%RSD	1.08	.746	1.43	1.12	.622	.161	.581	.494
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Sample Name: icsab Acquired: 05/26/2016 13:46:30 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1153100.□	389240.□	7853.6□
Stddev	6833.	1777.	10.2
%RSD	.59258	.45659	.12953

Sample Name: ICVLL ag Acquired: 05/26/2016 13:54:22 Type: Unk
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3158	Ca3933	Cd2265	Co2286	Cr2677	Cu2247	Fe2599
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**10.7**	**58.0**	**1.19**	**.878**	**.054**	**71.1**	**53.0**	**.058**	**.181**	**-1.63**	**.302**	**526.**
Stddev	.6	2.1	3.00	.492	.017	6.3	4.1	.121	.402	.20	.658	571.
%RSD	5.34	3.56	251.	56.0	31.2	8.91	7.76	206.	222.	12.1	218.	109.

Elem	Mg2802	Mn2576	Mo2020	Ni2316	Pb2203	Sb2175	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**49.1**	**.402**	**.290**	**-.174**	**-3.45**	**.594**	**-2.38**	**-.192**	**-.127**	**.129**	**60.8**
Stddev	.3	.058	.189	.472	1.70	1.68	5.12	.945	.456	.112	3.1
%RSD	.654	14.5	65.0	271.	49.4	283.	215.	491.	360.	86.7	5.08

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1298900.**	**401810.**	**8862.5**
Stddev	2417.	5102.	6.9
%RSD	.18607	1.2698	.07840

Sample Name: 724949 Acquired: 05/26/2016 14:20:40 Type: Unk
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 10
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Cu3247	Fe2395
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	1.26	17100.	41.9	2340.	1.99	20000.	2.88	137.	5840.	560.	1040.	77700.
Stddev	.88	3210.	4.1	400.	.17	3400.	.15	6.	281.	29.	178.	13800.
%RSD	70.3	18.7	9.72	17.1	8.56	17.0	5.13	4.72	4.81	5.12	17.1	17.8

Elem	Mg2790	Mn2576	Mn2593	Mo2020	Ni2316	Pb2169	Sb2068	Se1960	Tl1908	V_2924	Zn2062	Zn2138
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	17900.	490.	851.	4.83	33.2	29500.	7490.	9.25	-1.42	26.1	935.	923.
Stddev	3030.	47.	145.	.20	2.0	1620.	387.	2.29	1.27	1.7	46.	43.
%RSD	16.9	9.52	17.0	4.09	6.14	5.49	5.16	24.7	89.6	6.53	4.91	4.61

Elem	Sn1899
Units	ug/L
Avg	173.
Stddev	11.
%RSD	6.06

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	1274700.	409040.	8849.4
Stddev	1632.	2426.	16.3
%RSD	.12805	.59302	.18475

Sample Name: I724949 Acquired: 05/26/2016 14:27:10 Type: Unk
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 10
Comment:

Elem	Ag3280	Al3961	Al1670	As1937	Ba2335	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**2.06**	**3660.**	**1500.**	**16.8**	**218.**	**501.**	**.849**	**4020.**	**.678**	**25.9**	**1040.**	**106.**
Stddev	.36	369.	336.	3.4	46.	50.	.091	389.	.210	5.7	234.	24.
%RSD	17.5	10.1	22.4	20.4	21.2	9.98	10.7	9.68	30.9	22.1	22.5	22.6

Elem	Fe2395	Mg2790	Mn2576	Mo2020	Ni2316	Pb2169	Sb2068	Se1960	Tl1908	V_2924	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**16500.**	**3830.**	**114.**	**1.24**	**9.03**	**5340.**	**1430.**	**13.1**	**12.3**	**9.93**	**171.**	**22.6**
Stddev	1680.	367.	12.	.79	1.95	1110.	271.	1.5	2.8	.85	37.	7.5
%RSD	10.2	9.57	10.3	63.8	21.6	20.7	19.0	11.4	22.5	8.57	21.6	33.1

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1311800.**	**405310.**	**8964.3**
Stddev	5148.	1860.	13.0
%RSD	.39244	.45880	.14475

Sample Name: dup724949 Acquired: 05/26/2016 14:33:58 Type: Unk
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 10
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Cu3247	Fe2395
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**2.13**	**16000.**	**57.9**	**2220.**	**1.84**	**18800.**	**5.06**	**110.**	**8760.**	**1220.**	**1590.**	**74100.**
Stddev	.38	532.	9.6	75.	.08	640.	.69	8.	622.	85.	53.	2410.
%RSD	17.7	3.33	16.6	3.39	4.42	3.40	13.5	6.96	7.10	6.91	3.33	3.25

Elem	Mg2790	Mn2576	Mn2593	Mo2020	Ni2316	Pb2169	Sb2068	Se1960	Tl1908	V_2924	Zn2062	Zn2138
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**15200.**	**540.**	**695.**	**10.1**	**49.2**	**37400.**	**9490.**	**8.94**	**-3.63**	**32.8**	**1490.**	**1470.**
Stddev	512.	22.	20.	.7	3.6	2320.	579.	1.89	1.60	1.4	105.	100.
%RSD	3.37	4.08	2.81	6.53	7.37	6.19	6.10	21.2	44.1	4.20	7.03	6.86

Elem	Sn1899
Units	ug/L
Avg	**118.**
Stddev	7.
%RSD	6.12

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1272400.**	**404270.**	**8822.5**
Stddev	6682.	2460.	24.4
%RSD	.52514	.60853	.27665

Sample Name: mss724949 Acquired: 05/26/2016 14:40:27 Type: Unk
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 10
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**20.2**	**23800.**	**670.**	**4440.**	**22.2**	**16300.**	**21.6**	**320.**	**423.**	**6540.**	**1430.**	**2270.**
Stddev	.9	1320.	90.	236.	1.3	880.	3.5	47.	26.	950.	210.	119.
%RSD	4.70	5.55	13.4	5.32	6.00	5.40	16.2	14.6	6.09	14.5	14.7	5.24

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se2062	Se1960	Tl1908
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**88500.**	**40000.**	**900.**	**1170.**	**7.63**	**184.**	**191.**	**33000.**	**12400.**	**527.**	**598.**	**611.**
Stddev	4780.	2370.	52.	63.	.96	27.	27.	4390.	1650.	51.	74.	71.
%RSD	5.41	5.94	5.75	5.38	12.6	14.4	14.4	13.3	13.3	9.71	12.3	11.6

Elem	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L
Avg	**244.**	**1630.**	**1610.**	**98.2**
Stddev	14.	230.	229.	12.6
%RSD	5.59	14.1	14.3	12.9

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1269400.**	**406020.**	**8774.0**
Stddev	2418.	3988.	25.6
%RSD	.19050	.98220	.29139

Sample Name: msds724949 Acquired: 05/26/2016 14:46:50 Type: Unk
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 10
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Cr2055	Cu2247	Cu3247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**18.5**	**22500.**	**686.**	**3530.**	**21.1**	**18500.**	**19.0**	**298.**	**9500.**	**1320.**	**1900.**
Stddev	1.1	1310.	59.	184.	1.2	880.	1.9	30.	936.	132.	94.
%RSD	6.00	5.83	8.67	5.21	5.44	4.76	10.0	9.98	9.85	10.0	4.96

Elem	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se2062	Se1960
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**112000.**	**24700.**	**821.**	**1100.**	**16.8**	**221.**	**227.**	**42000.**	**14600.**	**544.**	**618.**
Stddev	5370.	1370.	44.	61.	1.4	21.	21.	3720.	1350.	43.	55.
%RSD	4.78	5.55	5.36	5.56	8.57	9.28	9.39	8.85	9.20	7.90	8.87

Elem	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**628.**	**226.**	**1800.**	**1780.**	**129.**
Stddev	52.	12.	172.	169.	13.
%RSD	8.22	5.10	9.52	9.48	9.86

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1269200.**	**408200.**	**8739.8**
Stddev	2778.	3083.	15.7
%RSD	.21888	.75530	.17983

Sample Name: pdss724949 Acquired: 05/26/2016 14:53:12 Type: Unk
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 10
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2286	Co2388	Cr2055	Cu2247
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**20.2**	**24600.**	**757.**	**4120.**	**24.8**	**126000.**	**19.9**	**402.**	**508.**	**10100.**	**1040.**
Stddev	1.4	1010.	68.	161.	1.6	4840.	2.5	44.	32.	1090.	112.
%RSD	6.71	4.12	8.95	3.90	6.27	3.84	12.6	10.9	6.37	10.7	10.8

Elem	Cu3247	Fe2395	Mg2790	Mn2576	Mn2593	Mo2020	Ni2216	Ni2316	Pb2169	Sb2068	Se2062
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**1530.**	**106000.**	**74100.**	**1060.**	**1340.**	**315.**	**218.**	**222.**	**47800.**	**12900.**	**659.**
Stddev	70.	4290.	3230.	64.	52.	33.	23.	24.	4700.	1330.	50.
%RSD	4.55	4.05	4.36	6.00	3.87	10.4	10.4	10.7	9.83	10.3	7.63

Elem	Se1960	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avg	**722.**	**668.**	**259.**	**1750.**	**1750.**	**612.**
Stddev	70.	57.	15.	182.	186.	69.
%RSD	9.68	8.60	5.93	10.4	10.6	11.2

Int. Std.	Y_3242	Y_3710	Y_2243
Units	Cts/S	Cts/S	Cts/S
Avg	**1240600.**	**404010.**	**8569.2**
Stddev	8528.	2685.	45.7
%RSD	.68743	.66466	.53385

Sample Name: ccv1 Acquired: 05/26/2016 14:59:15 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al3961	As1937	Ba4934	Be3130	Ca3158	Cd2265	Co2388	Cr2055	Cu2247	Cu3247	Fe2395
Avg	**485.▯**	**5150.▯**	**5340.▯**	**5100.▯**	**505.▯**	**5150.▯**	**501.▯**	**5290.▯**	**5270.▯**	**5060.▯**	**4980.▯**	**5280.▯**
Stddev	2.	35.	30.	6.	3.	22.	1.	28.	4.	5.	10.	43.
%RSD	.497	.676	.553	.116	.508	.418	.262	.526	.080	.090	.209	.809
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Mg2790	Mn2576	Mn2593	Mo2045	Ni2216	Pb2169	Sb2068	Se2062	Tl1908	V_2924	Zn2062	Zn2138
Avg	**4990.▯**	**5100.▯**	**5100.▯**	**5160.▯**	**5050.▯**	**5290.▯**	**5170.▯**	**5220.▯**	**5240.▯**	**5060.▯**	**5110.▯**	**5120.▯**
Stddev	14.	21.	12.	7.	16.	5.	10.	32.	6.	21.	11.	15.
%RSD	.273	.419	.236	.129	.317	.091	.185	.611	.113	.420	.213	.294
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Sn1899
Avg	**5200.▯**
Stddev	13.
%RSD	.240
Check ?	None
Value	
Range	

Sample Name: ccv1 Acquired: 05/26/2016 14:59:15 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1281200.□	405540.□	8814.2□
Stddev	2219.	1433.	16.4
%RSD	.17318	.35338	.18602

Sample Name: ccv2 Acquired: 05/26/2016 15:05:26 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Ba4934	Be3130	Ca3158	Ca3933	Cd2265	Co2286	Co2388	Cr2055
Avg	**52.6**	**492.**	**497.**	**503.**	**520.**	**53.4**	**535.**	**477.**	**49.4**	**508.**	**531.**	**510.**
Stddev	.9	62.	37.	35.	3.	.4	13.	1.	6.4	66.	3.	66.
%RSD	1.70	12.5	7.44	6.86	.565	.678	2.34	.266	13.0	12.9	.488	13.0
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Cr2677	Cu2247	Cu3247	Fe2599	Mg2802	Mn2576	Mn2593	Mo2020	Mo2045	Ni2216	Ni2316	Pb2169
Avg	**524.**	**477.**	**496.**	**511.**	**508.**	**519.**	**526.**	**482.**	**498.**	**504.**	**526.**	**522.**
Stddev	4.	64.	4.	6.	4.	3.	5.	64.	37.	36.	38.	44.
%RSD	.831	13.3	.895	1.20	.809	.546	.869	13.2	7.35	7.12	7.16	8.35
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Pb2203	Sb2068	Sb2175	Se2062	Se1960	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Avg	**517.**	**497.**	**482.**	**500.**	**510.**	**521.**	**521.**	**496.**	**492.**	**505.**
Stddev	35.	65.	64.	58.	63.	67.	3.	62.	33.	65.
%RSD	6.81	13.1	13.2	11.5	12.4	12.9	.505	12.5	6.71	12.9
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value										
Range										

Sample Name: ccv2 Acquired: 05/26/2016 15:05:26 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	1291900.□	406100.□	9143.9□
Stddev	3334.	2136.	560.2
%RSD	.25805	.52609	6.1259

Sample Name: ccb Acquired: 05/26/2016 15:11:35 Type: QC
Method: DOD Calibration Updated 060614(v1480) Mode: CONC Corr. Factor: 1.000000
User: NAH ICAP6500: Prep Batch: Post Digestion dilution: 1
Comment:

Elem	Ag3280	Al1670	As1937	Ba2335	Be3130	Ca3158	Ca3933	Cd2265	Co2388	Cr2677	Cu3247	Fe2395
Avg	**-711.**	**10100.**	**4.22**	**.369**	**-13.3**	**-105.**	**-.506**	**-918.**	**-433.**	**-53.2**	**6540.**	**26700.**
Stddev	999.	3460.	2.90	.381	58.7	3.	2.93	541.	744.	1010.	4140.	7740.
%RSD	140.	34.2	68.8	103.	440.	3.01	578.	58.9	172.	1910.	63.3	29.0
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Elem	Mg2802	Mn2576	Mn2593	Mo2045	Ni2216	Pb2203	Sb2068	Tl1908	V_2924	Zn2062	Zn2138	Sn1899
Avg	**1300.**	**318.**	**744.**	**2310.**	**-225.**	**-10.6**	**-180.**	**-7550.**	**5.97**	**821.**	**1670.**	**6540.**
Stddev	185.	63.	312.	930.	536.	1.8	2540.	6310.	654.	358.	129.	3780.
%RSD	14.2	19.9	41.9	40.3	239.	17.0	1410.	83.6	11000.	43.7	7.73	57.8
Check ?	None	None	None	None	None	None	None	None	None	None	None	None
Value												
Range												

Int. Std.	Y_3242	Y_3710	Y_2243
Avg	**814.34**	**1095.7**	**3.3274**
Stddev	86.05	1349.0	.4914
%RSD	10.567	123.11	14.768

METALS
LOGBOOK
DOCUMENTS

MICP SOIL QSM Analytical Run
126342 on 06/06/2016

Date Analyzed: _____ Date Reviewed: _____

Date Entered: _____ Date Validated: _____

COC	ORDER	SAMPLE DECRIPTION	SAMPLE DATE/ TIME	QC TYPE (Parent Sample)	CLIENT	PROJECT	TEST	PREP BATCH	MATRIX	DEL	RUSH
	728592						MICP SOIL QSM				
				ICV				0			
	728593						MICP SOIL QSM				
				ICVLL				0			
	728594						MICP SOIL QSM				
				ICB				0			
	728596						MICP SOIL QSM				
				ICSA				0			
	728597						MICP SOIL QSM				
				ICSAB				0			
	726117						ICP QSM 5.0				
				LCSS				57354			
	726116						ICP QSM 5.0				
				MBS				57354			
119075	724950	LL2SD-654(ST)-2515-SD	05/16/2016 1040		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	**4**	
	728601						MICP SOIL QSM	57354			
				CCV1				0			
	728602						MICP SOIL QSM				
				CCV2				0			
	728603						MICP SOIL QSM				
				CCB				0			
119075	724951	LL2SD-654(ST)-2516-SD	05/16/2016 1050		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	**4**	
119075	724952	LL2SD-654(ST)-2517-SD	05/16/2016 1100		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0	57354	S	**4**	
119075	724953	LL2SD-655(ST)-2518-SD	05/16/2016 1105		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0	57354	S	**4**	
119075	724954	LL2SD-655(ST)-4096-FD	05/16/2016 1105		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0	57354	S	**4**	

Matrix: S-Soil Slg-Sludge GW-GroundWater M-Misc Waste SW-Surface Water A-Air WW-WasteWater DW-Drinking Water SD=Sediment Leachate=LE

MICP SOIL QSM Analytical Run
126342 on 06/06/2016

Date Analyzed: _____ Date Reviewed: _____

Date Entered: _____ Date Validated: _____

COC	ORDER	SAMPLE DECRIPTION	SAMPLE DATE/ TIME	QC TYPE (Parent Sample)	CLIENT	PROJECT	TEST	PREP BATCH	MATRIX	DEL	RUSH
119075	724955		05/16/2016 1115		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	4	
		LL2SD-655(ST)2519-SD						57354			
119075	724956		05/16/2016 1125		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	4	
		LL2SD-655(ST)-2520-SD						57354			
119075	724957		05/16/2016 1155		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	4	
		LL2SD-653(ST)-4095-FD						57354			
119075	724958		05/16/2016 1155		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	4	
		LL2SD-653(ST)-2514-SD						57354			
119075	724959		05/16/2016 1200		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	4	
		LL2SD-656(ST)-2521-SD						57354			
119075	724960		05/16/2016 1204		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	4	
		LL2SD-656(ST)-2522-SD						57354			
	728604						MICP SOIL QSM				
				CCV1				0			
	728605						MICP SOIL QSM				
				CCV2				0			
	728606						MICP SOIL QSM				
				CCB				0			
119075	724961		05/16/2016 1206		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	4	
		LL2SD-656(ST)-2523-SD						57354			
119075	724962		05/16/2016 1215		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	4	
		LL2SD-657(ST)-2524-SD						57354			
119075	724963		05/16/2016 1218		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0		S	4	
		LL2SD-657(ST)-2525-SD						57354			

Matrix: S-Soil Slg-Sludge GW-GroundWater M-Misc Waste SW-Surface Water A-Air WW-WasteWater DW-Drinking Water SD=Sediment Leachate=LE

MICP SOIL QSM Analytical Run
126342 on 06/06/2016

Date Analyzed: _____ Date Reviewed: _____

Date Entered: _____ Date Validated: _____

COC	ORDER	SAMPLE DECRIPTION	SAMPLE DATE/ TIME	QC TYPE (Parent Sample)		CLIENT	PROJECT	TEST	PREP BATCH	MATRIX	DEL	RUSH
119075	724964	LL2SD-657(ST)-2526-SD	05/16/2016 1220			LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0	57354	S	4	
119075	724965	LL2SD-651(ST)-2512-SD	05/16/2016 1225			LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0	57354	S	4	
119075	724966	LL2SD-652(ST)-2513-SD	05/16/2016 1233			LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0	57354	S	4	
119075	724967	LL2SD-650(ST)-2511-SD	05/16/2016 1240			LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0	57354	S	4	
	728607			CCV1				MICP SOIL QSM	0			
	728608			CCV2				MICP SOIL QSM	0			
	728609			CCB				MICP SOIL QSM	0			
	729109			ICV				MICP SOIL QSM	0			
	729110			ICVLL				MICP SOIL QSM	0			
	729111			ICB				MICP SOIL QSM	0			
	729112			ICSA				MICP SOIL QSM	0			
	729113			ICSAB				MICP SOIL QSM	0			
119075	724949	LL2SD-308(ST)-2527-SD	05/16/2016 0945	Designated MS/MSD		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	ICP QSM 5.0	57354	S	4	
	728599			L	724949			ICP QSM 5.0	0			
	726074		05/16/2016 0945					ICP QSM 5.0				
	726075	LL2SD-308(ST)-2527-SD	05/16/2016 0945	DUP	724949			ICP QSM 5.0	57354			
		LL2SD-308(ST)-2527-SD		MSS	724949				57354			

Matrix: S-Soil Slg-Sludge GW-GroundWater M-Misc Waste SW-Surface Water A-Air WW-WasteWater DW-Drinking Water SD=Sediment Leachate=LE

MICP SOIL QSM Analytical Run
126342 on 06/06/2016

Date Analyzed: _____ Date Reviewed: _____

Date Entered: _____ Date Validated: _____

COC	ORDER	SAMPLE DECRIPTION	SAMPLE DATE/ TIME	QC TYPE (Parent Sample)	CLIENT	PROJECT	TEST	PREP BATCH	MATRIX	DEL	RUSH
	726076		05/16/2016 0945				ICP QSM 5.0				
		LL2SD-308(ST)-2527-SD		MSDS 726075				57354			
	728600						ICP QSM 5.0				
				PDSS 724949				0			
	729115						MICP SOIL QSM				
				CCV1				0			
	729116						MICP SOIL QSM				
				CCV2				0			
	729117						MICP SOIL QSM				
				CCB				0			

48 SAMPLE COUNT ON RUN, INCLUDING METHOD AND INSTRUMENT QC

Matrix: S-Soil Slg-Sludge GW-GroundWater M-Misc Waste SW-Surface Water A-Air WW-WasteWater DW-Drinking Water SD=Sediment Leachate=LE

PREP WORKSHEET
on 06/06/2016

Prep Batch **57,354** Date Prepped: 05/23/2016 Prepped By LJF

Folder #	Order	QC Type	Link	Test	Matrix	Volume	Weight	Initial Volume	SDG Level	Notes
	726116	MBS		ICP QSM 5.0	SOLID	50	2.00			
	726117	LCSS		ICP QSM 5.0	SOLID	50	2.00			
119075	724949	*		ICP QSM 5.0	SOIL	50	2.00		4	
	724950			ICP QSM 5.0	SOIL	50	1.98		4	
	724951			ICP QSM 5.0	SOIL	50	1.97		4	
	724952			ICP QSM 5.0	SOIL	50	2.04		4	
	724953			ICP QSM 5.0	SOIL	50	1.96		4	
	724954			ICP QSM 5.0	SOIL	50	1.91		4	
	724955			ICP QSM 5.0	SOIL	50	2.05		4	
	724956			ICP QSM 5.0	SOIL	50	2.05		4	
	724957			ICP QSM 5.0	SOIL	50	2.06		4	
	724958			ICP QSM 5.0	SOIL	50	2.00		4	
	724959			ICP QSM 5.0	SOIL	50	2.06		4	
	724960			ICP QSM 5.0	SOIL	50	2.09		4	
	724961			ICP QSM 5.0	SOIL	50	2.07		4	
	724962			ICP QSM 5.0	SOIL	50	2.00		4	
	724963			ICP QSM 5.0	SOIL	50	2.02		4	

PREP WORKSHEET
on 06/06/2016

Folder #	Order	QC Type	Link	Test	Matrix	Volume	Weight	Initial Volume	SDG Level	Notes
119075	724964			ICP QSM 5.0	SOIL	50	2.05		4	
	724965			ICP QSM 5.0	SOIL	50	2.05		4	
	724966			ICP QSM 5.0	SOIL	50	1.97		4	
	724967			ICP QSM 5.0	SOIL	50	2.03		4	
	726074	DUP	724949	ICP QSM 5.0	SOIL	50	2.10			
	726075	MSS	724949	ICP QSM 5.0	SOIL	50	2.04			
	726076	MSDS	726075	ICP QSM 5.0	SOIL	50	1.95			

Notes:_____

Metals Digestion Bench Sheet

(Prep Methods 3010, 3020, 3005, & 3050)

Program: QSM

*Matrix: SOIL

3010= ICP Liquids
3020= GFAA Liquids
3005= Sb Liquids
3050= ICP/GFAA Solids
7060/7740= GFAA, As & Se Liquids

Prep Batch #:	57354
Prep Method:	3050
Analyst:	LJF
Date:	05/23/2016
Start Time:	06:00

Prep Analyst: LJF

Balance ID: WCB03

End Date: 05/23/2016

End Time: 10:00

Digestion Tube Lot #: J237898-6560

Block Used: B

Cell Position for Temp. Check: F-3

Initial-DigestionTemp (ºC): 91.7

Final-Digestion Temp (ºC): 91.7

Reagent:	Ref. #
Nitric Acid:	AB.619
Hydrochloric Acid:	AB.618
Hydrogen Peroxide:	AB.620

Sample ID			(Solids) Sample Weight (g)	(Liquids) Sample Volume (ml)	Final Volume (ml)
726116	(MB)		2.00		50
726117	(LCS)		2.00		50
724949			2.00		50
724950	**Comments:**		1.98		50
724951			1.97		50
724952			2.04		50
724953			1.96		50
724954			1.91		50
724955			2.05		50
724956			2.05		50
724957			2.06		50
724958			2.00		50
724959			2.06		50
724960			2.09		50
724961			2.07		50
724962			2.00		50
724963			2.02		50
724964			2.05		50
724965			2.05		50
724966			1.97		50
724967			2.03		50
					50
726074	(DUP) if applicable		2.10		50
726075	(MS)	Parent Sample	2.04		50
726076	(MSD)	724949	1.95		50
	(DUP) if applicable				50
	(MS)	Parent Sample			50
	(MSD)				50
Leave >>	(DUP) if applicable				50
blank	(MS)	Parent Sample			50
if N/A	(MSD)				50

MB=Method Blank, LCS=Laboratory Control Sample, DUP=Duplicate, MS=Matrix Spike & MSD=Matrix Spike Duplicate

*Matrix: Soil, Sludge, Waste, GW=Groundwater, WW=Wastewater, Tissue, TLCP, SPLP, ASTM or other.

MS/MSD Spike Amount (ml)	Spike Ref. #
1	M12819

LCS Spike Amount (ml)	Spike Ref. #
1	M12819

Reviewed By/Date: _____

iCAP 6000 / 6500 Data Review Checklist	Analysis Date: 5-25-16	Data File: 00Dres-Dt	Date of review: 05/27/16
Cal Std ID: 1112705 LIMS # : 126342	Analyst: JA	Reviewer: MDS	Approved? Yes No
Is Audit Trail turned on or Manual Manipulations addressed? Yes / No (If no, any manual manipulations must be initialed, dated, and reason(s) stated for change)			

QC Parameters : 6010 / 200.7 / QSM / Other	YES	NO	YES	NO	Comments:
1) Calibration linearity: r ≥ 0.995 / r > 0.998	✓		✓		
2) ICV: 90-110% / 95-105%	✓		✓		
2) ICVLL: 70-130% / 80-120%	✓		✓		
3) ICB: < 3X IDL / <LOD / <LOQ	✓		✓		
4) ICSA: < ABS LOD	✓		✓		
5) ICSAB: 80-120%	✓		✓		
6) MRL: 70-130% / 80-120%			✓		
7) MDL Check: >LOD					
8) CCV1/CCB1 (CCV: 90-110%)	✓		✓		
9) CCV2/CCB2 (CCB: < 3X IDL / <LOD / <LOQ)					
10) CCV3/CCB3					
11) CCV4/CCB4					
12) CCV5/CCB5					

Preparation Batch Parameters	YES	NO	YES	NO	Comments:
Prep Batch ID#: 57354 Dig. Meth. 3050	—		✓		
LCS - generated limits or project specific limits	✓		✓		
MB - <LOD or ≤ ½ RL	✓	✓	✓	✓	PD > 100 Results > 10x or
Spiked samples in batch:					
a) 724949 matrix = S	✓	✓	✓	✓	MB, MSD, PDS "M"
b)_____ matrix =					
c)_____ matrix =					
PDS: ±15% / 20% / 25% Sample#:_____					
Prep Batch ID#:_____ Dig. Meth._____					
LCS - generated limits or project specific limits					
MB - <LOD or ≤ ½ RL					
Spiked samples in batch:					
a)_____ matrix =					
b)_____ matrix =					
c)_____ matrix =					
PDS: ±15% / 20% / 25% Sample#:_____					
Prep Batch ID#:_____ Dig. Meth._____					
LCS - generated limits or project specific limits					
MB - <LOD or ≤ ½ RL					
Spiked samples in batch:					
a)_____ matrix =					
b)_____ matrix =					
c)_____ matrix =					
PDS: ±15% / 20% / 25% Sample#:_____					
Prep Batch ID#:_____ Dig. Meth._____					
LCS - generated limits or project specific limits					
MB - <LOD or ≤ ½ RL					
Spiked samples in batch:					
a)_____ matrix =					
b)_____ matrix =					
c)_____ matrix =					
PDS: ±15% / 20% / 25% Sample#:_____					

CT Laboratories Instrument Run Log

Instrument ID: ICP 6500

Date	Time Start/End	Analyst	Analytes	LIMS run or Samples Analyzed	Sequence ID	Cal Std ID	Neb Pressure	Comments
5/18/16	0933 / 2150	[illegible]	DOD Cal u	126122 126126 126119 126128 126150	D051816	M12705	280	V1468
5/19/16	1234 / 2358	[illegible]	DOD Cal u	126196 126032 126193 126197 126199 126216	D051916	M12705	280	V1470
5/20/16	0838 / 2000	[illegible]	DOD Cal u	126193 126219 126237 126239 126197 126218 126235 126238	D052016	M12705	280	V1471
5/24/16	0808 / 5-25-16 0941	[illegible]	DOD Cal u	126332, 126343, 126344, 126334 126337, 123448, 126339, 126329, 40	D052416	M12705	280	V1474
5/25/16	0948 / 0205	[illegible]	DOD Cal u	126339, 126375, 126330, 126328, 126342 126341, 126331, 126387	D052516	M12705	280	V1475, V1476
5/26/16	1119 / 1511	[illegible]	DOD Cal u	126342, 126343	D052616	M12705	280	V1480
5/27/16	/	[illegible]	DOD Cal u		D052716	M12705	280	

Type	Date/Time	Message	User name	Application	Sequence Name
	05/25/2016 05:42:06	Running mss726248 (117)	NAH	Analyst	S_DOD Calibration
	05/25/2016 05:48:19	Running msds726248 (118)	NAH	Analyst	S_DOD Calibration
	05/25/2016 05:54:31	Running pdss726248 (119)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:01:01	Running ccv1 (28)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:06:43	Running ccv2 (26)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:12:42	Running ccb (27)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:19:12	Running 726249 (120)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:25:33	Running 726250 (121)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:32:08	Running 726251 (122)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:38:40	Running 726252 (123)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:45:00	Running 726253 (124)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:51:22	Running 726254 (125)	NAH	Analyst	S_DOD Calibration
	05/25/2016 06:57:43	Running 726255 (126)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:04:04	Running l726255 (127)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:10:20	Running dup726255 (128)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:16:40	Running mss726255 (129)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:23:05	Running ccv1 (28)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:28:46	Running ccv2 (26)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:34:45	Running ccb (27)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:41:16	Running msds725255 (130)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:47:40	Running pdss726755 (131)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:54:12	Running 726256 (132)	NAH	Analyst	S_DOD Calibration
	05/25/2016 07:55:24	Closing will close the method and all associated samples.	NAH	Analyst	
	05/25/2016 08:00:41	Running 726257 (133)	NAH	Analyst	S_DOD Calibration
	05/25/2016 08:07:01	Running 726258 (134)	NAH	Analyst	S_DOD Calibration
	05/25/2016 08:13:19	Running 726266 (135)	NAH	Analyst	S_DOD Calibration
	05/25/2016 08:19:52	Running 726270 (136)	NAH	Analyst	S_DOD Calibration
	05/25/2016 08:26:23	Running 726271 (137)	NAH	Analyst	S_DOD Calibration
	05/25/2016 08:32:45	Running 726272 (138)	NAH	Analyst	S_DOD Calibration
	05/25/2016 08:39:04	Running 726391 (139)	NAH	Analyst	S_DOD Calibration
	05/25/2016 08:45:16	Running ccv1 (31)	NAH	Analyst	S_DOD Calibration
	05/25/2016 08:50:59	Running ccv2 (29)	NAH	Analyst	S_DOD Calibration
	05/25/2016 08:57:01	Running ccb (30)	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:03:33	Running 726246 (140)	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:09:47	Running 726247 (141)	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:16:08	Running 725672 (142)	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:23:02	Running MRL (24)	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:29:27	Running ccv1 (31)	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:35:12	Running ccv2 (29)	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:41:12	Running ccb (30)	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:47:40	Autosampler Run Completed	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:48:02	Autosampler Run Started	NAH	Analyst	
	05/25/2016 09:48:02	Sequence Started	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:48:23	Running Blank (1)	NAH	Analyst	S_DOD Calibration
	05/25/2016 09:54:51	Running CalStd1=0.25 (2)	NAH	Analyst	S_DOD Calibration
	05/25/2016 10:01:19	Running CalStd2=0.5 (3)	NAH	Analyst	S_DOD Calibration
	05/25/2016 10:08:11	Running CalStd3=1 (4)	NAH	Analyst	S_DOD Calibration
	05/25/2016 10:14:47	Running CalStd4=5 (5)	NAH	Analyst	S_DOD Calibration
	05/25/2016 10:21:20	Running CalStd5=10 (6)	NAH	Analyst	S_DOD Calibration
	05/25/2016 10:27:52	Running CalStd6=20 (7)	NAH	Analyst	S_DOD Calibration
	05/25/2016 10:34:21	Running CalStd7=50 (8)	NAH	Analyst	S_DOD Calibration
	05/25/2016 10:45:13	Running CalStd8=100 (9)	NAH	Analyst	S_DOD Calibration
	05/25/2016 10:45:49	Closing will close the method and all associated samples.	NAH	Analyst	

Type	Date/Time	Message	User name	Application	Sequence Name
	05/25/2016 10:46:08	Closing will close the method and all associated samples.	NAH	Analyst	
	05/25/2016 10:51:31	Running CalStd9=1000 (10)	NAH	Analyst	S_DOD Calibration
	05/25/2016 10:57:20	Running CalStd10=10000 (11)	NAH	Analyst	S_DOD Calibration
	05/25/2016 11:03:30	Running CalStd11-100k (12)	NAH	Analyst	S_DOD Calibration
	05/25/2016 11:09:55	Running CalStd12-100000 (13)	NAH	Analyst	S_DOD Calibration
	05/25/2016 11:16:32	Running CalStd13=500000 (14)	NAH	Analyst	S_DOD Calibration
	05/25/2016 11:23:09	Running CalStd14-1000k (15)	NAH	Analyst	S_DOD Calibration
	05/25/2016 11:25:57	Closing will close the method and all associated samples.	NAH	Analyst	
	05/25/2016 11:30:01	Running blkrinse (22)	NAH	Analyst	S_DOD Calibration
	05/25/2016 11:36:27	Running icv (16)	NAH	Analyst	S_DOD Calibration
	05/25/2016 11:42:48	Running ICVLL (25)	NAH	Analyst	S_DOD Calibration
	05/25/2016 11:49:08	Running icb (17)	NAH	Analyst	S_DOD Calibration
	05/25/2016 11:55:35	Running icb (17)	NAH	Analyst	S_DOD Calibration
	05/25/2016 12:02:03	Running MRL (24)	NAH	Analyst	S_DOD Calibration
	05/25/2016 12:08:26	Running icsa (20)	NAH	Analyst	S_DOD Calibration
	05/25/2016 12:15:04	Running icsab (21)	NAH	Analyst	S_DOD Calibration
	05/25/2016 12:20:28	Closing will close the method and all associated samples.	NAH	Analyst	
	05/25/2016 12:22:12	Running ICVLL ag (1)	NAH	Analyst	S_DOD Calibration
	05/25/2016 12:28:39	Running lcss57354 (2)	NAH	Analyst	S_DOD Calibration
	05/25/2016 12:34:32	Running mbs57354 (3)	NAH	Analyst	S_DOD Calibration
	05/25/2016 12:40:58	Running 724949 (4)	NAH	Analyst	S_DOD Calibration
	05/25/2016 12:47:33	Running l724949 (5)	NAH	Analyst	S_DOD Calibration
	05/25/2016 12:53:46	Running dup724949 (6)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:00:23	Running mss724949 (7)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:06:51	Running msds724949 (8)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:13:23	Running pdss724949 (9)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:15:54	Closing will close the method and all associated samples.	NAH	Analyst	
	05/25/2016 13:19:47	Running 724950 (10)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:26:04	Running ccv1 (23)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:31:45	Running ccv2 (18)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:37:45	Running ccb (19)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:40:28	Closing will close the method and all associated samples.	NAH	Analyst	
	05/25/2016 13:44:15	Running 724951 (11)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:50:27	Running 724952 (12)	NAH	Analyst	S_DOD Calibration
	05/25/2016 13:56:58	Running 724953 (13)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:03:30	Running 724954 (14)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:09:50	Running 724955 (15)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:16:15	Running 724956 (16)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:21:06	Closing will close the method and all associated samples.	NAH	Analyst	
	05/25/2016 14:22:46	Running 724957 (17)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:29:03	Running 724958 (18)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:35:19	Running 724959 (19)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:41:37	Running 724960 (20)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:48:15	Running ccv1 (23)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:53:55	Running ccv2 (18)	NAH	Analyst	S_DOD Calibration
	05/25/2016 14:59:53	Running ccb (19)	NAH	Analyst	S_DOD Calibration
	05/25/2016 15:06:23	Running 724961 (21)	NAH	Analyst	S_DOD Calibration
	05/25/2016 15:12:51	Running 724962 (22)	NAH	Analyst	S_DOD Calibration
	05/25/2016 15:19:19	Running 724963 (23)	NAH	Analyst	S_DOD Calibration
	05/25/2016 15:25:41	Running 724964 (24)	NAH	Analyst	S_DOD Calibration
	05/25/2016 15:32:05	Running 724965 (25)	NAH	Analyst	S_DOD Calibration
	05/25/2016 15:38:46	Running 724966 (26)	NAH	Analyst	S_DOD Calibration
	05/25/2016 15:45:15	Running 724967 (27)	NAH	Analyst	S_DOD Calibration

Type	Date/Time	Message	User name	Application	Sequence Name
	05/25/2016 15:51:26	Running lcss57353 (28)	NAH	Analyst	S_DOD Calibration
	05/25/2016 15:57:21	Running mbs57353 (29)	NAH	Analyst	S_DOD Calibration
	05/25/2016 16:03:48	Running 724828 (30)	NAH	Analyst	S_DOD Calibration
	05/25/2016 16:10:06	Running ccv1 (23)	NAH	Analyst	S_DOD Calibration
	05/25/2016 16:15:47	Running ccv2 (18)	NAH	Analyst	S_DOD Calibration
	05/25/2016 16:21:46	Running ccb (19)	NAH	Analyst	S_DOD Calibration
	05/25/2016 16:28:14	Running l724828 (31)	NAH	Analyst	S_DOD Calibration
	05/25/2016 16:34:48	Running dup724828 (32)	NAH	Analyst	S_DOD Calibration
	05/25/2016 16:41:18	Running mss724828 (33)	NAH	Analyst	S_DOD Calibration
	05/25/2016 16:47:36	Running msds724828 (34)	NAH	Analyst	S_DOD Calibration
	05/25/2016 16:54:00	Running pdss724828 (35)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:00:18	Running 724836 (36)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:06:49	Running 724837 (37)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:13:19	Running 724838 (38)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:19:36	Running 724840 (39)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:26:03	Running 724841 (40)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:32:29	Running ccv1 (23)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:38:08	Running ccv2 (18)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:44:07	Running ccb (19)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:50:36	Running 724842 (41)	NAH	Analyst	S_DOD Calibration
	05/25/2016 17:57:06	Running 724843 (42)	NAH	Analyst	S_DOD Calibration
	05/25/2016 18:03:20	Running 724844 (43)	NAH	Analyst	S_DOD Calibration
	05/25/2016 18:10:06	Running 724845 (44)	NAH	Analyst	S_DOD Calibration
	05/25/2016 18:16:38	Running 724846 (45)	NAH	Analyst	S_DOD Calibration
	05/25/2016 18:23:03	Running 724849 (46)	NAH	Analyst	S_DOD Calibration
	05/25/2016 18:29:33	Running 724850 (47)	NAH	Analyst	S_DOD Calibration
	05/25/2016 18:36:04	Running 724852 (48)	NAH	Analyst	S_DOD Calibration
	05/25/2016 18:42:34	Running lcsw57386 (49)	NAH	Analyst	S_DOD Calibration
	05/25/2016 18:48:49	Running mbw57386 (50)	NAH	Analyst	S_DOD Calibration
	05/25/2016 18:55:15	Running ccv1 (23)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:00:56	Running ccv2 (18)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:06:55	Running ccb (19)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:13:24	Running 724815 (51)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:19:51	Running 724839 (52)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:26:43	Running 724847 (53)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:33:25	Running 724848 (54)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:40:08	Running 724851 (55)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:46:48	Running l724851 (56)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:53:13	Running dup724851 (57)	NAH	Analyst	S_DOD Calibration
	05/25/2016 19:59:53	Running msw724851 (58)	NAH	Analyst	S_DOD Calibration
	05/25/2016 20:06:07	Running msdw724851 (59)	NAH	Analyst	S_DOD Calibration
	05/25/2016 20:12:21	Running pdsw724851 (60)	NAH	Analyst	S_DOD Calibration
	05/25/2016 20:18:29	Running ccv1 (23)	NAH	Analyst	S_DOD Calibration
	05/25/2016 20:24:09	Running ccv2 (18)	NAH	Analyst	S_DOD Calibration
	05/25/2016 20:30:08	Running ccb (19)	NAH	Analyst	S_DOD Calibration
	05/25/2016 20:36:37	Running lcsw57388 (61)	NAH	Analyst	S_DOD Calibration
	05/25/2016 20:42:43	Running mbw57388 (62)	NAH	Analyst	S_DOD Calibration
	05/25/2016 20:49:13	Running 726297 (63)	NAH	Analyst	S_DOD Calibration
	05/25/2016 20:55:42	Running 726298 (64)	NAH	Analyst	S_DOD Calibration
	05/25/2016 21:02:09	Running 726299 (65)	NAH	Analyst	S_DOD Calibration
	05/25/2016 21:09:02	Running l726299 (66)	NAH	Analyst	S_DOD Calibration
	05/25/2016 21:15:33	Running dup726299 (67)	NAH	Analyst	S_DOD Calibration
	05/25/2016 21:22:26	Running msw726299 (68)	NAH	Analyst	S_DOD Calibration

Type	Date/Time	Message	User name	Application	Sequence Name
	05/26/2016 06:59:19	iTEVA loaded	NAH	iTEVA Control Center	
	05/26/2016 06:59:37	Connected to instrument 20082101	NAH	iTEVA Control Center	
	05/26/2016 07:00:39	Plasma On	NAH	iTEVA Control Center	
	05/26/2016 07:00:44	Plasma ignition successful	NAH	iTEVA Control Center	
	05/26/2016 07:01:23	D33534 - Debug:Wavelength check : x = 1.694, y =1.697	NAH	iTEVA Control Center	
	05/26/2016 07:06:46	iTEVA loaded	NAH	iTEVA Control Center	
	05/26/2016 07:07:04	Connected to instrument 20082101	NAH	iTEVA Control Center	
	05/26/2016 07:07:45	Plasma On	NAH	iTEVA Control Center	
	05/26/2016 07:12:55	iTEVA loaded	NAH	iTEVA Control Center	
	05/26/2016 07:13:14	Connected to instrument 20082101	NAH	iTEVA Control Center	
	05/26/2016 07:13:55	Plasma On	NAH	iTEVA Control Center	
	05/26/2016 07:47:29	iTEVA loaded	NAH	iTEVA Control Center	
	05/26/2016 07:47:47	Connected to instrument 20082101	NAH	iTEVA Control Center	
	05/26/2016 07:48:28	Plasma On	NAH	iTEVA Control Center	
	05/26/2016 07:49:37	iTEVA loaded	NAH	iTEVA Control Center	
	05/26/2016 07:54:59	iTEVA loaded	NAH	iTEVA Control Center	
	05/26/2016 07:59:14	iTEVA loaded	NAH	iTEVA Control Center	
	05/26/2016 07:59:32	Connected to instrument 20082101	NAH	iTEVA Control Center	
	05/26/2016 08:00:14	Plasma On	NAH	iTEVA Control Center	
	05/26/2016 10:16:41	Torch alignment successfully completed.	NAH	Analyst	
	05/26/2016 10:21:57	D33534 - Debug:Wavelength check : x = 1.197, y =1.506	NAH	Analyst	
	05/26/2016 10:24:32	Auto Peak	NAH	Analyst	
	05/26/2016 10:28:27	Auto Peak	NAH	Analyst	
	05/26/2016 10:31:53	Auto Peak	NAH	Analyst	
	05/26/2016 10:36:47	Auto Peak	NAH	Analyst	
	05/26/2016 10:40:58	Auto Peak	NAH	Analyst	
	05/26/2016 10:42:31	Sequence Started	NAH	Analyst	S_DOD Calibration
	05/26/2016 10:42:31	Autosampler Run Started	NAH	Analyst	
	05/26/2016 10:42:52	Running Blank (1)	NAH	Analyst	S_DOD Calibration
	05/26/2016 10:46:58	Autosampler Run Completed	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:00:39	Autosampler Run Started	NAH	Analyst	
	05/26/2016 11:00:39	Sequence Started	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:01:00	Running Blank (1)	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:07:36	Running CalStd1=0.25 (2)	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:14:21	Running CalStd2=0.5 (3)	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:14:43	Autosampler Run Completed	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:18:53	Autosampler Run Started	NAH	Analyst	
	05/26/2016 11:18:53	Sequence Started	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:19:14	Running Blank (1)	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:25:51	Running CalStd1=0.25 (2)	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:32:28	Running CalStd2=0.5 (3)	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:39:03	Running CalStd3=1 (4)	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:45:41	Running CalStd4=5 (5)	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:52:19	Running CalStd5=10 (6)	NAH	Analyst	S_DOD Calibration
	05/26/2016 11:58:57	Running CalStd6=20 (7)	NAH	Analyst	S_DOD Calibration
	05/26/2016 12:05:30	Running CalStd7=50 (8)	NAH	Analyst	S_DOD Calibration
	05/26/2016 12:07:53	Closing will close the method and all associated samples.	NAH	Analyst	
	05/26/2016 12:12:02	Running CalStd8=100 (9)	NAH	Analyst	S_DOD Calibration
	05/26/2016 12:18:30	Running CalStd9=1000 (10)	NAH	Analyst	S_DOD Calibration
	05/26/2016 12:24:26	Running CalStd10=10000 (11)	NAH	Analyst	S_DOD Calibration
	05/26/2016 12:31:09	Running CalStd11-100k (12)	NAH	Analyst	S_DOD Calibration
	05/26/2016 12:37:57	Running CalStd12-100000 (13)	NAH	Analyst	S_DOD Calibration
	05/26/2016 12:42:17	Closing will close the method and all associated samples.	NAH	Analyst	

Type	Date/Time	Message	User name	Application	Sequence Name
	05/26/2016 12:44:44	Running CalStd13=500000 (14)	NAH	Analyst	S_DOD Calibration
	05/26/2016 12:52:06	Running CalStd14-1000k (15)	NAH	Analyst	S_DOD Calibration
	05/26/2016 12:59:47	Running blkrinse (22)	NAH	Analyst	S_DOD Calibration
	05/26/2016 13:06:20	Running icv (16)	NAH	Analyst	S_DOD Calibration
	05/26/2016 13:12:52	Running ICVLL (25)	NAH	Analyst	S_DOD Calibration
	05/26/2016 13:19:22	Running icb (17)	NAH	Analyst	S_DOD Calibration
	05/26/2016 13:25:59	Running icb (17)	NAH	Analyst	S_DOD Calibration
	05/26/2016 13:32:34	Running MRL (24)	NAH	Analyst	S_DOD Calibration
	05/26/2016 13:39:07	Running icsa (20)	NAH	Analyst	S_DOD Calibration
	05/26/2016 13:46:30	Running icsab (21)	NAH	Analyst	S_DOD Calibration
	05/26/2016 13:54:22	Running ICVLL ag (1)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:00:57	Running 727245 (112)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:07:34	Running 727246 (113)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:14:02	Running 726258 (114)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:20:40	Running 724949 (4)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:27:10	Running l724949 (5)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:33:58	Running dup724949 (6)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:40:27	Running mss724949 (7)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:46:50	Running msds724949 (8)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:53:12	Running pdss724949 (9)	NAH	Analyst	S_DOD Calibration
	05/26/2016 14:59:15	Running ccv1 (23)	NAH	Analyst	S_DOD Calibration
	05/26/2016 15:05:26	Running ccv2 (18)	NAH	Analyst	S_DOD Calibration
	05/26/2016 15:11:35	Running ccb (19)	NAH	Analyst	S_DOD Calibration
	05/26/2016 15:17:55	Running lcswtclp (100)	NAH	Analyst	S_DOD Calibration
	05/26/2016 15:23:47	Running mbwtclp (101)	NAH	Analyst	S_DOD Calibration
	05/26/2016 15:30:07	Running 726129 (102)	NAH	Analyst	S_DOD Calibration
	05/26/2016 15:36:09	E9000 - : Plasma went out unexpectedly; please refer to error message	NAH	iTEVA Control Center	
	05/26/2016 15:36:57	Plasma extinguished successfully	NAH	Analyst	
	05/26/2016 15:36:59	Autosampler Run Completed	NAH	Analyst	S_DOD Calibration
	05/27/2016 06:44:10	Plasma On	NAH	iTEVA Control Center	
	05/27/2016 06:44:18	E2206 - : Plasma ignition failed; RF interface board reported over-curre	NAH	Analyst	
	05/27/2016 06:44:18	E2206 - : Plasma ignition failed; RF interface board reported over-curre	NAH	iTEVA Control Center	
	05/27/2016 06:48:22	Plasma On	NAH	iTEVA Control Center	
	05/27/2016 06:48:27	Plasma ignition successful	NAH	Analyst	
	05/27/2016 06:49:06	D33534 - Debug:Wavelength check : x = 1.603, y =1.609	NAH	Analyst	
	05/27/2016 06:54:20	E9006 - : Plasma went out unexpectedly; RF reported over current failu	NAH	iTEVA Control Center	
	05/27/2016 06:57:39	Plasma On	NAH	iTEVA Control Center	
	05/27/2016 06:57:44	Plasma ignition successful	NAH	Analyst	
	05/27/2016 06:58:24	D33534 - Debug:Wavelength check : x = 1.597, y =1.611	NAH	Analyst	
	05/27/2016 07:14:34	Autosampler Run Started	NAH	Analyst	
	05/27/2016 07:14:34	Sequence Started	NAH	Analyst	S_DOD Calibration
	05/27/2016 07:14:55	Running Blank (1)	NAH	Analyst	S_DOD Calibration
	05/27/2016 07:21:31	Running CalStd1=0.25 (2)	NAH	Analyst	S_DOD Calibration
	05/27/2016 07:28:07	Running CalStd2=0.5 (3)	NAH	Analyst	S_DOD Calibration
	05/27/2016 07:34:42	Running CalStd3=1 (4)	NAH	Analyst	S_DOD Calibration
	05/27/2016 07:41:19	Running CalStd4=5 (5)	NAH	Analyst	S_DOD Calibration
	05/27/2016 07:47:56	Running CalStd5=10 (6)	NAH	Analyst	S_DOD Calibration
	05/27/2016 07:54:31	Running CalStd6=20 (7)	NAH	Analyst	S_DOD Calibration
	05/27/2016 08:01:03	Running CalStd7=50 (8)	NAH	Analyst	S_DOD Calibration
	05/27/2016 08:07:33	Running CalStd8=100 (9)	NAH	Analyst	S_DOD Calibration
	05/27/2016 08:14:00	Running CalStd9=1000 (10)	NAH	Analyst	S_DOD Calibration
	05/27/2016 08:19:54	Running CalStd10=10000 (11)	NAH	Analyst	S_DOD Calibration
	05/27/2016 08:26:36	Running CalStd11-100k (12)	NAH	Analyst	S_DOD Calibration

Standard ID#:	M12866	Vendor:	Fisher, distributer (saint-gobain, manu
Analyst:	NAH	Chemical:	Chemware Ultra pure PTFE Boiling St
Date Received:	05/23/2016	Lot #:	5608-6E001
Expiration Date (if any):		Catalog #:	0919120

Standard ID#:	M12864	Vendor:	LabChem
Analyst:	LJF	Chemical:	STANNOUS CHLORIDE
Date Received:	05/19/2016	Lot #:	F120-15
Expiration Date (if any):		Catalog #:	LC251701

Standard Log #:	M12865	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	05/20/2016	Expiration Date:	05/20/2017
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.534 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard ID#:	M12862	Vendor:	Inorganic Ventures
Analyst:	MDS	Chemical:	GFAA ICAL/CCV
Date Received:	05/19/2016	Lot #:	J2-MEB581070
Expiration Date (if any):	06/01/2017	Catalog #:	CTI-SPK-1

Standard ID#:	M12863	Vendor:	Inorganic Ventures
Analyst:	MDS	Chemical:	GFAA ICV/SPIKE
Date Received:	05/19/2016	Lot #:	J2-MEB581069
Expiration Date (if any):	06/01/2017	Catalog #:	CTI-GFCAL-1

Standard ID#:	M12860	Vendor:	CPI
Analyst:	NAH	Chemical:	Arsenic 1000 mg/L
Date Received:	05/17/2016	Lot #:	16B070
Expiration Date (if any):	11/11/2017	Catalog #:	S4400-100031

Standard ID#:	M12861	Vendor:	CPI
Analyst:	NAH	Chemical:	Lead 10,000 mg/L
Date Received:	05/17/2016	Lot #:	16D240
Expiration Date (if any):	11/11/2017	Catalog #:	4400-10M281

Standard ID#:	M12859	Vendor:	Alfa Aesar Specpure
Analyst:	MDS	Chemical:	Nickel Nitrate Matrix Modifier
Date Received:	05/12/2016	Lot #:	921812Q
Expiration Date (if any):	06/30/2017	Catalog #:	39043

Standard ID#:	M12856	Vendor:	SPEX CertPrep
Analyst:	LJF	Chemical:	Hg
Date Received:	05/10/2016	Lot #:	CL8-144HGY
Expiration Date (if any):	05/30/2017	Catalog #:	CLHG4-2Y

Standard Log #:	M12857	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	05/10/2016	Expiration Date:	11/10/2016
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

Standard Log #:	M12858	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	05/10/2016	Expiration Date:	11/10/2016
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12403 and **60 g** hydroxylamine sulfate M12610 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12852	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	05/06/2016	Expiration Date:	08/18/2017
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12788 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12853	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	05/06/2016	Expiration Date:	06/30/2016
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12532 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12854	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	05/06/2016	Expiration Date:	05/06/2016
Prep:	Carefully mixed **3** parts HCl AB.618 with **1** part HNO_3 AB.619 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12855	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	05/06/2016	Expiration Date:	11/06/2016
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.618 and dissolved **100 g** Stannous chloride M12802 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12849	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	05/06/2016	Expiration Date:	08/18/2016
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12788 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12850	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	05/06/2016	Expiration Date:	06/30/2016
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12851	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	05/06/2016	Expiration Date:	06/30/2016
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12532 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	ICP 6000
Standard Log #:	M12848	Standard:	List 2 ICSAB
Analyst:	MDS	Concentrations:	500,000 µg/L (Al, Ca, Fe, Mg) 500 µg/L (Li, Sn, Sr, Ti, W)
Prep Date:	05/04/16	Expiration Date:	12/30/16
Prep:	Into a 200 mL volumetric flask, pipetted **20 mL** of Interferents A custom stock (5000 mg/L Al, Ca, Mg and 2000 mg/L Fe) M12733, **6 mL** of Fe (10,000 mg/L) M12745, **0.1 mL** of Li (1000 µg/mL) M12672, **0.1 mL** of Sn (1000 µg/mL) M12669, **0.1 mL** of Sr (1000 µg/mL) M12670, **0.1 mL** of Ti (1000 µg/mL) M12671, and **0.1 mL** of W (1000 µg/mL) M12673 and brought up to volume using Milli-Q H_2O. (0.5% HNO_3, 0.5% HCl)		

		Instrument:	GFAA
Standard Log #:	M12846	Standard:	CCV Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.5 ug/L (Ag)
Prep Date:	04/29/16	Expiration Date:	06/01/16
Prep:	Into a 1 L volumetric flask, pipetted **0.1 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

		Instrument:	GFAA
Standard Log #:	M12847	Standard:	ICV/LCS Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.0 ug/L (Ag)
Prep Date:	04/29/16	Expiration Date:	06/01/16
Prep:	Into a 1 L volumetric flask, pipetted **1.0 mL** of GFAA Custom Stock Std. ((10 ug/mL As, Pb, Sb, Se, Tl) (1.0 ug/mL Ag)) M12505 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

Standard ID#:	M12843	Vendor:	FISHER
Analyst:	LJF	Chemical:	HYDROXYLAMINE SULFATE
Date Received:	04/28/16	Lot #:	161238
Expiration Date (if any):		Catalog #:	H331-500

		Instrument:	ICP 6000
Standard Log #:	M12844	Standard:	B&Si ICV
Analyst:	MDS	Concentrations:	1000 ug/L (B, Si)
Prep Date:	04/29/16	Expiration Date:	02/28/17
Prep:	Into a 1 L volumetric flask, pipetted **10 mL** of Custom Assurance Std. #23 (100 mg/L Al, As, **B**, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12769 and **1.0 mL** Si (1000 mg/L) M12675 and brought up to volume using milli-Q H_2O.		

		Instrument:	GFAA
Standard Log #:	M12845	Standard:	Calibration Std.
Analyst:	MDS	Concentrations:	25 ug/L (As, Pb, Sb, Se, Tl) 3.75 ug/L (Ag)
Prep Date:	04/29/16	Expiration Date:	06/01/16
Prep:	Into a 1 L volumetric flask, pipetted **0.25 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q H_2O. (1% HNO_3)		

		Instrument:	ICP 6000
Standard Log #:	M12841	Standard:	NaK ICV
Analyst:	MDS	Concentrations:	100 mg/L (Na, K)
Prep Date:	04/22/2016	Expiration Date:	04/15/2017
Prep:	Into a 250 mL volumetric flask, pipetted **2.5 mL** of K (10,000 mg/L) M12744 and Na (10,000 mg/L) M12679 and brought up to volume using Milli-Q H_2O. (2% HNO_3)		

		Instrument:	ICP 6000
Standard Log #:	M12842	Standard:	NaK ICSAB
Analyst:	MDS	Concentrations:	500 mg/L (Al, Ca, Fe, Mg) 100 mg/L (Na, K)
Prep Date:	04/22/2016	Expiration Date:	12/30/2016
Prep:	Into a 250 mL volumetric flask, pipetted **25 mL** of Interferents A custom stock (5000 mg/L Al, Ca, Mg and 2000 mg/L Fe) M12733, **2.5 mL** of K (10,000 mg/L) M12744, **2.5 mL** of Na (10,000 mg/L) M12679 and **7.5 mL** of Fe (10,000 mg/L) M12745 and brought up to volume using Milli-Q H_2O. (2% HNO_3)		

Standard Log #:	M12840	Instrument:	ICP
Analyst:	NAH	Standard:	LOQ 3050 S Spiking Solution
Prep Date:	04/19/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3)

Analyte	Final MDL Conc. (ug/L)	Std. ID #	Std. Conc. (mg/L)	Volume (mL) pipetted
S	240	M12770	10000	1.2

Of this base standard, pipetted **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12839	Instrument:	ICP
Analyst:	NAH	Standard:	LOQ 3010 S Spiking Solution
Prep Date:	04/19/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3)

Analyte	Final MDL Conc. (ug/L)	Std. ID #	Std. Conc. (mg/L)	Volume (mL) pipetted
S	200	M12770	10000	1.0

Of this base standard, pipetted **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12838	Instrument:	ICP
Analyst:	NAH	Standard:	LOQ 3050 B&Si Spiking Solution
Prep Date:	04/19/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3)

Analyte	Final MDL Conc. (ug/L)	Std. ID #	Std. Conc. (mg/L)	Volume (mL) pipetted
B	52	M12471	1000	2.6
Si	192	M12675	1000	9.6

Of this base standard, pipetted **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12837	Instrument:	ICP
Analyst:	NAH	Standard:	LOQ 3010 B&Si Spiking Solution
Prep Date:	04/19/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3)

Analyte	Final MDL Conc. (ug/L)	Std. ID #	Std. Conc. (mg/L)	Volume (mL) pipetted
B	16	M12471	1000	0.8
Si	200	M12675	1000	10

Of this base standard, pipetted **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12836	Instrument:	ICP
Analyst:	NAH	Standard:	LOQ 3050 k&na Spiking Solution
Prep Date:	04/19/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3)

Analyte	Final MDL Conc. (ug/L)	Std. ID #	Std. Conc. (mg/L)	Volume (mL) pipetted
K	2640	M12744	10000	13.2
Na	960	M12679	10000	4.8

Of this base standard, pipetted **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12835	Instrument:	ICP
Analyst:	NAH	Standard:	LOQ 3010 k&na Spiking Solution
Prep Date:	04/19/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3)

Analyte	Final MDL Conc. (ug/L)	Std. ID #	Std. Conc. (mg/L)	Volume (mL) pipetted
K	500	M12744	10000	2.5
Na	600	M12679	10000	3

Of this base standard, pipetted **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12834	Instrument:	ICP
Analyst:	NAH	Standard:	LOQ 3050 L2 Spiking Solution
Prep Date:	04/19/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3)

Analyte	Final MDL Conc. (ug/L)	Std. ID #	Std. Conc. (mg/L)	Volume (mL) pipetted
Li	14.4	M12672	1000	0.72
Sn	20	M12669	1000	1
Sr	3.2	M12670	1000	0.16
Ti	9.6	M12671	1000	0.48
W	24	M12673	1000	1.2

Of this base standard, pipetted **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12833	Instrument:	ICP
Analyst:	NAH	Standard:	LOQ 3010 L2 Spiking Solution
Prep Date:	04/19/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3)

Analyte	Final MDL Conc. (ug/L)	Std. ID #	Std. Conc. (mg/L)	Volume (mL) pipetted
Li	10	M12672	1000	0.5
Sn	10	M12669	1000	0.5
Sr	2	M12670	1000	0.1
Ti	8	M12671	1000	0.8
W	36	M12673	1000	1.8

Of this base standard, pipetted **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12832	Instrument:	ICP 6500
Analyst:	NAH	Standard:	LOQ 3050 DOD Metals Spiking S
Prep Date:	0419/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3, 5% HCl)

Analyte	MDL Conc. (ug/L)	Std. ID #	Std Conc	Volume (mL) pipetted into 1 L
Ag	4	M12599	1000	0.2
Al	9.6	M12713	**10000**	0.048
As	32	M12315	1000	1.6
Ba	2	M12473	1000	0.1
Be	1.6	M12667	1000	0.08
Ca	56	M12716	**10000**	0.28
Cd	1.6	M12674	1000	0.08
Co	9.6	M12678	1000	0.48
Cr	5.6	M12470	**10000**	0.028
Cu	16	M12472	**10000**	0.08
Fe	72	M12745	**10000**	0.36
Mg	32	M12715	**10000**	0.16
Mn	6	M12733	**10000**	0.03
Mo	9.6	M12677	1000	0.48
Ni	4.8	M12681	1000	0.24
Pb	10	M12313	**10000**	0.05
Sb	32	M12602	1000	1.6
Se	16	M12600	1000	0.8
Tl	19	M12668	1000	0.95
V	3.2	M12676	1000	0.16
Zn	12	M12680	**10000**	0.06

Of this Base standard, pipet **10 mL** into a 500 mL volumetric flask to create a working std or **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12831	Instrument:	ICP 6500
Analyst:	NAH	Standard:	LOQ 3010 DOD Metals Spiking S
Prep Date:	04/19/2016	Expiration Date:	10/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3, 5% HCl)

Analyte	MDL Conc. (ug/L)	Std. ID #	Std Conc	Volume (mL) pipetted into 1 L
Ag	4	M12599	1000	0.2
Al	36	M12713	**10000**	0.18
As	24	M12315	1000	1.2
Ba	1.8	M12473	1000	0.09
Be	0.6	M12667	1000	0.03
Ca	100	M12716	**10000**	0.5
Cd	2.0	M12674	1000	0.1
Co	4	M12678	1000	0.2
Cr	4	M12470	**10000**	0.02
Cu	7	M12472	**10000**	0.035
Fe	100	M12745	**10000**	0.5
Mg	40	M12715	**10000**	0.2
Mn	4	M12533	**10000**	0.02
Mo	7	M12677	1000	0.35
Ni	6	M12681	1000	0.2
Pb	4	M12313	**10000**	0.02
Sb	12	M12602	1000	0.6
Se	13	M12600	1000	0.65
Tl	20	M12668	1000	0.75
V	5	M12676	1000	0.25
Zn	10	M12680	**10000**	0.05

Of this Base standard, pipet **10 mL** into a 500 mL volumetric flask to create a working std or **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12830	Reagent:	Potassium Persulfate Solution
Analyst:	LJF		
Prep Date:	041916	Expiration Date:	101916
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium persulfate M11748 and brought up to volume.		

Standard Log #:	M12827	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	041816	Expiration Date:	101816
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

Standard ID#:	M12828	Vendor:	Environmental Express
Analyst:	NAH	Chemical:	Yttrium 10,000 ug/mL
Date Received:	04/18/2016	Lot #:	1518025
Expiration Date (if any):	10/14/2017	Catalog #:	hp10m67-1

Standard ID#:	M12829	Vendor:	CPI
Analyst:	NAH	Chemical:	Yttrium 10,000 ug/mL
Date Received:	04/18/2016	Lot #:	16a118
Expiration Date (if any):	10/12/2017	Catalog #:	4400-10m671

		Instrument:	CETAC
Standard Log #:	M12823	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	041816	Expiration Date:	063016
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12788 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12824	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	041816	Expiration Date:	063016
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12825	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	041816	Expiration Date:	010118
Prep:	Carefully mixed **3** parts HCl AB.618 with **1** part HNO_3 AB.617 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12826	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	041816	Expiration Date:	101816
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.618 and dissolved **100 g** Stannous chloride M12802 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12820	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	041816	Expiration Date:	081817
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12788 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12821	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	041816	Expiration Date:	063016
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12822	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	041816	Expiration Date:	063016
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

Standard ID#:	M12819	Vendor:	Spex CertiPrep
Analyst:	NAH	Chemical:	Custom Assurance Std
Date Received:	04/12/2016	Lot #:	36-051CR
Expiration Date (if any):	4/30/2017	Catalog #:	XSPIKE-1-250

		Instrument:	CETAC
Standard Log #:	M12816	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	04/01/16	Expiration Date:	02/26/17
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.615 and dissolved **100 g** Stannous chloride M12789 and brought up to volume.		

Standard Log #:	M12817	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	04/01/16	Expiration Date:	10/01/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

Standard Log #:	M12818	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	04/01/16	Expiration Date:	10/01/16
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12403 and **60 g** hydroxylamine sulfate M12610 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12813	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	04/01/16	Expiration Date:	08/18/17
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12788 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12814	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	04/01/16	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12815	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	04/01/16	Expiration Date:	10/01/17
Prep:	Carefully mixed **3** parts HCl AB.615 with **1** part HNO_3 AB.614 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12810	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	04/01/16	Expiration Date:	08/18/17
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12788 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12811	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	04/01/16	Expiration Date:	06/30/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12812	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	04/01/16	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

Standard Log #:	M12809	Instrument:	ICP 6500
Analyst:	MDS	Standard:	MDL 21 Metals Spiking Solution
Prep Date:	03/22/2016	Expiration Date:	06/02/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (5% HNO_3, 5% HCl)

Analyte	MDL Conc. (ug/L)	Std. ID #	Std Conc	Volume (mL) pipetted into 1 L
Ag	5	M12599	1000	0.25
Al	10	M12713	**10000**	0.05
As	20	M12315	1000	1
Ba	2	M12473	1000	0.1
Be	0.5	M12667	1000	0.025
Ca	50	M12716	**10000**	0.25
Cd	0.5	M12674	1000	0.025
Co	2.5	M12678	1000	0.125
Cr	50	M12470	**10000**	0.25
Cu	10	M12472	**10000**	0.05
Fe	40	M12714	**10000**	0.2
Mg	25	M12715	**10000**	0.125
Mn	5	M12533	**10000**	0.025
Mo	2.5	M12677	1000	0.125
Ni	5	M12681	1000	0.25
Pb	10	M12313	**10000**	0.05
Sb	20	M12602	1000	1
Se	20	M12600	1000	1
Tl	20	M12668	1000	1
V	5	M12676	1000	0.25
Zn	5	M12680	**10000**	0.025

Of this Base standard, pipet **10 mL** into a 500 mL volumetric flask to create a working std or **1 mL** into a 50 mL digestion tube for a digested working standard.

Standard Log #:	M12808	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	03/17/16	Expiration Date:	03/17/17
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.534 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

		Instrument:	GFAA
Standard Log #:	M12805	Standard:	Calibration Std.
Analyst:	MDS	Concentrations:	25 ug/L (As, Pb, Sb, Se, Tl) 3.75 ug/L (Ag)
Prep Date:	03/15/2016	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **0.25 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q H_2O. (1% HNO_3)		

		Instrument:	GFAA
Standard Log #:	M12806	Standard:	CCV Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.5 ug/L (Ag)
Prep Date:	03/15/2016	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **0.1 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

		Instrument:	GFAA
Standard Log #:	M12807	Standard:	ICV/LCS Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.0 ug/L (Ag)
Prep Date:	03/15/2016	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **1.0 mL** of GFAA Custom Stock Std. ((10 ug/mL As, Pb, Sb, Se, Tl) (1.0 ug/mL Ag)) M12505 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

Standard ID#:	M12802	Vendor:	LabChem
Analyst:	LJF	Chemical:	STANNOUS CHLORIDE
Date Received:	03/09/16	Lot #:	F053-07
Expiration Date (if any):		Catalog #:	LC251701

Standard Log #:	M12803	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	03/09/16	Expiration Date:	09/09/17
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

Standard ID#:	M12804	Vendor:	CPI
Analyst:	NAH	Chemical:	Arsenic 10,000 mg/L
Date Received:	03/09/16	Lot #:	14A276
Expiration Date (if any):	09/03/17	Catalog #:	S4400-10M31

		Instrument:	ICP 6000
Standard Log #:	M12800	Standard:	L2 ICV
Analyst:	MDS	Concentrations:	1000 µg/L (Li, Sn, Sr, Ti, W)
Prep Date:	03/08/2016	Expiration Date:	04/15/2017
Prep:	Into a 1 L volumetric flask, pipetted **1.0 mL** of the following and brought up to volume using milli-Q H_2O. (0.5% HNO_3, 0.5% HCl) Li (1000 µg/mL) M12672 Sn (1000 µg/mL) M12669 Sr (1000 µg/mL) M12670 Ti (1000 µg/mL) M12671 W (1000 µg/mL) M12784		

		Instrument:	ICP 6000
Standard Log #:	M12801	Standard:	List 2 MRL/ICVLL Prep Solution
Analyst:	MDS	Concentrations:	5000 µg/L (W) 1000 µg/L (Li, Sn) 500 µg/L (Ti, Sr)
Prep Date:	03/08/2016	Expiration Date:	04/15/2017

Prep:

Analyte	MRL/ICVLL Conc. (µg/L)	Standard ID	Std. Conc. (µg/mL)	Volume (mL) Pipetted into 1 L	Expiration Date
Li	20/60	M12672	1000	1	04/15/2017
W	100/300	M12784	1000	5	08/11/2017
Ti	10/30	M12671	1000	0.5	04/15/2017
Sr	10/30	M12670	1000	0.5	04/15/2017
Sn	20/60	M12669	1000	1	04/15/2017

Pipette **10 mL** into a 500 mL volumetric flask to create a working MRL std. or **1 mL** into a 50 mL digestion tube for a digested MRL standard. Pipette **30 mL** into 500 mL for a working ICVLL std. or **3 mL** into a 50 mL digestion tube for a digested ICVLL standard.

(0.5% HNO_3, 0.5% HCl)

Standard Log #:	M12798	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	03/07/16	Expiration Date:	03/07/17
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard Log #:	M12799	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	03/07/16	Expiration Date:	03/07/17
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard Log #:	M12797	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	02/29/16	Expiration Date:	08/29/16
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12403 and **60 g** hydroxylamine sulfate M12548 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12793	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	02/26/16	Expiration Date:	08/18/17
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12788 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12794	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	02/26/16	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12795	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	02/26/16	Expiration Date:	10/01/17
Prep:	Carefully mixed **3** parts HCl AB.615 with **1** part HNO_3 AB.614 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12796	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	02/26/16	Expiration Date:	02/26/17
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.615 and dissolved **100 g** Stannous chloride M12789 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12790	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	02/26/16	Expiration Date:	08/18/17
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12788 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12791	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	02/26/16	Expiration Date:	06/30/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12792	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	02/26/16	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

Standard ID#:	M12787	Vendor:	CPI
Analyst:	NAH	Chemical:	Yttrium 10,000 mg/L
Date Received:	02/24/2016	Lot #:	16A118
Expiration Date (if any):	08/18/2017	Catalog #:	4400-10M671

Standard ID#:	M12788	Vendor:	CPI
Analyst:	NAH	Chemical:	Mercury 1000 mg/L
Date Received:	02/24/2016	Lot #:	15J139
Expiration Date (if any):	08/18/2017	Catalog #:	S4400-1000331

Standard ID#:	M12789	Vendor:	LabChem
Analyst:	LJF	Chemical:	STANNOUS CHLORIDE
Date Received:	02/24/16	Lot #:	F053-07
Expiration Date (if any):		Catalog #:	LC251701

Standard Log #:	M12786	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	02/22/16	Expiration Date:	02/22/17
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard Log #:	M12785	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	02/18/16	Expiration Date:	02/18/17
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard Log #:	M12783	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	02/16/16	Expiration Date:	08/16/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

Standard ID#:	M12784	Vendor:	CPI
Analyst:	NAH	Chemical:	Tungsten
Date Received:	02/16/2016	Lot #:	15k204
Expiration Date (if any):	08/11/2017	Catalog #:	S4400-1000633

		Instrument:	CETAC
Standard Log #:	M12780	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	02/15/16	Expiration Date:	10/01/17
Prep:	Carefully mixed **3** parts HCl AB.615 with **1** part HNO_3 AB.614 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12781	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	02/15/16	Expiration Date:	08/12/16
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.615 and dissolved **100 g** Stannous chloride M12731 and brought up to volume.		

Standard ID#:	M12782	Vendor:	ALFA AESAR
Analyst:	LJF	Chemical:	TIN CHLORIDE DIH
Date Received:	02/11/16	Lot #:	W03B012
Expiration Date (if any):		Catalog #:	11536

		Instrument:	CETAC
Standard Log #:	M12777	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	02/15/16	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12778	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	02/15/16	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12779	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	02/15/16	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

Standard Log #:	M12774	Reagent:	Potassium Persulfate Solution
Analyst:	LJF		
Prep Date:	02/15/16	Expiration Date:	08/15/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium persulfate M12774 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12775	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	02/15/16	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12776	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	02/15/16	Expiration Date:	06/30/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

Standard ID#:	M12773	Vendor:	Spex Certiprep
Analyst:	NAH	Chemical:	Custom Assurance std-spike
Date Received:	02/12/16	Lot #:	35-054CR
Expiration Date (if any):	02/28/2016	Catalog #:	XSPIKE-1-250

Standard ID#:	M12770	Vendor:	SPEX CertiPrep
Analyst:	MDS	Chemical:	Sulfur 10,000 µg/mL
Date Received:	02/09/2016	Lot #:	AJ16-45SY
Expiration Date (if any):	02/28/2017	Catalog #:	PLS9-3Y

		Instrument:	ICP 6000
Standard Log #:	M12771	Standard:	Sulfur ICAL
Analyst:	MDS	Concentrations:	1000 10,000 100,000 1000K µg/L (S)
Prep Date:	02/09/2016	Expiration Date:	02/28/2017
Prep:	Into four, 100 mL volumetric flasks, pipetted the following from stock standard S (10,000 µg/mL) M12770 and brought up to volume using milli-Q H_2O. *1000 ug/L std.* - **0.01 mL** *10,000 ug/L std.* - **0.1 mL** *100,000 ug/L std.* -**1.0 mL**, also used as the CCV *1000K ug/L std.* - **10 mL**		

		Instrument:	ICP 6000
Standard Log #:	M12772	Standard:	Sulfur ICV
Analyst:	MDS	Concentrations:	100,000 µg/L (S)
Prep Date:	02/09/2016	Expiration Date:	08/13/2016
Prep:	Into a 100 mL volumetric flask, pipetted **1.0 mL** of S (10,000 µg/mL) M12371 and brought up to volume using Milli-Q H_2O.		

Standard ID#:	M12769	Vendor:	Spex Certiprep
Analyst:	NAH	Chemical:	Custom Assurance Standard
Date Received:	02/08/2016	Lot #:	11-035WL
Expiration Date (if any):	02/28/2017	Catalog #:	XCTWI-5-500

		Instrument:	ICP 6000
Standard Log #:	M12766	Standard:	List 2 ICSAB
Analyst:	MDS	Concentrations:	500,000 µg/L (Al, Ca, Fe, Mg) 500 µg/L (Li, Sn, Sr, Ti, W)
Prep Date:	02/04/2016	Expiration Date:	12/30/2016
Prep:	Into a 200 mL volumetric flask, pipetted **20 mL** of Interferents A custom stock (5000 mg/L Al, Ca, Mg and 2000 mg/L Fe) M12733, **6 mL** of Fe (10,000 mg/L) M12714, **0.1 mL** of Li (1000 µg/mL) M12672, **0.1 mL** of Sn (1000 µg/mL) M12669, **0.1 mL** of Sr (1000 µg/mL) M12670, **0.1 mL** of Ti (1000 µg/mL) M12671, and **0.1 mL** of W (1000 µg/mL) M12673 and brought up to volume using Milli-Q H_2O. (0.5% HNO_3, 0.5% HCl)		

		Instrument:	ICP 6000
Standard Log #:	M12767	Standard:	List 2 MRL/ICVLL Prep Solution
Analyst:	MDS	Concentrations:	5000 µg/L (W) 1000 µg/L (Li, Sn) 500 µg/L (Ti, Sr)
Prep Date:	02/04/2016	Expiration Date:	02/06/2016

Prep:

Analyte	MRL/ICVLL Conc. (µg/L)	Standard ID	Std. Conc. (µg/mL)	Volume (mL) Pipetted into 1 L	Expiration Date
Li	20/60	M12672	1000	1	04/15/2017
W	100/300	M12163	1000	5	02/06/2016
Ti	10/30	M12671	1000	0.5	04/15/2017
Sr	10/30	M12670	1000	0.5	04/15/2017
Sn	20/60	M12669	1000	1	04/15/2017

Pipette **10 mL** into a 500 mL volumetric flask to create a working MRL std. or **1 mL** into a 50 mL digestion tube for a digested MRL standard. Pipette **30 mL** into 500 mL for a working ICVLL std. or **3 mL** into a 50 mL digestion tube for a digested ICVLL standard.

(0.5% HNO_3, 0.5% HCl)

Standard ID#:	M12768	Vendor:	Spex Certiprep
Analyst:	NAH	Chemical:	Custum Assurance Std Ca,Mg,Na
Date Received:	02/04/2016	Lot #:	11-022WL
Expiration Date (if any):	01/30/2017	Catalog #:	XTTWI-1-500

		Instrument:	ICP
Standard Log #:	M12764	Standard:	L2 ICAL
Analyst:	MDS	Concentrations:	1 (µg/L) 10 (µg/L) 100 (µg/L) 1000 (µg/L) 10,000 (µg/L)
Prep Date:	02/04/2016	Expiration Date:	11/30/2016
Prep:	Standard Conc. (ug/L)	Pipette the following:	
	1	**0.01 mL** of Custom Assurance Standard XCTWI-5-500 M12703 and **0.001 mL** W (1000 µg/mL) M12673 into 1L = *1 µg/L*	
	10	**0.10 mL** of Custom Assurance Standard XCTWI-5-500 M12703 and **0.01 mL** W (1000 µg/mL) M12673 into 1L = *10 µg/L*	
	100	**1 mL** of Custom Assurance Standard XCTWI-5-500 M12703 and **0.1 mL** W (1000 µg/mL) M12673 into 1L = *100 µg/L*	
	1000 (CCV)	**2 mL** of Custom Assurance Standard XCTWI-5-500 M12703 and **0.2 mL** W (1000 µg/mL) M12673 into 200mL = *1000 µg/L*	
	10000	**20 mL** of Custom Assurance Standard XCTWI-5-500 M12703 and **2 mL** W (1000 µg/mL) M12673 into 200mL = *10000 µg/L*	

		Instrument:	ICP 6000
Standard Log #:	M12765	Standard:	L2 ICV
Analyst:	MDS	Concentrations:	1000 µg/L (Li, Sn, Sr, Ti, W)
Prep Date:	02/04/2016	Expiration Date:	02/06/2016
Prep:	Into a 1 L volumetric flask, pipetted **1.0 mL** of the following and brought up to volume using milli-Q H_2O. (0.5% HNO_3, 0.5% HCl) Li (1000 µg/mL) M12672 Sn (1000 µg/mL) M12669 Sr (1000 µg/mL) M12670 Ti (1000 µg/mL) M12671 W (1000 µg/mL) M12163		

Standard Log #:	M12763	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	02/03/16	Expiration Date:	08/03/16
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12403 and **60 g** hydroxylamine sulfate M12548 and brought up to volume.		

Standard Log #:	M12762	Reagent:	Potassium Persulfate Solution
Analyst:	LJF		
Prep Date:	01/29/16	Expiration Date:	07/29/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium persulfate M11748 and brought up to volume.		

Standard Log #:	M12761	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	01/28/16	Expiration Date:	07/28/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

Standard Log #:	M12760	Instrument:	GFAA
Analyst:	MDS	Standard:	MDL Spiking Solution
Prep Date:	01/25/2016	Expiration Date:	06/02/2016

Prep:

Into a 1 L volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. (2% HNO_3)

Analyte	Final MDL Conc. (ug/L)	Std. ID #	Std. Conc. (mg/L)	Volume (mL) pipetted
Ag	0.2	M12599	1000	0.01
As	2	M12315	1000	0.1
Pb	2	M12313	10000	0.01
Sb	2	M12602	1000	0.1
Se	2	M12600	1000	0.1
Tl	2	M12668	1000	0.1

Of this base standard, pipetted **1 mL** into a 50 mL digestion tube for a digested working standard.

		Instrument:	CETAC
Standard Log #:	M12757	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	01/19/16	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12758	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	01/19/16	Expiration Date:	09/01/17
Prep:	Carefully mixed **3** parts HCl AB.611 with **1** part HNO_3 AB.609 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12759	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	01/19/16	Expiration Date:	08/12/16
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.611 and dissolved **100 g** Stannous chloride M12731 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12755	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	01/19/16	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12756	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	01/19/16	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

Standard Log #:	M12752	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	01/19/16	Expiration Date:	01/19/17
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

		Instrument:	CETAC
Standard Log #:	M12753	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	01/19/16	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12754	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	01/19/16	Expiration Date:	06/30/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

Standard Log #:	M12751	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	011116	Expiration Date:	071116
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12403 and **60 g** hydroxylamine sulfate M12548 and brought up to volume.		

		Instrument:	GFAA
Standard Log #:	M12750	Standard:	LODW/LOQW Spiking Sol'n
Analyst:	MDS	Concentrations:	150 ug/L (Sb) 100 ug/L (As) 200 ug/L (Se) 45 ug/L (Pb) 40 ug/L (Tl)
Prep Date:	01/05/2016	Expiration Date:	06/02/2016
Prep:	Into a 100 mL volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. **1.5 mL** of Sb (1000 mg/L) M12602 **1.0 mL** of As (1000 mg/L) M12315 **2.0 mL** of Se (1000 mg/L) M12600 **0.045 mL** of Pb (10,000 mg/L) M12313 **0.4 mL** of Tl (1000 mg/L) M12668 From this diluted standard solution, pipetted **10 mL** into a 1 L volumetric flask and brought up to volume with Milli-Q H_2O to make the spiking solution. (1% HNO_3) *Pipette **1 mL** spiking solution into 50 mL H_2O for LOD (*3 ug/L* Sb, *2 ug/L* As, *4 ug/L* Se, *0.9 ug/L* Pb, *0.8 ug/L* Tl) and **2 mL** spiking solution for LOQ (*6 ug/L* Sb, *4 ug/L* As, *8 ug/L* Se, *1.8 ug/L* Pb, *1.6 ug/L* Tl)		

Standard Log #:	M12748	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	010516	Expiration Date:	070516
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

		Instrument:	GFAA
Standard Log #:	M12749	Standard:	LODS/LOQS Spiking Sol'n
Analyst:	MDS	Concentrations:	60 ug/L (Sb) 160 ug/L (As,Se) 40 ug/L (Pb) 50 ug/L (Tl)
Prep Date:	01/05/2016	Expiration Date:	06/02/2016
Prep:	Into a 200 mL volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. **1.2 mL** of Sb (1000 mg/L) M12602 **3.2 mL** of As (1000 mg/L) M12315 **3.2 mL** of Se (1000 mg/L) M12600 **0.08 mL** of Pb (10,000 mg/L) M12313 **1.0 mL** of Tl (1000 mg/L) M12668 From this diluted standard solution, pipetted **10 mL** into a 1 L volumetric flask and brought up to volume with Milli-Q H_2O to make the spiking solution. (1% HNO_3) *Pipette **1 mL** spiking solution into 50 mL H_2O for LOD (1.2 *ug/L* Sb, *3.2 ug/L* As, *3.2 ug/L* Se, *0.8 ug/L* Pb, *1 ug/L* Tl) and **2 mL** spiking solution for LOQ (2.4 *ug/L* Sb, *6.4 ug/L* As, *6.4 ug/L* Se, *1.6 ug/L* Pb, *2 ug/L* Tl)		

Standard Log #:	M12747	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	123015	Expiration Date:	123016
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

		Instrument:	ICP 6000
Standard Log #:	M12744b	Standard:	B&Si ICAL
Analyst:	MDS	Concentrations:	50, 200, 1000, 2000 and 10,000 ug/L (B, Si)
Prep Date:	12/21/2015	Expiration Date:	10/15/2016
Prep:	Into five, 1 L volumetric flasks, pipetted the following from stock standards B (1000 mg/L) M12471 and Si (1000 mg/L) M12601 and brought up to volume using milli-Q H_2O. *50 ug/L std.* - **0.05 mL** of each *200 ug/L std.* - **0.2 mL** of each *1000 ug/L std.* -**1.0 mL** of each, also used for Continuing Calibration Verification *2000 ug/L std.* - **2.0 mL** of each *10,000 ug/L std.* -**10 mL** of each		

		Instrument:	ICP 6000
Standard Log #:	M12745b	Standard:	B & Si ICSAB
Analyst:	MDS	Concentrations:	500,000 µg/L (Al, Ca, Fe, Mg) 500 µg/L (B,Si)
Prep Date:	12/22/2015	Expiration Date:	06/30/2016
Prep:	Into a 100 mL volumetric flask, pipetted **10 mL** of Interferents A custom stock (5000 mg/L Al, Ca, Mg and 2000 mg/L Fe) M12529, **0.05 mL** of B (1000 µg/mL) M12471, **0.05 mL** of Si (1000 µg/mL) M12601 and **3 mL** of Fe (10,000 mg/L) M12714 and brought up to volume using Milli-Q H_2O.		

Standard Log #:	M12746b	Instrument:	GFAA
Analyst:	MDS	Reagent:	Pd/Mg Matrix Modifier
Prep Date:	12/22/2015	Expiration Date:	05/18/2017
Prep:	Into a 50 mL volumetric flask, partially filled with milli-Q H_2O, pipetted **15 mL** Pd Modifier M12584 and **10 mL** Mg (10,000 mg/L) M12715 and brought up to volume.		

Standard ID#:	M12744	Vendor:	CPI
Analyst:	NAH	Chemical:	potassium 10,000 mg/L
Date Received:	12/21/2015	Lot #:	15L015
Expiration Date (if any):	06/08/2017	Catalog #:	4400-10M411

Standard ID#:	M12745	Vendor:	CPI
Analyst:	NAH	Chemical:	iron 10,000 mg/L
Date Received:	12/21/2015	Lot #:	15H243
Expiration Date (if any):	06/08/2017	Catalog #:	4400-10M261

Standard ID#:	M12746	Vendor:	CPI
Analyst:	NAH	Chemical:	Y 10,000 mg/L
Date Received:	12/21/2015	Lot #:	15E153
Expiration Date (if any):	06/08/2017	Catalog #:	4400-10M671

		Instrument:	CETAC
Standard Log #:	M12740	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	12/21/15	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12741	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	12/21/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12742	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	12/21/15	Expiration Date:	09/01/17
Prep:	Carefully mixed **3** parts HCl AB.611 with **1** part HNO_3 AB.609 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12743	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	12/21/15	Expiration Date:	08/12/16
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.611 and dissolved **100 g** Stannous chloride M12731 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12737	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	12/21/15	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12738	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	12/21/15	Expiration Date:	06/30/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12739	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	12/21/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

Standard Log #:	M12734	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	121715	Expiration Date:	121716
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard Log #:	M12735	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	121715	Expiration Date:	061716
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12403 and **60 g** hydroxylamine sulfate M12548 and brought up to volume.		

Standard Log #:	M12736	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	121715	Expiration Date:	121716
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard Log #:	M12730	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	12/14/15	Expiration Date:	06/14/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

Standard ID#:	M12731	Vendor:	MACRON
Analyst:	LJF	Chemical:	STANNOUS CHLORIDE
Date Received:	12/10/15	Lot #:	0000119473
Expiration Date (if any):	08/12/16	Catalog #:	8176-04

Standard ID#:	M12732	Vendor:	Spex Certiprep
Analyst:	NAH	Chemical:	Custom Assurance Standard
Date Received:	12-14-2015	Lot #:	34-008CR
Expiration Date (if any):	12-30-2016	Catalog #:	XSPIKE-1-250

Standard ID#:	M12733	Vendor:	Spex Certiprep
Analyst:	NAH	Chemical:	Interference A
Date Received:	12-14-2015	Lot #:	12-165YPX
Expiration Date (if any):	12-30-2016	Catalog #:	INT-A1

		Instrument:	ICP 6000
Standard Log #:	M12729	Standard:	Na,K MRL
Analyst:	MDS	Concentrations:	1 mg/L (Na,K)
Prep Date:	12/07/2015	Expiration Date:	06/03/2015
Prep:	Into a 500 mL volumetric flask, pipetted **0.5 mL** of Na (1000 µg/mL) M12377 and **0.5 mL** K (1000 µg/mL) M12378 and brought to volume with Milli-Q H_2O. (2% HNO_3)		

Standard Log #:	M12725	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	120415	Expiration Date:	060416
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12403 and **60 g** hydroxylamine sulfate M12548 and brought up to volume.		

Standard Log #:	M12726	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	120415	Expiration Date:	060416
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

		Instrument:	ICP
Standard Log #:	M12727	Standard:	As Pb ICV1
Analyst:	MDS	Concentrations:	5000 ug/L (As,Pb)
Prep Date:	12/04/2015	Expiration Date:	03/26/2016
Prep:	Into a 1 L volumetric flask, pipetted **0.5 mL** of As (10,000 mg/L) M12213 and **0.5 mL** Pb (10,000 mg/L) M12313 and brought to volume with Milli-Q H_2O. (2% HNO_3, 2% HCl)		

Standard Log #:	M12728	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	120415	Expiration Date:	120416
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

		Instrument:	CETAC
Standard Log #:	M12721	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	120215	Expiration Date:	022616
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12722	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	120215	Expiration Date:	063016
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12723	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	120215	Expiration Date:	040117
Prep:	Carefully mixed **3** parts HCl AB.607 with **1** part HNO_3 AB.609 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12724	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	120215	Expiration Date:	120915
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.607 and dissolved **100 g** Stannous chloride M12549 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12718	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	120215	Expiration Date:	022616
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12719	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	120215	Expiration Date:	063016
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12720	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	120215	Expiration Date:	063016
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	ICP 6500
Standard Log #:	M12717	Standard:	ICV Std.
Analyst:	NAH	Concentrations:	**12,000 mg/L** Al **10,000 mg/L** Ca, Mg **5000 mg/L** Fe **2000 mg/L** As, Ba, Se, Tl **500 mg/L** B, Co, Li, Mn, Mo, Ni, Pb, Sb, Sn, Sr, Ti, V, Zn **250 mg/L** Cu **200 mg/L** Cr **50 mg/L** Ag, Be, Cd
Prep Date:	12-01-2015	Expiration Date:	06-16
Prep:	Into a 1 L volumetric flask, pipetted the following and brought up to volume with milli-Q H_2O. **10 mL** Custom Assurance Standard #18 ((200 mg/L Al, As, Ba, Se, Tl) (100 mg/L Fe) (50 mg/L Co, Mn, Ni, Pb, Sb, V, Zn) (25 mg/L Cu) (20 mg/L Cr) (5 mg/L Ag, Be, Cd)) M12653, **2 mL** Interferents A Standard ((5000 mg/L Al, Ca, Mg) (2000 mg/L Fe)) M12529, **0.5 mL** Mo (1000 mg/L) M12677, **0.5 mL** B (1000 mg/L) M12471, **0.5 mL** Sr (1000 mg/L) M12670, **0.5 mL** Li (1000 mg/L) M12672, **0.5 mL** Sn (1000 mg/L) M12669 and **0.5 mL** Ti (1000 mg/L) M12671.		

Standard ID#:	M12713	Vendor:	CPI
Analyst:	NAH	Chemical:	Al 10,000 mg/L
Date Received:	12/01/2015	Lot #:	15l132
Expiration Date (if any):	05/18/2017	Catalog #:	p/n 4400-10m11

Standard ID#:	M12714	Vendor:	CPI
Analyst:	NAH	Chemical:	Fe 10,000 mg/L
Date Received:	12/01/2015	Lot #:	15H243
Expiration Date (if any):	05/18/2017	Catalog #:	p/n 4400-10m261

Standard ID#:	M12715	Vendor:	CPI
Analyst:	NAH	Chemical:	Mg 10,000 mg/L
Date Received:	12-01-2015	Lot #:	15G077
Expiration Date (if any):	5-18-2015	Catalog #:	p/n 4400-10m311

Standard ID#:	M12716	Vendor:	CPI
Analyst:	NAH	Chemical:	Ca 10,000 mg/L
Date Received:	12-01-2015	Lot #:	15k045
Expiration Date (if any):	5-18-2015	Catalog #:	p/n 4400-10m91

		Instrument:	ICP 6500
Standard Log #:	M12710	Standard:	ICVLL
Analyst:	NAH	Concentrations:	12 ug/L: Be. 15 ug/L: Cd. 30 ug/L: Ag, Ba, Co, Cr, Cu, Mn, Mo. Ni, Pb, V, Zn, Sr, and Ti. 60 ug/L: Sb, As, Se, Tl, Li, Sn and B. 150 ug/L: W. 300 ug/L: Si. 900 ug/L: Fe. 1200 ug/L Al. 1500 ug/L: S, Ca and Mg. 3000 ug/L: K and Na.
Prep Date:	12/01/2015	Expiration Date:	06/2016
Prep:	Into a 500 mL volumetric flask, pipetted 30 **mL** of MRL Base STD M12709 and brought to volume with Milli-Q H_2O. (5% HNO_3 & 5% HCL)		

		Instrument:	ICP 6500
Standard Log #:	M12711	Standard:	ICSA
Analyst:	NAH	Concentrations:	**500,000 ug/L** Al, Ca, Fe, Mg
Prep Date:	12/01/2015	Expiration Date:	06/2016
Prep:	Into a 500 mL volumetric flask, pipetted **50 mL** Interferents A Standard ((5000 mg/L Al, Ca, Mg) (2000 mg/L Fe)) M12529 and **15 mL** Fe (10000 mg/L) M12603 and brought up to volume with milli-Q H_2O.		

		Instrument:	ICP 6500
Standard Log #:	M12712	Standard:	ICSAB
Analyst:	NAH	Concentrations:	**500,000 ug/L** Al, Ca, Fe, Mg **500 ug/L** Ag, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Tl, V, Zn
Prep Date:	12/01/2015	Expiration Date:	06/2016
Prep:	Into a 500 mL volumetric flask, pipetted **50 mL** Interferents A Standard ((5000 mg/L Al, Ca, Mg) (2000 mg/L Fe)) M12529, **15 mL** Fe (10,000 mg/L) M12603, **2.5 mL** of Custom Assurance Std. #3 (100 mg/L Ag, Be, Cd) M12530 and **2.5 mL** Custom Assurance Std. #23 (100 mg/L Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12558 and brought up to volume with milli-Q H_2O.		

MRL BASE STD M12709

Analyst NAH

Prep Date 12-01-2015

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	(ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L	Expiration Date
Ag	20	M12599	1000	1	-
Al	400	M12605	10000	2	-
Ba	10	M12473	1000	0.5	-
Be	4	M12667	1000	0.2	-
Cd	5	M12674	1000	0.25	-
Co	10	M12678	1000	0.5	-
Cr	10	M12470	10000	0.05	-
Cu	10	M12472	10000	0.05	-
Mg	500	M12606	10000	2.5	-
Mn	10	M12533	10000	0.05	-
Mo	10	M12677	1000	0.5	---
Ni	10	M12681	1000	0.5	--
Pb	10	M12313	10000	0.05	--
Sb	20	M12602	1000	1	--
V	10	M12676	1000	0.5	--
Zn	10	M12680	10000	0.05	--
K	1000	M12608	10000	5	--
Na	1000	M12607	10000	5	--
As	20	M12315	1000	1	--
Ca	500	M12604	10000	2.5	--
Fe	300	M12603	10000	1.5	--
Se	20	M12600	1000	1	--
Tl	20	M12668	1000	1	--
Si	100	M12601	1000	5	--
B	20	M12471	1000	1	--
Li	20	M12672	1000	1	--
W	50	M12673	1000	2.5	--
Ti	10	M12671	1000	0.5	--
Sr	10	M12670	1000	0.5	--
Sn	50	M12669	1000	2.5	--
S	300	M12371	10000	1.5	-

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working standard.

Expiration Date: 10/2016

		Instrument:	ICP 6500
Standard Log #:	M12706	Standard:	CCV1
Analyst:	NAH	Concentrations:	**5000 µg/L** Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn **500 µg/L** Ag, Be, Cd
Prep Date:	12/01/2015	Expiration Date:	06/2016
Prep:	Into a 1 L volumetric flask, pipetted **50 mL** Custom Assurance Standard #23 XCTWI-5-500 (100 mg/L Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12558 and **5.0 mL** of Custom Assurance Std. #3 XCTWI-4-500 (100 mg/L Ag, Be, Cd) M12530 and brought up to volume with milli-Q H_2O.		

		Instrument:	ICP 6500
Standard Log #:	M12707	Standard:	CCV2
Analyst:	NAH	Concentrations:	**500 µg/L** Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn **50 µg/L** Ag, Be, Cd
Prep Date:	12/01/2015	Expiration Date:	06/2016
Prep:	Into a 1 L volumetric flask, pipetted **5 mL** Custom Assurance Standard #23 XCTWI-5-500 (100 mg/L Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12558 and **0.5 mL** of Custom Assurance Std. #3 XCTWI-4-500 (100 mg/L Ag, Be, Cd) M12830 and brought up to volume with milli-Q H_2O.		

		Instrument:	ICP 6500
Standard Log #:	M12708	Standard:	DOD MRL
Analyst:	NAH	Concentrations:	4 ug/L: Be. 5 ug/L: Cd. 10 ug/L: Ag, Ba, Co, Cr, Cu, Mn, Mo. Ni, Pb, V, Zn, Sr, and Ti. 20 ug/L: Sb, As, Se, Tl, Li, Sn and B. 50 ug/L: W. 100 ug/L: Si. 300 ug/L: Fe. 400 ug/L Al. 500 ug/L: S, Ca and Mg. 1000 ug/L: K and Na.
Prep Date:	12/01/2015	Expiration Date:	06/2016
Prep:	Into a 500 mL volumetric flask, pipetted **10 mL** of MRL Base STD M12709 and brought to volume with Milli-Q H_2O. (5% HNO_3 & 5% HCL)		

		Instrument:	ICP 6000
Standard Log #:	M12704	Standard:	Na & K ICAL
Analyst:	MDS	Concentrations:	0.5, 1, 5, 10, 50, 100, and 200 mg/L (Na,K)
Prep Date:	12/01/2015	Expiration Date:	07/03/2016
Prep:	Into seven, 200 mL volumetric flasks, pipetted the following from Na (1000 µg/mL) M12377 and K (1000 µg/mL) M12378 and brought up to volume using milli-Q H_2O. (2% HNO_3) *0.5 mg/L std.* - **0.1 mL** of each *1.0 mg/L std.* - **0.2 mL** of each *5.0 mg/L std.* - **1.0 mL** of each *10 mg/L std.* - **2.0 mL** of each *50 mg/L std.* - **10 mL** of each *100 mg/L std.* -**20 mL** of each, also used for Continuing Calibration Verification *200 mg/L std.* - **40 mL** of each		

		Instrument:	ICP 6500
Standard Log #:	M12705	Standard:	ICAL
Analyst:	NAH	Concentrations:	0.25, 0.5, 1, 5, 10, 20, 50, 100, 1000, 10,000, 100k, 100,000, 500,000 and 1000k (ug/L)
Prep Date:	12/01/2015	Expiration Date:	06/2016
Prep:	Using 1 L volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (5% HNO_3, 5% HCl) *1000 ug/L Std.* - **10 mL** of Custom Assurance Std. #23 (100 mg/L Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12558, **10 mL** of Custom Assurance Std. #3 (100 mg/L Ag, Be, Cd) M12530 and **1 mL** of Si (1000 mg/L) M12601. *0.25 ug/L Std.* - **0.25 mL** of the 1000 ug/L Std. *0.5 ug/L Std.* - **0.5 mL** of the 1000 ug/L Std. *1 ug/L Std.* - **1 mL** of the 1000 ug/L Std. *5 ug/L Std.* - **5 mL** of the 1000 ug/L Std. *10 ug/L Std.* - **10 mL** of the 1000 ug/L Std. *20 ug/L Std.* - **20 mL** of the 1000 ug/L Std. *50 ug/L Std.* - **50 mL** of the 1000 ug/L Std. *100 ug/L Std.* - **1 mL** of Custom Assurance Std. (CAS) #23 and **1 mL** of CAS #3 *10,000 ug/L Std.* - **100 mL** CAS #23, **100 mL** CAS #3 and **1 mL** of K (10,000 mg/L) M12609. *100k ug/L Std.* - **10 mL** of Cu (10,000 mg/L) M12472, **10 mL** of Mn (10,000 mg/L) M12533, **10 mL** of Cr (10,000 mg/L) M12470, **10 mL** Pb (10,000 mg/L) M12313, **10 mL** of Zn (10,000 mg/L) M12680 and **10 mL** of Na (10,000 mg/L) M12679. *100,000 ug/L Std.* - **10 mL** of Mg (10,000 mg/L) M12606, **10 mL** of Fe (10,000 mg/L) M12603, **10 mL** of Ca (10,000 mg/L) M12490 and **10 mL** Al (10,000 mg/L) M12605. *500,000 ug/L Std.* - **50 mL** of Mg (10,000 mg/L), **50 mL** of Fe (10,000 mg/L), **50 mL** of Ca (10,000 mg/L) and **50 mL** of Al (10,000 mg/L) *1000k ug/L Std.* - **100 mL** of Mg (10,000 mg/L), **100 mL** of Fe (10,000 mg/L), **100 mL** of Ca (10,000 mg/L) and **100 mL** of Al (10,000 mg/L)		

		Instrument:	ICP 6000
Standard Log #:	M12701	Standard:	W ICAL and CCV
Analyst:	MDS	Concentrations:	100, 1000, and 10,000 µg/L (W)
Prep Date:	11/23/15	Expiration Date:	04/15/17
Prep:	Into four, 1 L volumetric flasks, pipetted the following from W (1000 µg/mL) M12673 and brought up to volume using milli-Q H_2O. (0.5% HNO_3, 0.5% HCl) *100 µg/L std.* - **0.1 mL** *1000 µg/L std.* - **1.0 mL** - also used for Continuing Calibration Verification *10,000 µg/L std.* - **10 mL**		

		Instrument:	ICP 6000
Standard Log #:	M12702	Standard:	W ICV
Analyst:	MDS	Concentrations:	1000 µg/L (W)
Prep Date:	11/23/15	Expiration Date:	02/06/16
Prep:	Into a 1 L volumetric flask, pipetted **1.0 mL** of W (1000 µg/mL) M12163 and brought up to volume using milli-Q H_2O. (0.5% HNO_3, 0.5% HCl)		

Standard ID#:	M12703	Vendor:	Spex CertiPrep
Analyst:	NAH	Chemical:	Custum Assurance Standard
Date Received:	11/19/2015	Lot #:	33-195CR
Expiration Date (if any):	11/30/2016	Catalog #:	XCTWI-5-500

Standard Log #:	M12700	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	11/20/15	Expiration Date:	11/20/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard Log #:	M12699	Standard:	GFAA Instrument Check
Analyst:	MDS	Final Concentration:	10 µg/L As 6 µg/L Pb 22 µg/L Tl 24 µg/L Sb, Se 0.8 µg/L Ag
Prep Date:	11/12/15	Expiration Date:	06/02/16

Into six, 100 mL volumetric flasks, add the following and bring up to volume with milli-Q H_2O.

Element	Volume Pipetted (mL)	Standard Conc. (µg/mL)	Standard ID	New Conc. (µg/L)
As	1	1000	M12315	10,000
Pb	0.1	10,000	M12313	10,000
Tl	1	1000	M12668	10,000
Se	1	1000	M12600	10,000
Sb	1	1000	M12602	10,000
Ag	0.1	1000	M12599	1000

Into a 1 L volumetric flask, add the following and bring up to volume with Milli-Q H_20. (1% HNO_3)

Element	Volume Pipetted (mL)	Standard Conc. (µg/L)	New Conc. (µg/L)
As	1	10,000	10
Pb	0.6	10,000	6
Tl	2.2	10,000	22
Se	2.4	10,000	24
Sb	2.4	10,000	24
Ag	0.8	1000	0.8

		Instrument:	ICP 6000
Standard Log #:	M12695	Standard:	NaK ICV
Analyst:	MDS	Concentrations:	100 mg/L (Na, K)
Prep Date:	11/11/15	Expiration Date:	02/12/17
Prep:	Into a 250 mL volumetric flask, pipetted **2.5 mL** of K (10,000 mg/L) M12609 and Na (10,000 mg/L) M12679 and brought up to volume using Milli-Q H_2O. (2% HNO_3)		

		Instrument:	ICP 6000
Standard Log #:	M12696	Standard:	Na,K ICVLL
Analyst:	MDS	Concentrations:	3 mg/L (Na,K)
Prep Date:	11/11/15	Expiration Date:	02/12/17
Prep:	Into a 500 mL volumetric flask, pipetted **0.15 mL** of Na (10,000 µg/mL) M12679 and **0.15 mL** K (10,000 µg/mL) M12609 and brought to volume with Milli-Q H_2O. (2% HNO_3)		

		Instrument:	ICP 6000
Standard Log #:	M12697	Standard:	NaK ICSAB
Analyst:	MDS	Concentrations:	500 mg/L (Al, Ca, Fe, Mg) 100 mg/L (Na, K)
Prep Date:	11/11/15	Expiration Date:	06/30/16
Prep:	Into a 250 mL volumetric flask, pipetted **25 mL** of Interferents A custom stock (5000 mg/L Al, Ca, Mg and 2000 mg/L Fe) M12529, **2.5 mL** of K (10,000 mg/L) M12609, **2.5 mL** of Na (10,000 mg/L) M12679 and **7.5 mL** of Fe (10,000 mg/L) M12603 and brought up to volume using Milli-Q H_2O. (2% HNO_3)		

Standard Log #:	M12698	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	11/11/15	Expiration Date:	05/11/16
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12403 and **60 g** hydroxylamine sulfate M12548 and brought up to volume.		

		Instrument:	GFAA
Standard Log #:	M12693	Standard:	ICV/LCS Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.0 ug/L (Ag)
Prep Date:	11/02/2015	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **1.0 mL** of GFAA Custom Stock Std. ((10 ug/mL As, Pb, Sb, Se, Tl) (1.0 ug/mL Ag)) M12505 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

		Instrument:	ICP 6000
Standard Log #:	M12694	Standard:	List 2 ICSAB
Analyst:	MDS	Concentrations:	500,000 µg/L (Al, Ca, Fe, Mg) 500 µg/L (Li, Sn, Sr, Ti, W)
Prep Date:	11/02/2015	Expiration Date:	02/06/2016
Prep:	Into a 200 mL volumetric flask, pipetted **20 mL** of Interferents A custom stock (5000 mg/L Al, Ca, Mg and 2000 mg/L Fe) M12529, **6 mL** of Fe (10,000 mg/L) M12603, **0.1 mL** of Li (1000 µg/mL) M12672, **0.1 mL** of Sn (1000 µg/mL) M12669, **0.1 mL** of Sr (1000 µg/mL) M12670, **0.1 mL** of Ti (1000 µg/mL) M12671, and **0.1 mL** of W (1000 µg/mL) M12163 and brought up to volume using Milli-Q H_2O. (0.5% HNO_3, 0.5% HCl)		

Standard ID#:	M12690	Vendor:	MACRON
Analyst:	LJF	Chemical:	STANNOUS CHLORIDE
Date Received:	11/02/15	Lot #:	0000119473
Expiration Date (if any):	08/12/16	Catalog #:	8176-04

		Instrument:	GFAA
Standard Log #:	M12691	Standard:	Calibration Std.
Analyst:	MDS	Concentrations:	25 ug/L (As, Pb, Sb, Se, Tl) 3.75 ug/L (Ag)
Prep Date:	11/02/2015	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **0.25 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q H_2O. (1% HNO_3)		

		Instrument:	GFAA
Standard Log #:	M12692	Standard:	CCV Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.5 ug/L (Ag)
Prep Date:	11/02/2015	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **0.1 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

		Instrument:	CETAC
Standard Log #:	M12688	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	10/27/15	Expiration Date:	08/12/16
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.607 and dissolved **100 g** Stannous chloride M12649 and brought up to volume.		

Standard Log #:	M12689	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	10/27/15	Expiration Date:	04/27/16
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12270 and **60 g** hydroxylamine sulfate M12548 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12685	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	10/27/15	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12686	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	10/27/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12687	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	10/27/15	Expiration Date:	06/30/15
Prep:	Carefully mixed **3** parts HCl AB.607 with **1** part HNO_3 AB.606 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12682	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	10/27/15	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12683	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	10/27/15	Expiration Date:	02/26/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12684	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	10/27/15	Expiration Date:	02/26/16
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

Standard ID#:	M12677	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Mo 1000 ug/L
Date Received:	10/21/15	Lot #:	15G130
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000343

Standard ID#:	M12678	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Co 1000 ug/L
Date Received:	10/21/15	Lot #:	15I020
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000131

Standard ID#:	M12679	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Na 10,000 ug/L
Date Received:	10/21/15	Lot #:	15I102
Expiration Date (if any):	04/15/17	Catalog #:	4400-10M521

Standard ID#:	M12680	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Zn 10,000 ug/L
Date Received:	10/21/15	Lot #:	15H234
Expiration Date (if any):	04/15/17	Catalog #:	S4400-10M681

Standard ID#:	M12681	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Ni 1000 ug/L
Date Received:	10/21/15	Lot #:	15G129
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000361

Standard ID#:	M12672	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Li 1000ug/L
Date Received:	10/21/15	Lot #:	15I044
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000291

Standard ID#:	M12673	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	W 1000ug/L
Date Received:	10/21/15	Lot #:	15F057
Expiration Date (if any):	04/15/17	Catalog #:	S4400-100633

Standard ID#:	M12674	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Cd 1000ug/L
Date Received:	10/21/15	Lot #:	15G138
Expiration Date (if any):	04/15/17	Catalog #:	S4400-100081

Standard ID#:	M12675	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Si 1000 ug/L
Date Received:	10/21/15	Lot #:	15H045
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000504F

Standard ID#:	M12676	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	V 1000 ug/L
Date Received:	10/21/15	Lot #:	15H133
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000651

Standard ID#:	M12667	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Be 1000ug/L
Date Received:	10/21/15	Lot #:	15I030
Expiration Date (if any):	04/15/17	Catalog #:	S4400-100051

Standard ID#:	M12668	Vendor:	CPI INERNATIONAL
Analyst:	LJF	Chemical:	Tl 1000ug/L
Date Received:	10/21/15	Lot #:	15F051
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000581

Standard ID#:	M12669	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Sn 1000ug/L
Date Received:	10/21/15	Lot #:	15H126
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000613

Standard ID#:	M12670	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Sr 1000ug/L
Date Received:	10/21/15	Lot #:	15F052
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000531

Standard ID#:	M12671	Vendor:	CPI INTERNATIONAL
Analyst:	LJF	Chemical:	Tl 100ug/L
Date Received:	10/21/15	Lot #:	15G013
Expiration Date (if any):	04/15/17	Catalog #:	S4400-1000623

		Instrument:	ICP 6000
Standard Log #:	M12666	Standard:	B&Si ICV
Analyst:	MDS	Concentrations:	1000 ug/L (B, Si)
Prep Date:	10/21/2015	Expiration Date:	03/2016
Prep:	Into a 1 L volumetric flask, pipetted **10 mL** of Custom Assurance Std. #23 (100 mg/L Al, As, **B**, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12558 and **1.0 mL** Si (1000 mg/L) M11919 and brought up to volume using milli-Q H_2O.		

		Instrument:	CETAC
Standard Log #:	M12662	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	10/16/15	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12663	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	10/16/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12664	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	10/16/15	Expiration Date:	07/01/17
Prep:	Carefully mixed **3** parts HCl AB.607 with **1** part HNO_3 AB.606 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12665	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	10/16/15	Expiration Date:	08/12/16
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.607 and dissolved **100 g** Stannous chloride M12649 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12659	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	10/16/15	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12660	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	10/16/15	Expiration Date:	06/30/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12661	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	10/16/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	GFAA
Standard Log #:	M12657	Standard:	LODS/LOQS Spiking Sol'n
Analyst:	MDS	Concentrations:	60 ug/L (Sb) 160 ug/L (As,Se) 40 ug/L (Pb) 50 ug/L (Tl)
Prep Date:	10/12/2015	Expiration Date:	11/08/2015
Prep:	Into a 200 mL volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. **1.2 mL** of Sb (1000 mg/L) M12602 **3.2 mL** of As (1000 mg/L) M12315 **3.2 mL** of Se (1000 mg/L) M12600 **0.08 mL** of Pb (10,000 mg/L) M12313 **1.0 mL** of Tl (1000 mg/L) M11997 From this diluted standard solution, pipetted **10 mL** into a 1 L volumetric flask and brought up to volume with Milli-Q H_2O to make the spiking solution. (1% HNO_3) *Pipette **1 mL** spiking solution into 50 mL H_2O for LOD (1.2 *ug/L* Sb, *3.2 ug/L* As, *3.2 ug/L* Se, *0.8 ug/L* Pb, *1 ug/L* Tl) and **2 mL** spiking solution for LOQ (2.4 *ug/L* Sb, *6.4 ug/L* As, *6.4 ug/L* Se, *1.6 ug/L* Pb, *2 ug/L* Tl)		

		Instrument:	GFAA
Standard Log #:	M12658	Standard:	LODW/LOQW Spiking Sol'n
Analyst:	MDS	Concentrations:	150 ug/L (Sb) 100 ug/L (As) 200 ug/L (Se) 45 ug/L (Pb) 40 ug/L (Tl)
Prep Date:	10/12/2015	Expiration Date:	11/08/2015
Prep:	Into a 100 mL volumetric flask, pipetted the following and brought up to volume with Milli-Q H_2O. **1.5 mL** of Sb (1000 mg/L) M12602 **1.0 mL** of As (1000 mg/L) M12315 **2.0 mL** of Se (1000 mg/L) M12600 **0.045 mL** of Pb (10,000 mg/L) M12313 **0.4 mL** of Tl (1000 mg/L) M11997 From this diluted standard solution, pipetted **10 mL** into a 1 L volumetric flask and brought up to volume with Milli-Q H_2O to make the spiking solution. (1% HNO_3) *Pipette **1 mL** spiking solution into 50 mL H_2O for LOD (*3 ug/L* Sb, *2 ug/L* As, *4 ug/L* Se, *0.9 ug/L* Pb, *0.8 ug/L* Tl) and **2 mL** spiking solution for LOQ (*6 ug/L* Sb, *4 ug/L* As, *8 ug/L* Se, *1.8 ug/L* Pb, *1.6 ug/L* Tl)		

		Instrument:	GFAA
Standard Log #:	M12655	Standard:	LODW/LOQW Ag Spiking Sol'n
Analyst:	MDS	Concentrations:	10 ug/L (Ag)
Prep Date:	10/12/2015	Expiration Date:	02/10/2017
Prep:	Into a 100 mL volumetric flask, pipetted **0.1 mL** of Ag (1000mg/L) M12599 and brought to volume with Milli-Q H_2O to make a 1000 ug/L Ag std. Into a 1 L volumetric flask, pipetted **10 mL** of Ag (*1000 ug/L*) std. and brought to volume with Milli-Q H_2O. (1% HNO_3) *Pipette **1 mL** spiking solution into 50 mL H_2O for LOD (*0.2 ug/L*) and **2 mL** spiking solution for LOQ (*0.4 ug/L*)		

		Instrument:	GFAA
Standard Log #:	M12656	Standard:	LODS/LOQS Ag Spiking Sol'n
Analyst:	MDS	Concentration:	6 ug/L (Ag)
Prep Date:	10/12/2015	Expiration Date:	02/10/2017
Prep:	Into a 200 mL volumetric flask, pipetted **0.12 mL** of Ag (1000 mg/L) M12599 and brought up to volume with Milli-Q H_2O. From this diluted standard solution, pipetted **10 mL** into a 1 L volumetric flask and brought up to volume with Milli-Q H_2O to make the spiking solution. (1% HNO_3) *Pipette **2 mL** spiking solution into 50 mL H_2O for LOD *(0.24 ug/L)* and **4 mL** spiking solution for LOQ *(0.48 ug/L)*		

Standard ID#:	M12652	Vendor:	SIGMA-ALDRICH
Analyst:	LJF	Chemical:	POTASSIUM PERSULFATE
Date Received:	10/09/2015	Lot #:	MKBV6966V
Expiration Date (if any):	10/09/2016	Catalog #:	216224

Standard ID#:	M12653	Vendor:	Spex Certiprep
Analyst:	NAH	Chemical:	Custom Assurance Standard
Date Received:	10/09/2015	Lot #:	33-28CR
Expiration Date (if any):	10/30/2016	Catalog #:	XSPIKE-1-250

Standard ID#:	M12654	Vendor:	AMCO Clear
Analyst:	NAH	Chemical:	turbidity standard 2.0 ntu
Date Received:	10/09/2015	Lot #:	C580865
Expiration Date (if any):	10/30/2016	Catalog #:	8008

Standard Log #:	M12651	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	10/08/15	Expiration Date:	10/08/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard Log #:	M12650	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	10/07/15	Expiration Date:	10/07/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard Log #:	M12648	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	10/02/15	Expiration Date:	10/02/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12645. Dilute to 20 L and mix.		

Standard ID#:	M12649	Vendor:	MACRON
Analyst:	LJF	Chemical:	STANNOUS CHLORIDE
Date Received:	10/02/15	Lot #:	119473
Expiration Date (if any):	08/12/16	Catalog #:	8176-04

Standard Log #:	M12646	Reagent:	Potassium Persulfate Solution
Analyst:	LJF		
Prep Date:	10/01/15	Expiration Date:	04/01/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium persulfate M11748 and brought up to volume.		

Standard Log #:	M12647	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	10/01/15	Expiration Date:	04/01/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

Standard Log #:	M12645	Reagent:	10N NaOH
Analyst:	LJF		
Prep Date:	09/29/15	Expiration Date:	09/29/16
Prep:	Into a 1 L volumetric flask, added **400 g** NaOH M12543 and brought up to volume.		

Standard Log #:	M12644	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	09/28/15	Expiration Date:	09/28/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12543. Dilute to 20 L and mix.		

Standard Log #:	M12641	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	MDS	pH:	4.93 ± 0.05
Prep Date:	09/24/2015	Expiration Date:	06/18/2016
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12543. Dilute to 20 L and mix.		

Standard Log #:	M12642	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	MDS	pH:	4.93 ± 0.05
Prep Date:	09/24/2015	Expiration Date:	06/18/2016
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12543. Dilute to 20 L and mix.		

Standard Log #:	M12643	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	09/24/15	Expiration Date:	03/24/16
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12270 and **60 g** hydroxylamine sulfate M12548 and brought up to volume.		

Standard Log #:	M12638	Standard:	GFAA Instrument Check
Analyst:	MDS	Final Concentration:	10 µg/L As 6 µg/L Pb 22 µg/L Tl 24 µg/L Sb, Se 0.8 µg/L Ag
Prep Date:	09/22/2015	Expiration Date:	11/08/2015

Into six, 100 mL volumetric flasks, add the following and bring up to volume with milli-Q H_2O.

Element	Volume Pipetted (mL)	Standard Conc. (µg/mL)	Standard ID	New Conc. (µg/L)
As	1	1000	M12315	10,000
Pb	0.1	10,000	M12313	10,000
Tl	1	1000	M11997	10,000
Se	1	1000	M12600	10,000
Sb	1	1000	M12602	10,000
Ag	0.1	1000	M12599	1000

Into a 1 L volumetric flask, add the following and bring up to volume with Milli-Q H_20. (1% HNO_3)

Element	Volume Pipetted (mL)	Standard Conc. (µg/L)	New Conc. (µg/L)
As	1	10,000	10
Pb	0.6	10,000	6
Tl	2.2	10,000	22
Se	2.4	10,000	24
Sb	2.4	10,000	24
Ag	0.8	1000	0.8

		Instrument:	GFAA
Standard Log #:	M12639	Standard:	As Spiking Solution
Analyst:	MDS	Concentration:	10 ug/mL (As)
Prep Date:	09/22/2015	Expiration Date:	06/02/2016
Prep:	Into a 100 mL volumetric flask, pipetted **1.0 mL** of As (1000 mg/L) M12315 and brought to volume with Milli-Q DI H_2O. (3% HNO_3) *Pipette **0.075 mL** of spiking solution into 50 mL DI or sample for a final spike concentration of 15 ug/L		

		Instrument:	GFAA
Standard Log #:	M12640	Standard:	As/Se Spiking Solution
Analyst:	MDS	Concentration:	10 ug/mL (As,Se)
Prep Date:	09/22/2015	Expiration Date:	06/02/2016
Prep:	Into a 100 mL volumetric flask, pipetted **1.0 mL** of As (1000 mg/L) M12315 and **1.0 mL** of Se (1000 mg/L) M12600 and brought to volume with Milli-Q DI H_2O. (3% HNO_3) *Pipette **0.075 mL** of spiking solution into 50 mL DI or sample for a final spike concentration of 15 ug/L		

		Instrument:	CETAC
Standard Log #:	M12636	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	09/18/15	Expiration Date:	12/09/15
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.604 and dissolved **100 g** Stannous chloride M12549 and brought up to volume.		

Standard Log #:	M12637	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	09/18/15	Expiration Date:	03/18/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12633	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	09/18/15	Expiration Date:	02/26/15
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12634	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	09/18/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12635	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	09/18/15	Expiration Date:	04/01/17
Prep:	Carefully mixed **3** parts HCl AB.604 with **1** part HNO_3 AB.603 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12630	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	09/18/15	Expiration Date:	02/26/15
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12631	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	09/18/15	Expiration Date:	06/30/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12632	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	09/18/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

Standard Log #:	M12628	Reagent:	10N NaOH
Analyst:	LJF		
Prep Date:	09/16/15	Expiration Date:	09/16/16
Prep:	Into a 1 L volumetric flask, added **400 g** NaOH M11852 and brought up to volume.		

Standard ID#:	M12629	Vendor:	GR ACS
Analyst:	LJF	Chemical:	SODIUM CHLORIDE
Date Received:	09/16/15	Lot #:	x131a
Expiration Date (if any):		Catalog #:	C710L50

		Instrument:	Hach 2100 turbidity meter
Standard Log #:	M12627	Standard:	Turbity ICAL
Analyst:	NAH	Concentrations:	20, 100, 200 ntu
Prep Date:	9/11/2015	Expiration Date:	08/2016
Prep:	Using the hach vials , pipet the following: *20 ntu Std.* = **1 ml** M12186 and 9 mls DI H20. *100 ntu Std.* = **5 mls** M12186 and 5 mls DI H20. *200 ntu Std.* = ***10 mls*** M12186 *and* 0 mls DI H20.		

Standard Log #:	M12626	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	09/10/15	Expiration Date:	09/10/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.577 and **128.6 mL** 10N NaOH M12543. Dilute to 20 L and mix.		

Standard Log #:	M12625	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	09/09/15	Expiration Date:	09/09/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.577 and **128.6 mL** 10N NaOH M12543. Dilute to 20 L and mix.		

		Instrument:	CETAC
Standard Log #:	M12622	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	09/03/15	Expiration Date:	12/09/15
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.604 and dissolved **100 g** Stannous chloride M12549 and brought up to volume.		

Standard Log #:	M12623	Reagent:	NaCl Hydroxylamine Sulfate
Analyst:	LJF		
Prep Date:	09/03/15	Expiration Date:	03/03/16
Prep:	Into a 500 mL volumetric flask, partially filled with milli-Q H_2O, dissolved **60 g** NaCl M12270 and **60 g** hydroxylamine sulfate M11798 and brought up to volume.		

Standard Log #:	M12624	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	09/03/15	Expiration Date:	03/03/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M12277 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12619	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	09/03/15	Expiration Date:	02/26/15
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12620	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	09/03/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12621	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	09/03/15	Expiration Date:	04/01/17
Prep:	Carefully mixed **3** parts HCl AB.604 with **1** part HNO_3 AB.603 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12616	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	09/03/15	Expiration Date:	02/26/15
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12617	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	09/03/15	Expiration Date:	06/30/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12618	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	09/03/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

Standard ID#:	M12615	Vendor:	SPEX Certiprep
Analyst:	NAH	Chemical:	Custum Assurance Standard
Date Received:	09/01/2015	Lot #:	32-105CR
Expiration Date (if any):	09/20/2015	Catalog #:	XSPIKE-1-250

		Instrument:	ICP 6000
Standard Log #:	M12614	Standard:	NaK ICSAB
Analyst:	MDS	Concentrations:	500 mg/L (Al, Ca, Fe, Mg) 100 mg/L (Na, K)
Prep Date:	08/31/15	Expiration Date:	11/08/15
Prep:	Into a 250 mL volumetric flask, pipetted **25 mL** of Interferents A custom stock (5000 mg/L Al, Ca, Mg and 2000 mg/L Fe) M12529, **2.5 mL** of K (10,000 mg/L) M12474, **2.5 mL** of Na (10,000 mg/L) M12010 and **7.5 mL** of Fe (10,000 mg/L) M12489 and brought up to volume using Milli-Q H_2O. (2% HNO_3)		

Standard Log #:	M12613	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	08/27/15	Expiration Date:	08/27/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12543. Dilute to 20 L and mix.		

Standard ID#:	M12612	Vendor:	CPI
Analyst:	NAH	Chemical:	Yttrium 10000 ug/mL
Date Received:	08/27/15	Lot #:	15E153
Expiration Date (if any):	02/20/17	Catalog #:	4400-10M671

Standard Log #:	M12611	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	08/24/15	Expiration Date:	08/24/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12543. Dilute to 20 L and mix.		

Standard ID#:	M12607	Vendor:	CPI
Analyst:	NAH	Chemical:	SODIUM 1000ug/mL
Date Received:	08/19/2015	Lot #:	15F159
Expiration Date (if any):	02/12/2017	Catalog #:	4400-1000521

Standard ID#:	M12608	Vendor:	CPI
Analyst:	NAH	Chemical:	POTASSIUM 1000ug/mL
Date Received:	08/19/2015	Lot #:	15E009
Expiration Date (if any):	02/12/2017	Catalog #:	4400-1000411

Standard ID#:	M12609	Vendor:	CPI
Analyst:	NAH	Chemical:	POTASSIUM 10000ug/mL
Date Received:	08/19/2015	Lot #:	15E086
Expiration Date (if any):	02/12/2017	Catalog #:	4400-10M411

Standard ID#:	M12610	Vendor:	ALFA AESAR
Analyst:	LJF	Chemical:	HYDROXYLAMINE SULFATE
Date Received:	08/20/15	Lot #:	Z16A019
Expiration Date (if any):		Catalog #:	88944

Standard ID#:	M12602	Vendor:	CPI
Analyst:	NAH	Chemical:	ANTIMONY 1000 ug/ml
Date Received:	08-14-2015	Lot #:	15D168
Expiration Date (if any):	02-10-2017	Catalog #:	S4400-100023

Standard ID#:	M12603	Vendor:	CPI
Analyst:	NAH	Chemical:	IRON 10000 ug/ml
Date Received:	08-14-2015	Lot #:	15C057
Expiration Date (if any):	02-10-2017	Catalog #:	4400-10M261

Standard ID#:	M12604	Vendor:	CPI
Analyst:	NAH	Chemical:	CALCIUM 10000 ug/ml
Date Received:	08-14-2015	Lot #:	15G076
Expiration Date (if any):	02-10-2017	Catalog #:	4400-10M91

Standard ID#:	M12605	Vendor:	CPI
Analyst:	NAH	Chemical:	ALUMINUM 10000 ug/ml
Date Received:	08-14-2015	Lot #:	15E015
Expiration Date (if any):	02-10-2017	Catalog #:	4400-10M11

Standard ID#:	M12606	Vendor:	CPI
Analyst:	NAH	Chemical:	MAGNESIUM 10000 ug/ml
Date Received:	08-14-2015	Lot #:	15G077
Expiration Date (if any):	02-10-2015	Catalog #:	4400-10M311

Standard ID#:	M12599	Vendor:	CPI
Analyst:	NAH	Chemical:	SILVER 1000 ug/ml
Date Received:	8-14-2015	Lot #:	15H040
Expiration Date (if any):	02-10-2017	Catalog #:	S4400-1000511

Standard ID#:	M12600	Vendor:	CPI
Analyst:	NAH	Chemical:	SELENIUM 1000 ug/ml
Date Received:	08-14-2015	Lot #:	15E095
Expiration Date (if any):	2-10-2017	Catalog #:	S4400-1000491

Standard ID#:	M12601	Vendor:	CPI
Analyst:	NAH	Chemical:	SILICON 1000 ug/ml
Date Received:	08-14-2015	Lot #:	15F050
Expiration Date (if any):	02-10-2017	Catalog #:	S4400-1000504F

		Instrument:	CETAC
Standard Log #:	M12596	Standard:	Hg CCV
Analyst:	LJF	Concentration:	3.0 ug/L Hg
Prep Date:	08/13/15	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *3.0 ug/L Std.* (CCV) - **3.0 mL** Hg (*100 ug/L*)		

		Instrument:	CETAC
Standard Log #:	M12597	Standard:	Hg MRL
Analyst:	LJF	Concentration:	0.2 ug/L Hg
Prep Date:	08/13/15	Expiration Date:	06/30/16
Prep:	Into a 100 mL volumetric flask, pipetted **0.2 mL** of Hg (*100 ug/L working std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

		Instrument:	CETAC
Standard Log #:	M12598	Reagent:	Hg Aqua Regia
Analyst:	LJF		
Prep Date:	08/13/15	Expiration Date:	04/01/17
Prep:	Carefully mixed **3** parts HCl AB.604 with **1** part HNO_3 AB.603 in a hood.		

		Instrument:	CETAC
Standard Log #:	M12599a	Reagent:	Stannous Chloride Solution
Analyst:	LJF		
Prep Date:	08/13/15	Expiration Date:	12/09/15
Prep:	Into a 1 L volumetric flask, partially filled with 400 mL milli-Q H_2O, added **70 mL** hydrochloric acid AB.604 and dissolved **100 g** Stannous chloride M12549 and brought up to volume.		

		Instrument:	CETAC
Standard Log #:	M12593	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	08/13/15	Expiration Date:	02/26/15
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	CETAC
Standard Log #:	M12594	Standard:	Alt. Source Working Std.
Analyst:	LJF	Concentrations:	10,000 and 100 ug/L
Prep Date:	08/13/15	Expiration Date:	06/30/16
Prep:	Into two, 100 mL volumetric flasks, pipetted the following and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** of Hg (1000 mg/L) M12532 *100 ug/L Std.* - **1 mL** of Hg (*10,000 ug/L working Std.*)		

		Instrument:	CETAC
Standard Log #:	M12595	Standard:	Hg ICV/LCS
Analyst:	LJF	Concentration:	3 ug/L
Prep Date:	08/13/15	Expiration Date:	06/30/15
Prep:	Into a 100 mL volumetric flask, pipetted **3 mL** of Hg (*100 ug/L working Std.*) M12552 and brought up to volume using Milli-Q H_2O. (0.2% HNO_3, 0.2% HCl)		

Standard Log #:	M12588	Instrument:	GFAA
Analyst:	MDS	Reagent:	Pd/Mg Matrix Modifier
Prep Date:	08/10/15	Expiration Date:	10/23/16
Prep:	Into a 50 mL volumetric flask, partially filled with milli-Q H_2O, pipetted **15 mL** Pd Modifier M12584 and **10 mL** Mg (10,000 mg/L) M12488 and brought up to volume.		

		Instrument:	ICP 6500
Standard Log #:	M12586	Standard:	ICSA
Analyst:	NAH	Concentrations:	**500,000 ug/L** Al, Ca, Fe, Mg
Prep Date:	08/05/15	Expiration Date:	07/16
Prep:	Into a 500 mL volumetric flask, pipetted **50 mL** Interferents A Standard ((5000 mg/L Al, Ca, Mg) (2000 mg/L Fe)) M12529 and **15 mL** Fe (10000 mg/L) M12489 and brought up to volume with milli-Q H_2O.		

		Instrument:	ICP 6500
Standard Log #:	M12587	Standard:	ICSAB
Analyst:	NAH	Concentrations:	**500,000 ug/L** Al, Ca, Fe, Mg **500 ug/L** Ag, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Tl, V, Zn
Prep Date:	08/05/15	Expiration Date:	07/16
Prep:	Into a 500 mL volumetric flask, pipetted **50 mL** Interferents A Standard ((5000 mg/L Al, Ca, Mg) (2000 mg/L Fe)) M12529 , **15 mL** Fe (10,000 mg/L) M12489 , **2.5 mL** of Custom Assurance Std. #3 (100 mg/L Ag, Be, Cd) M12530 and **2.5 mL** Custom Assurance Std. #23 (100 mg/L Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12558 and brought up to volume with milli-Q H_2O.		

1

Standard ID#:	M12584	Vendor:	Environmental Express
Analyst:	MDS	Chemical:	GFAA Pd Matrix Modifier
Date Received:	08/05/15	Lot #:	1421912
Expiration Date (if any):	07/31/17	Catalog #:	HP1900-100

		Instrument:	ICP 6500
Standard Log #:	M12585	Standard:	ICV Std.
Analyst:	NAH	Concentrations:	**12,000 mg/L** Al **10,000 mg/L** Ca, Mg **5000 mg/L** Fe **2000 mg/L** As, Ba, Se, Tl **500 mg/L** B, Co, Li, Mn, Mo, Ni, Pb, Sb, Sn, Sr, Ti, V, Zn **250 mg/L** Cu **200 mg/L** Cr **50 mg/L** Ag, Be, Cd
Prep Date:	08/05/15	Expiration Date:	11/15
Prep:	Into a 1 L volumetric flask, pipetted the following and brought up to volume with milli-Q H_2O. **10 mL** Custom Assurance Standard #18 ((200 mg/L Al, As, Ba, Se, Tl) (100 mg/L Fe) (50 mg/L Co, Mn, Ni, Pb, Sb, V, Zn) (25 mg/L Cu) (20 mg/L Cr) (5 mg/L Ag, Be, Cd)) M12574, **2 mL** Interferents A Standard ((5000 mg/L Al, Ca, Mg) (2000 mg/L Fe)) M12529, **0.5 mL** Mo (1000 mg/L) M12008, **0.5 mL** B (1000 mg/L) M12471, **0.5 mL** Sr (1000 mg/L) M11999, **0.5 mL** Li (1000 mg/L) M11998, **0.5 mL** Sn (1000 mg/L) M11996 and **0.5 mL** Ti (1000 mg/L) M12003.		

		Instrument:	ICP 6500
Standard Log #:	M12582	Standard:	CCV1
Analyst:	NAH	Concentrations:	**5000 µg/L** Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn **500 µg/L** Ag, Be, Cd
Prep Date:	08/03/15	Expiration Date:	7/30/16
Prep:	Into a 1 L volumetric flask, pipetted **50 mL** Custom Assurance Standard #23 XCTWI-5-500 (100 mg/L Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12558 and **5.0 mL** of Custom Assurance Std. #3 XCTWI-4-500 (100 mg/L Ag, Be, Cd) M12530 and brought up to volume with milli-Q H_2O.		

		Instrument:	ICP 6500
Standard Log #:	M12583	Standard:	CCV2
Analyst:	NAH	Concentrations:	**500 µg/L** Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn **50 µg/L** Ag, Be, Cd
Prep Date:	08/03/2015	Expiration Date:	7/30/16
Prep:	Into a 1 L volumetric flask, pipetted **5 mL** Custom Assurance Standard #23 XCTWI-5-500 (100 mg/L Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12558 and **0.5 mL** of Custom Assurance Std. #3 XCTWI-4-500 (100 mg/L Ag, Be, Cd) M12530 and brought up to volume with milli-Q H_2O.		

		Instrument:	ICP 6500
Standard Log #:	M12581	Standard:	ICAL
Analyst:	NAH	Concentrations:	0.25, 0.5, 1, 5, 10, 20, 50, 100, 1000, 10,000, 100k, 100,000, 500,000 and 1000k (ug/L)
Prep Date:	08/03/15	Expiration Date:	11/2015

Prep:

Using 1 L volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O.
(5% HNO_3, 5% HCl)
1000 ug/L Std. - **10 mL** of Custom Assurance Std. #23 (100 mg/L Al, As, B, Ba, Ca, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn) M12558, **10 mL** of Custom Assurance Std. #3 (100 mg/L Ag, Be, Cd) M12530 and **1 mL** of Si (1000 mg/L) M11919.
0.25 ug/L Std. - **0.25 mL** of the 1000 ug/L Std.
0.5 ug/L Std. - **0.5 mL** of the 1000 ug/L Std.
1 ug/L Std. - **1 mL** of the 1000 ug/L Std.
5 ug/L Std. - **5 mL** of the 1000 ug/L Std.
10 ug/L Std. - **10 mL** of the 1000 ug/L Std.
20 ug/L Std. - **20 mL** of the 1000 ug/L Std.
50 ug/L Std. - **50 mL** of the 1000 ug/L Std.
100 ug/L Std. - **1 mL** of Custom Assurance Std. (CAS) #23 and **1 mL** of CAS #3
10,000 ug/L Std. - **100 mL** CAS #23, **100 mL** CAS #3 and **1 mL** of K (10,000 mg/L) M12474.
100k ug/L Std. - **10 mL** of Cu (10,000 mg/L) M12472, **10 mL** of Mn (10,000 mg/L) M12533, **10 mL** of Cr (10,000 mg/L) M12470, **10 mL** Pb (10,000 mg/L) M12313, **10 mL** of Zn (10,000 mg/L) M12005 and **10 mL** of Na (10,000 mg/L) M12010.
100,000 ug/L Std. - **10 mL** of Mg (10,000 mg/L) M12488, **10 mL** of Fe (10,000 mg/L) M12489, **10 mL** of Ca (10,000 mg/L) M12490 and **10 mL** Al (10,000 mg/L) M12400.
500,000 ug/L Std. - **50 mL** of Mg (10,000 mg/L), **50 mL** of Fe (10,000 mg/L), **50 mL** of Ca (10,000 mg/L) and **50 mL** of Al (10,000 mg/L)
1000k ug/L Std. - **100 mL** of Mg (10,000 mg/L), **100 mL** of Fe (10,000 mg/L), **100 mL** of Ca (10,000 mg/L) and **100 mL** of Al (10,000 mg/L)

Standard Log #:	M12579	Reagent:	Potassium Permanganate Solution
Analyst:	LJF		
Prep Date:	07/24/15	Expiration Date:	01/24/16
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium permanganate M11285 and brought up to volume.		

		Instrument:	GFAA
Standard Log #:	M12576	Standard:	Calibration Std.
Analyst:	MDS	Concentrations:	25 ug/L (As, Pb, Sb, Se, Tl) 3.75 ug/L (Ag)
Prep Date:	07/23/2015	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **0.25 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q H_2O. (1% HNO_3)		

		Instrument:	GFAA
Standard Log #:	M12577	Standard:	CCV Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.5 ug/L (Ag)
Prep Date:	07/23/2015	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **0.1 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

		Instrument:	GFAA
Standard Log #:	M12578	Standard:	ICV/LCS Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.0 ug/L (Ag)
Prep Date:	07/23/2015	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **1.0 mL** of GFAA Custom Stock Std. ((10 ug/mL As, Pb, Sb, Se, Tl) (1.0 ug/mL Ag)) M12505 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

Standard ID#:	M12574	Vendor:	SpexCertiprep
Analyst:	NAH	Chemical:	Custum Assurance Std
Date Received:	07/21/2015	Lot #:	31-138CR
Expiration Date (if any):	07/30/2016	Catalog #:	XSPIKE-1-500

Standard ID#:	M12575	Vendor:	SpexCertiprep
Analyst:	NAH	Chemical:	Custum Assurance Std
Date Received:	07/21/2015	Lot #:	07-30-2016
Expiration Date (if any):	07/30/2015	Catalog #:	XCTWI-1-500

		Instrument:	ICP 6000
Standard Log #:	M12559	Standard:	B&Si ICAL
Analyst:	MDS	Concentrations:	50, 200, 1000, 2000 and 10,000 ug/L (B, Si)
Prep Date:	07/15/2015	Expiration Date:	11/08/2015
Prep:	Into five, 1 L volumetric flasks, pipetted the following from stock standards B (1000 mg/L) M12471 and Si (1000 mg/L) M12007 and brought up to volume using milli-Q H_2O. *50 ug/L std.* - **0.05 mL** of each *200 ug/L std.* - **0.2 mL** of each *1000 ug/L std.* -**1.0 mL** of each, also used for Continuing Calibration Verification *2000 ug/L std.* - **2.0 mL** of each *10,000 ug/L std.* -**10 mL** of each		

		Instrument:	ICP 6000
Standard Log #:	M12560	Standard:	B&Si CCV
Analyst:	MDS	Concentrations:	1000 ug/L (B, Si)
Prep Date:	07/15/2015	Expiration Date:	11/08/2015
Prep:	Into a 1 L volumetric flask, pipetted **1.0 mL** B (1000 mg/L) M12471 and **1.0 mL** Si (1000 mg/L) M12007 and brought up to volume using milli-Q H_2O.		

		Instrument:	ICP 6000
Standard Log #:	M12561	Standard:	B & Si ICSAB
Analyst:	MDS	Concentrations:	500,000 µg/L (Al, Ca, Fe, Mg) 500 µg/L (B,Si)
Prep Date:	07/15/2015	Expiration Date:	11/08/2015
Prep:	Into a 100 mL volumetric flask, pipetted **10 mL** of Interferents A custom stock (5000 mg/L Al, Ca, Mg and 2000 mg/L Fe) M12529, **0.05 mL** of B (1000 µg/mL) M12471, **0.05 mL** of Si (1000 µg/mL) M12007 and **3 mL** of Fe (10,000 mg/L) M12489 and brought up to volume using Milli-Q H_2O.		

Standard ID#:	M12558	Vendor:	Spex Certiprep
Analyst:	NAH	Chemical:	Custum Assurance Standard
Date Received:	07/13/2015	Lot #:	9-105WL
Expiration Date (if any):	07/30/2016	Catalog #:	XCTWI-5-500

Standard ID#:	M12548	Vendor:	Alfa Aesar
Analyst:	LJF	Chemical:	Hydroxylamine Sulfate
Date Received:	07/08/15	Lot #:	Z16A019
Expiration Date (if any):	N/A	Catalog #:	88944

Standard ID#:	M12549	Vendor:	MACRON
Analyst:	LJF	Chemical:	Stannous Chloride
Date Received:	07/08/15	Lot #:	0000111217
Expiration Date (if any):	12/09/15	Catalog #:	8176-04

Standard Log #:	M12543	Reagent:	10N NaOH
Analyst:	LJF		
Prep Date:	06/18/15	Expiration Date:	06/18/16
Prep:	Into a 1 L volumetric flask, added **400 g** NaOH M11852 and brought up to volume.		

Standard Log #:	M12544	Reagent:	TCLP EXTRACTION FLUID #1
Analyst:	LJF	pH:	4.93 ± 0.05
Prep Date:	06/18/15	Expiration Date:	06/18/16
Prep:	Into a 20 L carboy filled with 19 L of DI H_2O, add **114 mL** Glacial acetic acid AB.579 and **128.6 mL** 10N NaOH M12543. Dilute to 20 L and mix.		

Standard ID#:	M12529	Vendor:	SPEX Certiprep
Analyst:	NAH	Chemical:	Interference-A
Date Received:	06/04/2015	Lot #:	12-101YPX
Expiration Date (if any):	06/30/2016	Catelog #:	INT-A1

Standard ID#:	M12530	Vendor:	SPEX Certiprep
Analyst:	NAH	Chemical:	Custom Assurance STD (3) Ag,Be,Cd
Date Received:	06/04/2015	Lot #:	30-152CR
Expiration Date (if any):	06/30/2016	Catelog #:	XCTWI-4-500

Standard ID#:	M12531	Vendor:	SPEX Certiprep
Analyst:	NAH	Chemical:	Custom Assurance STD (23)
Date Received:	06/04/2015	Lot #:	30-153CR
Expiration Date (if any):	06/30/2016	Catelog #:	XCTWI-5-500

Standard ID#:	M12532	Vendor:	SPEX Certiprep
Analyst:	NAH	Chemical:	Mercury 1000 mg/L
Date Received:	06/04/2015	Lot #:	CL7-180HGY
Expiration Date (if any):	06/30/2016	Catelog #:	CLHG4-2Y

Standard ID#:	M12533	Vendor:	CPI
Analyst:	NAH	Chemical:	Mn 10000 mg/L
Date Received:	06/04/2015	Lot #:	15E180
Expiration Date (if any):	11/29/2016	Catelog #:	P/N S4400-10M321

Standard ID#:	M12518	Vendor:	Alfa Aesar Specpure
Analyst:	MDS	Chemical:	GFAA Nickel Nitrate Modifier
Date Received:	05/29/2015	Lot #:	785159H
Expiration Date (if any):	11/30/2016	Catelog #:	39043

		Instrument:	GFAA
Standard Log #:	M12519	Standard:	Calibration Std.
Analyst:	MDS	Concentrations:	25 ug/L (As, Pb, Sb, Se, Tl) 3.75 ug/L (Ag)
Prep Date:	05/29/2015	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **0.25 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q H_2O. (1% HNO_3)		

		Instrument:	GFAA
Standard Log #:	M12520	Standard:	CCV Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.5 ug/L (Ag)
Prep Date:	05/29/2015	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **0.1 mL** of GFAA Custom Stock Std. ((100 ug/mL As, Pb, Sb, Se, Tl) (15 ug/mL Ag)) M12504 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

		Instrument:	GFAA
Standard Log #:	M12521	Standard:	ICV/Spike Std.
Analyst:	MDS	Concentrations:	10 ug/L (As, Pb, Sb, Se, Tl) 1.0 ug/L (Ag)
Prep Date:	05/29/2015	Expiration Date:	06/01/2016
Prep:	Into a 1 L volumetric flask, pipetted **1.0 mL** of GFAA Custom Stock Std. ((10 ug/mL As, Pb, Sb, Se, Tl) (1.0 ug/mL Ag)) M12505 and brought to volume with Milli-Q DI H_2O. (1% HNO_3)		

		Instrument:	CETAC
Standard Log #:	M12507	Standard:	Hg ICAL
Analyst:	LJF	Concentrations:	10,000, 100, 0.5, 1, 2, 4, 5, 10 ug/L
Prep Date:	05/27/15	Expiration Date:	02/26/16
Prep:	Using 100 mL volumetric flasks, pipetted the following and brought up to volume using milli-Q H_2O. (0.2% HNO_3, 0.2% HCl) *10,000 ug/L Std.* - **1 mL** Hg (1000 mg/L) M12179 *100 ug/L Std.* - **1 mL** Hg (*10,000 ug/L*) *0.5 ug/L Std.* - **0.5 mL** Hg (*100 ug/L*) *1 ug/L Std.* - **1 mL** Hg (*100 ug/L*) *2 ug/L Std.* - **2 mL** Hg (*100 ug/L*) *4 ug/L Std.* - **4 mL** Hg (*100 ug/L*) *5 ug/L Std.* - **5 mL** Hg (*100 ug/L*) *10 ug/L Std.* - **10 mL** Hg *(100 ug/L)*		

		Instrument:	ICP 6000
Standard Log #:	M12508	Standard:	NaK ICSAB
Analyst:	MDS	Concentrations:	500 mg/L (Al, Ca, Fe, Mg) 100 mg/L (Na, K)
Prep Date:	05/27/2015	Expiration Date:	08/30/2015
Prep:	Into a 250 mL volumetric flask, pipetted **25 mL** of Interferents A custom stock (5000 mg/L Al, Ca, Mg and 2000 mg/L Fe) M12164, **2.5 mL** of K (10,000 mg/L) M12474, **2.5 mL** of Na (10,000 mg/L) M12010 and **7.5 mL** of Fe (10,000 mg/L) M12401 and brought up to volume using Milli-Q H_2O. (2% HNO_3)		

Standard ID#:	M12504	Vendor:	Inorganic Ventures
Analyst:	MDS	Chemical:	GFAA ICAL/CCV Standard
Date Received:	05/26/2015	Lot #:	J2-MEB581070
Expiration Date (if any):	06/01/2016	Catelog #:	CTI-SPK-1

Standard ID#:	M12505	Vendor:	Inorganic Ventures
Analyst:	MDS	Chemical:	GFAA ICV/Spiking Standard
Date Received:	05/26/2015	Lot #:	J2-MEB581069
Expiration Date (if any):	06/01/2016	Catelog #:	CTI-GFCAL-1

Standard ID#:	M12502	Vendor:	SpexCertiprep
Analyst:	NAH	Chemical:	Custum assurance standard
Date Received:	05-19-2015	Lot #:	30-096CR
Expiration Date (if any):	05-30-2016	Catelog #:	XSPIKE-1-250

Standard Log #:	M12501	Reagent:	Potassium Persulfate Solution
Analyst:	LJF		
Prep Date:	05/14/15	Expiration Date:	11/14/15
Prep:	Into a 1 L volumetric flask, partially filled with milli-Q H_2O, dissolved **50 g** potassium persulfate M10987 and brought up to volume.		

#M12488 5-5-15 - Mg 10,000mg/L CPI Lot 15C248 ex 10/2016.

#M12489 5-5-15 - Fe 10,000mg/L CPI Lot 15C290 ex 10/16.

#M12490 5-5-15 Ca 10,000mg/L CPI Lot 15A007 ex 10/16.

#M12491 05/06/15C3F TCLP Extraction Fluid #1: Fill a 20L carboy w/19L D.I. H2O. Add 114ml Glacial Acetic Acid (AB 579) and 128.6ml of 5N NaOH (#M12797). Dilute to 20L w/D.I. H2O and mix. pH = 4.93 ± 0.05

Exp: 05/06/16

#M12492 05/06/15C3F SPLP Extraction Fluid #2 west: Fill a 20L carboy with D.I. H2O and adjust pH to 5.00 ± 0.05 with (#M12457) 60/40 HNO_3, H_2SO_4 mix w/v mix.

Exp: 05/06/16

#M12493 05/11/15C3F	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12494 05/11/15C3F	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12495 05/11/15C3F	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12494) into 100ml = 3.0ug/L Hg
#M12496 05/11/15C3F	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12497 05/11/15C3F	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12494) into 100ml = 0.2ug/L Hg
#M12498 05/11/15 C3F	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12499 05/11/15C3F	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M12799 in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12468
4/22/15
MDS

		Instrument:	ICP 6000
Standard Log #:	M12468	Standard:	Na,K ICVLL
Analyst:	MDS	Concentrations:	3 mg/L (Na,K)
Prep Date:	04/22/2015	Expiration Date:	11/8/2015
Prep:	Into a 500 mL volumetric flask, pipetted **0.15 mL** of Na (10,000 µg/mL) M12010 and **0.15 mL** K (10,000 µg/mL) M12294 and brought to volume with Milli-Q H_2O. (2% HNO_3)		

#M12469
4/22/15
MDS

		Instrument:	ICP 6000
Standard Log #:	M12469	Standard:	Na,K MRL
Analyst:	MDS	Concentrations:	1 mg/L (Na,K)
Prep Date:	04/22/2015	Expiration Date:	04/29/2016
Prep:	Into a 500 mL volumetric flask, pipetted **0.5 mL** of Na (1000 µg/mL) M12296 and **0.5 mL** K (1000 µg/mL) M12295 and brought to volume with Milli-Q H_2O. (2% HNO_3)		

M12470 4-24-15 Cr 10,000 mg/L CPI 4-24-15 Lot # 13D123. ex oct/2016

M12471 4-24-15 Boron 1000 mg/L CPI Lot # 15D007. ex oct/2016

M12472 Cu 10,000 mg/L CPI Lot # 15B087. ex oct/2016

M12473 Ba 1000 mg/L CPI Lot # 15C142. ex oct/2016

M12474 K 10,000 mg/L CPI Lot # 15D114. ex oct/2016

#M12475
04/24/15
MDS

Standard Log #:	M12475	Instrument:	GFAA
Analyst:	MDS	Reagent:	Pd/Mg Matrix Modifier
Prep Date:	04/24/2015	Expiration Date:	08/07/2015
Prep:	Into a 50 mL volumetric flask, partially filled with milli-Q H_2O, pipetted **15 mL** Pd Modifier M12158 and **10 mL** Mg (10,000 mg/L) M12314 and brought up to volume.		

#M12459 04/20/15 CSF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12460 04/20/15 CSF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12461 04/20/15 CSF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12460) into 100ml = 3.0ug/L Hg
#M12462 04/20/15 CSF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12463 04/20/15 CSF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12460) into 100ml = 0.2ug/L Hg
#M12464 04/20/15 CSF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12465 04/20/15 CSF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M12299) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12466 04/22/15 CSF NaCl Hydroxylamine Sulfate Reagent: Dissolve 60g NaCl (#M11799) and 60g hydroxylamine sulfate (#M12096) in 500ml of Milli-Q H2O.
Exp: 10/22/15

#M12467
04/22/15
MDS

		Instrument:	ICP 6000
Standard Log #:	M12467	Standard:	Na & K ICAL
Analyst:	MDS	Concentrations:	0.5, 1, 5, 10, 50, 100, and 200 mg/L (Na,K)
Prep Date:	04/22/2015	Expiration Date:	04/29/2016
Prep:	Into seven, 200 mL volumetric flasks, pipetted the following from Na (1000 µg/mL) M12296 and K (1000 µg/mL) M12295 and brought up to volume using milli-Q H_2O. (2% HNO_3) *0.5 mg/L std.* - **0.1 mL** of each *1.0 mg/L std.* - **0.2 mL** of each *5.0 mg/L std.* - **1.0 mL** of each *10 mg/L std.* - **2.0 mL** of each *50 mg/L std.* - **10 mL** of each *100 mg/L std.* -**20 mL** of each, also used for Continuing Calibration Verification *200 mg/L std.* - **40 mL** of each		

#M12453 04/07/15 L3F
LOQ Check
3050 QSM DOD

3050 LOQ Spiking Solution
Base SPIKE PREPARATION 50x

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	LOQ (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L
K	2640	M12294	10000	13.2
Na	960	M12010	10000	4.8

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working standard.

Expires: 8-Nov

#M12454 04/07/15 L3F
LOQ check
3050 QSM DOD

3050 LOQ Spiking Solution
Base SPIKE PREPARATION 50x

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	LOQ (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L
B	52	M11763	1000	2.6
Si	192	M12007	1000	9.6

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working standard.

Expires: 13-May

M12455 4/8/15 TA Environmental Express 4, 10,000mg/L lot# 1418108.
expires. 10/16

#M12456 04/14/15 L3F potassium permanganate Soln: 50g potassium permanganate
Exp: 10/14/15 (#M11285) dissolve into 1,000mL of D.I. H_2O.

#M12457 04/15/15 L3F SPLP Ext. Fluid Acid mixture: Into a 200 mL Vol. Flask, add
Exp: 04/15/16 12g H_2SO_4 (AB.598) and 8g conc. HNO_3 (AB.596). Bring up to volume with D.I. H_2O.

#M12458 04/16/15 L3F SPLP Extraction Fluid West #2: Fill a 20L carboy with D.I. H_2O and adjust pH to
Exp: 04/16/16 5.00 ± 0.05 with (#M12457) 60/40 HNO_3, H_2SO_4 mix w/v mix.

#M12449 04/07/15 13F
LOQ Check
3010 QSM DOD

3010 LOQ Spiking Solution
Base SPIKE PREPARATION 50x

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	LOQ (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L
B	16	M11763	1000	0.8
Si	200	M12007	1000	10

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working standard.

Expires: 13-May

#M12450 04/07/15 13F
LOQ Check
3050 QSM DOD

3050 LOQ Spiking Solution
Base SPIKE PREPARATION 50x

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	LOQ (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L
Li	14.4	M11998	1000	0.72
Sn	20	M11996	1000	1
Sr	3.2	M11999	1000	0.16
Ti	9.6	M12003	1000	0.48
W	24	M12001	1000	1.2

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working standard.

Expires: 8-Nov

#M12451 04/07/15 13F
LOQ Check
3050 QSM DOD

3050 LOQ Spiking Solution
Base SPIKE PREPARATION 50x

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	LOQ (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L
Ag	4	M11908	1000	0.2
Al	9.6	M12312	10000	0.048
As	32	M12315	1000	1.6
Ba	2	M11768	1000	0.1
Be	1.6	M12006	1000	0.08
Ca	56	M12310	10000	0.28
Cd	1.6	M12002	1000	0.08
Co	9.6	M1200	1000	0.48
Cr	5.6	M11767	10000	0.028
Cu	16	M11764	10000	0.08
Fe	72	M1231	10000	0.36
Mg	32	M12314	10000	0.16
Mn	6	M11829	10000	0.03
Mo	9.6	M12008	1000	0.48
Ni	4.8	M12004	1000	0.24
Pb	10	M12313	10000	0.05
Sb	32	M11909	1000	1.6
Se	16	M11911	1000	0.8
Tl	19	M11997	1000	0.95
V	3.2	M12009	1000	0.16
Zn	12	M12005	10000	0.06

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working standard.

Expires: 13-May

#M12452 04/07/15 13F
LOQ Check
3050 QSM DOD

3050 LOQ Spiking Solution
Base SPIKE PREPARATION 50x

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	LOQ (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L
S	240	M11679	10000	1.2

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working

#M12445 04/06/15 L3F
LOQ Check
3010 GSM DoD

3010 LOQ Spiking Solution
Base SPIKE PREPARATION 50x

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	LOQ (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L
Li	10	M11998	1000	0.5
Sn	10	M11996	1000	0.5
Sr	2	M11999	1000	0.1
Ti	8	M12003	1000	0.4
W	36	M12163	1000	1.8

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working standard.

Expires: 8-Nov

#M12446 04/06/15 L3F
LOQ Check
3010 GSM DoD

3010 LOQ Spiking Solution
Base SPIKE PREPARATION 50x

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	LOQ (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L
K	500	M12294	10000	2.5
Na	600	M12010	10000	3

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working standard.

Expires: 8-Nov

List 2 MRL/ICVLL Base SPIKE PREPARATION 50x

#M12395
02/23/15 MDS

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	MRL (ug/L)	ICVLL (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) pipet into 1	Expired Date
Li	20	60	M11998	1000	1	11/08/2015
W	100	300	M12163	1000	5	02/06/2016
Ti	10	30	M12003	1000	0.5	11/08/2015
Sr	10	30	M11999	1000	0.5	11/08/2015
Sn	20	60	M11996	1000	1	11/08/2015
Pipette 10 mL into a 500 mL volumetric flask to create a working MRL std. or 1 mL into a 50 mL digestion tube for a digested MRL working standard. Pipette 30 mL into 500mL For ICVLL Working						

0.5% HNO_3
0.5% HCl

#M12396
02/23/15 MDS

List 2 MRL

Into a 500 mL volumetric flask, pipetted 10 mL of #M12395 and brought to volume with milli-Q H20.
Exp. 11/08/2015 0.5% HNO3, 0.5% HCl

#M12397
02/23/15 MDS

List 2 ICVLL

Into a 500 mL volumetric flask, pipetted 30 mL of #M12395 and brought to volume with milli-Q H20.
Exp. 11/08/2015 0.5% HNO3, 0.5% HCl

#M12398 02/23/15 I3F NaCl Hydroxylaminesulfate Reagent: Dissolve 60g NaCl (#M11799) and 60g hydroxylemine sulfate (#M11798) in 500mL of milli-Q H_2O.
Exp: 08/23/15

#M12399 02/24/15 I3F potassium permanganate Soln: 50g potassium permanganate (#M11285) dissolve into 1,000mL of D.I. H_2O.
Exp: 08/24/15

#M12400 2-25-15 JJ Al 10,000 mg/L CPI Lot# HK153 ex 7/2016

#M12401 JJ 2-25-15 Fe 10,000mg/L CPI Lot# HJ165 7/2016

#M12402 02/26/15 I3F Stannous Chloride (Amacrun) lot# 0000096553
02/26/15 I3F

#M12403 02/26/15 I5F Sodium Chloride (Fisher) lot# 145475
02/26/15 I3F

#M12404 03/04/15 I5F TCLP Extraction Fluid #1: Fill a 20L carboy w/19L D.I. H_2O. Add 114mL Glacial Acetic Acid (AB.579) and 128.6mL of 10N NaOH (#M12297). Dilute to 20L w/D.I. H_2O and mix.
pH = 4.93 ± 0.05

#M12405 03/04/15 I5F TCLP Extraction Fluid #1: Fill a 20L Carboy w/19L D.I. H_2O 03/04/15 I3F Add 114mL Glacial Acetic Acid (AB.579) and 128.6mL of 10N NaOH (#M12297). Dilute to 20L w/D.I. H_2O and mix.
pH = 4.93 ± 0.05

#M12383 02/19/15 LSF TCLP Extraction Fluid #1: Fill a 20L Carboy w/19L D.I. H2O. Add 114mL Glacial Acetic Acid (AB.579) and 128.6mL of 10N NaOH (#M12292). Dilute to 20L w/D.I. H2O and mix.

pH=4.93 ± 0.05

#M12384 02/19/15 LSF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12385 02/19/15 LSF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12386 02/19/15 LSF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12385) into 100ml = 3.0ug/L Hg
#M12387 02/19/15 LSF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12388 02/19/15 LSF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12385) into 100ml = 0.2ug/L Hg
#M12389 02/19/15 LSF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12390 02/19/15 LSF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M12299) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

ICAP Working Standards List 2

.5% HNO3 .5%HCL

#M12391 02/23/15 MDS

Standard name	Pipetted the following respectively:
1	0.01mL of #M12316 and 0.001mL #M12001 into 1L = 1 ug/L
10	0.10mL of #M12316 and 0.01mL #M12001 into 1L = 10 ug/L
100	1mL of #M12316 and 0.1mL #M12001 into 1L = 100 ug/L
1000	2 mL of #M12316 and 0.2 mL #M12001 into 200 mL = 1000 ug/L
10000	20mL of #M12316 and 2mL #M12001 into 200mL = 10000 ug/L

Brought up to mark with milli-Q H20 Exp. 11/08/2015

#M12392 02/23/15 MDS

Continuing Calibration Standard (CCV)

Into a 200mL volumetric flask pipetted 2mL of #M12316 and 0.2mL #M12001 = 1000 ug/L
Brought up to mark with milli-Q H20 Exp. 11/08/2015 0.5% HNO3, 0.5% HCl

#M12393 02/23/15 MDS

Initial Calibration Standard (ICV) List 2

Into a 1 liter volumetric flask pipetted 1mL of #M12003, M11999, M11996, M11998, M12163
Brought up to mark with milli-Q H20 Exp. 11/08/2015 0.5% HNO3, 0.5% HCl

#M12394 02/23/15 MDS

ICASB List 2

Into a 200 mL volumetric flask, pipetted 20 mL Interferents A #M12164, 6 mL Fe (10,000 µg/mL) #M12311, and 0.1 mL of 1000mg/L Ti, Sr, Sn, Li, and W #M12003, M11999, M11996, M11998, and M12001 respectively.
Brought up to mark with milli-Q H20 Exp. 08/30/2015 0.5% HNO3, 0.5% HCl

M12378 2-10-15 K 1000mg/L CLI Lot# 14L175 exp 7/16.

Standard Log #:	M12379	Standard:	GFAA Instrument Check
Analyst:	MDS	Final Concentration:	10 µg/L As 6 µg/L Pb 22 µg/L Tl 24 µg/L Sb, Se 0.8 µg/L Ag
Prep Date:	02/17/2015	Expiration Date:	09/18/2015

#M12379
MDS
02/17/15

Into six, 100 mL volumetric flasks, add the following and bring up to volume with milli-Q H_2O.

Element	Volume Pipetted (mL)	Standard Conc. (µg/mL)	Standard ID	New Conc. (µg/L)
As	1	1000	M12315	10,000
Pb	0.1	10,000	M12313	10,000
Tl	1	1000	M11997	10,000
Se	1	1000	M11911	10,000
Sb	1	1000	M11909	10,000
Ag	0.1	1000	M11908	1000

Into a 1 L volumetric flask, add the following and bring up to volume with Milli-Q H20. (1% HNO3)

Element	Volume Pipetted (mL)	Standard Conc. (µg/L)	Final Conc. (µg/L)
As	1	10,000	10
Pb	0.6	10,000	6
Tl	2.2	10,000	22
Se	2.4	10,000	24
Sb	2.4	10,000	24
Ag	0.8	1000	0.8

#M12380 - Custom Assurance Std - Spex Certiprep
2.17.15

#M12381 02/17/15 SF TCLP Extraction Fluid #1: Fill a 20L carboy w/19L D.I. H20. Add 114mL Glacial Acetic Acid (AB579) and 128.6mL of 10N NaOH (#M12292). Dilute to 20L w/D.I. H20 and mix. pH = 4.93 ± 0.05
Exp: 02/17/16

#M12382 02/17/15 SF TCLP Extraction Fluid #1: Fill a 20L carboy w/19L D.I. H20. Add 114mL Glacial Acetic Acid (AB579) and 128.6mL of 10N NaOH (#M12292). Dilute to 20L w/D.I. H20 and mix. pH = 4.93 ± 0.05
Exp: 02/17/16

#M12364 02/04/15 LSF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12365 02/04/15 LSF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12366 02/04/15 LSF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M 12365) into 100ml = 3.0ug/L Hg
#M12367 02/04/15 LSF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12368 02/04/15 LSF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12365) into 100ml = 0.2ug/L Hg
#M12369 02/04/15 LSF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12370 02/04/15 LSF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M 11995 in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12371 2-5-15 ZA Sulfur 10,000mg/L SPC Science lot# S140717006 ex 4/16.

#M12372 02/05/15 LSF TCLP Extraction Fluid#1: Fill a 2oL carboy w/ 19L D.I. H2O. Add 114ml Glacial Acetic Acid (AB: 579) and 128.6 mL of 10N NaOH (#M12291). Dilute to 20L w/ D.I. H2O and mix. pH = 4.93 ± 0.05
Exp: 02/05/16

#M12373 02/05/15 LSF TCLP Extraction Fluid#1: Fill a 2oL carboy w/ 19L D.I. H2O. Add 114ml Glacial Acetic Acid (AB: 579) and 128.6mL of 10N NaOH (#M12291). Dilute to 20L w/ D.I. H2O and mix. pH = 4.93 ± 0.05
Exp: 02/05/16

#M12374 2/5/15 Custom Assurance Std 100ug/ml 23 Lot# 8-91WL ex 1/16

#M12375 02/10/15 LSF 10N NaOH: Into a 1L flask, add 400g NaOH (#M11852) and bring up to volume with D.I. H2O.
Exp: 08/10/15

#M12376 02/10/15 LSF Potassium permanganate soln: 50g potassium permanganate (#M11285) dissolve into 1,000 mL of D.I. H2O.
Exp: 08/10/15

#M12377 ZA 2.10.15 Na 1000mg/L CPI Lot# 142083. ex 7/16.

#M12352 01/20/15 13F Potassium permanganate soln: 50g potassium permanganate (#M11285) dissolve into 1,000mL of D.I. H2O
Exp: 07/20/15

#M12353 01-22-15 MOS · S ICAL - Into 4, 100 mL vol. Flasks, pipetted the following and brought up to volume with milli-Q H2O. exp. 01-30-16
0.01 mL S (10,000ug/mL) # M12350 = 1000ug/L S
0.1 mL S (10,000ug/mL) # M12350 = 10,000ug/L S
Used as CCV → 1.0 mL S (10,000ug/mL) # M12350 = 100,000ug/L S
10 mL S (10,000ug/mL) # M12350 = 1000K ug/L S

#M12354 01-22-15 MOS S ICV - Into a 100mL vol. flask, pipetted 1.0mL S(10,000ug/mL) #M11828 and brought to volume with milli-Q H2O. exp. 01-30-15

#M12355 01/27/15 13F	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12356 01/27/15 13F	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg
#M12357 01/27/15 13F	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12356) into 100ml = 3.0ug/L Hg
#M12358 01/27/15 13F	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12359 01/27/15 13F	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12356) into 100ml = 0.2ug/L Hg
#M12360 01/27/15 13F	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12361 01/27/15 13F	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M11995) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12362 01/27/15 13F NaCl Hydroxylamine Sulfate Reagent: Dissolve 60g NaCl (#M11799) and 60g hydroxylamine sulfate (#M11798) in 500mL of Milli-Q H2O.
Exp: 07/27/15

#M12363 01/30/15 13F TCLP Extraction Fluid #1: Fill a 20L carboy w/ 19L D.I. H2O. Add 114mL Glacial Acetic Acid (AB: 579) and 128.6mL of 10N NaOH (#M12792). Dilute to 20L w/ D.I. H2O and mix. pH = 4.93 ± 0.05
Exp: 01/30/16

#M12340 1-9-15
5% HCl
5% HNO3

3050 MDL Spiking Solution
Base SPIKE PREPARATION 50x

Into a 1000 mL Volumetric Flask, pipet the following:

Analyte	MDL (ug/L)	Std ID #	Std Conc (mg/L)	Amount (mL) to pipet into 1 L
K	500	#M12294	10000	2.5
Na	500	#M12010	10000	2.5

Of this Base standard, pipet 10 mls into 500 ml volumetric to create a working std or 1 ml into 50 ml digestion tube for a digested working standard.

EXPIRES 11/15

#M12341 01-14-15 MMS GFAA LOD/LOQ Check Water Working Std. (Ag Only) - Into a 100mL vol. Flask, pipetted 0.1mL Ag (1000ug/mL) #M11908 and brought up to volume using milli-Q H_2O. exp. 09-18-15

#M12342 01-14-15 MMS GFAA LOD/LOQ Water Spiking Solution (Ag Only) - Into a 1L vol. Flask, pipetted 10mL #M12341 and brought up to volume using milli-Q H_2O. (1% HNO_3) exp. 09-18-15

#M12343 01/19/15 SF Hg Working Stds: (0.2% HNO3, HCl)
1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg
1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg
0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg
1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg
2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg
4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg
5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg
10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg

#M12344 01/19/15 SF Hg Alt Source Working Std: (0.2% HNO3, HCl)
1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg
1.0ml of 10mg/L into 100ml = 100ug/L Hg

#M12345 01/19/15 SF Hg ICV / LCSW (0.2% HNO3, HCl)
3.0ml of 100ug/L Hg (#M12344) into 100ml = 3.0ug/L Hg

#M12346 01/19/15 SF Hg CCV (0.2% HNO3, HCl)
1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg
1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg
3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg

#M12347 01/19/15 SF Hg MRL: (0.2% HNO3, HCl)
0.2ml of 100ug/L Hg (#M12344) into 100ml = 0.2ug/L Hg

#M12348 01/19/15 SF Hg Aqua Regia Reagent:
"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)

#M12349 01/19/15 SF Stannous Chloride Reagent:
Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M11995) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12350 1-19-15 Spex Certiprep S 10,000 mg/L Lot # AH15-85SY exp 1/16

#M12351 01/19/15 SF TCLP Extraction Fluid #1: Fill a 20L carboy w/ 19L D.I. H_2O. Add 11.4mL Glacial Acetic Acid (AB.579) and 128.6mL of 1N NaOH (#M12292). Dilute to 20L w/ D.I. H_2O and mix. pH = 4.93 ± 0.05
Exp: ~~09~~ 01/19/16
01/19/15 SF

#M12310 12-9-14 10,000 mg/L Ca CPI Lot# 14K204 ex 6/16

#M12311 12-9-14 10,000 mg/L Fe CPI Lot# 14J165 ex 6/16

#M12312 12-9-14 10,000 mg/L Al CPI Lot # 14H211 ex 6/16

#M12313 12-9-14 10,000 mg/L Pb CPI Lot #140135 ex 6/16

#M12314 12-9-14 10,000 mg/L Mg CPI Lot # 14K161 ex 6/16

#M12315 12-9-14 1000 mg/L As CPI Lot # 131194 ex 6/16

#M12316 12-9-14 Custom Assurance Std CPI Ex Centriprep lot 27-185CR ex 12/15

#M12317 12-09-14 mas GFAA Se Spike (10ng/mL) - Into a 100mL vol. Flask, pipetted 1.0mL Se (1000mg/mL) #M11911 + brought to volume with DI H_2O. (3% HNO_3) Exp. 09/18/15

#M12318 12/09/14 lsf TCLP Extraction Fluid #1: Fill a 7L carboy w/ 1gL D.I. H_2O. Add 11.4mL Glacial Acetic Acid (AB5379) and 128.6mL of 10N NaOH (#M12292) Dilute to 7L with D.I. H_2O and mix. pH = 4.93 ± 0.05 Exp: 12/09/15

#M12319 12/12/14 lsf potassium permanganate Soln: 50g potassium permanganate (#M11285) dissolve into 1,000mL of D.I. H_2O. Exp: 06/12/15

#M12320 12-15-14 Custom Assurance Std Spex Centriprep Lot 27-232CR XCTWT-1-500

#M12321 12-15-14 Custom Assurance Std Spex Centriprep Lot 27-231CR XSpike-1-250

#M12322 12/15/14 lsf TCLP Extraction Fluid #1: Fill a 7L Carboy w/ 1gL D.I. H_2O. Add 11.4mL Glacial Acetic Acid (AB5379) and 128.6mL of 10N NaOH (#M12292) Dilute to 7L with D.I. H_2O and mix. pH = 4.93 ± 0.05 Exp: 12/15/15

#M12323 12-22-14 mas GFAA Pd/Mg Matrix Modifier - Into a 50mL vol. Flask, pipetted 15mL of Pd Modifier #M12158 + 10mL of Mg (10,000mg/mL) #M12113 + brought up to volume using milli-Q H_2O. (2% HNO_3) exp. 8/7/15

#M12295 11-21-14 K 1000ug/ml CPI Lot 141165 Exp 4/16

#M12296 11-21-14 Na 1000mg/L CPI Lot 141167 Exp 4/16

#M12297 11/24/14 SF Potassium permanganate Soln: 50g potassium permanganate (#M11285) dissolved Exp: 05/24/15 into 1000mL of D.I. H2O.

#M12298 11/24/14 SF Stannous Chloride (Macron) Lot# 0000082282

#M12299 11-25-14 JT ICV 1 As + Pb. Into 1 Liter Vol flask pipet 5mL #M11912, 0.5mL #M11682. Bring up to mark w/ DI H2O.

~~#M12300~~ 12300 11/25/14 SF #M12299 11/25/14 SF Stannous Chloride (Macron) lot# 0000090643

#M12301 12/02/14 SF TCLP Extraction Fluid #1: Fill a 20L carboy w/ 19L D.I. H2O. Add 114mL Glacial Acetic Acid (AB: 579) and 128.6mL of 10N NaOH (#M12292). Dilute to 20L with D.I. H2O and mix. pH = 4.93 ± 0.05. Exp: 12/02/15

#M12302 12/05/14 SF — Hg Working Stds: (0.2% HNO3, HCl)

1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg
1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg
0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg
1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg
2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg
4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg
5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg
10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg

#M12303 12/05/14 SF — Hg Alt Source Working Std: (0.2% HNO3, HCl)

1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg
1.0ml of 10mg/L into 100ml = 100ug/L Hg

#M12304 12/05/14 SF — Hg ICV / LCSW (0.2% HNO3, HCl)

3.0ml of 100ug/L Hg (#M12303) into 100ml = 3.0ug/L Hg

#M12305 12/05/14 SF — Hg CCV (0.2% HNO3, HCl)

1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg
1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg
3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg

#M12306 12/05/14 SF — Hg MRL: (0.2% HNO3, HCl)

0.2ml of 100ug/L Hg (#M12303) into 100ml = 0.2ug/L Hg

#M12307 12/05/14 SF — Hg Aqua Regia Reagent:

"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)

#M12308 12/05/14 SF — Stannous Chloride Reagent:

Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M11995) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

~~#M12309~~ 12/09/14 SF #M12309 12/09/14 SF NaCl Hydroxylamine Sulfate Reagent: Dissolve 60g NaCl (#M11799) and 60g hydroxylamine sulfate (#M11798) in 500mL of milli-a H2O. Exp: 06/09/15

#M12282
11-13-14 MMS

ICASB List 2

Into a 200 mL volumetric flask, pipetted 20 mL Interferents A #M12082 and 0.1 mL of 1000mg/L Ti, Sr, Sn, Li, and W #M12003, M11999, M11996, M11998, and M12001 respectively. Brought up to mark with milli-Q H20 Exp. 06/30/2015

#M12283 Yttrium 10,000 ug/mL Environmental Express Lot#1418108
11-14-14

#M12284 11/14/14 ISF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12285 11/14/14 ISF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12286 11/14/14 ISF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M 12285) into 100ml = 3.0ug/L Hg
#M12287 11/14/14 ISF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12288 11/14/14 ISF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M 12285) into 100ml = 0.2ug/L Hg
#M12289 11/14/14 ISF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12290 11/14/14 ISF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M11995) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12291 11/15/14 ISF NaCl Hydroxylamine Sulfate Reagent: Dissolve 60g NaCl (#M11799) and 60g hydroxylamine sulfate (#M11782) in 500ml of milli-Q H2O.
Exp: 05/15/15

#M12292 11/20/14 ISF 10N NaOH: Into a 1L flask, add 400g NaOH (#M11145) and bring up to volume with D.I. H2O.
Exp: 05/20/15

#M12293 11/20/14 ISF TCLP Extraction Fluid #1: Fill a 20L carboy w/19L D.I. H2O. Add 114ml Glacial Acetic Acid (AB: 579) and 128.6ml of 10N NaOH (#M12292). Dilute to 20L with D.I. H2O and mix. pH = 4.93 ± 0.05
Exp: 11/20/15

#M12294 11-21-14 K 10,000 ug/mL CPI Lot 146213 ex 4/29/16

11/04/14 15F

#M12271 TCLP Extraction Fluid #1: Fill a 20L carboy w/ 19L D.I. H2O. Add 114mL Glacial Acetic Acid (AB: 579) and 128.6mL 10N NaOH (#M11955). Dilute to 20L with D.I. H2O and mix. pH = 4.93 ± 0.05

Exp: 10/21/04/14
11/04/14 15F

#M12272 11/05/14 15F	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12273 11/05/14 15F	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12274 11/05/14 15F	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12273) into 100ml = 3.0ug/L Hg
#M12275 11/05/14 15F	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12276 11/05/14 15F	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12273) into 100ml = 0.2ug/L Hg
#M12277 11/05/14 15F	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12276 11/05/14 15F	Stannous Chloride Reagent:	Into a 1000mL volumetric flask, dissolve 100g Stannous Chloride (#M11995) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12277 11/07/14 15F Potassium permanganate (Fisher) Lot# 138790A

#M12278 11/13/14 15F potassium permanganate soln: 50g potassium permanganate (#M11285) dissolve into 1000mL of D.I. H2O.
Exp: 05/13/15

ICAP Working Standards List 2

#M12279
11-13-14 MOS

.5% HNO3 .5%HCL

Standard name	Pipetted the following respectively:
1	0.01mL of #M12165 and 0.001mL #M12001 into 1L = 1 ug/L
10	0.10mL of #M12165 and 0.01mL #M12001 into 1L = 10 ug/L
100	1mL of #M12165 and 0.1mL #M12001 into 1L = 100 ug/L
1000	2mL of #M12165 and 0.2mL #M12001 into 200mL = 1000 ug/L
10000	20mL of #M12165 and 2mL #M12001 into 200mL = 10000 ug/L

Brought up to mark with milli-Q H20 Exp. 08/30/2015

#M12280
11-13-14 MOS

Continuing Calibration Standard (CCV)
Into a 200mL volumetric flask pipetted 2mL of #M12165 and 0.2mL #M12001 = 1000 ug/L
Brought up to mark with milli-Q H20 Exp. 08/30/2015

#M12281
11-13-14 MOS

Initial Calibration Standard (ICV) List 2
Into a 1 liter volumetric flask pipetted 1mL of #M12003, M11999, M11996, M11998 and M12163
Brought up to mark with milli-Q H20 Exp. 11/08/2015

#M122258 10/22/14 SF potassium permanganate soln: 50g potassium permanganate (#M11285) dissolve into 1,000ml of D.I. H2O.
Exp: 04/22/15

#M122259 10/27/14 SF Stannous Chloride (Macron) lot#0000087461

M122260 10/28/14 ICV/LCS boron and silicon

Into a one liter volmetric flask pipet 10ml of #M12165 and 1.0 ml #M11919

Bring up to mark with DI H2O

#M122261 10/28/14 SF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M122262 10/28/14 SF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M122263 10/28/14 SF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M122262) into 100ml = 3.0ug/L Hg
#M122264 10/28/14 SF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M122265 10/28/14 SF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M122262) into 100ml = 0.2ug/L Hg
#M122266 10/28/14 SF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M122267 10/28/14 SF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M11795) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M122268 10/29/14 SF potassium permanganate soln: 50g potassium permanganate (#M11285) dissolve into 1,000ml of D.I. H2O.
Exp: 04/29/15

#M122269 10/29/14 SF NaCl Hydroxylamine sulfate Reagent: Dissolve 60g NaCl (#M11799) and 60g hydroxylamine sulfate (#M11798) in 500ml of milli-Q H2O.
Exp: 04/29/14

#M122270 11/04/14 SF Sodium Chloride (Fisher) lot#142463

#M12210 10/02/14/SF TCLP Extraction Fluid #1: ~~Into~~ Fill 10/02/14/SF a 20L carboy w/ 1292 D.I. H2O. Add 114mL Glacial Acetic Acid (~~#M~~ AB. 599) 10/02/14/SF and 128.6mL 10N NaOH (#M11955). Dilute to 20L with D.I. H2O and mix pH = 4.93 ± 0.05

Exp: 10/02/15

#M12211 10/6/14 Custom Assurance Std Spex Certiprep lot # 26-201CR. ex 9/15

#M12212 10/6/14 Potassium 10,000 CPI lot # 14G213 ex 3/16

#M12213 10/6/14 Arsenic 10,000 CPI lot # 13L089 ex 3/16

#M12214 10/06/14/SF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12215 10/06/14/SF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12216 10/06/14/SF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M 12215) into 100ml = 3.0ug/L Hg
#M12217 10/06/14/SF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12218 10/06/14/SF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M 12215) into 100ml = 0.2ug/L Hg
#M12219 10/06/14/SF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12220 10/06/14/SF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M 11985) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12221 10/06/14/SF potassium permanganate soln: 50g potassium permanganate (#M11285) dissolve into 1,000mL of D.I. H2O.

Exp: 04/06/15

#M12222 10/06/14 mos GFAA LOD/LOQ Check Water Working Std (Ag Only) - Into a 100mL vol. Flask, pipetted 0.1mL Ag (1000ug/mL) # M11908 and brought up to volume using milli-Q H2O. (1% HNO3) exp. 09/18/15

M12223 10/06/14 mos GFAA LOD/LOQ Water Spiking Soln (Ag only) - Into a 1L vol. Flask, pipetted 10mL # M12222 and brought up to volume using milli-Q H2O. (1% HNO3) exp. 09/18/15

~~#M12149 08/28/14 I3F Stannous chloride lot#~~ 08/28/14 I3F

#M12179 9-4-15 Hg 1000 ug/mL CPI lot# 14F110.

#M12180 09/04/14 I4F	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12181 09/04/14 I3F	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12182 09/04/14 I3F	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12181) into 100ml = 3.0ug/L Hg
#M12183 09/04/14 I3F	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12184 09/04/14 I5F	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12181) into 100ml = 0.2ug/L Hg
#M12185 09/04/14 I5F	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12186 09/04/14 I3F	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M11995) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12185 09/05/14 I5F TCLP Extraction Fluid #1: Fill a 20l carboy w/19L DI H_2O. Add 114ml Glacial Acetic Acid (AB:579) and 128.6ml 10N NaOH (#M11955). Dilute to 20L with DI H_2O and mix. pH = 4.93 ± 0.05

Exp: 09/05/15

#M12186 9-9-14 StablCal Standard 200 ntu turbidity Hach lot #A4216 exp 8/16

#M12187 9-9-14 Turbidity Working Stds → into 3 Hach Vials =>

~~pipet 1, 5 #9-9-14~~

~~1mls → 9mls DH #9-9-14~~

1 ml #M12186 → 9mls DI H_2O = 20 ntu

5 mls M12186 → 5 mls DI H_2O = 100 ntu

10 Ø #9-9-14 mls M12186 → 0 ml DI H_2O = 200 ntu

#M12157 MOS
08-06-14

ICAP Working Standards Boron & Silicon

Standard name	Into a 1L volumetric flask, pipetted the following respectively:
50	0.05mL of #M11763 and 0.05mL #M12007 = 50 ug/L
200	0.2mL of #M11763 and 0.2mL #M12007 = 100 ug/L
1000	1.0mL of #M11763 and 1.0mL #M12007 = 1000 ug/L
2000	2.0mL of #M11763 and 2.0mL #M12007 = 1000 ug/L
10000	10.0mL of #M11763 and 10.0mL #M12007 = 10000 ug/L

Expires: 05/13/2015

Continuing Calibration Standard (CCV)

Into a 1L volumetric flask, pipetted 1.0mL of #M11763 and 1.0mL #M12007 = 1000 ug/L
Brought up to volume with DI H20. Expires 05/13/2015

#M12158 MOS 08/11/14: 1% Pd GFAA matrix modifier. Environmental Express Lot# 1421912
expires: 08/07/15

#M12159 MOS 08/11/14: 1% Nickel Nitrate GFAA matrix modifier. Alfa Aesar Lot# 41-553987D

#M12160 08/12/14 LSF Friscolyt (Mettler Toledo) Lot# 1Z134C

#M12161 08/12/14 LSF TCLP Extraction Fluid #1: Into a 20L Carboy w/19L D.I. H2O. Add 114mL Glacial Acetic Acid (AB.579) and 228.6mL 10N NaOH (#M11955). Dilute to 20L with D.I. H2O and mix pH = 4.93 ± 0.05
Exp: 08/12/15

#M12162 8-13-14 Potassium 1000 mg/L CPI Lot# 14F193 ex 2/16.

#M12163 8-13-14 Tungsten Std. CPI Lot# 14F230 ex 2/16

#M12164 8-13-14 Interference A Spex Certiprep Lot# 11-384PX ex 8/15

#M12165 8-13-14 Custom Assurance Std Spex Certiprep Lot # 7-93WL ex 8/15

#M12134 MOS
07-21-14

Working Standards for Sodium and Potassium - Into seven, 200 mL volumetric flasks, pipetted the following from #M11719 and #M11722 and brought up to volume using milli-Q H_2O. (2% HNO_3)

0.5 mg/L std - 0.1 mL of each
1.0 mg/L std - 0.2 mL of each
5.0 mg/L std - 1.0 mL of each
10.0 mg/L std - 2.0 mL of each
50.0 mg/L std -10 mL of each
100 mg/L std - 20 mL of each, used for Continuing Calibration Standard (CCV)
200 mg/L std - 40 mL of each
Expires: 04/24/15

#M12135 MOS
07-21-14

Initial Calibration Standard (ICV) - Into a 250 mL volumetric flask, pipetted 2.5 mL of #M12010 and #M12011 and brought up to volume using milli-Q H_2O. (2% HNO_3)
Expires: 11/08/2015

#M12136 MOS
07-21-14

ICAP 6000 ICSAB Standard for Sodium and Potassium – Into a 250 mL volumetric flask, pipetted 25 mL of #M11776 and 2.5 mL of each #M12010 & #M12011 and brought to volume using milli-Q H_2O. (2% HNO_3) 7.5mL of #M11915
Expires: 12/30/14

#M12137 MOS
07-22-14

TCLP Extraction Fluid #1 – Into a 20L carboy, added 114mL Glacial Acetic acid #AB586 + 128.6mL 10N NaOH #M12086 + brought to volume w/ D.I H_2O. Mix. pH = 4.93 ± 0.05

#M12138 07/30/14 SF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12139 07/30/14 SF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12140 07/30/14 SF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12139) into 100ml = 3.0ug/L Hg
#M12141 07/30/14 SF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg

#M12105 07/08/14/SF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12106 07/08/14/SF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12107 07/08/14/SF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12106) into 100ml = 3.0ug/L Hg
#M12108 07/08/14/SF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12109 07/08/14/SF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12106) into 100ml = 0.2ug/L Hg
#M12110 07/08/14/SF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12111 07/08/14/SF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M1995) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12112 7-10-14 Ca 10,000 mg/L CPI Lot # 14D176 exp 1/16
D

#M12113 7-10-14 Mg 10,000 mg/L CPI Lot # 14F190 exp 1/16

#M12114 07/11/14/SF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12115 07/11/14/SF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12116 07/11/14/SF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12115) into 100ml = 3.0ug/L Hg
#M12117 07/11/14/SF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12118 07/11/14/SF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12115) into 100ml = 0.2ug/L Hg
#M12119 07/11/14/SF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12120 07/11/14/SF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M1995) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M12079 06/18/14 CSF NaCl Hydroxylamine sulfate Reagent: Dissolve 60g NaCl (#M11799) and 60g hydroxylamine sulfate (#M11998) in 500mL of milli-Q H2O
Exp: 12/18/14

ICAP Working Standards W Only

.5% HNO3 .5%HCL

#M12080 06/19/14 MDS

Standard name	Pipetted the following respectively:
100	0.1mL #M12001 into 1L = 100 ug/L
1000 M12080	1mL #M12001 into 1L = 1000 ug/L
10000	10mL #M12001 into 1L = 10000 ug/L
	Bring up to mark with milli-Q H20 Exp. 11/08/15

Continuing Calibration Standard (CCV) M12080
Into a 1L volumetric flask pipetted 1mL #M12001 = 1000 ug/L
Bring up to mark with milli-Q H20 Exp. 11/08/15

#M12081 06/19/14 MDS

Initial Calibration Standard (ICV) W Only M12081
Into a 1 liter volumetric flask pipetted 1mL of #M11365
Bring up to mark with milli-Q H20 Exp. ~~04/23/15~~ 06/20/14
MDS 06/19/14

#M12082 6-23-14 ZA Spex Certiprep INT-A Lot # 11-38YPX ex 6/15,

#M12083 ZB 6-23-14 Spex Certprep Cust. Assurance std T Hardness + Na ex 6/15.

#M12084 ZA 6-23-14 TCLP Extraction fluid into 20 liter carboy, Add 114ml Glacial acetic Acid (AB-558) + 128.6 mls 10N NaOH #M11955 Dilute up to 20L with DI H20 & mix pH=4.93±.05

#M12085 ZA 6-23-14 TCLP Extraction fluid into 20 Liter carboy add 114ml Glacial acetic Acid (AB-558), + 128.6 mls 10N NaOH #M11955 Dilute up to 20L with DI H2O & Mix ph=4.93±.05

#M12086 ZA 6-23-14 10N NaOH into 1 Liter vol dissolve 400g Sodium Hydroxide #M11145. Bring up to mark w/DI H2O ex 6-23-15.

#M12087 CSF 06/25/14 Potassium permanganate Soln: 50g potassium permanganate (#M11785) dissolve into 1,000mL of D.I. H2O.
Exp: 12/25/14

#M12002 05/13/14 LSF Cadmium 1,000mg/L CPI Lot#14A402 Exp: 11/08/15

#M12003 05/13/14 LSF Titanium 1,000mg/L CPI Lot#13H001 Exp: 11/08/15

#M12004 05/13/14 LSF Nickel 1,000mg/L CPI Lot#14D214 Exp: 11/08/15

#M12005 05/13/14 LSF Zinc ~~1,000~~ 10,000 05/13/14 LSF mg/L CPI Lot#14A199 Exp: 11/08/15

#M12006 05/13/14 LSF Beryllium 1,000mg/L CPI Lot#14D241 Exp: 11/08/15

#M12007 05/13/14 LSF Silicon 1,000mg/L CPI Lot#132019 Exp: 11/08/15

#M12008 05/13/14 LSF Molybdenum 1,000mg/L CPI Lot#148183 Exp: 11/08/15

#M12009 05/13/14 LSF Vanadium 1,000mg/L CPI Lot#14A107 Exp: 11/08/15

#M12010 05/13/14 LSF Sodium 10,000mg/L CPI Lot#148243 Exp: 11/08/15

#M12011 05/13/14 LSF Potassium 10,000mg/L CPI Lot#14C131 Exp: 11/08/15

#M12012 05/14/14 LSF Potassium permanganate soln: 50g potassium permanganate (#M11785) dissolve into 1,000mL of D.I. H_2O.
Exp: 11/14/14

#M12013 05/14/14 LSF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M12014 05/14/14 LSF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M12015 05/14/14 LSF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M12014) into 100ml = 3.0ug/L Hg
#M12016 05/14/14 LSF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M12017 05/14/14 LSF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M12014) into 100ml = 0.2ug/L Hg
#M12018 05/14/14 LSF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M12019 05/14/14 LSF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M11779) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M 11986 05/08/14 LSF NaCl Hydroxylamine Sulfate Reagent: Dissolve into 60g NaCl (#M 11799) and 60g hydroxylamine sulfate (#M 11798) in 500mL Milli-Q H_2O.

Exp: 11/08/14

#M11987 05/09/14 LSF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M11988 05/09/14 LSF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M11989 05/09/14 LSF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M 11988) into 100ml = 3.0ug/L Hg
#M11990 05/09/14 LSF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M11991 05/09/14 LSF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M 11988) into 100ml = 0.2ug/L Hg
#M11992 05/09/14 LSF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M11993 05/09/14 LSF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M 11779 in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M11994 05/12/14 LSF TCLP Extraction Fluid #1: Fill a 20L carboy w/ 19.2 D.I. H_2O. Add 114mL Glacial Acetic Acid (AB.579) and 128.6mL 10N NaOH (#M11955), Dilute to 20L with D.I. H_2O and mix. pH = 4.93 ± 0.05 05/12/14 LSF

Exp: 05/12/15

#M11995 05/13/14 LSF Stannous Chloride (Macron) lot #0000076357 Exp: 02/14/15

#M11996 05/13/14 LSF Tin 1,000 mg/L CPI lot# 13H238 Exp: 11/08/15

#M11997 05/13/14 LSF Thallium 1,000mg/L CPI lot# 13I105 Exp: 11/08/15

#M11998 05/13/14 LSF Lithium 1,000 mg/L CPI lot# 14E049 Exp: 11/08/15

#M11999 05/13/14 LSF Strontium 1,000 mg/L CPI lot# 14C002 Exp: 11/08/15

#M12000 05/13/14 LSF Cobalt 1,000mg/L CPI lot# 14D005 Exp: 11/08/15

#M12001 05/13/14 LSF Tungsten 1,000mg/L CPI lot# 13H199 Exp: 11/08/15

#M11917 4-1-14 S ICV(AH) ent 100 ml vol flask pipet From M11679 60mls = 100,000 =100,000ug/L S. ex 5/15

#M11918 04/02/14 LSF Potassium permanganate soln: 50g potassium permanganate (#M11285) dissolve into 1,000ml of D.I. H_2O.
Exp: 10/02/14 04/02/14 LSF

M11919 4-2-14 Si 1000 mg/L Std Fisher Lot # 141902 ex 3/16

M11920 4-2-14 AMCO Clear turbity Std 20 ntu ex Lot # C467460 ex 3/15.

#M11921 04/03/14 LSF Potassium persulfate: 50g potassium persulfate (#M10987) dissolve into 1,000ml of D.I. H_2O.
Exp: 10/03/14 04/03/14 LSF

#M11922 04/04/14 LSF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M11923 04/04/14 LSF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg
#M11924 04/04/14 LSF	Hg ICV / LCSW (0.2% HNO3, HCl)	3.0ml of 100ug/L Hg (#M11923) into 100ml = 3.0ug/L Hg
#M11925 04/04/14 LSF	Hg CCV (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 3.0ml of 100ug/L Hg into 100ml = 3.0ug/L Hg
#M11926 04/04/14 LSF	Hg MRL: (0.2% HNO3, HCl)	0.2ml of 100ug/L Hg (#M 11923) into 100ml = 0.2ug/L Hg
#M11927 04/04/14 LSF	Hg Aqua Regia Reagent:	"Carefully" in hood, mix 3 parts HCl (AB: 553) with 1part HNO3 (AB: 554)
#M11928 04/04/14 LSF	Stannous Chloride Reagent:	Into a 1000 mL volumetric flask, dissolve 100g Stannous Chloride (#M11790) in 70 mL HCl (AB: 553). Bring up to volume with D.I. Water.

#M11929 04/10/14 LSF NaCl Hydroxylamine Sulfate Reagent: Dissolve into 60g NaCl (#M11799) and 60g hydroxylamine sulfate (#M11798) in 500mL Milli-Q
Exp: 10/10/14

#M11930 04/11/14 LSF	Hg Working Stds: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M10563) into 100ml=10mg/L Hg 1.0ml of 10mg/L Hg into 100ml = 100ug/L Hg 0.5ml of 100ug/L Hg into 100ml = 0.5ug/L Hg 1.0ml of 100ug/L Hg into 100ml = 1.0ug/L Hg 2.0ml of 100ug/L Hg into 100ml = 2.0ug/L Hg 4.0ml of 100ug/L Hg into 100ml = 4.0ug/L Hg 5.0ml of 100ug/L Hg ino 100ml =5.0ug/L Hg 10.0ml of 100ug/L Hg into 100ml = 10.0ug/L Hg
#M11931 04/11/14 LSF	Hg Alt Source Working Std: (0.2% HNO3, HCl)	1.0ml of 1000mg/L Hg (#M9063) into 100ml = 10mg/L Hg 1.0ml of 10mg/L into 100ml = 100ug/L Hg

INORGANIC
CLP FORMS
DOCUMENTS

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-308(ST)-2527-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	37.1	Lab Sample ID:	724949
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	37.1	Y	0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-650(ST)-2511-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	57.3	Lab Sample ID:	724967
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	57.3		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-651(ST)-2512-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	74.8	Lab Sample ID:	724965
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	74.8		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-652(ST)-2513-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	72.1	Lab Sample ID:	724966
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	72.1		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-653(ST)-2514-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	72.1	Lab Sample ID:	724958
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	72.1		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-656(ST)-2521-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	42.3	Lab Sample ID:	724959
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	42.3		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-653(ST)-4095-FD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	68.0	Lab Sample ID:	724957
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	68.0		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-654(ST)-2515-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	24.8	Lab Sample ID:	724950
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	24.8		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-654(ST)-2516-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	54.7	Lab Sample ID:	724951
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	54.7		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-654(ST)-2517-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	77.8	Lab Sample ID:	724952
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	77.8		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-655(ST)-2518-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	73.7	Lab Sample ID:	724953
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	73.7		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-655(ST)2519-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	74.9	Lab Sample ID:	724955
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	74.9		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-655(ST)-2520-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	75.1	Lab Sample ID:	724956
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	75.1		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-655(ST)-4096-FD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	65.4	Lab Sample ID:	724954
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	65.4		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-656(ST)-2522-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	71.8	Lab Sample ID:	724960
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	71.8		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-656(ST)-2523-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	58.3	Lab Sample ID:	724961
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	58.3		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-657(ST)-2524-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	72.0	Lab Sample ID:	724962
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	72.0		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-657(ST)-2525-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	77.0	Lab Sample ID:	724963
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	77.0		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

1

INORGANIC ANALYSIS DATA SHEET

Sample Description

LL2SD-657(ST)-2526-SD

Lab Name:	CT Laboratories	Contract:	LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (
Matrix (soil/water):	SOIL	SDG No.:	119075
% Solids:	79.2	Lab Sample ID:	724964
Analytical Method:	EPA 8000C	Date Received:	05/18/2016
Dilution Factor:	1.00	TCLP/SPLP Extraction Date/time:	
Analytical Run #:	126186	Analysis Date/Time	05/20/2016 15:00
Analytical Prep Batch #:		Prep. Date/Time:	
ICAL Calibration #:		Concentration Units:	%

CAS #	Analyte	Concentration	Qualifiers	DL	LOD	LOQ	RL
SOLID	Solids, Percent	79.2		0.1	0.1	0.1	0.1

CT LABORATORIES
delivering more than data from your environmental analyses

6

DUPLICATES

Sample Description

LL2SD-308(ST)-2527-SD

Lab Name: CT Laboratories

Contract: LEIDOS-FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL

Matrix: SOLID

SDG No.: 119075

% Solid for Sample: 37.1

Concentration Units: %

Analytical Prep Batch # 1

Analytical Preparation Date/Time 0

Analytical Run #: 126186

ICAL Calibration #:

Sample #: 726872

Parent Sample #: 724949

Analysis Type *Initial Analysis*

Analyte	Analysis Date/Tim		RPD Limit	Original Parent Conc. (S)	C	Duplicate Conc. (D)	C	RPD	Q	M	
Solids, Percent	05/20/2016	15:00	8	37.1		29.0		25		GRA	*FAIL*

INORGANICS
RAW DATA
DOCUMENTS

TOTAL SOLIDS (PERCENT)

LIMS #: 126186

Start Date:	**05/20/2016**	**Start Time:**	15:00		**Analyst:**	AMA
	Sample ID#	**Dish#**	**Tared Weight g** *(D)*	**Wet Weight g** *(E)*	**Dry Weight g** *(F)*	**RESULTS % TOTAL SOLIDS**
1)	724950	B0636385	2.55	17.97	6.37	24.8%
2)	724951	B0636384	2.55	16.50	10.18	54.7%
3)	724952	B0636383	2.54	16.93	13.73	77.8%
4)	724953	B0636382	2.55	14.86	11.62	73.7%
5)	724954	B0636381	2.55	15.28	10.88	65.4%
6)	724955	B0636380	2.56	19.03	14.89	74.9%
7)	724956	B0636378	2.59	16.54	13.07	75.1%
8)	724957	B0636379	2.54	16.07	11.74	68.0%
9)	724958	B0636377	2.55	17.26	13.15	72.1%
10)	724959	B0636376	2.56	16.35	8.39	42.3%
11)	724960	B0636375	2.54	16.38	12.48	71.8%
12)	724961	B0636374	2.59	15.22	9.95	58.3%
13)	724962	B0636373	2.58	20.55	15.51	72.0%
14)	724963	B0636372	2.59	14.85	12.03	77.0%
15)	724964	B0636371	2.58	13.69	11.38	79.2%
16)	724965	B0636370	2.55	14.52	11.50	74.8%
17)	724966	B0636369	2.58	15.72	12.05	72.1%
18)	724967	B0636367	2.55	14.61	9.46	57.3%
19)						0.0%
*20)	724949	B0636368	2.58	16.16	7.62	37.1%
Dup 20)	724949	B0636366	2.57	13.96	5.87	29.0%

Dry Weight = Sample + Dish (gms)		* 2nd Reading,	7.61
Wet Weight = Sample + Dish (gms)			Set RPD: 25%
	Balance: VOB-01		
			*mg Difference 10

Stop Date:	05/23/2016
Stop Time:	07:30

Calculations

*2nd reading must be within 50mg of the 1st

% Total Solids = ((*F-D*)/(*E-D*))*100

RPD, % = Absolute value of…((Sample-Dup % TS)/(Average%TS))*100

INORGANICS
LOGBOOK
DOCUMENTS

WSOLIDS Analytical Run
126186 on 05/23/2016

Date Analyzed: _____ Date Reviewed: _____

Date Entered: _____ Date Validated: _____

COC	ORDER	SAMPLE DECRIPTION	SAMPLE DATE/ TIME	QC TYPE (Parent Sample)	CLIENT	PROJECT	TEST	PREP BATCH	MATRIX	DEL	RUSH
119075	724949		05/16/2016 0945		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724950	LL2SD-308(ST)-2527-SD	05/16/2016 1040	Designated MS/MSD	LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724951	LL2SD-654(ST)-2515-SD	05/16/2016 1050		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724952	LL2SD-654(ST)-2516-SD	05/16/2016 1100		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724953	LL2SD-654(ST)-2517-SD	05/16/2016 1105		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724954	LL2SD-655(ST)-2518-SD	05/16/2016 1105		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724955	LL2SD-655(ST)-4096-FD	05/16/2016 1115		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724956	LL2SD-655(ST)2519-SD	05/16/2016 1125		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724957	LL2SD-655(ST)-2520-SD	05/16/2016 1155		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724958	LL2SD-653(ST)-4095-FD	05/16/2016 1155		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
119075	724959	LL2SD-653(ST)-2514-SD	05/16/2016 1200		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
		LL2SD-656(ST)-2521-SD									

Matrix: S-Soil Slg-Sludge GW-GroundWater M-Misc Waste SW-Surface Water A-Air WW-WasteWater DW-Drinking Water SD=Sediment Leachate=LE

WSOLIDS Analytical Run
126186 on 05/23/2016

Date Analyzed: _____ Date Reviewed: _____

Date Entered: _____ Date Validated: _____

COC	ORDER	SAMPLE DECRIPTION	SAMPLE DATE/ TIME	QC TYPE (Parent Sample)	CLIENT	PROJECT	TEST	PREP BATCH	MATRIX	DEL	RUSH
119075	724960		05/16/2016 1204		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
		LL2SD-656(ST)-2522-SD									
119075	724961		05/16/2016 1206		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
		LL2SD-656(ST)-2523-SD									
119075	724962		05/16/2016 1215		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
		LL2SD-657(ST)-2524-SD									
119075	724963		05/16/2016 1218		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
		LL2SD-657(ST)-2525-SD									
119075	724964		05/16/2016 1220		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
		LL2SD-657(ST)-2526-SD									
119075	724965		05/16/2016 1225		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
		LL2SD-651(ST)-2512-SD									
119075	724966		05/16/2016 1233		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
		LL2SD-652(ST)-2513-SD									
119075	724967		05/16/2016 1240		LEIDOS	FW SEWERS EE/CA PRE-DELINEATION SAMPLING (LL2)	SOLIDS,PERCENT		S	4	
		LL2SD-650(ST)-2511-SD									
	726872		05/16/2016 0945				SOLIDS,PERCENT				
		LL2SD-308(ST)-2527-SD		DUP 724949				0			

20 SAMPLE COUNT ON RUN, INCLUDING METHOD AND INSTRUMENT QC

Matrix: S-Soil Slg-Sludge GW-GroundWater M-Misc Waste SW-Surface Water A-Air WW-WasteWater DW-Drinking Water SD=Sediment Leachate=LE

FWC26-10 Data Review Checklist

		Method: Percent Solids SW846-8000C	Independent Data Review Checklist		
LIMS Run #(s)	**Analysis Date**	**Analyst / Data Interpreter**	**Independent Reviewer**	**Date of Review**	**Approved? (Yes or No)**
126184, 126185, 126186, 126261, 126263, 126264	05/20/2016	AMA/ABS	RLD	05/23/2016	Yes

Instructions: Complete one checklist per *analytical run* . Enter the appropriate response for each question.
Each "No" response requires an explanation in the Comments section, and may require the initiation of a Nonconformance Report.

Requirement:	**Acceptance Criteria**	**Analyst Review**		**Independent Review**		**Comments:**
		Yes	No	Yes	No	(indicate reference to an attachment if necessary)
1. Were samples analyzed within hold time?	14 days or program/project specific	Yes		Yes		Qualify data prepared after hold time
2. Were samples dried overnight?	> 8hours	Yes		Yes		If No: place samples back into oven for mimium of 8 hours of total dry time.
3. Were drying start and stop times recorded?	---	Yes		Yes		If No: record times and temperatures
4. Were duplicates analyzed at the appropriate frequency?	1 per 20 of similar matrix or at program/project specific frequency	Yes		Yes		If No: reprep samples with appropreate frequency for a duplicate.
5. Were the duplicates within acceptable limits?	Within in-house or program/project specific QC limits	No		Yes		If No: reprep and reanalyze samples or qualify parent sample result (Y).
6. Are all samples on the job lists accounted for?	---	Yes		Yes		If No: analyze samples that were were missed.
7. Were nonconformities (if applicable) documented in the NCR spreadsheet?		Yes		Yes		If No: Enter nonformities into the NCR spreadsheet before data review/validation.

CHAIN OF CUSTODY,
PM CONFIRMATION
AND
SAMPLE CONDITION FORMS
DOCUMENTS

CT LABORATORIES
delivering more than data from your environmental analyses

Sample Condition Report

Folder #: 119075
Client: LEIDOS

Print Date / Time: 05/18/2016 15:38
Received Date / Time / By: 05/18/2016 1115 JLS

Project Name: FW SEWERS EE/CA PRE-DELINEATION
Project Phase:

Log-In Date / Time / By: 05/18/2016 1304 JLS
Project #: 315391.00.00.10.00.1 PM: ETK

Coolers: 5235
Custody Seals Present : **Y**

Temperature: 1.8 C On Ice: **Y**
COC Present:? **Y** Complete? **Y**

Seal Intact? **Y**
Ship Method: UPS
Adequate Packaging: **Y**

Numbers: DATED AND SIGNED
Tracking Number: 1Z76449F0192004445
Temp Blank Enclosed? **Y**

Notes: SAMPLES REC'D IN GOOD CONDITIION ON ICE
2 CUSTODY SEALS PRESENT AND INTACT, BOTH DATED 5/17/16 AND SIGNED

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
724949 LL2SD-308(ST)-2527-SD				
	SOLIDS	1	/	%SOL,ICP
	SOLIDS	1	/	%SOL,ICP
	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 3			
724950 LL2SD-654(ST)-2515-SD				
	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724951 LL2SD-654(ST)-2516-SD				
	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724952 LL2SD-654(ST)-2517-SD				
	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724953 LL2SD-655(ST)-2518-SD				
	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
724954 LL2SD-655(ST)-4096-FD	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724955 LL2SD-655(ST)2519-SD	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724956 LL2SD-655(ST)-2520-SD	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724957 LL2SD-653(ST)-4095-FD	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724958 LL2SD-653(ST)-2514-SD	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724959 LL2SD-653(ST)-2521-SD	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724960 LL2SD-656(ST)-2522-SD	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
724961 LL2SD-656(ST)-2523-SD	SOLIDS	1	/	%SOL,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			

724962 LL2SD-657(ST)-2524-SD

SOLIDS	1	/	%SOL,ICP

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

724963 LL2SD-657(ST)-2525-SD

SOLIDS	1	/	%SOL,ICP

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

724964 LL2SD-657(ST)-2526-SD

SOLIDS	1	/	%SOL,ICP

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

724965 LL2SD-651(ST)-2512-SD

SOLIDS	1	/	%SOL,ICP

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

724966 LL2SD-652(ST)-2513-SD

SOLIDS	1	/	%SOL,ICP

Total # of Containers of Type (*SOLIDS*) = 1

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

724967 LL2SD-650(ST)-2511-SD

SOLIDS	1	/	%SOL,ICP

Total # of Containers of Type (*SOLIDS*) = 1

Condition Code	*Condition Description*
1	Sample Received OK

119075

leidos Chain of Custody Record

Leidos, Inc.

COC No.: FWS-EE/CA-001

Page 1 of 2 Date: 05/17/2016

Name: Leidos
Address: 8866 Commons Blvd. Twinsburg, OH 44087
Phone Number: 330-405-5802
Project Manager: Jed Thomas
Project Name: FW Sewers EE/CA Pre-Delineation Sampling (LL2)
Job/P.O. #: 315391.00.00.10.00.100 PO: P010183168

Sampler (Signature) (Printed Name)
HEATHER ADAMS

Folder #: 119075
Company: LEIDOS
Project: FW SEWERS EE/CA PRE
Logged By: JLS PM: ET

Laboratory Name:
CT Labs
Address: 1230 Lange Court
Baraboo, WI 53913
Phone: 608-356-2760
Fax:
Contact: Eric Korthals

Laboratory No.	Field Sample #	Location ID	Depth	Date	Time	Matrix	Lead (A9) S	No. of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
LL2SD-	308(ST)-2527-SD	LL2SD-308(ST)	0-0.5	5/16/16	945	S	1	1	724949
LL2SD-	308(ST)-2527-MS/MSD	LL2SD-308(ST)	0-0.5	5/16/16	945	S	2	724949 2	USED EQUIPMENT RINSE @ MS/MSD
LL2SD-	654(ST)-2515-SD	LL2SD-654(ST)	0-0.5	5/16/16	1040	S	1	1	724~~951~~ 950
LL2SD-	654(ST)-2516-SD	LL2SD-654(ST)	0.5-1.0	5/16/16	1050	S	1	1	724~~952~~ 951
LL2SD-	654(ST)-2517-SD	LL2SD-654(ST)	1.0-2.0	5/16/16	1100	S	1	1	724~~953~~ 952
LL2SD-	655(ST)-2518-SD	LL2SD-655(ST)	0-0.5	5/16/16	1105	S	1	1	724~~954~~ 953
LL2SD-	655(ST)-4096-FD	LL2sd-655(ST)	0-0.5	5/16/16	1105	S	1	1	724~~955~~ 954
LL2SD-	655(ST)-2519-SD	LL2sd-655(ST)	0.5-1.0	5/16/16	1115	S	1	1	724~~956~~ 955
LL2SD-	655(ST)-2520-SD	LL2sd-655(ST)	1.0-1.25	5/16/16	1125	S	1	1	724~~957~~ 956
LL2SD-	653(ST)-4095-FD	LL2sd-653(ST)	0-0.5	5/16/16	1155	S	1	1	724~~958~~ 957

Subtotal Number of Containers: 11
Total 21

Relinquished by	Date	Received by	Date
Signature	05/17/2016	Signature	
HEATHER ADAMS	Time	Printed Name	Time
Printed Name	1700	Company	5/18/16
Company LEIDOS			

Relinquished by	Date	Received by	Date
Signature		Signature	1304
Printed Name	Time	Printed Name	Time
Company		Company CT Labs	

Notes:
A. Cool 4°C
B. Cool 4°C, zero headspace
C. None

Methods:
1.) SW 846 8260
2.) SW 846 8270D
3.) SW 846 8151A
4.) SW 846 8081B
5.) SW 846 8082A
6.) SW 846 6010C/7471B
7.) SW 846 8330A
8.) EPA 600
9.) SW 846 6010C
VOC = volatile organic compound
SVOC = semi-volatile organic compound

L = Liquid matrix
S = Soil/solid matrix

Shipment Method: Courier JLS 5-18-16

1.8° on ice
ir #10
5/18/16 1115
jls
Cooler 5235

Leidos, Inc.

5/18/16 1115 1.8° ir #10
jls
Cooler 5235

119075

leidos **Chain of Custody Record**

Leidos, Inc.

COC No.: FWS-EE/CA-001

Page 1 of 2 Date: 05/17/2016

Name: Leidos
Address: 8866 Commons Blvd. Twinsburg, OH 44087
Phone Number: 330-405-5802
Project Manager: Jed Thomas
Project Name: FW Sewers EE/CA Pre-Delineation Sampling (LL2)
Job/P.O. #: 315391.00.00.10.00.100 PO: P010183168
Sampler (Signature) (Printed Name) HEATHER ADAMS

Laboratory Name:
CT Labs
Address: 1230 Lange Court
Baraboo, WI 53913
Phone: 608-356-2760
Fax:
Contact: Eric Korthals

Laboratory No.	Field Sample #	Location ID	Depth	Date	Time	Matrix	Requested Parameters: Lead (A9)	No. of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
LL2SD-	053(SI)-2514-SD	LL2SD-053(SI)	0-0.5	5/16/16	1155	S	1	1	724958
LL2SD-	053(SI)-2515-SD	LL2SD-053(SI)	0-0.5	5/16/16	1200	S	1	1	724~~960~~959
LL2SD-	052(SI)-2522-SD	LL2SD-052(SI)	0.5-1.0	5/16/16	1204	S	1	1	724~~961~~960
LL2SD-	052(SI)-2523-SD	LL2SD-052(SI)	1.0-2.0	5/16/16	1206	S	1	1	724~~962~~961
LL2SD-	057(SI)-2524-SD	LL2SD-057(SI)	0-0.5	5/16/16	1215	S	1	1	724~~963~~962
LL2SD-	057(SI)-2525-SD	LL2SD-057(SI)	0.5-1.0	5/16/16	1218	S	1	1	724~~964~~963
LL2SD-	057(SI)-2526-SD	LL2SD-057(SI)	1.0-2.0	5/16/16	1220	S	1	1	724~~965~~964
LL2SD-	051(SI)-2512-SD	LL2SD-051(SI)	0-0.5	5/16/16	1225	S	1	1	724~~966~~965
LL2SD-	052(SI)-2513-SD	LL2SD-052(SI)	0-0.5	5/16/16	1233	S	1	1	724~~967~~966
LL2SD-	050(SI)-2511-SD	LL2SD-050(SI)	0-0.5	5/16/16	1240	S	1	1	724967

Subtotal Number of Containers: 10
Total 21

Relinquished by	Date	Received by	Date
Signature	05/17/16	Signature	
HEATHER ADAMS	Time 1700	Printed Name	Time
Company LEIDOS		Company	
Relinquished by	Date	Received by	Date 5/18/16
Signature		Signature	
Printed Name	Time	Printed Name CT Labs	Time 1304
Company		Company	

Notes:
A. Cool 4°C
B. Cool 4°C, zero headspace
C. None

Methods:
1.) SW 846 8260
2.) SW 846 8270D
3.) SW 846 8151A
4.) SW 846 8081B
5.) SW 846 8082A
6.) SW 846 6010C/7471B
7.) SW 846 8330A
8.) EPA 600
9.) SW 846 6010C

VOC = volatile organic compound
SVOC = semi-volatile organic compound

L = Liquid matrix
S = Soil/solid matrix

Shipment Method: Courier JLS 5-18-16

1.8° on ice
in #10
5/18/16 1115
cooler 23
5235

FORM #: FPM3-02
Rev. #: 1.0
Effective Date: 05/27/2014
Page 1 of 1

Cooler Receipt Form

Ice Present (YES) NO

Temperature 1.8

IR Gun # 10

Initials JL

Date 5/18/16 Time 1115

Cooler #: 5235

HEATHER ADAMS
3305738571
LEIDOS
8866 COMMONS BLVD
TWINSBURG OH 44087

50 LBS

1 OF 1

SHIP TO:
ERIC KORTHALS
608-356-2760
CT LABS
1230 LANGE COURT
BARABOO WI 53913-3109

WI 539 0-10

UPS NEXT DAY AIR

TRACKING #: 1Z 764 49F 01 9200 4445

BILLING: P/P

Project Number: 315391.00.00.10.00.100
Org Number (exp. 00123): 00827

CS 18.1.15. WNINV50 75.0A 04/2016

Korthals, Eric T

Subject: FW: RVAAP SDG 119075, 119072
Attachments: SDG_119072_119075_Correct_labcoc.pdf

From: Schmon-Stasik, Rita M. [mailto:RITA.M.SCHMON-STASIK@leidos.com]
Sent: 06/28/2016 4:32 PM
To: Korthals, Eric T
Cc: Thomas, Jed H.; Adams, Heather R.; Ryan, Pat F.; Simpson, Marie A.
Subject: RE: RVAAP SDG 119075, 119072

Eric
Please proceed with revising the report and data package for the following 2 SDGs per the attached marked up COC; any questions please do not hesitate to contact me

SDG 119072
COC # RVAAP-LL1-LL4-001
Page 2
Line 7
Original sample ID: LL3SD/SW-554-4099-SD
Corrected sample ID: LL3SD/SW-554-4099-FD

SDG 119075
COC # FWS-EE/CA-001
Page 1
Line 2
Original sample ID: LL2SD-653(ST)-2521-SD
Corrected sample ID: LL2SD-656(ST)-2521-SD

Rita M. Schmon-Stasik | Leidos
Senior Environmental Chemist | Environmental Restoration Division
mobile: 973.715.4492

119075

leidos Chain of Custody Record

Leidos, Inc.

COC No.: FWS-EE/CA-001

Page 1 of 2 Date: 05/17/2016

Name: Leidos
Address: 8866 Commons Blvd. Twinsburg, OH 44087
Phone Number: 330-405-5802
Project Manager: Jed Thomas
Project Name: FW Sewers EE/CA Pre-Delineation Sampling (LL2)
Job/P.O. #: 315391.00.00.10.00.100 PO: P010183168
Sampler (Signature) (Printed Name) HEATHER ADAMS

Laboratory Name: CT Labs
Address: 1230 Lange Court
Baraboo, WI 53913
Phone: 608-356-2760
Fax:
Contact: Eric Korthals

Change 653 to 656 BR 6/28/16

Laboratory No.	Field Sample #	Location ID	Depth	Date	Time	Matrix	Lead (A9)	No. of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
LL2SD-	653(ST)-2514-SD	LL2SD-653(ST)	0-0.5	5/16/16	1155	S	1	1	724958
LL2SD-	653(ST)-2521-SD	LL2SD-656(ST)	0-0.5	5/16/16	1200	S	1	1	724 ~~960~~ 959
LL2SD-	656(ST)-2522-SD	LL2SD-656(ST)	0.5-1.0	5/16/16	1204	S	1	1	724 ~~961~~ 960
LL2SD-	656(ST)-2523-SD	LL2SD-656(ST)	1.0-2.0	5/16/16	1206	S	1	1	724 ~~962~~ 961
LL2SD-	657(ST)-2524-SD	LL2SD-657(ST)	0-0.5	5/16/16	1215	S	1	1	724 ~~963~~ 962
LL2SD-	657(ST)-2525-SD	LL2SD-657(ST)	0.5-1.0	5/16/16	1218	S	1	1	724 ~~964~~ 963
LL2SD-	657(ST)-2526-SD	LL2SD-657(ST)	1.0-2.0	5/16/16	1220	S	1	1	724 ~~965~~ 964
LL2SD-	651(ST)-2512-SD	LL2SD-651(ST)	0-0.5	5/16/16	1225	S	1	1	724 ~~966~~ 965
LL2SD-	652(ST)-2513-SD	LL2SD-652(ST)	0-0.5	5/16/16	1233	S	1	1	724 ~~967~~ 966
LL2SD-	650(ST)-2511-SD	LL2SD-650(ST)	0-0.5	5/16/16	1240	S	1	1	724 967

Subtotal Number of Containers: 10
Total 21

Relinquished by	Date	Received by	Date
Signature	05/17/16	Signature	
Printed Name: HEATHER ADAMS	Time: 1700	Printed Name	Time
Company: LEIDOS		Company	

Relinquished by	Date	Received by	Date
Signature		Signature	5/18/16
Printed Name	Time	Printed Name	Time
Company		Company	1304

Notes:
A. Cool 4°C
B. Cool 4°C, zero headspace
C. None

Methods:
1.) SW 846 8260
2.) SW 846 8270D
3.) SW 846 8151A
4.) SW 846 8081B
5.) SW 846 8082A
6.) SW 846 6010C/7471B
7.) SW 846 8330A
8.) EPA 600
9.) SW 846 6010C
VOC = volatile organic compound
SVOC = semi-volatile organic compound

L = Liquid matrix
S = Soil/solid matrix

Shipment Method: Courier JLS 5-18-16

1.8° on ice
ir #10
5/18/16 1115
cooler 5235

Leidos, Inc.

APPENDIX C

Investigation-Derived Waste Letter Report, Laboratory Data Package, and Waste Profile

THIS PAGE INTENTIONALLY LEFT BLANK.

July 1, 2016

Ms. Katie Tait, OHARNG
Camp Ravenna
1438 State Route 534 SW
Newton Falls, OH 44444

References: **Contract No. W912QR-12-D-0020, Delivery Order 0008, 2013 Performance-Based Acquisition (PBA) for Supplemental Remedial Investigations (RI)/Feasibility Reports (FSs) for Multiple AOCs at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio**
Contract No. W912QR-15-C-0046, Completion of RI, FS, PP, and ROD Documents, Multiple Areas of Concern, Former RVAAP Restoration Program

Subject: **Investigation-Derived Waste (IDW) Characterization and Disposal Plan**

Dear Ms. Tait:

Investigative activities in accordance with the following plans were performed from May 16, 2016 through May 18, 2016:

1) *PBA 2013 Sample and Analysis Plan Addendum for Surface Water and Sediment at Load Lines 1, 2, 3, and 4* (April 2016) (herein referred to as the 2016 SAP Addendum).
2) *Letter Work Plan for Pre-Delineation Sampling of Lead-Contaminated Sediment in the Load Line 2 Functional Area* (May 2016).

These activities have resulted in the generation of IDW consisting of soil cuttings and equipment decontamination fluids. The purpose of this letter is to characterize and classify IDW for disposal and to propose methods for disposing the IDW.

This letter report includes a summary of IDW generated, the origin of the IDW (Table 1), as well as proposed classification and recommendations for disposal of the IDW (Table 2). In addition to the specified plans, this letter report follows guidance established by the *Facility-Wide Sampling and Analysis Plan* (USACE 2011) (herein referred to at the Facility-wide SAP).

Two distinct IDW streams were sampled as part of the field activities. Each waste stream was composited and sampled on May 18, 2016 per requirements outlined in Section 7.0 of the Facility-wide SAP.

IDW streams generated are:

- One (1), 55-gallon drum containing equipment decontamination fluids containing liquinox wash water, 2% hydrochloric acid (HCl), 10% nitric acid, isopropanol, and DI water; and
- One (1), 55-gallon drums containing soil and sediment.

Table 1. Summary of Sampled Investigation-Derived Wastes

Container Number	Container Type and Size	Contents	Generation Date	Sample ID	Date Sampled
Leidos-2016-01	55 Gallon, Steel, Open Top Drum	Soil Cuttings	5/16/2016 – 5/18/2016	PBA13-IDW-2541-WS	5/18/2016
Leidos-2016-02	55 Gallon, Steel, Closed Top Drum	Decon Wash Water	5/16/2016 – 5/18/2016	PBA13-IDW-2542-WW	5/18/2016

Liquid IDW Discussion

Per Section 8.4 of the Facility-wide SAP, one composite waste sample was collected for Toxicity Characteristic Leaching Procedure (TCLP) parameters and submitted for laboratory analysis to characterize the waste for disposal. Sample PBA13-IDW-2542-WW was collected to characterize one drum of equipment decontamination fluids containing liquinox wash water, 2% HCl, 10% nitric acid, isopropanol, and DI water. Upon receipt of analytical results from the laboratory, the analytical results were validated and reviewed to determine if the waste was potentially hazardous. This review consisted of a comparison of the analytical results against the TCLP criteria presented in Table 8-1, Maximum Concentration of Contaminants for the Toxicity Characteristic (40 *CFR* 261.24), presented in the Facility-Wide SAP (USACE 2011) and Resource Conservation Recovery Act (RCRA) Hazardous Waste regulations 40 *CFR* 261 – 265.

The laboratory analysis for pH was reported at a value of 1.8 for sample PBA13-IDW-2542-WW. On June 23, 2016, Leidos neutralized the liquid (approximately 10 gallons) by adding clean tap water from the project source water tap. A total of 19 gallons were added to the 55 gal drum, for a total of 29 gallons. The final pH of the drum was recorded at 6.0. The field form and photographs are presented in Attachment 1.

Attachment 2 presents the analytical laboratory data for TCLP analysis for IDW water. The results are summarized below:

1) All analytical results were below available quantitative limits for the IDW liquid sample;
2) The pH for the IDW aqueous waste is considered neutral (2 S. U. < pH < 12 S.U.); and
3) The flash point was below detectable limits, >180°F.

Given the observed analytical results, it is recommended that the liquid IDW be classified as non-hazardous, non-contaminated.

Solid IDW Discussion

Per Section 8.4 of the Facility-wide SAP, a composite waste sample (PBA13-IDW-2541-WS) was collected for TCLP parameters and submitted for laboratory analysis to characterize the soil IDW for disposal. Upon receipt of analytical results from the laboratory, the analytical results were validated and reviewed to determine if the waste was potentially hazardous. This review consisted of a comparison of the analytical results against the TCLP criteria presented in Table 7-1, Maximum

Concentration of Contaminants for the Toxicity Characteristic (40 *CFR* 261.24), presented in the Facility-Wide SAP (USACE 2001) and RCRA Hazardous Waste regulations 40 *CFR* 261 – 265.

Attachment 2 presents the analytical laboratory data for TCLP analysis for solid IDW generated during ongoing field activities. The results are summarized below:

1) All analytical results were below quantitative limits for the IDW solid sample;
2) The pH for the IDW sample was neutral, at 7.5 standard units; and
3) The flash point was below detectable limits, >180°F.

Given the observed analytical results, it is recommended that the solid IDW stream be classified as non-hazardous, non-contaminated.

Recommended Disposal Pathways for IDW

Table 2 presents the disposal pathway identified as a result of IDW characterization data. This IDW has been characterized under provisions of the Facility-Wide SAP using TCLP analyses and process knowledge. Leidos recommends that all IDW be disposed as non-hazardous, non-contaminated waste to be removed offsite by a permitted water treatment or waste facility unless the U.S. Army has additional information that would result in the IDW meeting the definition of a listed hazardous waste as defined in 40 *CFR* Part 261 Subpart D.

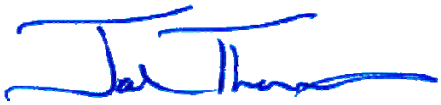
Table 2. Summary of Final Waste Classification and Recommended Disposal

NON-HAZARDOUS WASTE			
Container Number	**Medium**	**Waste Criterion**	**Disposal Recommendation**
Leidos-2016-01	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
Leidos-2016-02	Liquid	Inorganics, organics	Permitted Treatment or Waste Facility

Since the former RVAAP, under RCRA, is the generator of this material, Leidos requests concurrence or direction on the waste classification and recommended disposal pathways prior to disposal. Following your concurrence, we will proceed with the appropriate waste disposal.

If you have any questions, or require additional information, please do not hesitate to contact me at (330) 405-5802.

Leidos



Jed Thomas, P.E.
Project Manager

cc: Mark Leeper, Army National Guard Directorate
Kevin Sedlak, ARNG, Camp Ravenna
Nat Peters, UACE Louisville
Greg Moore, USACE Louisville
Vasu Peterson, Leidos
Heather Adams, Leidos
Pat Ryan, Leidos-REIMS
Gail Harris, Vista Sciences Corporation

ATTACHMENT 1
FIELD FORMS AND PHOTGRAPHS

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: RVAAP FW Sewers EE/CA **PROJECT NO:**

Date: (mm/dd/yy): 06/23/16 Page 1 of 1

Task Team Members:

Rich Sprinzl

Narrative (include time and location):

1350 Rich arrived @ Camp Ravenna East Gate, Pickup B1036 from VISTA (AL Brillhart)

1415 Rich arrived @ Main Gate then unlocked B1036. Inspect IDW drums - No issues

1430 Calibrate Hanna 99301 pH meter (#028282) pH 7 #5GG637 (exp 7/31/17) pH 4 # 4AG1032 (exp 7/2016)
pH 7 6.98 ✓
pH 4 4.04 ✓

1445 Test existing pH of Decon Wastewater (#Leidos-2016-02) → 5.75 (stirred/mixed → 5.85),
- Test potable water pH = 7.05 ; Existing Volume 1 gal (remaining from sampling)
- Add al 9 gal potable water (Tunnsburg office); Retest pH = 6.00
- Add al 5 gal more (24 gal total in drum); Retest pH = 6.00. Inform Heather Adams.
- Check pH meter w/buffers. (7.17/4.21)
- Test IDW w/pH strip → ~6 (matches pH meter)

1530 Drum secured, Locked up B1036, Depart Main Gate.

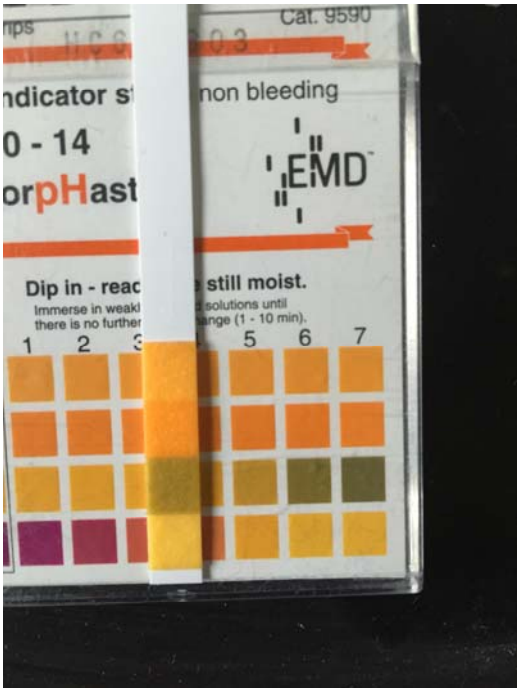
Daily Weather Condition: A.M. NA

P.M. 70s overcast, drizzle

Recorded By: RSprinzl (Signature) QC Checked by: (Signature)

leidos


HANNA
ATC
pH
6.00
27.1°C
Calibrated


Cat. 9590
non bleeding
EMD
still moist.
1 2 5 6 7

ATTACHMENT 2
ANALYTICAL RESULTS FOR IDW

Sample Id				PBA13-IDW-2541-WS	PBA13-IDW-2542-WW
Date				**05/18/2016**	**05/18/2016**
Analyte	**CAS Number**	**Units**	**Maximum Concentration for Toxicity Characteristic (mg/L)**		
TCLP Metals					
Arsenic	7440-38-2	mg/L	5	0.0096 J	0.0082 J
Barium	7440-39-3	mg/L	100	0.27 J	0.28
Cadmium	7440-43-9	mg/L	1	0.0038	0.03
Chromium	7440-47-3	mg/L	5	0.0033 J	0.044
Lead	7439-92-1	mg/L	5	0.27	0.67
Mercury	7439-97-6	mg/L	0.2	<0.00006 U	0.000036 J
Selenium	7782-49-2	mg/L	1	0.011 J	0.0043 J
Silver	7440-22-4	mg/L	5	<0.002 U	<0.002 U
TCLP Miscellaneous					
Flashpoint		Deg. F	>180/>140	>140	>140
Cyanide	57-12-5		0.66 (mg/kg)/0.01 (mg/L)	<20 UJ (mg/kg)	<0.012 UJ (mg/L)
Sulfide	18496-25-8		39.5 (mg/kg)/3.0 (mg/L)	<100 U (mg/kg)	<1 UJ (mg/L)
pH		Std Unit	2≤pH≤12.5	6.81	6.0*
TCLP Herbicides					
2,4,5-TP (Silvex)	93-72-1	mg/L	1	<0.010 U	<0.010 U
2,4-D	94-75-7	mg/L	10	<0.001 U	<0.001 U
TCLP Pesticides					
Chlordane	57-74-9	mg/L	0.03	<0.003 U	<0.003 U
Endrin	72-20-8	mg/L	0.02	<0.0001 U	<0.0001 U
Heptachlor	76-44-8	mg/L	0.008	<0.0001 U	<0.0001 U
Heptachlor epoxide	1024-57-3	mg/L	0.008	<0.0001 U	<0.0001 U
Methoxychlor	72-43-5	mg/L	10	<0.0001 U	<0.0001 U
Toxaphene	8001-35-2	mg/L	0.5	<0.003 U	<0.003 U
alpha-Chlordane	5103-71-9	mg/L	-	<0.0001 U	<0.0001 U
gamma-BHC [Lindane]	58-89-9	mg/L	0.4	<0.0001 U	<0.0001 U
gamma-Chlordane	5103-74-2	mg/L	-	<0.0001 U	<0.0001 U
TCLP Semivolatile Organics					
1,4-Dichlorobenzene	106-46-7	mg/L	7.5	<0.004 U	<0.004 U
2,4,5-Trichlorophenol	95-95-4	mg/L	400	<0.02 U	<0.02 U
2,4,6-Trichlorophenol	88-06-2	mg/L	2	<0.02 U	<0.02 U
2,4-Dinitrotoluene	121-14-2	mg/L	0.13	<0.004 U	<0.004 U
2-Methylphenol	95-48-7	mg/L	200	<0.02 U	<0.02 U
4-Methylphenol	1319-77-3	mg/L	200	<0.036 U	<0.036 U
Hexachlorobenzene	118-74-1	mg/L	0.13	<0.004 U	<0.004 U
Hexachlorobutadiene	87-68-3	mg/L	0.5	<0.004 U	<0.004 U
Hexachloroethane	67-72-1	mg/L	3	<0.004 U	<0.004 U
Nitrobenzene	98-95-3	mg/L	2	<0.004 U	<0.004 U
Pentachlorophenol	87-86-5	mg/L	100	<0.02 U	<0.02 U
Pyridine	110-86-1	mg/L	5	<0.01 U	<0.01 U

Sample Id				PBA13-IDW-2541-WS	PBA13-IDW-2542-WW
Date				**05/18/2016**	**05/18/2016**
Analyte	**CAS Number**	**Units**	**Maximum Concentration for Toxicity Characteristic (mg/L)**		
TCLP Volatile Organics					
1,1-Dichloroethene	75-35-4	mg/L	0.7	<0.05 U	<0.05 U
1,2-Dichloroethane	107-06-2	mg/L	0.5	<0.05 U	<0.05 U
2-Butanone	78-93-3	mg/L	200	<0.5 U	<0.5 U
Benzene	71-43-2	mg/L	0.5	<0.05 U	<0.05 U
Carbon tetrachloride	56-23-5	mg/L	0.5	<0.05 U	<0.05 U
Chlorobenzene	108-90-7	mg/L	100	<0.05 U	<0.05 U
Chloroform	67-66-3	mg/L	6	<0.025 U	<0.025 U
Tetrachloroethene	127-18-4	mg/L	0.7	<0.05 U	<0.05 U
Trichloroethene	79-01-6	mg/L	0.5	<0.05 U	<0.05 U
Vinyl chloride	75-01-4	mg/L	0.2	<0.05 U	<0.05 U
PCBs				*mg/kg*	*mg/L*
Aroclor 1016	12674-11-2		-	<0.036 U	<0.00031 U
Aroclor 1221	11104-28-2		-	<0.036 U	<0.00031 U
Aroclor 1232	11141-16-5		-	<0.036 U	<0.00031 U
Aroclor 1242	53469-21-9		-	<0.036 U	<0.00031 U
Aroclor 1248	12672-29-6		-	<0.036 U	<0.00031 U
Aroclor 1254	11097-69-1		-	0.202**	<0.00031 U
Aroclor 1260	11096-82-5		-	0.0644	<0.00031 U
Aroclor 1262	37324-23-5		-	<0.036 U	<0.00031 U
Aroclor 1268	11100-14-4		-	<0.036 U	<0.00031 U
Explosives			*mg/L*	*mg/kg*	*mg/L*
1,3,5-Trinitrobenzene [1,3,5-TNB]	99-35-4		-	<0.3 UJ	<0.00008 U
1,3-Dinitrobenzene [1,3-DNB]	99-65-0		-	<0.2 U	<0.00008 U
2,4,6-Trinitrotoluene	118-96-7		-	<0.2 U	<0.00016 U
2,4-Dinitrotoluene	121-14-2		0.13	<0.2 U	<0.00004 U
2,6-Dinitrotoluene	606-20-2		-	<0.2 U	<0.00004 U
2-Amino-4,6-dinitrotoluene	35572-78-2		-	<0.2 U	<0.00008 U
2-Nitrotoluene	88-72-2		-	<0.2 U	0.0039
3,5-Dinitroaniline	618-87-1		-	<0.2 U	<0.00008 U
3-Nitrotoluene	99-08-1		-	<0.3 U	0.00096
4-Amino-2,6-dinitrotoluene	19406-51-0		-	<0.2 U	<0.00008 U
4-Nitrotoluene	99-99-0		-	<0.2 U	<0.00008 U
Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX)	121-82-4		-	<0.3 U	<0.00008 U
Nitrobenzene	98-95-3		2	<0.2 U	<0.00008 U
Nitroglycerin	55-63-0		-	<1.2 U	<0.00032 U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0		-	<0.3 U	<0.00008 U

Sample Id				PBA13-IDW-2541-WS	PBA13-IDW-2542-WW
Date				**05/18/2016**	**05/18/2016**
Analyte	**CAS Number**	**Units**	**Maximum Concentration for Toxicity Characteristic (mg/L)**		
PETN	78-11-5		-	<1.2 U	<0.00032 U
Tetryl	479-45-8		-	<0.2 U	<0.00016 U

Notes:
*initial pH was 1.8. Added 14 gallons of clean water on 6/23/2016 which raised the pH to 6.
**below 50 ppm, therefore not required to managed under TSCA 40 CFR 761.
J = Estimated Concentration, less than the reporting limit – Lab Qualifier
U = Non-detect, concentration reported is reporting limit – Lab Qualifier
UJ = Non-detect, reporting limit estimated – Lab Qualifier
- = No Standard Exists

WASTE CHARACTERIZATION SAMPLING ANALYTICAL SUMMARY REPORT

CT LABORATORIES
delivering more than data from your environmental analyses

1230 Lange Court • Baraboo, WI 53913 • 608-356-2760
www.ctlaboratories.com

REVISED

ANALYTICAL SUMMARY REPORT

This report at a minimum contains the following information:

Analytical Report of Test Results
Description of QC Qualifiers
Chain of Custody (copy)
Quality Control Summary (if applicable)
Case Narrative (if applicable)
Correspondence with Client (if applicable)

Revision Date 06/08/2016
Reason for Revision
Reported absent reactive sulfide data.

This report has been specifically prepared to satisfy project or program requirements. These results are in compliance with NELAC requirements for parameters where accreditation is required or available, unless otherwise noted in the case narrative.

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

ACCREDITED IN ACCORDANCE WITH nelac

REVISED

ANALYTICAL SAMPLE DATA

LEIDOS
MARIE SIMPSON
301 LABORATORY ROAD
OAKRIDGE, TN 37831

Project Name: FW SEWERS EE/CA (LL2)
Project Phase:
Project #:
Folder #: 119145
Purchase Order #: P010183168
Contract #: 2941

Arrival Temperature: 1.8
Report Date: 06/06/2016
Date Received: 05/19/2016
Reprint Date: 06/08/2016

CT LAB#: 725918 Sample Description: PBA13-IDW-2541-WS Client Sample #: Sampled: 05/18/2016 1225

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
Solids, Percent	***55.5***	%	0.1	0.1	0.1	0.1	1.00	Y		5/20/16 15:00	AMA	EPA 8000C	
pH	***6.81***	S.U.					1.00			5/24/16 12:50	MER	EPA 9045D	^
Flashpoint	***>140.0***	Deg. F					1.00			5/20/16 12:00	LJS	EPA 1010A	^
Cyanide, Reactive	<20	mg/kg	20	20	20	20	1.00	U M		5/24/16 14:00	SAW	ASTM D5049	^
Sulfide Reactive	<100	mg/kg	100	100	100	100	1.00	U		5/24/16 14:00	SAW	ASTM D4978	^
Organic Results													
Aroclor-1016	<36	ug/kg	8.9	36	54	54	1.00	U	05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A	
Aroclor-1221	<36	ug/kg	13	36	54	54	1.00	U	05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A	
Aroclor-1232	<36	ug/kg	16	36	54	54	1.00	U	05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A	
Aroclor-1242	<36	ug/kg	13	36	54	54	1.00	U	05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A	
Aroclor-1248	<36	ug/kg	13	36	54	54	1.00	U	05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A	
Aroclor-1254	***202***	ug/kg	16	36	54	54	1.00		05/23/2016 13:30	5/24/16 12:42	JJY	EPA 8082A	
Aroclor-1260	***64.4***	ug/kg	11	36	54	54	1.00		05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A	
Aroclor-1262	<36	ug/kg	13	36	54	54	1.00	U	05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A	
Aroclor-1268	<36	ug/kg	8.9	36	54	54	1.00	U	05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A	

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 725918 Sample Description: PBA13-IDW-2541-WS Client Sample #: Sampled: 05/18/2016 1225

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method
Surr: 2,4,5,6-TCMX	112	% Recovery	44			130	1.00		05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A
Surr: DCBP	102	% Recovery	54			141	1.00		05/23/2016 13:30	5/24/16 00:46	JJY	EPA 8082A
1,3,5-Trinitrobenzene	<0.30	mg/kg	0.13	0.30	0.50	0.50	1.00	U M	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
1,3-Dinitrobenzene	<0.20	mg/kg	0.080	0.20	0.30	0.30	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
2,4,6-Trinitrotoluene	<0.20	mg/kg	0.090	0.20	0.50	0.50	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
2,4-Dinitrotoluene	<0.20	mg/kg	0.080	0.20	0.30	0.30	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
2,6-Dinitrotoluene	<0.20	mg/kg	0.070	0.20	0.30	0.30	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
2-Amino-4,6-dinitrotoluene	<0.20	mg/kg	0.090	0.20	0.30	0.30	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
2-Nitrotoluene	<0.20	mg/kg	0.090	0.20	0.30	0.30	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
3,5-Dinitroaniline	<0.20	mg/kg	0.090	0.20	0.60	0.60	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
3-Nitrotoluene	<0.30	mg/kg	0.11	0.30	0.50	0.50	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
4-Amino-2,6-dinitrotoluene	<0.20	mg/kg	0.080	0.20	0.30	0.30	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
4-Nitrotoluene	<0.20	mg/kg	0.10	0.20	0.50	0.50	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
HMX	<0.30	mg/kg	0.12	0.30	0.50	0.50	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
Nitrobenzene	<0.20	mg/kg	0.10	0.20	0.50	0.50	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
Nitroglycerin	<1.2	mg/kg	0.50	1.2	2.0	2.0	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
PETN	<1.2	mg/kg	0.60	1.2	2.0	2.0	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
RDX	<0.30	mg/kg	0.14	0.30	0.50	0.50	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
Tetryl	<0.20	mg/kg	0.090	0.20	0.50	0.50	1.00	U	05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B
1,2-Dinitrobenzene	103	% Recovery	78			119	1.00		05/26/2016 11:30	6/2/16 13:55	RED	EPA 8330B

CT LAB#: 725919 Sample Description: PBA13-IDW-2541-WS Client Sample #: Sampled: 05/18/2016 1225

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method
Metals Results												
TCLP Arsenic	***0.0096***	mg/L	0.0040	0.012	0.024	0.024	1.00	J	05/25/2016 07:00	5/27/16 18:06	NAH	EPA 6010C

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 725919 Sample Description: PBA13-IDW-2541-WS Client Sample #: Sampled: 05/18/2016 1225

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
TCLP Barium	***0.27***	mg/L	0.00029	0.00090	0.0018	0.0018	1.00	M	05/25/2016 07:00	5/27/16 18:06	NAH	EPA 6010C	
TCLP Cadmium	***0.0038***	mg/L	0.00030	0.0010	0.0020	0.0020	1.00	M	05/25/2016 07:00	5/27/16 18:06	NAH	EPA 6010C	
TCLP Chromium	***0.0033***	mg/L	0.00060	0.0020	0.0040	0.0040	1.00	J M	05/25/2016 07:00	5/27/16 18:06	NAH	EPA 6010C	
TCLP Lead	***0.27***	mg/L	0.0014	0.0020	0.0040	0.0040	1.00		05/25/2016 07:00	5/27/16 18:06	NAH	EPA 6010C	
TCLP Selenium	***0.011***	mg/L	0.0022	0.0065	0.013	0.013	1.00	J	05/25/2016 07:00	5/27/16 18:06	NAH	EPA 6010C	
TCLP Silver	<0.0020	mg/L	0.00070	0.0020	0.0040	0.0040	1.00	U	05/25/2016 07:00	5/27/16 18:06	NAH	EPA 6010C	
TCLP Mercury	<0.000060	mg/L	0.000030	0.000060	0.00012	0.00012	1.00	U	05/25/2016 07:00	5/31/16 08:23	LJF	EPA 7470A	
Organic Results													
TCLP alpha-Chlordane	<0.00010	mg/L	0.000090	0.00010	0.00040	0.00040	1.00	U	05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	^
TCLP Chlordane (Technical)	<0.0030	mg/L	0.0010	0.0030	0.0060	0.0060	1.00	U	05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	^
TCLP Endrin	<0.00010	mg/L	0.000060	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	^
TCLP gamma-Chlordane	<0.00010	mg/L	0.000070	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	^
TCLP Heptachlor	<0.00010	mg/L	0.000060	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	^
TCLP Heptachlor epoxide	<0.00010	mg/L	0.000070	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	^
TCLP Lindane	<0.00010	mg/L	0.000070	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	^
TCLP Methoxychlor	<0.00010	mg/L	0.000060	0.00010	0.00040	0.00040	1.00	U	05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	^
TCLP Toxaphene	<0.0030	mg/L	0.0018	0.0030	0.0060	0.0056	1.00	U	05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	^
TCLP SURR:2,4,5,6-CL4-m-xylene	94	% Recovery	25			140	1.00		05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	
TCLP SURR:Decachlorobiphenyl	106	% Recovery	30			135	1.00		05/25/2016 07:00	5/26/16 16:47	JJY	EPA 8081B	
TCLP 1,1-Dichloroethene	<0.050	mg/L	0.024	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C	
TCLP 1,2-Dichloroethane	<0.050	mg/L	0.030	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C	
TCLP 2-Butanone	<0.50	mg/L	0.24	0.50	1.0	1.0	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C	
TCLP Benzene	<0.050	mg/L	0.019	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C	
TCLP Carbon tetrachloride	<0.050	mg/L	0.023	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C	
TCLP Chlorobenzene	<0.050	mg/L	0.024	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C	
TCLP Chloroform	<0.025	mg/L	0.015	0.025	0.050	0.050	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C	

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 725919 Sample Description: PBA13-IDW-2541-WS Client Sample #: Sampled: 05/18/2016 1225

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method
TCLP Tetrachloroethene	<0.050	mg/L	0.030	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C
TCLP Trichloroethene	<0.050	mg/L	0.021	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C
TCLP Vinyl chloride	<0.050	mg/L	0.018	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C
TCLP 1,2 Dichloroethane-d4	98	% Recovery	81			118	1.00		05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C
TCLP Bromofluorobenzene	98	% Recovery	85			114	1.00		05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C
TCLP d8-Toluene	101	% Recovery	89			112	1.00		05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C
TCLP Dibromofluoromethane	100	% Recovery	80			119	1.00		05/24/2016 14:00	5/26/16 11:05	RLD	EPA 8260C
TCLP 1,4-Dichlorobenzene	<0.0040	mg/L	0.0019	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP 2,4,5-Trichlorophenol	<0.020	mg/L	0.011	0.020	0.050	0.050	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP 2,4,6-Trichlorophenol	<0.020	mg/L	0.010	0.020	0.050	0.050	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP 2,4-Dinitrotoluene	<0.0040	mg/L	0.0021	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP 2-Methylphenol	<0.020	mg/L	0.0086	0.020	0.050	0.050	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP 3 & 4-Methylphenol	<0.036	mg/L	0.014	0.036	0.090	0.090	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Hexachlorobenzene	<0.0040	mg/L	0.0027	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Hexachlorobutadiene	<0.0040	mg/L	0.0018	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Hexachloroethane	<0.0040	mg/L	0.0022	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Nitrobenzene	<0.0040	mg/L	0.0016	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Pentachlorophenol	<0.020	mg/L	0.011	0.020	0.050	0.050	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Pyridine	<0.010	mg/L	0.0062	0.010	0.030	0.040	1.00	U	05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Surr: 2,4,6-Tribromophenol	77	% Recovery	43			140	1.00		05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Surr: 2-Fluorobiphenyl	69	% Recovery	44			119	1.00		05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Surr: 2-Fluorophenol	39	% Recovery	19			119	1.00		05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Surr: Nitrobenzene-d5	67	% Recovery	44			120	1.00		05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Surr: Phenol-d5	29	% Recovery	1			114	1.00		05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D
TCLP Surr: Terphenyl-d14	86	% Recovery	50			134	1.00		05/25/2016 07:00	5/26/16 14:51	RPN	EPA 8270D

Sub Lab Results

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

ACCREDITED IN ACCORDANCE WITH nelac

CT LAB#: 725919 Sample Description: PBA13-IDW-2541-WS Client Sample #: Sampled: 05/18/2016 1225

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
TCLP Herbicides	***attached***						1.00		05/25/2016 07:00	6/6/16 00:00	SUB	SW8151	

CT LAB#: 725920 Sample Description: PBA13-IDW-2542-WW Client Sample #: Sampled: 05/18/2016 1340

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
Inorganic Results													
pH	***1.98***	S.U.					1.00	X		5/24/16 12:50	MER	EPA 9040C	^
Flashpoint	***>140.0***	Deg. F					1.00			5/20/16 12:00	LJS	EPA 1010	^
Cyanide	<12	ug/L	5.0	12	24	24	1.00	U M	05/25/2016 10:45	5/25/16 15:26	MER	EPA 9012A	^
Sulfide	<1.0	mg/L	1.0	1.0	1.0	1.0	1.00	U M		5/24/16 15:00	SAW	EPA 9034	^
Organic Results													
Aroclor-1016	<0.31	ug/L	0.12	0.31	1.0	1.0	1.00	U	05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Aroclor-1221	<0.31	ug/L	0.088	0.31	1.0	1.0	1.00	U	05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Aroclor-1232	<0.31	ug/L	0.15	0.31	1.0	1.0	1.00	U	05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Aroclor-1242	<0.31	ug/L	0.099	0.31	1.0	1.0	1.00	U	05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Aroclor-1248	<0.31	ug/L	0.091	0.31	1.0	1.0	1.00	U	05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Aroclor-1254	<0.31	ug/L	0.097	0.31	1.0	1.0	1.00	U	05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Aroclor-1260	<0.31	ug/L	0.10	0.31	1.0	1.0	1.00	U	05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Aroclor-1262	<0.31	ug/L	0.29	0.31	1.0	1.0	1.00	U	05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Aroclor-1268	<0.31	ug/L	0.058	0.31	1.0	1.0	1.00	U	05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Surr: 2,4,5,6-TCMX	100	% Recovery	38			137	1.00		05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
Surr: DCBP	82	% Recovery	23			147	1.00		05/25/2016 09:00	5/26/16 17:24	JJY	EPA 8082A	
1,3,5-Trinitrobenzene	<0.080	ug/L	0.038	0.080	0.16	0.16	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B	
1,3-Dinitrobenzene	<0.080	ug/L	0.030	0.080	0.16	0.16	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B	
2,4,6-Trinitrotoluene	<0.16	ug/L	0.052	0.16	0.32	0.32	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B	

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 725920 Sample Description: PBA13-IDW-2542-WW Client Sample #: Sampled: 05/18/2016 1340

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method
2,4-Dinitrotoluene	<0.040	ug/L	0.022	0.040	0.080	0.080	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
2,6-Dinitrotoluene	<0.040	ug/L	0.022	0.040	0.080	0.080	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
2-Amino-4,6-dinitrotoluene	<0.080	ug/L	0.028	0.080	0.16	0.16	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
2-Nitrotoluene	***3.9***	ug/L	0.050	0.16	0.32	0.32	1.00	P	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
3,5-Dinitroaniline	<0.080	ug/L	0.034	0.080	0.16	0.16	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
3-Nitrotoluene	***0.96***	ug/L	0.025	0.040	0.080	0.080	1.00		05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
4-Amino-2,6-dinitrotoluene	<0.080	ug/L	0.032	0.080	0.16	0.16	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
4-Nitrotoluene	<0.080	ug/L	0.042	0.080	0.16	0.16	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
HMX	<0.080	ug/L	0.040	0.080	0.16	0.16	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
Nitrobenzene	<0.080	ug/L	0.038	0.080	0.16	0.16	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
Nitroglycerin	<0.32	ug/L	0.10	0.32	0.64	0.64	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
PETN	<0.32	ug/L	0.14	0.32	0.64	0.64	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
RDX	<0.080	ug/L	0.034	0.080	0.16	0.16	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
Tetryl	<0.16	ug/L	0.050	0.16	0.32	0.32	1.00	U	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B
1,2-Dinitrobenzene	85	% Recovery	83			119	1.00	P	05/23/2016 08:00	6/1/16 16:00	RED	EPA 8330B

CT LAB#: 725921 Sample Description: PBA13-IDW-2542-WW Client Sample #: Sampled: 05/18/2016 1340

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method
Metals Results												
TCLP Arsenic	***0.0082***	mg/L	0.0040	0.012	0.024	0.024	1.00	J	05/25/2016 07:00	5/27/16 18:48	NAH	EPA 6010C
TCLP Barium	***0.28***	mg/L	0.00029	0.00090	0.0018	0.0018	1.00		05/25/2016 07:00	5/27/16 18:48	NAH	EPA 6010C
TCLP Cadmium	***0.030***	mg/L	0.00030	0.0010	0.0020	0.0020	1.00		05/25/2016 07:00	5/27/16 18:48	NAH	EPA 6010C
TCLP Chromium	***0.044***	mg/L	0.00060	0.0020	0.0040	0.0040	1.00		05/25/2016 07:00	5/27/16 18:48	NAH	EPA 6010C
TCLP Lead	***0.67***	mg/L	0.0014	0.0020	0.0040	0.0040	1.00		05/25/2016 07:00	5/27/16 18:48	NAH	EPA 6010C
TCLP Selenium	***0.0043***	mg/L	0.0022	0.0065	0.013	0.013	1.00	J	05/25/2016 07:00	5/27/16 18:48	NAH	EPA 6010C

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 725921 Sample Description: PBA13-IDW-2542-WW Client Sample #: Sampled: 05/18/2016 1340

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method	
TCLP Silver	<0.0020	mg/L	0.00070	0.0020	0.0040	0.0040	1.00	U	05/25/2016 07:00	5/27/16 18:48	NAH	EPA 6010C	
TCLP Mercury	***0.000036***	mg/L	0.000030	0.000060	0.00012	0.00012	1.00	J	05/25/2016 07:00	5/31/16 08:36	LJF	EPA 7470A	
Organic Results													
TCLP alpha-Chlordane	<0.00010	mg/L	0.000090	0.00010	0.00040	0.00040	1.00	U	05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	^
TCLP Chlordane (Technical)	<0.0030	mg/L	0.0010	0.0030	0.0060	0.0060	1.00	U	05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	^
TCLP Endrin	<0.00010	mg/L	0.000060	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	^
TCLP gamma-Chlordane	<0.00010	mg/L	0.000070	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	^
TCLP Heptachlor	<0.00010	mg/L	0.000060	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	^
TCLP Heptachlor epoxide	<0.00010	mg/L	0.000070	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	^
TCLP Lindane	<0.00010	mg/L	0.000070	0.00010	0.00024	0.00024	1.00	U	05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	^
TCLP Methoxychlor	<0.00010	mg/L	0.000060	0.00010	0.00040	0.00040	1.00	U	05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	^
TCLP Toxaphene	<0.0030	mg/L	0.0018	0.0030	0.0060	0.0056	1.00	U	05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	^
TCLP SURR:2,4,5,6-CL4-m-xylene	101	% Recovery	25			140	1.00		05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	
TCLP SURR:Decachlorobiphenyl	87	% Recovery	30			135	1.00		05/25/2016 07:00	5/26/16 16:30	JJY	EPA 8081B	
TCLP 1,1-Dichloroethene	<0.050	mg/L	0.024	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP 1,2-Dichloroethane	<0.050	mg/L	0.030	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP 2-Butanone	<0.50	mg/L	0.24	0.50	1.0	1.0	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP Benzene	<0.050	mg/L	0.019	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP Carbon tetrachloride	<0.050	mg/L	0.023	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP Chlorobenzene	<0.050	mg/L	0.024	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP Chloroform	<0.025	mg/L	0.015	0.025	0.050	0.050	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP Tetrachloroethene	<0.050	mg/L	0.030	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP Trichloroethene	<0.050	mg/L	0.021	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP Vinyl chloride	<0.050	mg/L	0.018	0.050	0.10	0.10	100.00	U	05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP 1,2 Dichloroethane-d4	103	% Recovery	81			118	1.00		05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	
TCLP Bromofluorobenzene	96	% Recovery	85			114	1.00		05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C	

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

CT LAB#: 725921 Sample Description: PBA13-IDW-2542-WW Client Sample #: Sampled: 05/18/2016 1340

Analyte	Result	Units	DL	DOD LOD	DOD LOQ	RL	DF	Qualifier	Prep Date/Time	Analysis Date/Time	Analyst	Method
TCLP d8-Toluene	100	% Recovery	89			112	1.00		05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C
TCLP Dibromofluoromethane	100	% Recovery	80			119	1.00		05/24/2016 14:00	5/26/16 11:33	RLD	EPA 8260C
TCLP 1,4-Dichlorobenzene	<0.0040	mg/L	0.0019	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP 2,4,5-Trichlorophenol	<0.020	mg/L	0.011	0.020	0.050	0.050	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP 2,4,6-Trichlorophenol	<0.020	mg/L	0.010	0.020	0.050	0.050	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP 2,4-Dinitrotoluene	<0.0040	mg/L	0.0021	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP 2-Methylphenol	<0.020	mg/L	0.0086	0.020	0.050	0.050	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP 3 & 4-Methylphenol	<0.036	mg/L	0.014	0.036	0.090	0.090	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Hexachlorobenzene	<0.0040	mg/L	0.0027	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Hexachlorobutadiene	<0.0040	mg/L	0.0018	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Hexachloroethane	<0.0040	mg/L	0.0022	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Nitrobenzene	<0.0040	mg/L	0.0016	0.0040	0.010	0.010	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Pentachlorophenol	<0.020	mg/L	0.011	0.020	0.050	0.050	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Pyridine	<0.010	mg/L	0.0062	0.010	0.030	0.040	1.00	U	05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Surr: 2,4,6-Tribromophenol	86	% Recovery	43			140	1.00		05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Surr: 2-Fluorobiphenyl	71	% Recovery	44			119	1.00		05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Surr: 2-Fluorophenol	45	% Recovery	19			119	1.00		05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Surr: Nitrobenzene-d5	67	% Recovery	44			120	1.00		05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Surr: Phenol-d5	29	% Recovery	1			114	1.00		05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D
TCLP Surr: Terphenyl-d14	86	% Recovery	50			134	1.00		05/25/2016 07:00	5/26/16 15:11	RPN	EPA 8270D

Sub Lab Results

TCLP Herbicides	***attached***						1.00		05/25/2016 07:00	6/6/16 00:00	SUB	SW8151

Unless specifically stated to the contrary, soil/sediment/sludge sample results reported on a Dry Weight Basis

ACCREDITED IN ACCORDANCE WITH nelac

Notes:
^ Indicates the laboratory is NELAP accredited for this analyte by the indicated matrix and method. DL (detection limit), LOD (limit of detection), loq

(limit of quantitation) as defined by most recent DOD QSM version.
All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without written approval of this laboratory. The Chain of Custody is attached.

Submitted by: Eric T. Korthals
Project Manager
608-356-2760

This report has been specifically prepared to satisfy project or program requirements. These results are in compliance with NELAC requirements for the parameters where accreditation is required or available, unless noted in the case narrative.

QC Qualifiers

Code	Description
B	Analyte detected in the associated Method Blank.
C	Toxicity present in BOD sample.
D	Diluted Out.
E	Safe, No Total Coliform detected.
F	Unsafe, Total Coliform detected, no E. Coli detected.
G	Unsafe, Total Coliform detected and E. Coli detected.
H	Holding time exceeded.
I	BOD incubator temperature was outside acceptance limits during test period.
J	Estimated value.
L	Significant peaks were detected outside the chromatographic window.
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits.
N	Insufficient BOD oxygen depletion.
O	Complete BOD oxygen depletion.
P	Concentration of analyte differs more than 40% between primary and confirmation analysis.
Q	Laboratory Control Sample outside acceptance limits.
R	See Narrative at end of report.
S	Surrogate standard recovery outside acceptance limits due to apparent matrix effects.
T	Sample received with improper preservation or temperature.
U	Analyte concentration was below detection limit.
V	Raised Quantitation or Reporting Limit due to limited sample amount or dilution for matrix background interference.
W	Sample amount received was below program minimum.
X	Analyte exceeded calibration range.
Y	Replicate/Duplicate precision outside acceptance limits.
Z	Specified calibration criteria was not met.

Current CT Laboratories Certifications

Kansas NELAP ID# E-10368
Kentucky ID# 0023
ISO/IEC 17025-2005 A2LA Cert # 3806.01
North Carolina ID# 674
Wisconsin (WDNR) Chemistry ID# 157066030
Wisconsin (DATCP) Bacteriology ID# 105-289
DoD-ELAP A2LA 3806.01
GA EPD Stipulation ID E871111, Expires Annually
Louisiana ID # 115843
Virginia ID# 7608
Illinois NELAP ID # 002413
Wisconsin (WOSB) ID# WI-5499-WBE
Maryland ID# 344

Microbac

Lab Report #: L16051594
Lab Project #: 2694.005
Project Name: CT Labs DOD
Lab Contact: Emily Yoak

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

Discrepancy	Resolution
The temperature was out of the acceptable range.BRG	
Ice was melted. BRG	Per the client please proceed. SLM
Sample ID: 725921 (5/18 @ 13:40). Sample received broken. BRG	Please proceed with the remaining sample SLM

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
00113985	I	9.0		1Z1A377E0340782880	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	No
4	Was ice present?	No
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	No
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	All samples were checked for pH and met the standard. Exceptions are noted above under discrepancy. (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	NA
12	Were VOA samples free of headspace (less than 6mm)?	NA

Microbac

Lab Report #: L16051594
Lab Project #: 2694.005
Project Name: CT Labs DOD
Lab Contact: Emily Yoak

Samples Received

Client ID	Laboratory ID	Date Collected	Date Received
725919/PBA13-IDW-2541-WS	L16051594-01	05/25/2016 07:00	05/27/2016 10:41

Microbac

Lab Report #: L16051594
Lab Project #: 2694.005
Project Name: CT Labs DOD
Lab Contact: Emily Yoak

Certificate of Analysis

Sample #:	L16051594-01	**PrePrep Method:**		**Instrument:**	HP17
Client ID:	725919/PBA13-IDW-2541-WS	**Prep Method:**	METHOD	**Prep Date:**	06/01/2016 17:00
Matrix:	TCLP Leach	**Analytical Method:**	8151A	**Cal Date:**	05/04/2016 18:01
Workgroup #:	WG571266	**Analyst:**	ECL	**Run Date:**	06/03/2016 20:39
Collect Date:	05/25/2016 07:00	**Dilution:**	1	**File ID:**	17G22089.F
Sample Tag:	01	**Units:**	ug/L		

Analyte	Result	Qual	LOQ	LOD	DL	EPA HW#	Reg. Limit
2,4-D		U,CT1	20.0	10.0	5.00	D016	10000
2,4,5-TP (Silvex)		U,CT1	2.00	1.00	0.500	D017	1000

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2,4-Dichlorophenylacetic acid	50.7	32	138	

U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample reciept exceeded regulatory limit.

Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16051594 Prep Date: 06/01/16 17:00 Sample ID: WG570849-01
Instrument ID: HP17 Run Date: 06/03/16 14:11 Prep Method: METHOD
File ID: 17G22074.F Analyst: ECL Method: 8151A
Workgroup (AAB#): WG571266 Matrix: Water Units: ug/L
Contract #: Cal ID: HP17-04-MAY-16

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
2,4-D	0.500	2.00	0.500	1	U
2,4,5-TP (Silvex)	0.0500	0.200	0.0500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4-Dichlorophenylacetic acid	64.4	32 - 138	PASS

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Microbac Laboratories Inc.

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16051594 Run Date: 06/03/2016 Sample ID: WG570849-02

Instrument ID: HP17 Run Time: 14:37 Prep Method: METHOD

File ID: 17G22075.F Analyst: ECL Method: 8151A

Workgroup (AAB#): WG571266 Matrix: Water Units: ug/L

QC Key: DOD5 Lot#: STD74844 Cal ID: HP17-04-MAY-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
2,4-D	5.00	2.87	57.3	45 - 152	
2,4,5-TP (Silvex)	0.500	0.312	62.4	51 - 134	

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4-Dichlorophenylacetic acid	58.4	32 - 138	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008

PDF File ID: 4793823

Report generated: 06/06/2016 14:07

Microbac

Lab Report #: L16060019
Lab Project #: 2694.005
Project Name: CT Labs DOD
Lab Contact: Emily Yoak

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

Discrepancy	Resolution
No date/time on container. Will log per information on COC. BRG	Please log per the information on the COC and proceed. -eny

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
00113448	I	4.0		420457505279	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	No
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	All samples were checked for pH and met the standard. Exceptions are noted above under discrepancy. (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	NA
12	Were VOA samples free of headspace (less than 6mm)?	NA

Microbac

Lab Report #: L16060019
Lab Project #: 2694.005
Project Name: CT Labs DOD
Lab Contact: Emily Yoak

Samples Received

Client ID	Laboratory ID	Date Collected	Date Received
PBA13-IDW-2542-WW	L16060019-01	05/18/2016 13:40	06/01/2016 10:39

Microbac

Lab Report #: L16060019
Lab Project #: 2694.005
Project Name: CT Labs DOD
Lab Contact: Emily Yoak

Certificate of Analysis

Sample #:	L16060019-01	**PrePrep Method:**		**Instrument:**	HP17
Client ID:	PBA13-IDW-2542-WW	**Prep Method:**	METHOD	**Prep Date:**	06/01/2016 17:00
Matrix:	TCLP Leach	**Analytical Method:**	8151A	**Cal Date:**	05/04/2016 18:01
Workgroup #:	WG571266	**Analyst:**	ECL	**Run Date:**	06/03/2016 18:04
Collect Date:	05/18/2016 13:40	**Dilution:**	1	**File ID:**	17G22083.F
Sample Tag:	01	**Units:**	ug/L		

Analyte	Result	Qual	LOQ	LOD	DL	EPA HW#	Reg. Limit
2,4-D		U	20.0	10.0	5.00	D016	10000
2,4,5-TP (Silvex)		U	2.00	1.00	0.500	D017	1000

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2,4-Dichlorophenylacetic acid	67.4	32	138	

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number: L16060019 Prep Date: 06/01/16 17:00 Sample ID: WG570849-01
Instrument ID: HP17 Run Date: 06/03/16 14:11 Prep Method: METHOD
File ID: 17G22074.F Analyst: ECL Method: 8151A
Workgroup (AAB#): WG571266 Matrix: Water Units: ug/L
Contract #: Cal ID: HP17-04-MAY-16

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
2,4-D	0.500	2.00	0.500	1	U
2,4,5-TP (Silvex)	0.0500	0.200	0.0500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4-Dichlorophenylacetic acid	64.4	32 - 138	PASS

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name:BLANK
PDF ID: 4793966
06-JUN-2016 14:08

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16060019 Run Date: 06/03/2016 Sample ID: WG570849-02
Instrument ID: HP17 Run Time: 14:37 Prep Method: METHOD
File ID: 17G22075.F Analyst: ECL Method: 8151A
Workgroup (AAB#): WG571266 Matrix: Water Units: ug/L
QC Key: DOD5 Lot#: STD74844 Cal ID: HP17-04-MAY-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
2,4-D	5.00	2.87	57.3	45 - 152	
2,4,5-TP (Silvex)	0.500	0.312	62.4	51 - 134	

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4-Dichlorophenylacetic acid	58.4	32 - 138	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
PDF File ID: 4793967
Report generated: 06/06/2016 14:08

CT LABORATORIES
delivering more than data from your environmental analyses

1230 Lange Court • Baraboo, WI 53913 • 608-356-2760
www.ctlaboratories.com

QC SUMMARY REPORT

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Duplicate

Analytical Run #:	126264	Analysis Date:	05/20/2016	Prep Batch #:		Matrix:	SOIL
CTLab #:	726875	Analysis Time:	15:00	Prep Date/Time:		Method:	SW8000C
Parent Sample #:	725918	Analyst:	AMA	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Solids, Percent	64.4	%	55.5					15	8

Duplicate

Analytical Run #:	126351	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	SOIL
CTLab #:	727575	Analysis Time:	12:50	Prep Date/Time:		Method:	SW9045C
Parent Sample #:	725918	Analyst:	MER	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
pH	6.80	S.U.						0	1

Duplicate

Analytical Run #:	126351	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	GROUND WATER
CTLab #:	727576	Analysis Time:	12:50	Prep Date/Time:		Method:	SW9045C
Parent Sample #:	725920	Analyst:	MER	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
pH	2.00	S.U.						1	1

Duplicate

Analytical Run #:	126369	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	SOIL
CTLab #:	727557	Analysis Time:	14:00	Prep Date/Time:		Method:	SW7.3
Parent Sample #:	725918	Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Sulfide Reactive	100	mg/kg	BDL	U				0	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Soil

Analytical Run #:	126369	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	SOLID
CTLab #:	727558	Analysis Time:	14:00	Prep Date/Time:		Method:	SW7.3
Parent Sample #:		Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Sulfide Reactive	100	mg/kg			100	100	70 --- 130		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Soil

Analytical Run #:	126369	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	SOLID
CTLab #:	727559	Analysis Time:	14:00	Prep Date/Time:		Method:	SW7.3
Parent Sample #:		Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Sulfide Reactive	100	mg/kg		U	0.00		100		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Soil

Analytical Run #:	126369	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	SOIL
CTLab #:	727556	Analysis Time:	14:00	Prep Date/Time:		Method:	SW7.3
Parent Sample #:	725918	Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Sulfide Reactive	100	mg/kg	BDL		100	100	70-130		

Duplicate

Analytical Run #:	126370	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	SOIL
CTLab #:	727537	Analysis Time:	14:00	Prep Date/Time:		Method:	SW7.3
Parent Sample #:	725918	Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Cyanide, Reactive	20	mg/kg	BDL	U				0	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Soil

Analytical Run #:	126370	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	SOLID
CTLab #:	727539	Analysis Time:	14:00	Prep Date/Time:		Method:	SW7.3
Parent Sample #:		Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Cyanide, Reactive	20.0	mg/kg			20.0	100	70 --- 130		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Soil

Analytical Run #:	126370	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	SOLID
CTLab #:	727540	Analysis Time:	14:00	Prep Date/Time:		Method:	SW7.3
Parent Sample #:		Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Cyanide, Reactive	20	mg/kg		U	0.00			8	

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Soil

Analytical Run #:	126370	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	SOIL
CTLab #:	727538	Analysis Time:	14:00	Prep Date/Time:		Method:	SW7.3
Parent Sample #:	725918	Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Cyanide, Reactive	20	mg/kg	BDL	U	20.0	0	70 --- 130		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Duplicate

Analytical Run #:	126374	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	GROUND WATER
CTLab #:	727567	Analysis Time:	15:00	Prep Date/Time:		Method:	SW9034
Parent Sample #:	725920	Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Sulfide	1.00	mg/L	<1.00	U				0	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Water

Analytical Run #:	126374	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	LIQUID
CTLab #:	727555	Analysis Time:	15:00	Prep Date/Time:		Method:	SW9034
Parent Sample #:		Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Sulfide	4.000	mg/L			5.000	80	80 --- 120		

Method Blank Water

Analytical Run #:	126374	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	LIQUID
CTLab #:	727568	Analysis Time:	15:00	Prep Date/Time:		Method:	SW9034
Parent Sample #:		Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Sulfide	1.0	mg/L		U	0		1.5		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Duplicate Water

Analytical Run #:	126374	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	GROUND WATER
CTLab #:	727566	Analysis Time:	15:00	Prep Date/Time:		Method:	SW9034
Parent Sample #:	727565	Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Sulfide	1.20	mg/L	BDL		2.50	48	80 --- 120	0	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Water

Analytical Run #:	126374	Analysis Date:	05/24/2016	Prep Batch #:		Matrix:	GROUND WATER
CTLab #:	727565	Analysis Time:	15:00	Prep Date/Time:		Method:	SW9034
Parent Sample #:	725920	Analyst:	SAW	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Sulfide	1.20	mg/L	BDL		2.50	48	80 --- 120		20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Water

Analytical Run #:	126402	Analysis Date:	05/25/2016	Prep Batch #:	57430	Matrix:	LIQUID
CTLab #:	727762	Analysis Time:	15:19	Prep Date/Time:	05/25/2016 10:45	Method:	SW9012A
Parent Sample #:		Analyst:	MER	Prep Analyst:	MER		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Cyanide	43.90	ug/L			40.00	110	83 --- 116		

Method Blank Water

Analytical Run #:	126402	Analysis Date:	05/25/2016	Prep Batch #:	57430	Matrix:	LIQUID
CTLab #:	727761	Analysis Time:	15:22	Prep Date/Time:	05/25/2016 10:45	Method:	SW9012A
Parent Sample #:		Analyst:	MER	Prep Analyst:	MER		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Cyanide	5	ug/L		U	0		12		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Duplicate Water

Analytical Run #:	126402	Analysis Date:	05/25/2016	Prep Batch #:	57430	Matrix:	GROUND WATER
CTLab #:	727768	Analysis Time:	15:32	Prep Date/Time:	05/25/2016 10:45	Method:	SW9012A
Parent Sample #:	727767	Analyst:	MER	Prep Analyst:	MER		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Cyanide	35.2	ug/L	BDL		40.0	88	83 --- 116	10	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Water

Analytical Run #:	126402	Analysis Date:	05/25/2016	Prep Batch #:	57430	Matrix:	GROUND WATER
CTLab #:	727767	Analysis Time:	15:29	Prep Date/Time:	05/25/2016 10:45	Method:	SW9012A
Parent Sample #:	725920	Analyst:	MER	Prep Analyst:	MER		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Cyanide	31.9	ug/L	BDL		40.0	80	83 --- 116		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Duplicate

Analytical Run #:	126420	Analysis Date:	05/27/2016	Prep Batch #:	57426	Matrix:	TCLP
CTLab #:	727726	Analysis Time:	18:20	Prep Date/Time:	05/25/2016 11:00	Method:	SW6010
Parent Sample #:	725919	Analyst:	NAH	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Arsenic	0.00928	mg/L	0.0096				24	3	20
Barium	0.266	mg/L	0.27				1.80	1	20
Cadmium	0.00382	mg/L	0.0038				2.0	1	20
Chromium	0.00307	mg/L	0.0033				4.0	7	20
Lead	0.270	mg/L	0.27				4.0	0	20
Selenium	0.00940	mg/L	0.011				13.0	16	20
Silver	0.000700	mg/L	<0.000700	U			4.0	0	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Water

Analytical Run #:	126420	Analysis Date:	05/27/2016	Prep Batch #:	57426	Matrix:	LIQUID
CTLab #:	727725	Analysis Time:	17:34	Prep Date/Time:	05/25/2016 11:00	Method:	SW6010
Parent Sample #:		Analyst:	NAH	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Arsenic	0.860	mg/L			0.800	108	87 --- 113		
Barium	0.868	mg/L			0.800	108	88 --- 113		
Cadmium	0.0217	mg/L			0.0200	108	88 --- 113		
Chromium	0.0840	mg/L			0.0800	105	90 --- 113		
Lead	0.225	mg/L			0.200	112	86 --- 113		
Selenium	0.884	mg/L			0.800	110	83 --- 114		
Silver	0.0202	mg/L			0.0200	101	84 --- 115		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Water

Analytical Run #:	126420	Analysis Date:	05/27/2016	Prep Batch #:	57426	Matrix:	LIQUID
CTLab #:	727724	Analysis Time:	17:40	Prep Date/Time:	05/25/2016 11:00	Method:	SW6010
Parent Sample #:		Analyst:	NAH	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Arsenic	0.004	mg/L		U	0		0.012		
Barium	0.00029	mg/L		U	0		00090		
Cadmium	0.0003	mg/L		U	0		.0010		
Chromium	0.0006	mg/L		U	0		.0020		
Lead	0.0014	mg/L		U	0		.0020		
Selenium	0.0022	mg/L		U	0		.0065		
Silver	0.0007	mg/L		U	0		.0020		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Duplicate Water

Analytical Run #:	126420	Analysis Date:	05/27/2016	Prep Batch #:	57426	Matrix:	TCLP
CTLab #:	727728	Analysis Time:	18:34	Prep Date/Time:	05/25/2016 11:00	Method:	SW6010
Parent Sample #:	727727	Analyst:	NAH	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Arsenic	0.865	mg/L	0.0096		0.800	107	87 --- 113	2	20
Barium	1.40	mg/L	0.27		0.800	141	88 --- 113	3	20
Cadmium	0.0233	mg/L	0.0038		0.0200	98	88 --- 113	1	20
Chromium	0.0843	mg/L	0.0033		0.0800	101	90 --- 113	0	20
Lead	0.463	mg/L	0.27		0.200	96	86 --- 113	0	20
Selenium	1.02	mg/L	0.011		0.800	126	83 --- 114	1	20
Silver	0.0227	mg/L	BDL		0.0200	114	84 --- 115	2	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Water

Analytical Run #:	126420	Analysis Date:	05/27/2016	Prep Batch #:	57426	Matrix:	TCLP
CTLab #:	727727	Analysis Time:	18:27	Prep Date/Time:	05/25/2016 11:00	Method:	SW6010
Parent Sample #:	725919	Analyst:	NAH	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Arsenic	0.852	mg/L	0.0096		0.800	105	87 --- 113		
Barium	1.36	mg/L	0.27		0.800	136	88 --- 113		
Cadmium	0.0236	mg/L	0.0038		0.0200	99	88 --- 113		
Chromium	0.0847	mg/L	0.0033		0.0800	102	90 --- 113		
Lead	0.461	mg/L	0.27		0.200	96	86 --- 113		
Selenium	1.03	mg/L	0.011		0.800	127	83 --- 114		
Silver	0.0223	mg/L	BDL		0.0200	112	84 --- 115		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Duplicate

Analytical Run #:	126512	Analysis Date:	05/31/2016	Prep Batch #:	57463	Matrix:	TCLP
CTLab #:	728737	Analysis Time:	08:26	Prep Date/Time:	05/27/2016 07:30	Method:	
Parent Sample #:	725919	Analyst:	LJF	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Mercury	0.0000300	mg/L	<0.0000300	U			0.12	0	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Water

Analytical Run #:	126512	Analysis Date:	05/31/2016	Prep Batch #:	57463	Matrix:	LIQUID
CTLab #:	728736	Analysis Time:	08:19	Prep Date/Time:	05/27/2016 07:30	Method:	
Parent Sample #:		Analyst:	LJF	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Mercury	0.00273	mg/L			0.00300	91	82 --- 119		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Water

Analytical Run #:	126512	Analysis Date:	05/31/2016	Prep Batch #:	57463	Matrix:	LIQUID
CTLab #:	728735	Analysis Time:	08:21	Prep Date/Time:	05/27/2016 07:30	Method:	
Parent Sample #:		Analyst:	LJF	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Mercury	0.00003	mg/L		U	0		00006		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Duplicate Water

Analytical Run #:	126512	Analysis Date:	05/31/2016	Prep Batch #:	57463	Matrix:	TCLP
CTLab #:	728739	Analysis Time:	08:34	Prep Date/Time:	05/27/2016 07:30	Method:	
Parent Sample #:	728738	Analyst:	LJF	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Mercury	0.00196	mg/L	BDL		0.00200	98	82 --- 119	7	20

Matrix Spike Water

Analytical Run #:	126512	Analysis Date:	05/31/2016	Prep Batch #:	57463	Matrix:	TCLP
CTLab #:	728738	Analysis Time:	08:28	Prep Date/Time:	05/27/2016 07:30	Method:	
Parent Sample #:	725919	Analyst:	LJF	Prep Analyst:	LJF		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Mercury	0.00182	mg/L	BDL		0.00200	91	82 --- 119		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Soil

Analytical Run #:	126326	Analysis Date:	05/24/2016	Prep Batch #:	57397	Matrix:	SOLID
CTLab #:	727025	Analysis Time:	00:03	Prep Date/Time:	05/23/2016 13:30	Method:	SW8082
Parent Sample #:		Analyst:	JJY	Prep Analyst:	JDB		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Aroclor-1016	463	ug/kg			500	93	47 --- 134		30
Aroclor-1260	458	ug/kg			500	92	53 --- 140		30

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Soil

Analytical Run #:	126326	Analysis Date:	05/23/2016	Prep Batch #:	57397	Matrix:	SOLID
CTLab #:	727024	Analysis Time:	23:41	Prep Date/Time:	05/23/2016 13:30	Method:	SW8082
Parent Sample #:		Analyst:	JJY	Prep Analyst:	JDB		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Aroclor-1016	5	ug/kg		U	0		15		
Aroclor-1221	7	ug/kg		U	0		15		
Aroclor-1232	9	ug/kg		U	0		15		
Aroclor-1242	7	ug/kg		U	0		15		
Aroclor-1248	7	ug/kg		U	0		15		
Aroclor-1254	9	ug/kg		U	0		15		
Aroclor-1260	6	ug/kg		U	0		15		
Aroclor-1262	7	ug/kg		U	0		15		
Aroclor-1268	5	ug/kg		U	0		15		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Duplicate Soil

Analytical Run #:	126326	Analysis Date:	05/24/2016	Prep Batch #:	57397	Matrix:	SOIL
CTLab #:	727028	Analysis Time:	01:29	Prep Date/Time:	05/23/2016 13:30	Method:	SW8082
Parent Sample #:	727027	Analyst:	JJY	Prep Analyst:	JDB		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Aroclor-1016	836	ug/kg	BDL		896	93	47 --- 134	3	30
Aroclor-1221	12.5		BDL	U	896	0	70 --- 130	0	30
Aroclor-1232	16.1		BDL	U	896	0	70 --- 130	0	30
Aroclor-1242	12.5		BDL	U	896	0	70 --- 130	0	30
Aroclor-1248	12.5		BDL	U	896	0	70 --- 130	0	30
Aroclor-1254	16.1		BDL	U	896	0	67 --- 135	0	30
Aroclor-1260	725	ug/kg	64.4		896	74	53 --- 140	6	30
Aroclor-1262	12.5		BDL	U	896	0	70 --- 130	0	30
Aroclor-1268	8.96		BDL	U	896	0	70 --- 130	0	30
Surr: 2,4,5,6-TCMX	110	% Recovery			100	110	44 --- 130		
Surr: DCBP	99.8	% Recovery			100	99.8	54 --- 141		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Soil

Analytical Run #:	126326	Analysis Date:	05/24/2016	Prep Batch #:	57397	Matrix:	SOIL
CTLab #:	727027	Analysis Time:	01:07	Prep Date/Time:	05/23/2016 13:30	Method:	SW8082
Parent Sample #:	725918	Analyst:	JJY	Prep Analyst:	JDB		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Aroclor-1016	863	ug/kg	BDL		901	96	47 --- 134		
Aroclor-1221	12.6		BDL	U	901	0	70 --- 130		
Aroclor-1232	16.2		BDL	U	901	0	70 --- 130		
Aroclor-1242	12.6		BDL	U	901	0	70 --- 130		
Aroclor-1248	12.6		BDL	U	901	0	70 --- 130		
Aroclor-1254	16.2		202	U	901	0	67 --- 135		
Aroclor-1260	686	ug/kg	64.4		901	69	53 --- 140		
Aroclor-1262	12.6		BDL	U	901	0	70 --- 130		
Aroclor-1268	9.01		BDL	U	901	0	70 --- 130		
Surr: 2,4,5,6-TCMX	111	% Recovery			100	111	44 --- 130		
Surr: DCBP	91.2	% Recovery			100	91.2	54 --- 141		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Water

Analytical Run #:	126392	Analysis Date:	05/26/2016	Prep Batch #:		Matrix:	LIQUID
CTLab #:	728898	Analysis Time:	10:08	Prep Date/Time:		Method:	SW8260C
Parent Sample #:		Analyst:	RLD	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,1-Dichloroethene	1.06	mg/L			1.00	106	71 --- 131		
1,2-Dichloroethane	0.935	mg/L			1.00	94	73 --- 128		
2-Butanone	9.23	mg/L			10.0	92	56 --- 143		
Benzene	1.05	mg/L			1.00	105	79 --- 120		
Carbon tetrachloride	0.996	mg/L			1.00	100	72 --- 136		
Chlorobenzene	1.02	mg/L			1.00	102	82 --- 118		
Chloroform	0.962	mg/L			1.00	96	79 --- 124		
Tetrachloroethene	1.02	mg/L			1.00	102	74 --- 129		
Trichloroethene	1.01	mg/L			1.00	101	79 --- 123		
Vinyl chloride	1.03	mg/L			1.00	103	58 --- 137		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Water

Analytical Run #:	126392	Analysis Date:	05/26/2016	Prep Batch #:		Matrix:	LIQUID
CTLab #:	728900	Analysis Time:	10:37	Prep Date/Time:		Method:	SW8260C
Parent Sample #:		Analyst:	RLD	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,1-Dichloroethene	0.00024	mg/L		U	0		00025		
1,2-Dichloroethane	0.0003	mg/L		U	0		.0005		
2-Butanone	0.0024	mg/L		U	0		.0025		
Benzene	0.00019	mg/L		U	0		00025		
Carbon tetrachloride	0.00023	mg/L		U	0		00025		
Chlorobenzene	0.00024	mg/L		U	0		00025		
Chloroform	0.00015	mg/L		U	0		00025		
Tetrachloroethene	0.0003	mg/L		U	0		.0005		
Trichloroethene	0.00021	mg/L		U	0		00025		
Vinyl chloride	0.00018	mg/L		U	0		00025		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Duplicate Water

Analytical Run #:	126392	Analysis Date:	05/26/2016	Prep Batch #:		Matrix:	TCLP
CTLab #:	728894	Analysis Time:	12:30	Prep Date/Time:		Method:	SW8260C
Parent Sample #:	728853	Analyst:	RLD	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,1-Dichloroethene	1.04	mg/L	BDL		1.00	104	71 --- 131	9	20
1,2 Dichloroethane-d4	105	% Recovery			100	105	81 --- 118		
1,2-Dichloroethane	0.976	mg/L	BDL		1.00	98	73 --- 128	4	20
2-Butanone	9.59	mg/L	BDL		10.0	96	56 --- 143	4	20
Benzene	1.05	mg/L	BDL		1.00	105	79 --- 120	7	20
Bromofluorobenzene	95.0	% Recovery			100	95.0	85 --- 114		
Carbon tetrachloride	0.955	mg/L	BDL		1.00	96	72 --- 136	9	20
Chlorobenzene	1.03	mg/L	BDL		1.00	103	82 --- 118	5	20
Chloroform	0.985	mg/L	BDL		1.00	98	79 --- 124	3	20
d8-Toluene	100	% Recovery			100	100	89 --- 112		
Dibromofluoromethane	100	% Recovery			100	100	80 --- 119		
Tetrachloroethene	0.988	mg/L	BDL		1.00	99	74 --- 129	5	20
Trichloroethene	1.06	mg/L	BDL		1.00	106	79 --- 123	9	20
Vinyl chloride	0.957	mg/L	BDL		1.00	96	58 --- 137	1	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Water

Analytical Run #:	126392	Analysis Date:	05/26/2016	Prep Batch #:		Matrix:	TCLP
CTLab #:	728853	Analysis Time:	12:02	Prep Date/Time:		Method:	SW8260C
Parent Sample #:	725919	Analyst:	RLD	Prep Analyst:			

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,1-Dichloroethene	0.953	mg/L	BDL		1.00	95	71 --- 131		20
1,2 Dichloroethane-d4	101	% Recovery			100	101	81 --- 118		
1,2-Dichloroethane	0.938	mg/L	BDL		1.00	94	73 --- 128		20
2-Butanone	9.18	mg/L	BDL		10.0	92	56 --- 143		20
Benzene	0.975	mg/L	BDL		1.00	98	79 --- 120		20
Bromofluorobenzene	95.0	% Recovery			100	95.0	85 --- 114		
Carbon tetrachloride	0.876	mg/L	BDL		1.00	88	72 --- 136		20
Chlorobenzene	0.978	mg/L	BDL		1.00	98	82 --- 118		20
Chloroform	0.954	mg/L	BDL		1.00	95	79 --- 124		20
d8-Toluene	101	% Recovery			100	101	89 --- 112		
Dibromofluoromethane	100	% Recovery			100	100	80 --- 119		
Tetrachloroethene	0.944	mg/L	BDL		1.00	94	74 --- 129		20
Trichloroethene	0.965	mg/L	BDL		1.00	96	79 --- 123		20
Vinyl chloride	0.949	mg/L	BDL		1.00	95	58 --- 137		20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Water

Analytical Run #:	126448	Analysis Date:	05/26/2016	Prep Batch #:	57362	Matrix:	LIQUID
CTLab #:	726436	Analysis Time:	16:41	Prep Date/Time:	05/25/2016 09:00	Method:	SW8082
Parent Sample #:		Analyst:	JJY	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Aroclor-1016	4.42	ug/L			5.00	88	46 --- 129		30
Aroclor-1260	4.11	ug/L			5.00	82	45 --- 134		30

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Water

Analytical Run #:	126448	Analysis Date:	05/26/2016	Prep Batch #:	57362	Matrix:	LIQUID
CTLab #:	726435	Analysis Time:	16:19	Prep Date/Time:	05/25/2016 09:00	Method:	SW8082
Parent Sample #:		Analyst:	JJY	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Aroclor-1016	0.113	ug/L		U	0		0.50		
Aroclor-1221	0.085	ug/L		U	0		0.50		
Aroclor-1232	0.145	ug/L		U	0		0.50		
Aroclor-1242	0.096	ug/L		U	0		0.50		
Aroclor-1248	0.088	ug/L		U	0		0.50		
Aroclor-1254	0.094	ug/L		U	0		0.50		
Aroclor-1260	0.099	ug/L		U	0		0.50		
Aroclor-1262	0.28	ug/L		U	0		0.50		
Aroclor-1268	0.056	ug/L		U	0		0.50		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Duplicate Water

Analytical Run #:	126448	Analysis Date:	05/26/2016	Prep Batch #:	57362	Matrix:	GROUND WATER
CTLab #:	726439	Analysis Time:	18:07	Prep Date/Time:	05/25/2016 09:00	Method:	SW8082
Parent Sample #:	726438	Analyst:	JJY	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Aroclor-1016	4.33	ug/L	BDL		5.21	83	46 --- 129	1	30
Aroclor-1221	0.0885		BDL	U	5.21	0	70 --- 130	0	30
Aroclor-1232	0.151		BDL	U	5.21	0	70 --- 130	0	30
Aroclor-1242	0.100		BDL	U	5.21	0	70 --- 130	0	30
Aroclor-1248	0.0917		BDL	U	5.21	0	70 --- 130	0	30
Aroclor-1254	0.0979		BDL	U	5.21	0	34 --- 127	0	30
Aroclor-1260	3.52	ug/L	BDL		5.21	68	45 --- 134	0	30
Aroclor-1262	0.292		BDL	U	5.21	0	70 --- 130	0	30
Aroclor-1268	0.0583		BDL	U	5.21	0	70 --- 130	0	30
Surr: 2,4,5,6-TCMX	101	% Recovery			100	101	38 --- 137		
Surr: DCBP	80.1	% Recovery			100	80.1	23 --- 147		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Water

Analytical Run #:	126448	Analysis Date:	05/26/2016	Prep Batch #:	57362	Matrix:	GROUND WATER
CTLab #:	726438	Analysis Time:	17:45	Prep Date/Time:	05/25/2016 09:00	Method:	SW8082
Parent Sample #:	725920	Analyst:	JJY	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
Aroclor-1016	4.34	ug/L	BDL		5.15	84	46 --- 129		
Aroclor-1221	0.0876		BDL	U	5.15	0	70 --- 130		
Aroclor-1232	0.149		BDL	U	5.15	0	70 --- 130		
Aroclor-1242	0.0990		BDL	U	5.15	0	70 --- 130		
Aroclor-1248	0.0907		BDL	U	5.15	0	70 --- 130		
Aroclor-1254	0.0969		BDL	U	5.15	0	34 --- 127		
Aroclor-1260	3.48	ug/L	BDL		5.15	68	45 --- 134		
Aroclor-1262	0.289		BDL	U	5.15	0	70 --- 130		
Aroclor-1268	0.0577		BDL	U	5.15	0	70 --- 130		
Surr: 2,4,5,6-TCMX	101	% Recovery			100	101	38 --- 137		
Surr: DCBP	80.1	% Recovery			100	80.1	23 --- 147		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Water

Analytical Run #:	126450	Analysis Date:	05/26/2016	Prep Batch #:	57418	Matrix:	LIQUID
CTLab #:	727672	Analysis Time:	15:57	Prep Date/Time:	05/25/2016 09:00	Method:	SW8081
Parent Sample #:		Analyst:	JJY	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
alpha-Chlordane	0.000463	mg/L			0.000400	116	65 --- 125		30
Chlordane (Technical)	0.00259	mg/L			0.00250	104	50 --- 150		30
Endrin	0.000529	mg/L			0.000400	132	55 --- 135		30
gamma-Chlordane	0.000464	mg/L			0.000400	116	60 --- 125		30
Heptachlor	0.000480	mg/L			0.000400	120	40 --- 130		30
Heptachlor epoxide	0.000458	mg/L			0.000400	114	60 --- 130		30
Lindane	0.000453	mg/L			0.000400	113	25 --- 135		30
Methoxychlor	0.000536	mg/L			0.000400	134	55 --- 150		30
Toxaphene	0.00233	mg/L			0.00250	93	50 --- 150		30

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Water

Analytical Run #:	126450	Analysis Date:	05/26/2016	Prep Batch #:	57418	Matrix:	LIQUID
CTLab #:	727671	Analysis Time:	15:41	Prep Date/Time:	05/25/2016 09:00	Method:	SW8081
Parent Sample #:		Analyst:	JJY	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
alpha-Chlordane	0.000009	mg/L		U	0		00020		
Chlordane (Technical)	0.000102	mg/L		U	0		00025		
Endrin	0.000006	mg/L		U	0		00012		
gamma-Chlordane	0.000007	mg/L		U	0		00020		
Heptachlor	0.000006	mg/L		U	0		00012		
Heptachlor epoxide	0.000007	mg/L		U	0		00012		
Lindane	0.000007	mg/L		U	0		00012		
Methoxychlor	0.000006	mg/L		U	0		00020		
Toxaphene	0.000176	mg/L		U	0		00025		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Water

Analytical Run #:	126450	Analysis Date:	05/26/2016	Prep Batch #:	57418	Matrix:	TCLP
CTLab #:	727674	Analysis Time:	17:03	Prep Date/Time:	05/25/2016 09:00	Method:	SW8081
Parent Sample #:	725919	Analyst:	JJY	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
alpha-Chlordane	0.00440	mg/L	BDL		0.00400	110	65 --- 125		
Chlordane (Technical)	0.00102	mg/L	BDL	U	0.0500	0	50 --- 150		
Endrin	0.00518	mg/L	BDL		0.00400	130	55 --- 135		
gamma-Chlordane	0.00445	mg/L	BDL		0.00400	111	60 --- 125		
Heptachlor	0.00455	mg/L	BDL		0.00400	114	40 --- 130		
Heptachlor epoxide	0.00431	mg/L	BDL		0.00400	108	60 --- 130		
Lindane	0.00432	mg/L	BDL		0.00400	108	25 --- 135		
Methoxychlor	0.00516	mg/L	BDL		0.00400	129	55 --- 150		
SURR:2,4,5,6-CL4-m-xylene	92.8	% Recovery			100	92.8	25 --- 140		
SURR:Decachlorobiphenyl	106	% Recovery			100	106	30 --- 135		
Toxaphene	0.00176	mg/L	BDL	U	0.0500	0	50 --- 150		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Water

Analytical Run #:	126456	Analysis Date:	06/01/2016	Prep Batch #:	57390	Matrix:	LIQUID
CTLab #:	726968	Analysis Time:	15:42	Prep Date/Time:	05/23/2016 08:00	Method:	SW8330B
Parent Sample #:		Analyst:	RED	Prep Analyst:	SRT		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,3,5-Trinitrobenzene	1.73	ug/L			2.00	86	73 --- 125		20
1,3-Dinitrobenzene	1.93	ug/L			2.00	96	78 --- 120		20
2,4,6-Trinitrotoluene	1.94	ug/L			2.00	97	71 --- 123		20
2,4-Dinitrotoluene	1.74	ug/L			2.00	87	78 --- 120		20
2,6-Dinitrotoluene	2.11	ug/L			2.00	106	77 --- 127		20
2-Amino-4,6-dinitrotoluene	1.79	ug/L			2.00	90	79 --- 120		20
2-Nitrotoluene	1.69	ug/L			2.00	84	70 --- 127		20
3,5-Dinitroaniline	1.92	ug/L			2.00	96	71 --- 117		20
3-Nitrotoluene	1.81	ug/L			2.00	90	73 --- 125		20
4-Amino-2,6-dinitrotoluene	1.96	ug/L			2.00	98	76 --- 125		20
4-Nitrotoluene	1.78	ug/L			2.00	89	71 --- 127		20
HMX	1.89	ug/L			2.00	94	65 --- 135		20
Nitrobenzene	1.56	ug/L			2.00	78	65 --- 134		20
Nitroglycerin	4.08	ug/L			4.00	102	74 --- 127		20
PETN	4.31	ug/L			4.00	108	73 --- 127		20
RDX	1.89	ug/L			2.00	94	68 --- 130		20
Tetryl	1.96	ug/L			2.00	98	64 --- 128		20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Water

Analytical Run #:	126456	Analysis Date:	06/01/2016	Prep Batch #:	57390	Matrix:	LIQUID
CTLab #:	726967	Analysis Time:	15:23	Prep Date/Time:	05/23/2016 08:00	Method:	SW8330B
Parent Sample #:		Analyst:	RED	Prep Analyst:	SRT		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,3,5-Trinitrobenzene	0.019	ug/L		U	0		0.040		
1,3-Dinitrobenzene	0.015	ug/L		U	0		0.040		
2,4,6-Trinitrotoluene	0.026	ug/L		U	0		0.080		
2,4-Dinitrotoluene	0.011	ug/L		U	0		0.020		
2,6-Dinitrotoluene	0.011	ug/L		U	0		0.020		
2-Amino-4,6-dinitrotoluene	0.014	ug/L		U	0		0.040		
2-Nitrotoluene	0.025	ug/L		U	0		0.080		
3,5-Dinitroaniline	0.017	ug/L		U	0		0.040		
3-Nitrotoluene	0.012	ug/L		U	0		0.020		
4-Amino-2,6-dinitrotoluene	0.016	ug/L		U	0		0.040		
4-Nitrotoluene	0.021	ug/L		U	0		0.040		
HMX	0.020	ug/L		U	0		0.040		
Nitrobenzene	0.019	ug/L		U	0		0.040		
Nitroglycerin	0.05	ug/L		U	0		0.16		
PETN	0.07	ug/L		U	0		0.16		
RDX	0.017	ug/L		U	0		0.040		
Tetryl	0.025	ug/L		U	0		0.080		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Water

Analytical Run #:	126465	Analysis Date:	05/26/2016	Prep Batch #:	57419	Matrix:	LIQUID
CTLab #:	727676	Analysis Time:	14:31	Prep Date/Time:	05/25/2016 00:00	Method:	SW8270
Parent Sample #:		Analyst:	RPN	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,4-Dichlorobenzene	0.0149	mg/L			0.0200	74	29 --- 112		20
2,4,5-Trichlorophenol	0.0174	mg/L			0.0200	87	53 --- 123		20
2,4,6-Trichlorophenol	0.0175	mg/L			0.0200	88	50 --- 125		20
2,4-Dinitrotoluene	0.0184	mg/L			0.0200	92	57 --- 128		20
2-Methylphenol	0.0145	mg/L			0.0200	72	30 --- 117		20
3 & 4-Methylphenol	0.0142	mg/L			0.0200	71	29 --- 110		20
Hexachlorobenzene	0.0179	mg/L			0.0200	90	53 --- 125		20
Hexachlorobutadiene	0.0151	mg/L			0.0200	76	22 --- 124		20
Hexachloroethane	0.0145	mg/L			0.0200	72	21 --- 115		20
Nitrobenzene	0.0154	mg/L			0.0200	77	45 --- 121		20
Pentachlorophenol	0.0192	mg/L			0.0200	96	35 --- 138		20
Pyridine	0.00852	mg/L			0.0200	43	0 --- 106		20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Water

Analytical Run #:	126465	Analysis Date:	05/26/2016	Prep Batch #:	57419	Matrix:	LIQUID
CTLab #:	727675	Analysis Time:	13:51	Prep Date/Time:	05/25/2016 00:00	Method:	SW8270
Parent Sample #:		Analyst:	RPN	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,4-Dichlorobenzene	0.00019	mg/L		U	0		00050		
2,4,5-Trichlorophenol	0.0011	mg/L		U	0		.0025		
2,4,6-Trichlorophenol	0.0010	mg/L		U	0		.0025		
2,4-Dinitrotoluene	0.00021	mg/L		U	0		00050		
2-Methylphenol	0.00086	mg/L		U	0		02500		
3 & 4-Methylphenol	0.0014	mg/L		U	0		.0045		
Hexachlorobenzene	0.00027	mg/L		U	0		00050		
Hexachlorobutadiene	0.00018	mg/L		U	0		00050		
Hexachloroethane	0.00022	mg/L		U	0		00050		
Nitrobenzene	0.00016	mg/L		U	0		00050		
Pentachlorophenol	0.0011	mg/L		U	0		.0025		
Pyridine	0.00062	mg/L		U	0		00200		

Matrix Spike Water

Analytical Run #:	126465	Analysis Date:	05/26/2016	Prep Batch #:	57419	Matrix:	TCLP
CTLab #:	727678	Analysis Time:	15:31	Prep Date/Time:	05/25/2016 00:00	Method:	SW8270
Parent Sample #:	725919	Analyst:	RPN	Prep Analyst:	AJZ		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,4-Dichlorobenzene	0.133	mg/L	BDL		0.200	66	29 --- 112		
2,4,5-Trichlorophenol	0.172	mg/L	BDL		0.200	86	53 --- 123		
2,4,6-Trichlorophenol	0.169	mg/L	BDL		0.200	84	50 --- 125		
2,4-Dinitrotoluene	0.184	mg/L	BDL		0.200	92	57 --- 128		
2-Methylphenol	0.137	mg/L	BDL		0.200	68	30 --- 117		
3 & 4-Methylphenol	0.131	mg/L	BDL		0.200	66	29 --- 110		
Hexachlorobenzene	0.179	mg/L	BDL		0.200	90	53 --- 125		
Hexachlorobutadiene	0.145	mg/L	BDL		0.200	72	22 --- 124		
Hexachloroethane	0.132	mg/L	BDL		0.200	66	21 --- 115		
Nitrobenzene	0.147	mg/L	BDL		0.200	74	45 --- 121		
Pentachlorophenol	0.206	mg/L	BDL		0.200	103	35 --- 138		
Pyridine	0.0209	mg/L	BDL		0.200	10	0 --- 106		
Surr: 2,4,6-Tribromophenol	92.9	% Recovery			100	92.9	43 --- 140		
Surr: 2-Fluorobiphenyl	77.6	% Recovery			100	77.6	44 --- 119		
Surr: 2-Fluorophenol	44.7	% Recovery			100	44.7	19 --- 119		
Surr: Nitrobenzene-d5	73.7	% Recovery			100	73.7	44 --- 120		
Surr: Phenol-d5	33.5	% Recovery			100	33.5	1 --- 114		
Surr: Terphenyl-d14	93.1	% Recovery			100	93.1	50 --- 134		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Lab Control Spike Soil

Analytical Run #:	126534	Analysis Date:	06/02/2016	Prep Batch #:	57393	Matrix:	SOLID
CTLab #:	726976	Analysis Time:	13:37	Prep Date/Time:	05/26/2016 11:30	Method:	SW8330B
Parent Sample #:		Analyst:	RED	Prep Analyst:	RED		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,3,5-Trinitrobenzene	1.89	mg/kg			2.00	94	80 --- 116		
1,3-Dinitrobenzene	2.04	mg/kg			2.00	102	74 --- 120		
2,4,6-Trinitrotoluene	2.07	mg/kg			2.00	104	71 --- 120		
2,4-Dinitrotoluene	1.76	mg/kg			2.00	88	75 --- 121		
2,6-Dinitrotoluene	2.30	mg/kg			2.00	115	79 --- 117		
2-Amino-4,6-dinitrotoluene	1.86	mg/kg			2.00	93	71 --- 123		
2-Nitrotoluene	1.95	mg/kg			2.00	98	70 --- 124		
3,5-Dinitroaniline	2.07	mg/kg			2.00	104	86 --- 118		
3-Nitrotoluene	2.01	mg/kg			2.00	100	67 --- 129		
4-Amino-2,6-dinitrotoluene	2.05	mg/kg			2.00	102	64 --- 127		
4-Nitrotoluene	1.99	mg/kg			2.00	100	71 --- 124		
HMX	2.00	mg/kg			2.00	100	74 --- 124		
Nitrobenzene	1.66	mg/kg			2.00	83	67 --- 129		
Nitroglycerin	4.26	mg/kg			4.00	106	73 --- 124		
PETN	4.38	mg/kg			4.00	110	72 --- 128		
RDX	1.95	mg/kg			2.00	98	67 --- 129		
Tetryl	2.10	mg/kg			2.00	105	68 --- 135		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Method Blank Soil

Analytical Run #:	126534	Analysis Date:	06/02/2016	Prep Batch #:	57393	Matrix:	SOLID
CTLab #:	726975	Analysis Time:	13:18	Prep Date/Time:	05/26/2016 11:30	Method:	SW8330B
Parent Sample #:		Analyst:	RED	Prep Analyst:	RED		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,3,5-Trinitrobenzene	0.13	mg/kg		U	0		0.25		
1,3-Dinitrobenzene	0.08	mg/kg		U	0		0.15		
2,4,6-Trinitrotoluene	0.09	mg/kg		U	0		0.25		
2,4-Dinitrotoluene	0.08	mg/kg		U	0		0.15		
2,6-Dinitrotoluene	0.07	mg/kg		U	0		0.15		
2-Amino-4,6-dinitrotoluene	0.09	mg/kg		U	0		0.15		
2-Nitrotoluene	0.09	mg/kg		U	0		0.15		
3,5-Dinitroaniline	0.09	mg/kg		U	0		0.30		
3-Nitrotoluene	0.11	mg/kg		U	0		0.25		
4-Amino-2,6-dinitrotoluene	0.08	mg/kg		U	0		0.15		
4-Nitrotoluene	0.10	mg/kg		U	0		0.25		
HMX	0.12	mg/kg		U	0		0.25		
Nitrobenzene	0.10	mg/kg		U	0		0.25		
Nitroglycerin	0.5	mg/kg		U	0		1.0		
PETN	0.6	mg/kg		U	0		1.0		
RDX	0.14	mg/kg		U	0		0.25		
Tetryl	0.09	mg/kg		U	0		0.25		

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Duplicate Soil

Analytical Run #:	126534	Analysis Date:	06/02/2016	Prep Batch #:	57393	Matrix:	SOIL
CTLab #:	726978	Analysis Time:	15:23	Prep Date/Time:	05/26/2016 11:30	Method:	SW8330B
Parent Sample #:	726977	Analyst:	RED	Prep Analyst:	RED		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,2-Dinitrobenzene	106	% Recovery			100	106	78 --- 119		
1,3,5-Trinitrobenzene	1.55	mg/kg	BDL		2.00	78	80 --- 116	3	20
1,3-Dinitrobenzene	1.82	mg/kg	BDL		2.00	91	73 --- 119	0	20
2,4,6-Trinitrotoluene	1.83	mg/kg	BDL		2.00	92	71 --- 120	4	20
2,4-Dinitrotoluene	1.59	mg/kg	BDL		2.00	80	75 --- 121	5	20
2,6-Dinitrotoluene	2.12	mg/kg	BDL		2.00	106	79 --- 117	10	20
2-Amino-4,6-dinitrotoluene	1.61	mg/kg	BDL		2.00	80	71 --- 123	5	20
2-Nitrotoluene	1.76	mg/kg	BDL		2.00	88	70 --- 124	4	20
3,5-Dinitroaniline	1.72	mg/kg	BDL		2.00	86	86 --- 118	0	20
3-Nitrotoluene	1.77	mg/kg	BDL		2.00	88	67 --- 129	3	20
4-Amino-2,6-dinitrotoluene	1.72	mg/kg	BDL		2.00	86	64 --- 127	3	20
4-Nitrotoluene	1.86	mg/kg	BDL		2.00	93	71 --- 124	2	20
HMX	2.00	mg/kg	BDL		2.00	100	74 --- 124	2	20
Nitrobenzene	1.48	mg/kg	BDL		2.00	74	67 --- 129	0	20
Nitroglycerin	3.85	mg/kg	BDL		4.00	96	73 --- 124	6	20
PETN	3.54	mg/kg	BDL		4.00	88	72 --- 128	1	20
RDX	1.57	mg/kg	BDL		2.00	78	67 --- 129	3	20
Tetryl	1.60	mg/kg	BDL		2.00	80	68 --- 135	4	20

LEIDOS **Project Name: FW SEWERS EE/CA (LL2)**

SDG #: 119145 **Folder #: 119145** **Project Number:**

Matrix Spike Soil

Analytical Run #:	126534	Analysis Date:	06/02/2016	Prep Batch #:	57393	Matrix:	SOIL
CTLab #:	726977	Analysis Time:	14:50	Prep Date/Time:	05/26/2016 11:30	Method:	SW8330B
Parent Sample #:	725918	Analyst:	RED	Prep Analyst:	RED		

Analyte	QC sample result	Units	Parent sample result	Qualifier(s)	Spike Amount Added	% Recovery	Control Limits	RPD	RPD Limit
1,2-Dinitrobenzene	108	% Recovery			100	108	78 --- 119		
1,3,5-Trinitrobenzene	1.50	mg/kg	BDL		1.98	76	80 --- 116		
1,3-Dinitrobenzene	1.82	mg/kg	BDL		1.98	92	73 --- 119		
2,4,6-Trinitrotoluene	1.74	mg/kg	BDL		1.98	88	71 --- 120		
2,4-Dinitrotoluene	1.50	mg/kg	BDL		1.98	76	75 --- 121		
2,6-Dinitrotoluene	1.91	mg/kg	BDL		1.98	96	79 --- 117		
2-Amino-4,6-dinitrotoluene	1.52	mg/kg	BDL		1.98	77	71 --- 123		
2-Nitrotoluene	1.68	mg/kg	BDL		1.98	85	70 --- 124		
3,5-Dinitroaniline	1.71	mg/kg	BDL		1.98	86	86 --- 118		
3-Nitrotoluene	1.71	mg/kg	BDL		1.98	86	67 --- 129		
4-Amino-2,6-dinitrotoluene	1.65	mg/kg	BDL		1.98	83	64 --- 127		
4-Nitrotoluene	1.89	mg/kg	BDL		1.98	95	71 --- 124		
HMX	1.94	mg/kg	BDL		1.98	98	74 --- 124		
Nitrobenzene	1.48	mg/kg	BDL		1.98	75	67 --- 129		
Nitroglycerin	3.59	mg/kg	BDL		3.97	90	73 --- 124		
PETN	3.48	mg/kg	BDL		3.97	88	72 --- 128		
RDX	1.51	mg/kg	BDL		1.98	76	67 --- 129		
Tetryl	1.66	mg/kg	BDL		1.98	84	68 --- 135		

CT LABORATORIES
delivering more than data from your environmental analyses

Sample Condition Report

Folder #: 119145
Client: LEIDOS

Print Date / Time: 05/19/2016 15:17
Received Date / Time / By: 05/19/2016 1043 CHB

Project Name: RVAAP
Project Phase:

Log-In Date / Time / By: 05/19/2016 1445 BNA
Project #: PM: ETK

Coolers: 3221
Custody Seals Present : **Y**

Temperature: 1.8 C On Ice: **Y**
COC Present:? **Y** Complete? **Y**

Seal Intact? **Y**
Ship Method: UPS NEXT DAY AIR
Adequate Packaging: **Y**

Numbers: SIGNED AND DATED
Tracking Number: 1Z76449F0191192253
Temp Blank Enclosed? **Y**

Notes: SAMPLES RECEIVED IN GOOD CONDITION INTACT ON ICE WITH CUSTODY SEALS SIGNED AND DATED

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
725918 PBA13-IDW-2541-WS				
	SOLIDS	1	/	%SOL,pH,FLASH
	Total # of Containers of Type (*SOLIDS*) = 1			
725918 PBA13-IDW-2541-WS				
	UNPRES GL	1	/	PCB
	Total # of Containers of Type (*UNPRES GL*) = 1			

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
725919 PBA13-IDW-2541-WS				
	AMBER GL	1	/	8270,PEST,HERB
	Total # of Containers of Type (*AMBER GL*) = 1			
725919 PBA13-IDW-2541-WS				
	SOLIDS	1	/	HG,ICP
	Total # of Containers of Type (*SOLIDS*) = 1			
725919 PBA13-IDW-2541-WS				
	JAR GL	1	/	VOC
	Total # of Containers of Type (*JAR GL*) = 1			

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests
725920 PBA13-IDW-2542-WW				
	NAOH PL	1	/	CYN
	Total # of Containers of Type (*NAOH PL*) = 1			
725920 PBA13-IDW-2542-WW				
	AMBER GL	1	/	EXPL,PCB
	AMBER GL	1	/	EXPL,PCB

	AMBER GL	1	/	EXPL,PCB
	AMBER GL	1	/	EXPL,PCB
	AMBER GL	1	/	EXPL,PCB
	AMBER GL	1	/	EXPL,PCB
	AMBER GL	1	/	EXPL,PCB
	Total # of Containers of Type	**(*AMBER GL*) = 7**		

725920 PBA13-IDW-2542-WW

	UNPRES PL	1	/	FLASH,pH
	Total # of Containers of Type	**(*UNPRES PL*) = 1**		

725920 PBA13-IDW-2542-WW

	NAOH W/ZNAC	1	/	SLFD
	Total # of Containers of Type	**(*NAOH W/ZNAC*) = 1**		

Sample ID / Description	Container Type	Cond. Code	pH OK?/Filtered?	Tests

---

725921 PBA13-IDW-2542-WW

	AMBER GL	1	/	8270,PEST,HERB
	AMBER GL	1	/	8270,PEST,HERB
	AMBER GL	1	/	8270,PEST,HERB
	AMBER GL	1	/	8270,PEST,HERB
	AMBER GL	1	/	8270,PEST,HERB
	AMBER GL	1	/	8270,PEST,HERB
	Total # of Containers of Type	**(*AMBER GL*) = 6**		

725921 PBA13-IDW-2542-WW

	HNO3	1	/	HG,ICP
	Total # of Containers of Type	**(*HNO3*) = 1**		

725921 PBA13-IDW-2542-WW

	VOA	1	/	VOC
	VOA	1	/	VOC
	VOA	1	/	VOC
	Total # of Containers of Type	**(*VOA*) = 3**		

Condition Code	*Condition Description*
1	Sample Received OK

119145

leidos

Chain of Custody Record

Leidos, Inc.

COC No.: FWS-EE/CA-002

Page 1 of 1 Date: 5/18/16

Name: Leidos
Address: 8866 Commons Blvd. Twinsburg, OH 44087
Phone Number: 330-405-5802
Project Manager: ~~Vasu Paterson~~ JED THOMAS FWS EWERS EE/CA
Project Name: ~~PBA13 Sediment and Surface Water Sampling at LL1-3~~ (LL2)
Job/P.O. #: ~~212080.00.08.90.302~~ PO:P010183168
Sampler (Signature) RSprinzl (Printed Name) RichSprinzl

Laboratory Name:
CT Labs
Address: 1230 Lange Court
Baraboo, WI 53913
Phone: 608-356-2760
Fax:
Contact: Eric Korthals

Requested Parameters

Laboratory No.	Field Sample #	Location ID	Depth	Date	Time	Matrix	TCLP VOCs (A1) S	TCLP Pest/Herb/Metals/SVOC/pH/Ignitability/Sulfide/cyanide/Wet Chem (A 4,3,9,2) S	PCBs (A5) S	TCLP VOCs (A1) L	TCLP SVOC/Pest/PCB/Herb L	TCLP Metal (A9) L	Total Cyanide L	Explosives (A7) L	pH/Ignitability/~~Sulfide~~ L	Sulfide							No. of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
PBA13-IDW-2541-WS		IDW	NA	5/18/16	1225	S	1	1	1									725918/919					3	1/3 full drum 725918/725919
PBA13-IDW-2542-WW		IDW	NA	5/18/16	1340	L				3	2	1	1	2	1	1		725920/921					11	15 gal in drum 725920/725921

RS 5/18/16

Relinquished by	Date	Received by	Date
Signature: RSprinzl	5/18/16	Signature	
Printed Name: RichSprinzl	Time: 1420	Printed Name	Time
Company: LEIDOS		Company	
Relinquished by	Date	Received by	Date
Signature		Signature: [signature]	5-19-16
	Time	Printed Name	Time: 1445
		Company	

Subtotal Number of Containers: 14
Total 14

Notes:
A. Cool 4°C
B. HCl to pH<2, Cool 4°C
C. HNO3 to pH<2

Methods:
1.) SW 846 8260
2.) SW 846 8270D
3.) SW 846 8151A
4.) SW 846 8081B
5.) SW 846 8082A
6.) SW 846 6020A/7470A
7.) SW 846 8330A
8.) EPA 600
9.) SW 846 6010C

*TCLP Pest/Herb/Metals/SVOC/pH/Ignitability

*10 DAY RUSH TAT FOR COMPLETE DATA PACKAGE

VOC = volatile organic compound
SVOC = semi-volatile organic compound

L = Liquid matrix
S = Soil/solid matrix

Shipment Method: ~~Courier~~ UPS
1Z76449F0191192253

Folder #: 119145
Company: LEIDOS
Project: RVAAP
Logged By: JLS PM: ET

Cooler Receipt Form

Present (YES) NO

Temperature 1.8

Gun # 10

Seals CHB

Date 5/19/16 Time 10:43

Cooler #: 3221

HEATHER ADAMS
330.5738571
LEIDOS
8866 COMMONS BLVD
TWINSBURG OH 44087

50 LBS

1 OF 1

SHIP TO:
ERIC KORTHALS
608-356-2760
CT LABS
1230 LANGE COURT
BARABOO WI 53913-3109

WI 539 0-10

UPS NEXT DAY AIR 1

TRACKING #: 1Z 764 49F 01 9119 2253

CUSTODY SEAL
DATE 5/19/16
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE 5/19/16
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

WASTE PROFILE FORMS

US ecology

Profile Tracking # _____

WASTE PROFILE FORM

For assistance in completing this document or for additional information on service offerings, please visit our website at www.usecology.com, or call 800-592-5489.

US Ecology will choose the appropriate facility and method of waste management for your waste from the technologies offered at each operation.

If you wish to direct this waste to a specific facility(s) or treatment technology please indicate here:

Waste Common Name: IDW Soil cuttings

Section 1 – Generator & Customer Information

Generator EPA ID # OH5210020736
NAICS/SIC Code
Generator Former Ravenna Army Ammunition Plant
Facility Address 8451 State Route 5
City Ravenna State Ohio Zip 44266
24-hour Emergency Response Number
1-800-275-6629
Mailing Address 1438 State Route 534 SW
City Newton Falls State Ohio Zip 44444
Generator Contact Katie Tait
Title Environmental Specialist 2
Phone 614-336-6136 Fax
E-mail kathryn.s.tait.nfg@mail.mil

Internal Use Only: EQ Division
EQ Customer No.
Invoicing Company
Address
City State Zip
Country
Invoicing Contact
Phone Fax
Technical Contact
Phone Fax
Cell Phone
E-mail

Section 2 – Shipping & Packaging Information

2.1) Shipping Volume & Frequency:
a) Volume of Waste to be Shipped: 55 gallon drum
b) Frequency: ☒ One time ☐ Month ☐ Year ☐ Other:

2.2) DOT Information
a) Is this a U.S. Department of Transportation (USDOT) Hazardous Material? ☐ Yes ☒ No
b) If "Yes", indicate the proper shipping name per 49CFR 172.101 Hazardous Materials Table:

Section 3 – Special Properties

3.1) Color brown
3.2) Odor ☒ None ☐ Ammonia ☐ Amines ☐ Mercaptans ☐ Sulfur ☐ Organic Acid ☐ Amines/Ammonia ☐ Other:
3.3) Consistency at 70°F: ☒ Solid ☐ Dust/Powder ☐ Debris ☐ Sludge ☐ Liquid ☐ Gas/Aerosol ☐ Varies
3.4) What is the pH? ☐ ≤2 ☐ 2.1-4.9 ☒ 5 – 10 ☐ 10.1 – 12.4 ☐ ≥12.5 ☐ N/A

3.5) What is the flash point? ☐ <90°F ☐ 90-139°F ☒ 140-199°F ☐ >200°F ☐ N/A

3.6) Does this waste exhibit any of the following properties? **(check all that apply)**

☒ **None**	☐ Free Liquids	☐ Metal Fines	☐ Water Reactive	☐ Biohazard
☐ Shock Sensitive	☐ Oily Residue	☐ Dioxins	☐ Furans	☐ Aluminum
☐ Asbestos – non-friable	☐ Asbestos – friable	☐ Other Radioactive	☐ Air Reactive	☐ Isocyanates
☐ Biodegradable Sorbents	☐ Pyrophoric	☐ Reactive Sulfide	☐ Reactive Cyanide	☐ Explosives
☐ Temperature Controlled Organic Peroxide		☐ NORM	☐ TENORM	

Section 4 – Composition and Generating Process

4.1) Provide a physical and chemical composition of the waste (e.g. soil, water, PPE, debris, etc.). List the percent ranges of the material, either estimated or known.

soil 0 to 100 % to %

to % to %

to % to %

4.2) Provide a description of the generating process. *Remediation & IDW Sites: please provide a site history.*
The facility, previously known as RVAAP, was formerly used as a load, assemble, and pack facility for munitions production. The soil cuttings were generated from sampling during an environmental investigation.

4.3) Are there any known previous handling or treatment issues involving this waste? ☐ Yes* ☒ No
*If yes, describe:

Section 5 – Hazardous Wastes

As determined by 40 CFR, Part 261 and State Rules: **Please list applicable waste code(s):**

5.1) Is this waste exempted from RCRA? ☐ Yes, please provide exemption: ☒ No

5.2) Is this an EPA RCRA listed hazardous waste (F, K, P or U)? ☐ Yes: ☒ No
a) For F006–F009, F012, does this come from a generator that conducts a cyanide plating process? ☐ Yes ☒ No

5.3) Is this an EPA RCRA characteristic hazardous waste (D001-D043)? ☐ Yes: ☒ No

5.4) Do any State Specific Hazardous Waste Codes apply? ☐ Yes: ☒ No

If you answered 'no' to 5.2, 5.3 and 5.4, please proceed to Section 6.

5.5) EPA Source Code: EPA Form Code:

5.6) Waste Code Determination Is Based On: ☐ Generator Knowledge ☐ Analysis ☐ MSDS
Analysis and/or MSDS may be required for review and approval for hazardous and non-hazardous waste streams.

5.7) Does this waste exceed Land Disposal Restriction levels? ☐ Yes ☐ No

a) Is this stream a wastewater (WW) or non-wastewater (NWW)? ☐ WW ☐ NWW
b) If this waste stream is greater than 50% soil, does it meet the alternative soil treatment standards of 40CFR 268.49? ☐ Yes ☐ No
c) Does this waste contain greater than 50% debris, by volume? (Debris is greater than 2.5 inches in size.) ☐ Yes ☐ No
d) If the debris is larger than 3 ft x 3 ft x 3 ft, please provide the approximate dimensions and weight:

5.8) If this is a characteristic hazardous waste, does it contain Underlying Hazardous Constituents? ☐ Yes* ☐ No

*If Yes, please list:

For a complete list of UHC constituents, please refer to 40 CFR 268.48

SAMPLE

Section 6 – Non-Hazardous Wastes

Please list applicable waste code(s):

6.1) Do any State Specific Non-Hazardous Waste Codes apply? ☐ Yes ☒ No

6.2) Is this a Universal (UNIV) waste or a Recyclable Good (RG)? ☐ UNIV ☐ RG ☒ N/A

6.3) Is this waste used oil as defined by 40 CFR Part 279? ☐ Yes ☒ No

a) If yes, is the total halogen content of the used oil waste stream greater than 1,000 ppm? ☐ Yes ☐ No

b) If yes, what is the source of the halogen content?

- ☐ This is a metalworking oil/fluid containing chlorinated paraffins.
- ☐ This is used oil contaminated with chlorofluorocarbons from refrigeration units.
- ☐ This oil contains halogenated solvents. List specific solvents:
- ☐ Other, describe:

Section 7 – TSCA Information

7.1) What is the concentration of PCBs in the waste? ☐ None ☒ 0-49 ppm ☐ 50-499 ppm ☐ 500+ ppm

7.2) Does the waste contain PCB contamination from a source with a concentration ≥ 50 ppm? ☐ Yes ☒ No ☐ Unknown

If you answered "none" or "0-49 ppm"' to 7.1 and "no" to 7.2, please proceed to Section 8.

7.3) Has this waste been processed into a non-liquid form? ☐ Yes* ☐ No

*If yes, what was the concentration of PCBs prior to processing? ☐ 0-499 ppm ☐ 500+ ppm

7.4) Is this non-liquid PCB waste in the form of soil, rags, debris, or other contaminated media? ☐ Yes ☐ No

7.5) Are you a PCB capacitor manufacturer or a PCB equipment manufacturer? ☐ Yes ☐ No

7.6) Has the PCB Article (e.g., transformer, hydraulic machine, PCB-contaminated electrical equipment) been drained/flushed of all PCBs and decontaminated in accordance with 40 CFR 761.60(b)? ☐ N/A ☐ Yes ☐ No

Section 8 – Clean Air Act Information

8.1) Is this waste subject to regulation under 40 CFR, Part 264, Subpart CC (VOC > 500 ppmw)? ☐ Yes ☒ No

8.2) Is this waste subject to regulation under 40 CFR, Part 63, Subpart DD (VOHAP > 500 ppmw)? ☐ Yes ☒ No

8.3) Is the site, or waste, subject to any other NESHAP/MACT standard(s)? ☐ Yes* ☒ No

*If Yes this document serves as notification that this waste contains chemicals , required to be managed in accordance with Part ☐ 61 ☐ 62 ☐ 63 Subpart of NESHAP/MACT standards.

8.4) Does this waste stream contain Benzene? ☐ Yes ☒ No

If you answered "no" to 8.4, please proceed to Section 9.

8.5) Does the waste stream come from a facility subject to 40 CFR 61, Subpart FF (Benzene NESHAP)?

☐ Yes, please provide the SIC/NAICS code: ☐ No

If you answered "no" to questions 8.5, please proceed to Section 9.

8.6) Does your facility manage the waste subject to Benzene NESHAP in a manner other than shipping off-site?

☐ Yes, please specify: ☐ No

8.7) Is the generating source of this waste a facility with Total Annual Benzene (TAB) ≥10 Mg/year? ☐ Yes ☐ No

8.8) Does the waste contain >10% water? ☐ Yes ☐ No

8.9) What is the TAB quantity for your facility? Mg/Year

8.10) What is the total Benzene concentration in your waste? Percent or ppmw.

Supporting analysis must be attached. Do not use TCLP analytical results. Acceptable laboratory methods include 8020, 8240, 8260, 602 and 624.

Section 9 – Certification

I certify that all information (including attachments) is complete and factual and is an accurate representation of the known and suspected hazards, pertaining to the waste described herein. I authorize EQ's personnel to add supplemental information to the waste approval file, provided I am contacted and give verbal permission. I authorize EQ's personnel to obtain a sample from any waste shipment for purposes of verification and confirmation. I agree that, if EQ approves the waste described herein, all such wastes that are transported, delivered, or tendered to EQ by Generator or on Generator's behalf shall be subject to, and Generator shall be bound by, the attached Standard Terms and Conditions.

If I am an agent acting on behalf of the generator, I also certify that I have permission to sign any and all waste characterization paperwork on the generator's behalf and that I can produce such certification in writing upon request.

Generator Signature Kathryn S Tait Printed Name Kathryn S Tait

Company Ohio Natl Guard Title Envntl. Specialist 2 Date 7/6/2016

VRE

STANDARD TERMS AND CONDITIONS

The Agreement between the Customer and EQ – The Environmental Quality Company and/or its member companies (hereinafter "EQ") related to or associated with Delivered Waste, as herein defined, shall be governed by the following Standard Terms and Conditions in addition to the terms and conditions contained in any Waste Profile Form, Customer Approval Quote Confirmation, Generator Approval Notification, Notice of Waste Approval Expiration, and/or Credit Agreement associated with such Delivered Waste.

The Customer may use its standard forms (such as purchase orders, acknowledgments of orders, and invoices) to administer its dealings under this Agreement for convenience purposes, but all provisions thereof in conflict with these terms and conditions shall be deemed stricken.

Definitions

The following definitions shall apply for purposes of this Agreement:

"Acceptable Waste" shall mean any hazardous waste, as defined under applicable State or federal law, determined by EQ as acceptable for treatment and/or disposal in accordance with this Agreement.

"Delivered Wastes" shall mean all wastes (i) which are transported, delivered, or tendered to EQ by the Customer; (ii) which the Customer has arranged for the transport, delivery or tender to EQ; or (iii)) which are transported, delivered, or tendered to EQ under a Credit Agreement between the Customer and EQ.

"Non-Conforming Wastes" shall mean wastes that (a) are not in accordance in all material respects with the warranties, descriptions, specifications or limitations stated in the Waste Profile Form and this Agreement; (b) have constituents or components of a type or concentration not specifically identified in the Waste Profile Form (i) which increase the nature or extent of the hazard and risk undertaken by EQ in treating and/or disposing of the waste, or (ii) for whose treatment and/or disposal a Waste Management Facility is not designed or permitted, or (iii) which increase the cost of treatment and/or disposal of waste beyond that specified in EQ's price quote; or (c) are not properly packaged, labeled, described, or placarded, or otherwise not in compliance with United States Department of Transportation and United States Environmental Protection Agency regulations.

Control of Operations.

EQ shall have sole control over all aspects of the operation of any treatment and/or disposal facility of EQ receiving Delivered Wastes under this Agreement (hereinafter, "Waste Management Facility"), including, without limitation, maintaining EQ's desired volume of Acceptable Wastes being delivered to any Waste Management Facility by the Customer or any other person or entity.

Identification of Waste.

For each waste material to be transported, delivered, or tendered to EQ under this Agreement, the Customer shall provide, or cause to be provided, to EQ a representative sample of the waste material and a completed Waste Profile Form containing a physical and chemical description or analysis of such waste material, which description shall conform with any and all guidelines for waste acceptance provided by EQ. On the basis of EQ's analysis of such representative sample of the waste material and such Waste Profile Form, EQ will determine whether such wastes are Acceptable Wastes. EQ does not make any guarantee that it will handle any waste material or any particular quantity or type of waste material, and EQ reserves the right to the decline to transport, treat and/or dispose of waste material. The Customer shall promptly furnish to EQ any information regarding known, suspected or planned changes in the composition of the waste material. Further, the Customer shall promptly inform EQ of any change in the characteristic or condition of the waste material which becomes known to the Customer subsequent to the date of the Waste Profile Form.

Non-Conforming Wastes.

In the event that EQ at any time discovers that any Delivered Waste is Non-Conforming Waste, EQ may reject or revoke its acceptance of the Non-Conforming Waste. The Customer shall have seven (7) days to direct an alternative lawful manner of disposition of the waste, unless it is necessary by reason of law or otherwise to move the Non-Conforming Waste prior to expiration of the seven (7) day period. If the Customer does not direct an alternative disposal, at its option, EQ may return any such Non-Conforming Wastes to the Customer, and the Customer shall pay or reimburse EQ for all costs and expenses incurred by EQ in connection with the receipt, handling, sampling, analyses, transportation and return to the Customer of such Non-Conforming Wastes. If it is impossible or impractical for EQ to return the Non-Conforming Waste to the Customer, the Customer shall reimburse EQ for all costs, of any type or nature whatsoever, incurred by EQ, solely because such Delivered Waste was Non-Conforming Waste (including, but not limited to, all costs associated with any remedial steps necessary, due to the nature of the Non-Conforming Waste, in connection with material with which the Non-Conforming Waste may have been commingled and all expenses and charges for analyzing, handling, locating, preparing for transporting, storing and disposing of any Non-Conforming Waste).

Customer Warranty - Acceptable Wastes.

All Delivered Wastes shall be Acceptable Wastes and shall conform in all material respects to the description and specifications contained in the Waste Profile Form. The information set forth in the Waste Profile Form or any manifest, placard or label associated with any Delivered Wastes, or otherwise represented by the Customer or the generator (if other than the Customer) to EQ, is and shall be true, accurate and complete as of the date of receipt of the involved waste by EQ.

Customer Warranty - Title to Wastes.

Either the Customer or the generator (if other than the Customer) shall hold clear title, free of any all liens, claims, encumbrances, and charges to Delivered Waste until such waste is accepted by EQ.

Customer Warranty - Compliance with Laws.

The Customer shall comply with all applicable federal, state and local environmental statutes, regulations, and other governmental requirements, as well as directives issued by EQ from time to time, governing the transportation, treatment and/or disposal of Acceptable Wastes, including, but not limited to, all packaging, manifesting, containerization, placarding and labeling requirements.

Customer Warranty - Updating Information.

If the Customer receives information that Delivered Waste or other hazardous waste described in the Waste Profile Form, or some component of such waste, presents or may present a hazard or risk to persons, property or the environment which was not disclosed to EQ, or if the Customer or generator (if other than the Customer) has changed the process by which such waste results, the Customer shall promptly report such information to EQ in writing.

Customer Indemnity.

The Customer shall indemnify, defend and hold harmless EQ, and its affiliated or related companies, and all of their respective present or future officers, directors, shareholders, employees and agents from and against any and all losses, damages, liabilities, penalties, fines, forfeitures, demands, claims, causes of action, suits, costs and expenses (including, but not limited to, reasonable costs of defense, settlement, and reasonable attorneys' fees), which may be asserted against any or all of them by any person or any governmental agency, or which any or all of them may hereafter suffer, incur, be responsible for or pay out, as a result of or in connection with bodily injuries (including, but not limited to, death, sickness, disease and emotional or mental distress) to any person (including EQ's employees), damage (including, but not limited to, loss of use) to any property (public or private), or any requirements to conduct or incur expense for investigative, removal or remedial expenses in connection with contamination of or adverse effect on the environment, or any violation or alleged violation of any statues, ordinances, orders, rules or regulations of any governmental entity or agency, caused or arising out of (i) a breach of this Agreement by the Customer, (ii) the failure of any warranty of the Customer to be true, accurate and complete, or (iii) any willful or negligent act or omission of the Customer, or its employees or agents in connection with the performance of this Agreement.

Force Majeure

EQ shall not be liable for any failure to accept, receive, handle, treat, and/or dispose of Delivered Waste due to an act of God, fire, casualty, flood, war, strike, lockout, labor trouble, failure of public utilities, equipment failure, facility shutdown, injunction, accident, epidemic, riot, insurrection, destruction of operation or transportation facilities, the inability to procure materials, equipment, or sufficient personnel or energy in order to meet operational needs without the necessity of allocation, the failure or inability to obtain any governmental approvals or to meet Environmental Requirements (including, but not limited to voluntary or involuntary compliance with any act, exercise, assertion, or requirement of any governmental authority) which may temporarily or permanently prohibit operations of EQ, the Customer, or the Generator, or any other circumstances beyond the control of EQ which prevents or delays performance of any of its obligations under this Agreement.

Governing Laws

This Agreement shall in all respects be governed by and shall be construed in accordance with the laws of the State of Michigan applied to contracts executed and performed wholly within such state.

Bulk Disposal Charges

Quoted bulk disposal charges for solid materials will be billed by the cubic yard, if the waste density is less than 2,000lbs./cubic yard. If waste density is greater than 2,000 lbs./cubic yard, then bulk disposal charges will be billed by the ton, regardless of the approved container.

VALIS

US ecology

Profile Tracking # _____

WASTE PROFILE FORM

For assistance in completing this document or for additional information on service offerings, please visit our website at www.usecology.com, or call 800-592-5489.

US Ecology will choose the appropriate facility and method of waste management for your waste from the technologies offered at each operation.

If you wish to direct this waste to a specific facility(s) or treatment technology please indicate here:

Waste Common Name: IDW wash water

Section 1 – Generator & Customer Information

Generator EPA ID # OH5210020736
NAICS/SIC Code
Generator Former Ravenna Army Ammunition Plant
Facility Address 8451 State Route 5
City Ravenna State Ohio Zip 44266
24-hour Emergency Response Number
1-800-275-6629
Mailing Address 1438 State Route 534 SW
City Newton Falls State Ohio Zip 44444
Generator Contact Katie Tait
Title Environmental Specialist 2
Phone 614-336-6136 Fax
E-mail kathryn.s.tait.nfg@mail.mil

Internal Use Only: EQ Division
EQ Customer No.
Invoicing Company
Address
City State Zip
Country
Invoicing Contact
Phone Fax
Technical Contact
Phone Fax
Cell Phone
E-mail

Section 2 – Shipping & Packaging Information

2.1) Shipping Volume & Frequency:
a) Volume of Waste to be Shipped: 55 gallon drum
b) Frequency: ☒ One time ☐ Month ☐ Year ☐ Other:

2.2) DOT Information
a) Is this a U.S. Department of Transportation (USDOT) Hazardous Material? ☐ Yes ☒ No
b) If "Yes", indicate the proper shipping name per 49CFR 172.101 Hazardous Materials Table:

Section 3 – Special Properties

3.1) Color brownish clear

3.2) Odor ☒ None ☐ Ammonia ☐ Amines ☐ Mercaptans ☐ Sulfur ☐ Organic Acid ☐ Amines/Ammonia ☐ Other:

3.3) Consistency at 70°F: ☐ Solid ☐ Dust/Powder ☐ Debris ☐ Sludge ☒ Liquid ☐ Gas/Aerosol ☐ Varies

3.4) What is the pH? ☐ ≤2 ☐ 2.1-4.9 ☒ 5 – 10 ☐ 10.1 – 12.4 ☐ ≥12.5 ☐ N/A

3.5) What is the flash point? ☐ <90°F ☐ 90-139°F ☒ 140-199°F ☐ >200°F ☐ N/A

3.6) Does this waste exhibit any of the following properties? **(check all that apply)**

☒ **None**	☐ Free Liquids	☐ Metal Fines	☐ Water Reactive	☐ Biohazard
☐ Shock Sensitive	☐ Oily Residue	☐ Dioxins	☐ Furans	☐ Aluminum
☐ Asbestos – non-friable	☐ Asbestos – friable	☐ Other Radioactive	☐ Air Reactive	☐ Isocyanates
☐ Biodegradable Sorbents	☐ Pyrophoric	☐ Reactive Sulfide	☐ Reactive Cyanide	☐ Explosives
☐ Temperature Controlled Organic Peroxide		☐ NORM	☐ TENORM	

Section 4 – Composition and Generating Process

4.1) Provide a physical and chemical composition of the waste (e.g. soil, water, PPE, debris, etc.). List the percent ranges of the material, either estimated or known.

Liquid 0 to 95 % to %

Soil 0 to 5 % to %

to % to %

4.2) Provide a description of the generating process. *Remediation & IDW Sites: please provide a site history.*
The facility, previously known as RVAAP, was formerly used as a load, assemble, and pack facility for munitions production. The liquid was generated from decontamination of sampling equipment used during an environmental investigation.

4.3) Are there any known previous handling or treatment issues involving this waste? ☐ Yes* ☒ No
*If yes, describe:

Section 5 – Hazardous Wastes

As determined by 40 CFR, Part 261 and State Rules: **Please list applicable waste code(s):**

5.1) Is this waste exempted from RCRA? ☐ Yes, please provide exemption: ☒ No

5.2) Is this an EPA RCRA listed hazardous waste (F, K, P or U)? ☐ Yes: ☒ No
a) For F006–F009, F012, does this come from a generator that conducts a cyanide plating process? ☐ Yes ☒ No

5.3) Is this an EPA RCRA characteristic hazardous waste (D001-D043)? ☐ Yes: ☒ No

5.4) Do any State Specific Hazardous Waste Codes apply? ☐ Yes: ☒ No

If you answered 'no' to 5.2, 5.3 and 5.4, please proceed to Section 6.

5.5) EPA Source Code: EPA Form Code:

5.6) Waste Code Determination Is Based On: ☐ Generator Knowledge ☐ Analysis ☐ MSDS
Analysis and/or MSDS may be required for review and approval for hazardous and non-hazardous waste streams.

5.7) Does this waste exceed Land Disposal Restriction levels? ☐ Yes ☐ No

a) Is this stream a wastewater (WW) or non-wastewater (NWW)? ☐ WW ☐ NWW
b) If this waste stream is greater than 50% soil, does it meet the alternative soil treatment standards of 40CFR 268.49? ☐ Yes ☐ No
c) Does this waste contain greater than 50% debris, by volume? (Debris is greater than 2.5 inches in size.) ☐ Yes ☐ No
d) If the debris is larger than 3 ft x 3 ft x 3 ft, please provide the approximate dimensions and weight:

5.8) If this is a characteristic hazardous waste, does it contain Underlying Hazardous Constituents? ☐ Yes* ☐ No

*If Yes, please list:

For a complete list of UHC constituents, please refer to 40 CFR 268.48

SAMPLE

Section 6 – Non-Hazardous Wastes

Please list applicable waste code(s):

6.1) Do any State Specific Non-Hazardous Waste Codes apply? ☐ Yes ☒ No

6.2) Is this a Universal (UNIV) waste or a Recyclable Good (RG)? ☐ UNIV ☐ RG ☒ N/A

6.3) Is this waste used oil as defined by 40 CFR Part 279? ☐ Yes ☒ No

a) If yes, is the total halogen content of the used oil waste stream greater than 1,000 ppm? ☐ Yes ☐ No

b) If yes, what is the source of the halogen content?

- ☐ This is a metalworking oil/fluid containing chlorinated paraffins.
- ☐ This is used oil contaminated with chlorofluorocarbons from refrigeration units.
- ☐ This oil contains halogenated solvents. List specific solvents:
- ☐ Other, describe:

Section 7 – TSCA Information

7.1) What is the concentration of PCBs in the waste? ☒ None ☐ 0-49 ppm ☐ 50-499 ppm ☐ 500+ ppm

7.2) Does the waste contain PCB contamination from a source with a concentration ≥ 50 ppm? ☐ Yes ☒ No ☐ Unknown

If you answered "none" or "0-49 ppm"' to 7.1 and "no" to 7.2, please proceed to Section 8.

7.3) Has this waste been processed into a non-liquid form? ☐ Yes* ☐ No

*If yes, what was the concentration of PCBs prior to processing? ☐ 0-499 ppm ☐ 500+ ppm

7.4) Is this non-liquid PCB waste in the form of soil, rags, debris, or other contaminated media? ☐ Yes ☐ No

7.5) Are you a PCB capacitor manufacturer or a PCB equipment manufacturer? ☐ Yes ☐ No

7.6) Has the PCB Article (e.g., transformer, hydraulic machine, PCB-contaminated electrical equipment) been drained/flushed of all PCBs and decontaminated in accordance with 40 CFR 761.60(b)? ☐ N/A ☐ Yes ☐ No

Section 8 – Clean Air Act Information

8.1) Is this waste subject to regulation under 40 CFR, Part 264, Subpart CC (VOC > 500 ppmw)? ☐ Yes ☒ No

8.2) Is this waste subject to regulation under 40 CFR, Part 63, Subpart DD (VOHAP > 500 ppmw)? ☐ Yes ☒ No

8.3) Is the site, or waste, subject to any other NESHAP/MACT standard(s)? ☐ Yes* ☒ No

*If Yes this document serves as notification that this waste contains chemicals , required to be managed in accordance with Part ☐ 61 ☐ 62 ☐ 63 Subpart of NESHAP/MACT standards.

8.4) Does this waste stream contain Benzene? ☐ Yes ☒ No

If you answered "no" to 8.4, please proceed to Section 9.

8.5) Does the waste stream come from a facility subject to 40 CFR 61, Subpart FF (Benzene NESHAP)?

☐ Yes, please provide the SIC/NAICS code: ☐ No

If you answered "no" to questions 8.5, please proceed to Section 9.

8.6) Does your facility manage the waste subject to Benzene NESHAP in a manner other than shipping off-site?

☐ Yes, please specify: ☐ No

8.7) Is the generating source of this waste a facility with Total Annual Benzene (TAB) ≥10 Mg/year? ☐ Yes ☐ No

8.8) Does the waste contain >10% water? ☐ Yes ☐ No

8.9) What is the TAB quantity for your facility? Mg/Year

8.10) What is the total Benzene concentration in your waste? Percent or ppmw.

Supporting analysis must be attached. Do not use TCLP analytical results. Acceptable laboratory methods include 8020, 8240, 8260, 602 and 624.

Section 9 – Certification

I certify that all information (including attachments) is complete and factual and is an accurate representation of the known and suspected hazards, pertaining to the waste described herein. I authorize EQ's personnel to add supplemental information to the waste approval file, provided I am contacted and give verbal permission. I authorize EQ's personnel to obtain a sample from any waste shipment for purposes of verification and confirmation. I agree that, if EQ approves the waste described herein, all such wastes that are transported, delivered, or tendered to EQ by Generator or on Generator's behalf shall be subject to, and Generator shall be bound by, the attached Standard Terms and Conditions.

If I am an agent acting on behalf of the generator, I also certify that I have permission to sign any and all waste characterization paperwork on the generator's behalf and that I can produce such certification in writing upon request.

Generator Signature Kathryn S Tait Printed Name Kathryn S. Tait

Company Ohio Natl Guard Title Envmtl Specialist 2 Date 7/6/2016

VRE

STANDARD TERMS AND CONDITIONS

The Agreement between the Customer and EQ – The Environmental Quality Company and/or its member companies (hereinafter "EQ") related to or associated with Delivered Waste, as herein defined, shall be governed by the following Standard Terms and Conditions in addition to the terms and conditions contained in any Waste Profile Form, Customer Approval Quote Confirmation, Generator Approval Notification, Notice of Waste Approval Expiration, and/or Credit Agreement associated with such Delivered Waste.

The Customer may use its standard forms (such as purchase orders, acknowledgments of orders, and invoices) to administer its dealings under this Agreement for convenience purposes, but all provisions thereof in conflict with these terms and conditions shall be deemed stricken.

Definitions

The following definitions shall apply for purposes of this Agreement:

"Acceptable Waste" shall mean any hazardous waste, as defined under applicable State or federal law, determined by EQ as acceptable for treatment and/or disposal in accordance with this Agreement.

"Delivered Wastes" shall mean all wastes (i) which are transported, delivered, or tendered to EQ by the Customer; (ii) which the Customer has arranged for the transport, delivery or tender to EQ; or (iii)) which are transported, delivered, or tendered to EQ under a Credit Agreement between the Customer and EQ.

"Non-Conforming Wastes" shall mean wastes that (a) are not in accordance in all material respects with the warranties, descriptions, specifications or limitations stated in the Waste Profile Form and this Agreement; (b) have constituents or components of a type or concentration not specifically identified in the Waste Profile Form (i) which increase the nature or extent of the hazard and risk undertaken by EQ in treating and/or disposing of the waste, or (ii) for whose treatment and/or disposal a Waste Management Facility is not designed or permitted, or (iii) which increase the cost of treatment and/or disposal of waste beyond that specified in EQ's price quote; or (c) are not properly packaged, labeled, described, or placarded, or otherwise not in compliance with United States Department of Transportation and United States Environmental Protection Agency regulations.

Control of Operations.

EQ shall have sole control over all aspects of the operation of any treatment and/or disposal facility of EQ receiving Delivered Wastes under this Agreement (hereinafter, "Waste Management Facility"), including, without limitation, maintaining EQ's desired volume of Acceptable Wastes being delivered to any Waste Management Facility by the Customer or any other person or entity.

Identification of Waste.

For each waste material to be transported, delivered, or tendered to EQ under this Agreement, the Customer shall provide, or cause to be provided, to EQ a representative sample of the waste material and a completed Waste Profile Form containing a physical and chemical description or analysis of such waste material, which description shall conform with any and all guidelines for waste acceptance provided by EQ. On the basis of EQ's analysis of such representative sample of the waste material and such Waste Profile Form, EQ will determine whether such wastes are Acceptable Wastes. EQ does not make any guarantee that it will handle any waste material or any particular quantity or type of waste material, and EQ reserves the right to the decline to transport, treat and/or dispose of waste material. The Customer shall promptly furnish to EQ any information regarding known, suspected or planned changes in the composition of the waste material. Further, the Customer shall promptly inform EQ of any change in the characteristic or condition of the waste material which becomes known to the Customer subsequent to the date of the Waste Profile Form.

Non-Conforming Wastes.

In the event that EQ at any time discovers that any Delivered Waste is Non-Conforming Waste, EQ may reject or revoke its acceptance of the Non-Conforming Waste. The Customer shall have seven (7) days to direct an alternative lawful manner of disposition of the waste, unless it is necessary by reason of law or otherwise to move the Non-Conforming Waste prior to expiration of the seven (7) day period. If the Customer does not direct an alternative disposal, at its option, EQ may return any such Non-Conforming Wastes to the Customer, and the Customer shall pay or reimburse EQ for all costs and expenses incurred by EQ in connection with the receipt, handling, sampling, analyses, transportation and return to the Customer of such Non-Conforming Wastes. If it is impossible or impractical for EQ to return the Non-Conforming Waste to the Customer, the Customer shall reimburse EQ for all costs, of any type or nature whatsoever, incurred by EQ, solely because such Delivered Waste was Non-Conforming Waste (including, but not limited to, all costs associated with any remedial steps necessary, due to the nature of the Non-Conforming Waste, in connection with material with which the Non-Conforming Waste may have been commingled and all expenses and charges for analyzing, handling, locating, preparing for transporting, storing and disposing of any Non-Conforming Waste).

Customer Warranty - Acceptable Wastes.

All Delivered Wastes shall be Acceptable Wastes and shall conform in all material respects to the description and specifications contained in the Waste Profile Form. The information set forth in the Waste Profile Form or any manifest, placard or label associated with any Delivered Wastes, or otherwise represented by the Customer or the generator (if other than the Customer) to EQ, is and shall be true, accurate and complete as of the date of receipt of the involved waste by EQ.

Customer Warranty - Title to Wastes.

Either the Customer or the generator (if other than the Customer) shall hold clear title, free of any all liens, claims, encumbrances, and charges to Delivered Waste until such waste is accepted by EQ.

Customer Warranty - Compliance with Laws.

The Customer shall comply with all applicable federal, state and local environmental statutes, regulations, and other governmental requirements, as well as directives issued by EQ from time to time, governing the transportation, treatment and/or disposal of Acceptable Wastes, including, but not limited to, all packaging, manifesting, containerization, placarding and labeling requirements.

Customer Warranty - Updating Information.

If the Customer receives information that Delivered Waste or other hazardous waste described in the Waste Profile Form, or some component of such waste, presents or may present a hazard or risk to persons, property or the environment which was not disclosed to EQ, or if the Customer or generator (if other than the Customer) has changed the process by which such waste results, the Customer shall promptly report such information to EQ in writing.

Customer Indemnity.

The Customer shall indemnify, defend and hold harmless EQ, and its affiliated or related companies, and all of their respective present or future officers, directors, shareholders, employees and agents from and against any and all losses, damages, liabilities, penalties, fines, forfeitures, demands, claims, causes of action, suits, costs and expenses (including, but not limited to, reasonable costs of defense, settlement, and reasonable attorneys' fees), which may be asserted against any or all of them by any person or any governmental agency, or which any or all of them may hereafter suffer, incur, be responsible for or pay out, as a result of or in connection with bodily injuries (including, but not limited to, death, sickness, disease and emotional or mental distress) to any person (including EQ's employees), damage (including, but not limited to, loss of use) to any property (public or private), or any requirements to conduct or incur expense for investigative, removal or remedial expenses in connection with contamination of or adverse effect on the environment, or any violation or alleged violation of any statues, ordinances, orders, rules or regulations of any governmental entity or agency, caused or arising out of (i) a breach of this Agreement by the Customer, (ii) the failure of any warranty of the Customer to be true, accurate and complete, or (iii) any willful or negligent act or omission of the Customer, or its employees or agents in connection with the performance of this Agreement.

Force Majeure

EQ shall not be liable for any failure to accept, receive, handle, treat, and/or dispose of Delivered Waste due to an act of God, fire, casualty, flood, war, strike, lockout, labor trouble, failure of public utilities, equipment failure, facility shutdown, injunction, accident, epidemic, riot, insurrection, destruction of operation or transportation facilities, the inability to procure materials, equipment, or sufficient personnel or energy in order to meet operational needs without the necessity of allocation, the failure or inability to obtain any governmental approvals or to meet Environmental Requirements (including, but not limited to voluntary or involuntary compliance with any act, exercise, assertion, or requirement of any governmental authority) which may temporarily or permanently prohibit operations of EQ, the Customer, or the Generator, or any other circumstances beyond the control of EQ which prevents or delays performance of any of its obligations under this Agreement.

Governing Laws

This Agreement shall in all respects be governed by and shall be construed in accordance with the laws of the State of Michigan applied to contracts executed and performed wholly within such state.

Bulk Disposal Charges

Quoted bulk disposal charges for solid materials will be billed by the cubic yard, if the waste density is less than 2,000lbs./cubic yard. If waste density is greater than 2,000 lbs./cubic yard, then bulk disposal charges will be billed by the ton, regardless of the approved container.


VAIS

WASTE MANIFEST

37435

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number: OH5 210 020 736
2. Page 1 of 2
3. Emergency Response Phone: (800) 851-8061
4. Waste Tracking Number: 104148

5. Generator's Name and Mailing Address: FORMER RAVENNA ARMY AMMUN
1438 STATE ROUTE 534 SW
NEWTON FALLS, OH 44444
Generator's Phone: (614) 336-6136

Generator's Site Address (if different than mailing address):
8451 STATE ROUTE 5
RAVENNA, OH 44266

6. Transporter 1 Company Name: EQ INDUSTRIAL SERVICES
U.S. EPA ID Number: MIK 435 642 742

7. Transporter 2 Company Name: Smith Systems Trans.
U.S. EPA ID Number: NED986382133

8. Designated Facility Name and Site Address: EQIS TRANSFER & PROCESSING
2650 N. SHADELAND AVENUE
INDIANAPOLIS, IN 46219
Facility's Phone: (317) 247-7160
U.S. EPA ID Number: INR 000 125 641

9. Waste Shipping Name and Description	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.
1. NON-REGULATED MATERIAL	001	DM	00117	P
2. NON-REGULATED MATERIAL	001	DM	00242	P
3.				
4.				

13. Special Handling Instructions and Additional Information
1. G164339IND / soil 2. G164351IND / IDW WASH WATER [T:14.06.45040.1]

WO 1027800

14. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Generator's/Offeror's Printed/Typed Name: x Kevin Sedlak
Signature: x [signature]
Month 07 Day 29 Year 16

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Ron Good
Signature: [signature]
Month 07 Day 29 Year 16

Transporter 2 Printed/Typed Name: Vincent G. Roberts
Signature: [signature]
Month 7 Day 31 Year 16

17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

17b. Alternate Facility (or Generator) Manifest Reference Number:
U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator)
Month Day Year

~~HW~~ RG ~~HW~~ RG

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in item 17a
Printed/Typed Name: Steven Bavetz
Signature: [signature]
Month 8 Day 4 Year 16

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

169-BLC-I 6 Rev. 8/06

DESIGNATED FACILITY TO GENERATOR

EQ The Environmental Quality Company 1-800-592-5489 www.eqonline.com

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
OH5 210 020 736	2	104148

24. Generator's Name: Former Ravenna Army Ammunition Plant

25. Transporter 3 Company Name: EQ Industrial Services — U.S. EPA ID Number: MIK435642742

26. Transporter 4 Company Name: S&C Transport — U.S. EPA ID Number: MIKP639984

GENERATOR

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

Transporters Copy

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Tonya Woodward — Signature: [signature] — Month: 08 Day: 01 Year: 16

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Tom Cizy — Signature: [signature] — Month: 8 Day: 31 Year: [illegible]

35. Discrepancy

DESIGNATED FACILITY

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

THIS PAGE INTENTIONALLY LEFT BLANK.

APPENDIX D

Cost Estimates

THIS PAGE INTENTIONALLY LEFT BLANK.

Engineering Evaluation/Cost Analysis (EE/CA) for RVAAP Load Line 2 Functional Area
Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio
Summary of Alternatives

RVAAP Load Line 2 Functional Area		Duration	Non Discounted Cost		
			Soil		
			Capital Cost	O&M Cost	Total
1	Alternative LL2-1: No Action	0	$0	$0	$0
2	Alternative LL2-2: Excavation with Offsite Disposal	<1 yr	$164,482	$0	$164,482

Notes:

1. The base year of comparison and cost data will be CY2016. The discounted rates used to calculate present values will be based on Economic Guidance Memorandum, 16-01, Federal Interest Rates for Corps of Engineers Projects for Fiscal Year 2016.

2. Costs were estimated for comparison purposes only and are believed to be accurate within a range of -30% to +50%. Use of these costs for other purposes, including but not limited to, budgetary or construction cost estimating is not appropriate.

Engineering Evaluation/Cost Analysis (EE/CA) for RVAAP Load Line 2 Functional Area
Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio
Summary of AOC Areas and Volumes

EE/CA Table 4–1. Estimated Sediment Volumes Requiring Removal at Load Line 2 Functional Area

Media	Length (ft)	Width (ft)	Depth (ft bgs)	In-situ		In-situ with Constructability[a]		Ex-situ[a,b]	
				Volume (ft^3)	Volume (yd^3)	Volume (ft^3)	Volume (yd^3)	Volume (ft^3)	Volume (yd^3)
Ditch Sediment [DB22 to LL2sd-657(st)]	325	4	2	2,600	96	2,990	111	3,588	133
Sediment near DB-20 [LL2-250 and LL2sd-615(st)]	4	4	4	64.0	2.4	73.6	2.7	88.3	3.3
Total				2664.0	98.4	3063.6	113.7	3676.3	136.3

[a]Includes 15% constructability factor.
[b]Includes 20% swell factor.
bgs = Below ground surface.

EE/CA Table 4-2 Estimated Piping Removal at Load Line 2 FA

Media	Length of Pipe (ft)	Diameter of Pipe (in)	Weight of Pipe (tons)	Depth to Top of Pipe (ft bgs)	Trench Depth (ft bgs)	Trench Width (ft)
Storm sewer pipe between DB-20 and DB-21	250	10	5.6	4	4-5	3
Storm sewer pipe between DB-21 and DB-22	32	18	2.3	4	4-5	3

bgs = Below ground surface.

Engineering Evaluation/Cost Analysis (EE/CA) for RVAAP Load Line 2 Functional Area
Alternative LL2-2: Excavation with Offsite Disposal
Key Parameters and Assumptions

Key Parameters and Assumptions:

Item	Unit	Value	Notes
Capital Cost			
Characterization Sampling			
Samples	ea	27	Characterization sampling includes 7 soil borings to 2 ft bgs with 3 samples (0-0.5, 0.5-1, 1-2 ft bgs) collected from each boring and 24 total samples including QA/QC samples analyzed for lead. Additionally, 3 composite samples will be collected and analyzed for TCLP VOCs, SVOCs, Metals, RCRA Characteristics, and Paint Filter.
Sampling Labor	hrs	10	Assumes 1 sampling technician at 10 hours to collect and ship samples.
Sampling Labor	$/hr	70	
Truck Rental / Gas	$/event	110	1 truck x $90/day. Add $20 for gas.
Sample Materials	ea	27	Reference ECHOS 33 02 0401/0402 for ISM, processing, disposable sampling and decontamination materials.
Sample Materials	$/ea	35	
Analytical Cost	$/event	1,416	Analyze samples for lead (24 @ $14) and TCLP VOCs, SVOCs, Metals, RCRA Characteristics, and Paint Filter (3 @ $360).
Site Work			
Site Area	sf	2,200	Approximate site area.
Civil Survey	day	1.0	Survey AOC areas to document excavation area. RSMeans 017123131100.
Civil Survey	$/day	1,025	
As Built Drawings	hours	8	Develop plat map for incorporation into the Base Master Plan.
As Built Drawings	$/hr	70	
Sediment and Erosion Control	lf	900	Includes silt fence and straw bales along down slope of excavation. RSMeans 312514161000 & 250.
Sediment and Erosion Control	$/lf	12.19	
Contaminated Soil Excavation			Includes excavation of the AOC area based on the areas and depths presented in the summary table. In situ volumes include a 15% constructability factor.
Soil Excavation Volume (In situ)	cy	114	
Soil Excavation Volume (Ex situ)	cy	136	Includes soil volume to be transported and disposed. Ex situ volumes include 20% swell factor.
Volume to Weight Conversion	tons/cy	1.60	In situ soil conversion.
Soil Excavation Mass	tons	182	Includes soil mass to be transported and disposed.
Soil Excavation Surface Area	sf	2,200	
Mobilization/Demobilization	ls	5,000	Includes mob/demob of excavation equipment and preparing submittals.
Excavate Contaminated Soils	day	1	Includes 2 cy excavator, 2-22 cy off highway trucks, 1 O.E., 2 T.D., 1 L.S. spotter, 2 L.S. to prep trucks/and misc. Reduced productivity by 33% for loading trucks, precise excavations, and security/S&H requirements. Assume trucks are direct loaded. Average 200 cy/day, so 1 day duration. RSMeans Crew B12-E.
	$/day	5,501.03	
Standby Time	day	3	Assume 3 days equipment standby while analysis is being performed. Assume no additional hot spot excavation.
	$/day	707	

Engineering Evaluation/Cost Analysis (EE/CA) for RVAAP Load Line 2 Functional Area
Alternative LL2-2: Excavation with Offsite Disposal
Key Parameters and Assumptions

Key Parameters and Assumptions:

Item	Unit	Value	Notes
Nonhazardous Soil Disposal	tons	182	Based on shipping waste to American Landfill, Waynesburg, Ohio (approximately 80 mi RT). Assumes a minimum of 22 tons /load. Rate includes $16.60/ton tax from Portage County.
Transport and Offsite Disposal	$/ton	52.00	
Mark-out Pipe Location	ls	2,500	Private utility locate to precisely locate pipe prior to excavation.
Excavate Soils and Remove Pipe	day	2	Assume 5 ft. deep trench is excavated adjacent to pipe followed by removing 3-4 ft. of soil over pipe (~140 cy in-situ). Includes 2 cy excavator, 1-22 cy off highway trucks, 1 O.E., 1 T.D., 1 L.S. spotter, and 2 L.S. to remove pipe and place in truck. Reduced productivity by 50% for precise excavations, protecting pipe, and security/S&H requirements. Assume trucks are direct loaded. Average 100 cy/day, so 2 day duration. RSMeans Crew B12-E.
	$/day	4,215.30	
Nonhazardous Pipe Disposal	tons	22	Includes 250 ft. of 10 inch clay pipe at 45 lbs per linear ft., 32 ft. of 18 inch clay pipe at 141 lbs per linear ft., and assume 1 ton of sediment = 8.9 tons. Based on shipping waste to American Landfill, Waynesburg, Ohio (approximately 80 mi RT). Assumes a minimum of 22 tons/load. Rate includes $16.60/ton tax from Portage County.
Transport and Offsite Disposal	$/ton	52.00	
Confirmation Sampling			
Samples	ea	8	Includes 1 sample in sediment area and 1 sample every 100 lf in ditch and sewer pipe. Includes 8 ISM samples for confirmation (Metals).
Sampling Labor	hrs	8	Assumes 1 sampling technician at 8 hours over 2 days to collect and ship samples.
Sampling Labor	$/hr	70	
Truck Rental / Gas	$/event	200	1 truck x $90/day. Add $20 for gas.
Sample Materials	ea	8	Reference ECHOS 33 02 0401/0402 for ISM, processing, disposable sampling and decontamination materials.
Sample Materials	$/ea	35	
Analytical Cost	$/event	736	Analyze samples for Metals (8 @ $92).
Restoration			
Replace Pipe	lf	32	There will be no backfill of the drainage ditch. The 32 ft. culvert will need to be replaced. Add 50% for small job. Engineering Estimate.
Replace Pipe	$/lf	75.00	
Seeding, Vegetative Cover	MSF	11	Seeding with mulch and fertilizer. Assume 0.25 acre is revegetated for restored areas and equipment damage. RSMeans 329219142200.
Seeding, Vegetative Cover	$/MSF	102.95	
SWPPP Inspections	hrs	24	Assume 4 hrs per week for 6 weeks.
SWPPP Inspections	$/hr	70	
Plans and Reports			
Corrective Action Completion Report	hrs	240	Includes Construction QC data and preparing report.
Technical Labor	$/hr	90	

Engineering Evaluation/Cost Analysis (EE/CA) for RVAAP Load Line 2 Functional Area
Alternative LL2-2: Excavation with Offsite Disposal
Cost Estimate

CAPITAL COST			$164,482
Activity (unit)	Quantity	Unit Cost	Total
Characterization Sampling			
Sampling Labor (hrs)	10	$70.00	$700
Truck Rental / Gas (event)	1	$110.00	$110
Sample Materials (ea)	27	$35.00	$945
Sample Analysis (event)	1	$1,416.00	$1,416
Site Work			
Civil Survey (day)	1.0	$1,025.00	$1,025
As Built Drawings (hrs)	8	$70.00	$560
Sediment and Erosion Control (lf)	900	$12.19	$10,971
Contaminated Soil Excavation			
Mobilization/Demobilization (ls)	1	$5,000.00	$5,000
Excavate Soil (days)	1	$5,501.03	$5,501
Standby Time (day)	3	$706.95	$2,121
Transport and Offsite Disposal (ton)	182	$52.00	$9,462
Excavate Soils and Remove Pipe			
Mark-out Pipe Location (ls)	1	$2,500.00	$2,500
Excavate Soil (days)	2	$4,215.30	$8,431
Transport and Offsite Disposal (ton)	22	$52.00	$1,144
Confirmation Sampling			
Sampling Labor (hrs)	8	$70.00	$560
Truck Rental / Gas (event)	1	$200.00	$200
Sample Materials (ea)	8	$35.00	$280
Sample Analysis (event)	1	$736.00	$736
Restoration			
Replace Pipe (lf)	32	$75.00	$2,400
Seeding, Vegetative Cover (MSF)	11	$102.95	$1,132
SWPPP Inspections (hrs)	24	$70.00	$1,680
Plans and Reports			
Corrective Action Completion Report (ea)	240	$90.00	$21,600
Subtotal			$78,474
Design		30%	$23,542
Office Overhead		15%	$11,771
Field Overhead		15%	$11,771
Subtotal			$125,559
Profit		6%	$7,534
Contingency		25%	$31,390
Total			$164,482

Engineering Evaluation/Cost Analysis (EE/CA) Study for RVAAP George Road Sewage Treatment Plant
Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio
Summary of Alternatives

RVAAP George Road Sewage Treatment Plant		Duration	Non Discounted Cost		
			Soil		
			Capital Cost	O&M Cost	Total
1	Alternative GR-1: No Action	0	$0	$0	$0
2	Alternative GR-2: Excavation and Offsite Disposal	<1 yr	$63,581	$0	$63,581

Notes:

1. The base year of comparison and cost data will be CY2016. The discounted rates used to calculate present values will be based on Economic Guidance Memorandum, 16-01, Federal Interest Rates for Corps of Engineers Projects for Fiscal Year 2016.

2. Costs were estimated for comparison purposes only and are believed to be accurate within a range of -30% to +50%. Use of these costs for other purposes, including but not limited to, budgetary or construction cost estimating is not appropriate.

Engineering Evaluation/Cost Analysis (EE/CA) Study for RVAAP George Road Sewage Treatment Plant
Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio
Summary of AOC Areas and Volumes

EE/CA Table 4–3. Estimated Piping Removal at George Road Sewage Treatment Plant

Media	Length of Pipe (ft)	Diameter of Pipe (inches)	Weight of Pipe (tons)	Depth to Top of Pipe (ft bgs)	Trench Depth (ft bgs)	Trench Width (ft)
Pipe containing mercury deposits	20	15	0.90	6	6-7	3
	18	4	0.04	6	6-7	3

bgs = Below ground surface.
ft = Feet.

Engineering Evaluation/Cost Analysis (EE/CA) Study for RVAAP George Road Sewage Treatment Plant
Alternative GR-2: Excavation with Offsite Disposal
Key Parameters and Assumptions

Key Parameters and Assumptions:

Item	Unit	Value	Notes
Capital Cost			
Waste Characterization Sampling			
Samples	ea	2	Waste characterization includes 2 composite samples for TCLP VOCs, SVOCs, Metals, RCRA Characteristics, and Paint Filter.
Sampling Labor	hrs	4	Assumes 1 sampling technician at 4 hours to collect and ship samples.
Sampling Labor	$/hr	70	
Truck Rental / Gas	$/event	110	1 truck x $90/day. Add $20 for gas.
Sample Materials	ea	2	Reference ECHOS 33 02 0401/0402 for ISM, processing, disposable sampling and decontamination materials.
Sample Materials	$/ea	35	
Analytical Cost	$/event	720	Analyze samples for TCLP VOCs, SVOCs, Metals, RCRA Characteristics, and Paint Filter (2 @ $360).
Site Work			
Site Area	sf	<200	Approximate site area.
Civil Survey	day	0.5	Survey pipe to document excavation area. RSMeans 017123131100.
Civil Survey	$/day	1,025	
As Built Drawings	hours	2	Develop plat map for incorporation into the Base Master Plan.
As Built Drawings	$/hr	70	
Sediment and Erosion Control	lf	50	Includes silt fence and straw bales along down slope of excavation. RSMeans 312514161000 & 250.
Sediment and Erosion Control	$/lf	12.19	
Saw Cut Concrete	lf	20	Includes saw cutting concrete. Assume 8 in thick and add 200% for small job and blade. Engineering estimate.
Saw Cut Concrete	$/lf	12.00	
Contaminated Pipe and Sediment Removal			
Soil Excavation Volume (Ex situ)	cy	2	Includes approximate volume of pipe and sediment to be transported and disposed. Volume of pipe includes void space within pipe.
Mobilization/Demobilization	ls	4,000	Includes mob/demob of excavation equipment and preparing submittals.
Mark-out Pipe Location	ls	1,250	Private utility locate to precisely locate pipe prior to excavation.
Excavate Soils and Remove Pipe	day	1	Assume 7 ft deep trench is excavated adjacent to pipe followed by removing 6-7 ft of soil over pipe (~30 cy in-situ). Includes 1 cy excavator, 1-22 cy off highway trucks, 1 O.E., 1 T.D., 1 L.S. spotter, and 2 L.S. to remove pipe and place in truck. Reduced productivity by 70% for precise excavations, protecting pipe, and security/S&H requirements. Assume trucks are direct loaded. Average 50 cy/day, so 1 day duration. RSMeans Crew B12-E.
	$/day	3,952.46	

Engineering Evaluation/Cost Analysis (EE/CA) Study for RVAAP George Road Sewage Treatment Plant
Alternative GR-2: Excavation with Offsite Disposal
Key Parameters and Assumptions

Key Parameters and Assumptions:

Item	Unit	Value	Notes
Nonhazardous Pipe and Sediment Disposal	tons	22	Includes 20 ft of 15 inch clay pipe at 90 lbs per linear ft, 18 ft of 4 in cast iron pipe at 13 lbs per linear ft, and assume 1 ton of sediment = 2 tons. Based on shipping waste to American Landfill, Waynesburg, Ohio (approximately 80 mi RT). Assumes a minimum of 22 tons/load. Use minimum weight. Rate includes $16.60/ton tax from Portage County.
Transport and Offsite Disposal	$/ton	52.00	
Confirmation Sampling			
Samples	ea	5	Includes 1 sample in sediment area and 2 samples for each pipe. Includes 5 ISM samples for confirmation (metals).
Sampling Labor	hrs	4	Assumes 1 sampling technician at 4 hours to collect and ship samples.
Sampling Labor	$/hr	70	
Truck Rental / Gas	$/event	110	1 truck x $90/day. Add $20 for gas.
Sample Materials	ea	5	Reference ECHOS 33 02 0401/0402 for ISM, processing, disposable sampling and decontamination materials.
Sample Materials	$/ea	35	
Analytical Cost	$/event	460	Analyze samples for Metals (5 @ $92).
Restoration			
Backfill Trench	cy	2	Includes 6-in lift of existing and imported fill assuming 20% swell. Add 100% for small area and indoor location. Engineering Estimate.
Backfill Trench	$/cy	12.00	
Soil Backfill	cy	2	Assume local backfill source. Add 100% for small volume.
Soil Backfill	$/cy	40.00	
Seeding, Vegetative Cover	MSF	1	Seeding with mulch and fertilizer. Assume 1000 sf is revegetated for restored areas and equipment damage. RSMeans 329219142200.
Seeding, Vegetative Cover	$/MSF	102.95	
SWPPP Inspections	hrs	24	Assume 4 hrs per week for 6 weeks.
SWPPP Inspections	$/hr	70	
Plans and Reports			
Corrective Action Completion Report	hrs	160	Includes Construction QC data and preparing report.
Technical Labor	$/hr	90	

Engineering Evaluation/Cost Analysis (EE/CA) Study for RVAAP George Road Sewage Treatment Plant
Alternative GR-2: Excavation with Offsite Disposal
Cost Estimate

CAPITAL COST			$63,581
Activity (unit)	Quantity	Unit Cost	Total
Waste Characterization Sampling			
Sampling Labor (hrs)	4	$70.00	$280
Truck Rental / Gas (event)	1	$110.00	$110
Sample Materials (ea)	2	$35.00	$70
Sample Analysis (event)	1	$720.00	$720
Site Work			
Civil Survey (day)	0.5	$1,025.00	$513
As Built Drawings (hrs)	2	$70.00	$140
Sediment and Erosion Control (lf)	50	$12.19	$610
Saw Cutting Concrete (lf)	20	$12.00	$240
Contaminated Pipe and Sediment Removal			
Mobilization/Demobilization (ls)	1	$4,000.00	$4,000
Mark-out Pipe Location (ls)	1	$1,250.00	$1,250
Excavate Soil (days)	1	$3,952.46	$3,952
Transport and Offsite Disposal (ton)	22	$52.00	$1,144
Confirmation Sampling			
Sampling Labor (hrs)	4	$70.00	$280
Truck Rental / Gas (event)	1	$110.00	$110
Sample Materials (ea)	5	$35.00	$175
Sample Analysis (event)	1	$460.00	$460
Restoration			
Backfill Trench (cy)	2	$12.00	$18
Soil Backfill (cy)	2	$40.00	$80
Seeding, Vegetative Cover (MSF)	1	$102.95	$103
SWPPP Inspections (hrs)	24	$70.00	$1,680
Plans and Reports			
Corrective Action Completion Report (ea)	160	$90.00	$14,400
Subtotal			$30,334
Design		30%	$9,100
Office Overhead		15%	$4,550
Field Overhead		15%	$4,550
Subtotal			$48,535
Profit		6%	$2,912
Contingency		25%	$12,134
Total			$63,581

APPENDIX E

Ohio EPA Comments

THIS PAGE INTENTIONALLY LEFT BLANK.

Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

March 2, 2017

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859221

Mr. Mark Leeper, P.G., MBA
Manager
Restoration/Cleanup Program
ARNG Directorate
111 S. George Mason Dr.
Arlington, VA 22204

Subject: Ohio EPA's Approval of the Draft Engineering Evaluation/Cost Analysis for RVAAP-67, Facility-wide Sewers, Load Line 2 Functional Area, and RVAAP-75 George Road Sewage Treatment Plant Mercury Spill

Dear Mr. Leeper:

On February 1, 2017, the Ohio Environmental Protection Agency (Ohio EPA) received your response to Ohio EPA's December 23, 2016 comment letter on the Engineering Evaluation/Cost Analysis for RVAAP-67, Facility-wide Sewers, Load Line 2 Functional Area, and RVAAP-75 George Road Sewage Treatment Plant Mercury Spill.

The Army's response is adequate. Please incorporate the proposed changes and re-submit the document in final form.

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please free feel to contact me at (330) 963-1170.

Sincerely,

Edward J. D'Amato
Project Coordinator
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

ec: Rod Beals, Manager, DERR, NEDO
Tom Schneider, Supervisor, DERR, CO
Al Muller, DDAGW, NEDO
Brian Tucker, DERR, CO
Nathaniel Peters II, USACE Louisville
Kevin Sedlak, ARNG
Gail Harris, Vista Sciences Corp.
Bob Princic, Supervisor, DERR, NEDO
Kevin Palombo, DERR, NEDO
Carrie Rasik, DERR, CO
Craig Coombs, USACE Louisville
Katie Tait, OHARNG RTLS
Gregory F. Moore, USACE
Rebecca Schreffler, Vista Sciences Corp.

Northeast District Office • 2110 East Aurora Road • Twinsburg, OH 44087-1924
epa.ohio.gov • (330) 963-1200 • (330) 487-0769 (fax)

Received
6 MAR 2017

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

February 1, 2017

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Edward D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Responses to Ohio EPA Comments, RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill Engineering Evaluation/Cost Analysis (Work Activity No. 267-000-859-221)

References:
1) *Draft Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill*, dated September 21, 2016
2) Ohio EPA's Comment Letter for the Draft Engineering Evaluation/Cost Analysis for RVAAP-67, dated December 8, 2016.
3) Army responses to Ohio EPA' December 8, 2016 comment letter, dated December 14, 2016.
4) Ohio EPA responses to Army's December 14, 2016 letter, dated December 23, 2016.

Dear Mr. D'Amato:

The Army appreciates your time and comments (referenced above) on the *Draft Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill*. Enclosed for your review are responses to your comments. Upon Ohio EPA's concurrence of these responses, the Army will distribute the final version of this report.

Please contact the undersigned at (703) 607-7955 or mark.s.leeper.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mark Leeper
RVAAP Restoration Program Manager
Army National Guard Directorate

cc:
Bob Princic, Ohio EPA, NEDO
Rod Beals, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, CO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Kevin Jago, Leidos
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill Engineering Evaluation/Cost Analysis (Work Activity No. 267-000-859-221)

Ohio EPA Comments

1) Section 4.1.1 identifies the remediation goal of 400 mg/kg for lead based on protection of human health. This value (400 mg/kg) is acceptable for this action, provided the extent of sediment removal is expanded as discussed in Comment #2. It should be noted that generally 128 mg/kg of lead is used as a remediation goal for sediment based ecological receptors.

   Army Response (12/14/16): Comment noted. As deemed acceptable to Ohio EPA, the removal action at Load Line 2 will have a lead cleanup goal of 400 mg/kg.

   Ohio EPA Response (12/23/16): The Army's response to this comment is adequate.

2) Proposed Removal Area at the Load Line 2 Functional Area (Alternative LL-2) should be expanded to include all sediment to just downstream of sample LLsd-655(st). The current estimate (to sample LL2sd-657(st)) is not sufficient to address the elevated lead identified in the ditch sediment. Alternatively, additional sampling can be completed to delineate the extent of lead contamination, although this alternative does not appear to be the best use of resources.

   Action Item: Please expand the area of sediment removal as described.

   Army Response (12/14/16): Clarification. As indicated on Figure 4-1. Proposed Removal Areas at Load Line 2 Functional Area, the sediment to be removed includes the entire length of open ditch from sample location LL2sd-308(st), which is the storm sewer outfall, downstream to the point of sample location LL2sd-657(st). The proposed removal area incorporates all sample locations within this reach of the open ditch, including sample locations LL2sd-654(st), LL2sd-655(st), LL2sd-656(st), and LL2sd-657(st). As presented on Figure 4-1, the results at sample location LL2sd-657(st) were below the acceptable cleanup goal of 400 mg/kg; therefore, excavation of the ditch to the south (downstream) of this sample location was not included in the removal area estimate. The removal of contaminated sediment would be followed by confirmation sampling to verify sediment above the CUG was removed.

   The Army recognizes that additional pre-construction (delineation) sampling may be conducted in that portion of the open ditch between sample locations LL2sd-656(st) and LL2sd-657(st) to further refine and potentially reduce the volume of material to be excavated. However, any reduction of volume is anticipated to be nominal, and the Army concurs that any associated cost savings would not be offset by the additional cost and resources to conduct the additional delineation sampling.

   Ohio EPA Response (12/23/16): The initial comment included an error regarding the downstream portion of the ditch removal limit. The first sentence should have read "Proposed Removal Area at the Load Line 2 Functional Area (Alternative LL-2) should be expanded to include all sediment to just downstream of sample LL-252 (not LLsd-655(st))."

   Army Response (current): Comment noted. Please see the final response to Comment 3.

3) Depth of excavation for the expanded area discussed in Comment #1 above could be reduced to a one-foot depth in most locations, with the exception to near sample LL2-sd-656(st). This includes the area downstream to sample LL2-252.

Army Response (12/14/16): Comment noted. For constructability purposes and to increase the likelihood that the initial removal of sediment will result in confirmation samples attaining cleanup goals, it is the preference of the Army to perform sediment removal in the entire ditch to 2 ft bgs.

With respect to lead observed at sample at location LL2-252 at a concentration of 656 mg/kg, Section 2.2.2.2 of the EECA notes this location is approximately 1,000 ft downstream of DB22. The lead concentration observed at LL2-252 is not attributed to the LL2 storm sewer system, as lead concentrations at sample location LL2-212, collected between the storm sewer and upstream of location LL2-252, had a concentration of 50.4 mg/kg. The lead concentration at sample location LL2-252 is included in the evaluation of soil at Load Line 2 in the *Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12*.

Ohio EPA Response (12/23/16): The results from sample LL2-212 and the information provided in Section 2.2.2.2 is not sufficient to eliminate the ditch sediment between samples LL2-212 and LL2-252 from the removal action.

Action Item: Ohio EPA recommends either including the ditch sediment to just below sample LL2-252 in the removal action, or taking additional sediment samples in that area to evaluate the lead concentrations, limits, and potential sources in that area.

Army Response (current): Agree. Alternative LL2-2: Excavation with Off-site Disposal has been revised to include Characterization Sampling. Figure 4-1 has been revised to present the new sampling scheme, and the cost estimate has been updated to include costs for the Characterization sampling. Section 6.1.2.2 Characterization Sampling and revised Figure 4-1 is presented below.

6.1.2.2 Characterization Sampling

Seven soil borings will be installed to collect samples from the 0 – 0.5-ft-bgs interval, the 0.5 – 1.0-ft-bgs interval; and the 1.0 – 2.0-ft-bgs interval at each location. As shown on Figure 4-1, four borings will be installed between LL2sd-657 and LL2-252, one boring will be installed at LL2-252, and two borings will be installed downstream of LL2-252. Samples will be analyzed for lead by USEPA method SW-846 6020. Field duplicates will be collected for analysis at a rate of 10% (1 duplicate per up to 10 primary environmental samples). Matrix spike/matrix spike duplicate (MS/MSD) will be collected for analysis at a rate of 5% (1 MS/MSD per 20 environmental samples).

Upon receipt of analytical results, a comparison of the results against the CUG of 400 mg/kg for lead will be completed. The removal extent will be modified to include areas that are above the CUG.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill Engineering Evaluation/Cost Analysis (Work Activity No. 267-000-859-221)

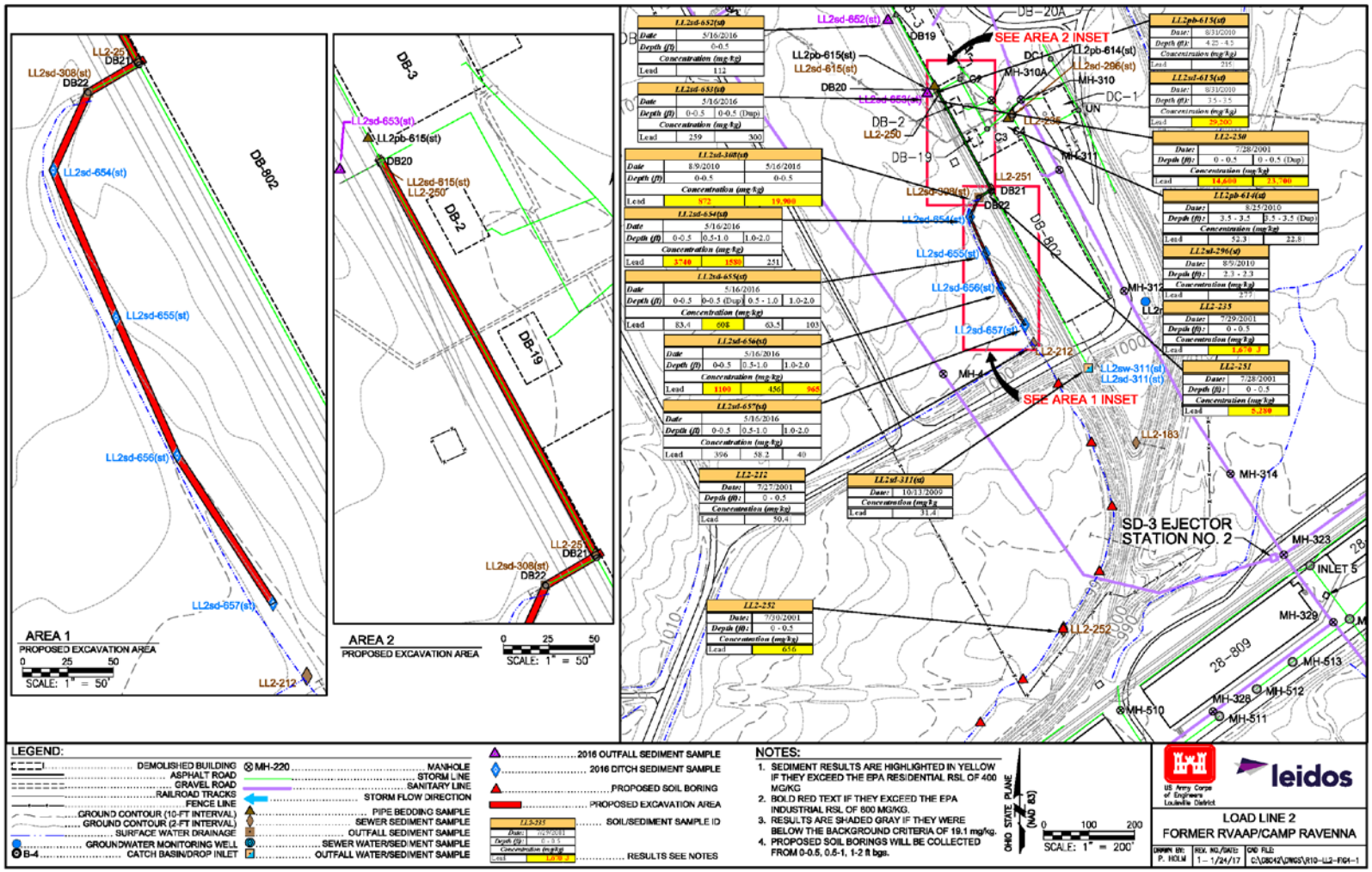


Figure 4-1. Proposed Characterization Sampling Scheme and Removal Area at Load Line 2 Functional Area

Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

December 23, 2016

Mr. Mark Leeper, P.G., MBA
Chief (Acting)
Cleanup and Restoration Branch
ARNG Directorate
111 S. George Mason Dr.
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859221

Subject: Ohio EPA's Review of the Draft Engineering Evaluation/Cost Analysis for RVAAP-67, Facility-wide Sewers, Load Line 2 Functional Area, and RVAAP-75 George Road Sewage Treatment Plant Mercury Spill

Dear Mr. Leeper:

On December 16, 2016, the Ohio Environmental Protection Agency (Ohio EPA) received your response to Ohio EPA's December 8, 2016 comment letter on the Engineering Evaluation/Cost Analysis for RVAAP-67, Facility-wide Sewers, Load Line 2 Functional Area, and RVAAP-75 George Road Sewage Treatment Plant Mercury Spill.

Ohio EPA's responses to the Army's comments are below:

1. Section 4.1.1 identifies the remediation goal of 400 mg/kg for lead based on protection of human health. This value (400 mg/kg) is acceptable for this action, provided the extent of sediment removal is expanded as discussed in Comment #2. It should be noted that generally 128 mg/kg of lead is used as a remediation goal for sediment-based ecological receptors.

   Army Response: Comment noted. As deemed acceptable to Ohio EPA, the removal action at Load Line 2 will have a lead cleanup goal of 400 mg/kg.

The Army's response to this comment is adequate.

2. Proposed Removal Area at the Load Line 2 Functional Area (Alternative LL-2) should be expanded to include all sediment to just downstream of sample LLsd-655(st). The current estimate (to sample LL2sd-657(st)) is not sufficient to address the elevated lead identified in the ditch sediment. Alternatively, additional sampling can be completed to delineate the extent of lead contamination, although this alternative does not appear to be the best use of resources.

Received
28 Dec 2016

Army Response: Clarification. As indicated on Figure 4-1. Proposed Removal Areas at Load Line 2 Functional Area, the sediment to be removed includes the entire length of open ditch from sample location LL2sd-308(st), which is the storm sewer outfall, downstream to the point of sample location LL2sd-657(st). The proposed removal area incorporates all sample locations within this reach of the open ditch, including sample locations LL2sd-654(st), LL2sd-655(st), LL2sd-656(st), and LL2sd- 657(st). As presented on Figure 4-1, the results at sample location LL2sd-657(st) were below the acceptable cleanup goal of 400 mg/kg; therefore, excavation of the ditch to the south (downstream) of this sample location was not included in the removal area estimate. The removal of contaminated sediment would be followed by confirmation sampling to verify sediment above the CUG was removed.

The Army recognizes that additional pre-construction (delineation) sampling may be conducted in that portion of the open ditch between sample locations LL2sd-656(st) and LL2sd-657(st) to further refine and potentially reduce the volume of material to be excavated. However, any reduction of volume is anticipated to be nominal, and the Army concurs that any associated cost savings would not be offset by the additional cost and resources to conduct the additional delineation sampling.

Ohio EPA Response: The initial comment included an error regarding the downstream portion of the ditch removal limit. The first sentence should have read "Proposed Removal Area at the Load Line 2 Functional Area (Alternative LL-2) should be expanded to include all sediment to just downstream of sample LL-252 (not LLsd-655(st))."

Action Item: Army Responses to comments two and three should be revised based on this clarification and in response to comment three below.

3. Depth of excavation for the expanded area discussed in Comment #1 above could be reduced to a one-foot depth in most locations, with the exception to near sample LL2-sd-656(st). This includes the area downstream to sample LL2-252.

   Army Response: Comment noted. For constructability purposes and to increase the likelihood that the initial removal of sediment will result in confirmation samples attaining cleanup goals, it is the preference of the Army to perform sediment removal in the entire ditch to 2 ft. bgs.

   With respect to lead observed at sample at location LL2-252 at a concentration of 656 mg/kg, Section 2.2.2.2 of the EECA notes this location is approximately 1,000 ft. downstream of DB22. The lead concentration observed at LL2-252 is not attributed to the LL2 storm sewer system, as lead concentrations at sample location LL2-212, collected between the storm sewer and upstream of location LL2-252, had a concentration of 50.4 mg/kg. The lead concentration at sample location LL2-252 is included in the evaluation of soil at Load Line 2 in the Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12.

Ohio EPA response: The results from sample LL2-212 and the information provided in section 2.2.2.2 is not sufficient to eliminate the ditch sediment between samples LL2-212 and LL2-252 from the removal action.

Action Item: Ohio EPA recommends either including the ditch sediment to just below sample LL2-252 in the removal action, or taking additional sediment samples in that area to evaluate the lead concentrations, limits, and potential sources in that area.

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please free feel to contact me at (330) 963-1170.

Sincerely,

Edward J. D'Amato
Project Coordinator
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

ec: Rod Beals, Manager, DERR, NEDO
Bob Princic, Supervisor, DERR, NEDO
Kevin Palombo, DERR, NEDO
Al Muller, DDAGW, NEDO
Carrie Rasik, DERR, CO
Brian Tucker, DERR, CO
Craig Coombs, USACE Louisville
Nathaniel Peters II, USACE Louisville
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Gregory F. Moore, USACE
Mark Nichter, USACE
Rebecca Shreffler/Gail Harris, Vista Sciences Corp.
DERR/DO VAP Files

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

December 14, 2016

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Edward D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Responses to Ohio EPA Comments, RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill Engineering Evaluation/Cost Analysis (Work Activity No. 267-000-859-221)

Dear Mr. D'Amato:

The Army appreciates your time and comments (dated October December 8, 2016) on the *Draft Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill*. Enclosed for your review are responses to your comments. Upon the final resolution of these responses to comments, the Army will distribute the final version of this report.

Please contact the undersigned at (703) 607-7955 or mark.s.leeper.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mark Leeper
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO
Rod Beals, Ohio EPA, NEDO
Kelly Kaletsky, Ohio EPA, CO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Kevin Jago, Leidos
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill Engineering Evaluation/Cost Analysis (Work Activity No. 267-000-859-221)

Ohio EPA Comments

1) Section 4.1.1 identifies the remediation goal of 400 mg/kg for lead based on protection of human health. This value (400 mg/kg) is acceptable for this action, provided the extent of sediment removal is expanded as discussed in Comment #2. It should be noted that generally 128 mg/kg of lead is used as a remediation goal for sediment based ecological receptors.

   Army Response: Comment noted. As deemed acceptable to Ohio EPA, the removal action at Load Line 2 will have a lead cleanup goal of 400 mg/kg.

2) Proposed Removal Area at the Load Line 2 Functional Area (Alternative LL-2) should be expanded to include all sediment to just downstream of sample LLsd-655(st). The current estimate (to sample LL2sd-657(st)) is not sufficient to address the elevated lead identified in the ditch sediment. Alternatively, additional sampling can be completed to delineate the extent of lead contamination, although this alternative does not appear to be the best use of resources.

   Action Item: Please expand the area of sediment removal as described.

   Army Response: Clarification. As indicated on Figure 4-1. Proposed Removal Areas at Load Line 2 Functional Area, the sediment to be removed includes the entire length of open ditch from sample location LL2sd-308(st), which is the storm sewer outfall, downstream to the point of sample location LL2sd-657(st). The proposed removal area incorporates all sample locations within this reach of the open ditch, including sample locations LL2sd-654(st), LL2sd-655(st), LL2sd-656(st), and LL2sd-657(st). As presented on Figure 4-1, the results at sample location LL2sd-657(st) were below the acceptable cleanup goal of 400 mg/kg; therefore, excavation of the ditch to the south (downstream) of this sample location was not included in the removal area estimate. The removal of contaminated sediment would be followed by confirmation sampling to verify sediment above the CUG was removed.

   The Army recognizes that additional pre-construction (delineation) sampling may be conducted in that portion of the open ditch between sample locations LL2sd-656(st) and LL2sd-657(st) to further refine and potentially reduce the volume of material to be excavated. However, any reduction of volume is anticipated to be nominal, and the Army concurs that any associated cost savings would not be offset by the additional cost and resources to conduct the additional delineation sampling.

3) Depth of excavation for the expanded area discussed in Comment #1 above could be reduced to a one-foot depth in most locations, with the exception to near sample LL2-sd-656(st). This includes the area downstream to sample LL2-252.

   Army Response: Comment noted. For constructability purposes and to increase the likelihood that the initial removal of sediment will result in confirmation samples attaining cleanup goals, it is the preference of the Army to perform sediment removal in the entire ditch to 2 ft bgs.

With respect to lead observed at sample at location LL2-252 at a concentration of 656 mg/kg, Section 2.2.2.2 of the EECA notes this location is approximately 1,000 ft downstream of DB22. The lead concentration observed at LL2-252 is not attributed to the LL2 storm sewer system, as lead concentrations at sample location LL2-212, collected between the storm sewer and upstream of location LL2-252, had a concentration of 50.4 mg/kg. The lead concentration at sample location LL2-252 is included in the evaluation of soil at Load Line 2 in the *Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12*.

Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

December 8, 2016

Mr. Craig Coombs, P.E.
Contracting Officer's Representative
Environmental Branch
U.S. Army Corps of Engineers
600 Martin Luther King, Jr. Pl.
Room 708 (ATTN: Coombs)
Louisville, KY 40202

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859221

Subject: Ohio EPA Review of the Draft Engineering Evaluation/Cost Analysis for RVAAP-67, Facility-wide Sewers, Load Line 2 Functional Area, and RVAAP-75 George Road Sewage Treatment Plant Mercury Spill

Dear Mr. Coombs:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO) has reviewed the Engineering Evaluation/Cost Analysis for RVAAP-67, Facility-wide Sewers, Load Line 2 Functional Area, and RVAAP-75 George Road Sewage Treatment Plant Mercury Spill. The document was prepared by ECC and AMEC under contract no. W912QR-04-D-0039. Ohio EPA received the document on June 17, 2013. Ohio EPA's review of the document was put on hold while issues with the Tech Memo were worked out and then again after the ECC contract expired.

Ohio EPA has identified the following deficiencies in the report. Ohio EPA will review either a response to comments letter or Response to Comments (RTC) table; however, a revised report will need to be completed prior to final approval of the document.

Comments:

1) Section 4.1.1 identifies the remediation goal of 400 mg/kg for lead based on protection of human health. This value (400 mg/kg) is acceptable for this action, provided the extent of sediment removal is expanded as discussed in Comment

Received
09 DEC 2016

#2. It should be noted that generally 128 mg/kg of lead is used as a remediation goal for sediment based ecological receptors.

2) Proposed Removal Area at the Load Line 2 Functional Area (Alternative LL-2) should be expanded to include all sediment to just downstream of sample LLsd-655(st). The current estimate (to sample LL2sd-657(st)) is not sufficient to address the elevated lead identified in the ditch sediment. Alternatively, additional sampling can be completed to delineate the extent of lead contamination, although this alternative does not appear to be the best use of resources.

   Action Item: Please expand the area of sediment removal as described.

3) Depth of excavation for the expanded area discussed in Comment #1 above could be reduced to a one-foot depth in most locations, with the exception to near sample LL2-sd-656(st). This includes the area downstream to sample LL2-252.

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please feel free to contact me at (330) 963-1170.

Sincerely,

Edward J. D'Amato
Project Coordinator
Ohio EPA - Division of Environmental Response and Revitalization

ED/nvr

ec: Rod Beals, Manager, DERR, NEDO
Bob Princic, Supervisor, DERR, NEDO
Kevin Palombo, DERR, NEDO
Al Muller, DDAGW, NEDO
Carrie Rasik, DERR, CO
Brian Tucker
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Gregory F. Moore, USACE
Mark Nichter, USACE
Rebecca Schreffler/Gail Harris, Vista Sciences Corp.
DERR/DO VAP Files

THIS PAGE INTENTIONALLY LEFT BLANK.