
# 2020 PERIODIC REVIEW REPORT

## FRANCZYK PARK SITE
## 550-564 Babcock Street
## Buffalo, New York
## NYSDEC ID: B00174

**17-039-1144**

*Prepared for:*

**City of Buffalo**
Office of Strategic Planning
Division of Environmental Affairs

*Prepared by:*

**LiRo Engineers, Inc.**
690 Delaware Avenue
Buffalo, New York 14209

December 23, 2020

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# 1.0 Introduction

LiRo Engineers, Inc. (LiRo) has prepared this Periodic Review Report (PRR) on behalf of the City of Buffalo (COB) to summarize the post remedial status of the New York State Department of Environmental Conservation (NYSDEC) State Assistance Contract (SAC) Site No. B00174, located at 550 and 564 Babcock Street in the City of Buffalo, Erie County, New York (the "Site"; see Figure 1).

This PRR has been prepared for the Franczyk Park Site in accordance with NYSDEC Division of Environmental Remediation (DER)-10 *Technical Guidance for Site Investigation and Remediation.* The NYSDEC Institutional and Engineering Controls (IC/EC) Certification Form has been completed for the Site (Appendix A). This PRR and associated inspection form have been completed for the post-remedial activities at the Site for the reporting period from September 15, 2019 to September 15, 2020.

## 1.1 Background Information

The Franczyk Park Site (Site) is located at 550 and 564 Babcock Street in the City of Buffalo, Erie County, New York (Figure 1).

The Site is a public park composed of two adjoining parcels totaling an approximately 15.49-acre area bounded by Lyman Street to the north, Fleming Street to the south, New Babcock Street to the east, and Lewis Street to the west. The Site is generally rectangular in shape and is in an area that is zoned for industrial use. Land use in the vicinity of the Site is characterized as a mixture of commercial, industrial, and residential. Residential properties are located on the south side of Fleming Street and on the west side of Lewis Street.

The Site was first developed by Buffalo Fertilizing Chemical Works, (L.L. Crocker) as an agricultural fertilizer manufacturing facility. These manufacturing operations lasted almost a century while the facility underwent a number of name changes during its tenure as a fertilizer manufacturing facility. The parcel adjoining the northwest corner of the Site was sold to the Thaddeus Joseph Dulski Community Center, Inc. in 1975. The following year, the remainder of the Site was sold to the Industrial Refining Corporation and then to Car Salvage World in 1977. The Site was used as an automobile junk yard in the final years until Car Salvage World went bankrupt in 1981. The Brondy Real Estate Co. acquired the Site and later sold it to the City of Buffalo in 1984. The City of Buffalo redeveloped the Site into a park in 1987.

## 1.2 Regulatory History

The City of Buffalo entered into a SAC with the NYSDEC to complete a Site Investigation/Remedial Alternatives Report (SI/RAR) for the Site. The Site investigation, performed in the fall of 2003 and the spring of 2004, identified contaminated subsurface soil/fill throughout the Site as well as a minor amount of contaminated surface soil/fill in some high traffic areas.

Following the completion of the SI, an SI/RAR was prepared to describe the approach and results of the investigation, and provided an assessment of the risks posed by the contaminants encountered. The report also described the process used to develop and evaluate alternatives for addressing the contaminated media at the Site. Based on the SI/RAR, a Proposed Remedial Action Plan (PRAP) was prepared. The PRAP

was finalized in the March 2005 Record of Decision (ROD) following receipt of public input. The ROD presents the remedies that were selected by NYSDEC and the New York State Department of Health (NYSDOH) to address the identified contamination.

A Remedial Action Work Plan (RAWP) was prepared in March 2006 to describe the specific remedial activities that were proposed for the Site. In December 2006, the City of Buffalo entered into an agreement with a contractor to implement the RAWP.

On June 15, 2016, a Certificate of Completion was issued by NYSDEC indicating approval of the Final Engineering Report and satisfactory completion of the remediation phase of the environmental restoration project.

# 2.0 Site Overview

The Franczyk Park Site is an approximately 15.49-acre public park located at 550 and 564 Babcock Street in the City of Buffalo, Erie County, New York (Figure 1). The environmental restoration of the park was completed in 2016 and the Site Management Plan (SMP) prepared by KHEOPS Architecture, Engineering, & Survey, DPC (KHEOPS) was implemented in 2016 by the City of Buffalo.

# 3.0 Site Management

## 3.1 Monitoring and Maintenance Program

### 3.1.1 Site Inspection and Certification

In accordance with NYSDEC DER-10 6.3(a)(4), this PRR is to provide the information necessary to document the basis for the IC/EC certification. The certification primarily consists of a Site inspection to complete the NYSDEC's IC/EC Certification Form in order to confirm:

- That the IC/ECs are in place, performing properly, and remain effective;
- that nothing has occurred that would impair the ability of the controls to protect the public health and environment;
- that nothing has occurred that would constitute a violation or failure to comply with any operation and maintenance plan for such controls; and,
- that access is available to the Site to evaluate continued maintenance of such controls.

The Site inspection of the property was conducted on December 9, 2019 by a LiRo employee who meets the requirements of a Qualified Environmental Professional (QEP). The Site inspection included the following components:

- inspection of the Site Soil cover system;
- inspection of the groundwater containment system (interceptor trenches);
- inspection of the site access and security systems; and,
- inspection of Site monitoring wells shown on Figure 2.

The Site soil cover system inspection included a complete walk of the entire Site area. Evidence of erosion, ponding water, tree and brush growth, and protruding objects were not observed within the Site area. Vehicle ruts (most likely from lawn mowing equipment) were observed on the north side of the Site near the basketball courts. The ruts were approximately 4-inches deep. Geotextile material was observed in low spots within the swing set area.

The inspection of the groundwater containment system including inspection of interceptor trench cleanouts and sewer tie-ins. No obstructions were observed within the interceptor trench system.

The Site monitoring wells were found to be in generally good condition. At the time of the Site inspection, monitoring well MW-5 was not located and was believed to have been buried. Due to the COVID pandemic, well MW-05 was not replaced as planned in the spring of 2020. The Corrective Action Work Plan for replacing the well is provided in Appendix G.

At the time of the inspection, the Site was in compliance with the IC/ECs. Appendix A includes the completed IC/ECs Certification form and Appendix B contains the completed Site inspection form. Appendix C provides a photographic log showing the current conditions of the Site at the time of the inspections.

### 3.1.2 Groundwater Monitoring

The SMP specifies that groundwater sampling would be performed at four down-gradient monitoring wells (MW-03, MW-05, MW-07, and MW0-8) on an annual basis and would include analysis of Target Compound List (TCL) Semi-Volatile Organic Compounds (SVOCs) and Target Analyte List (TAL) metals. Sampling of the monitoring wells is to be conducted using low-flow sampling procedures.

As previously discussed, one groundwater monitoring well (MW-5) was not located. As a result, MW-5 was not sampled during this groundwater monitoring event.

The following groundwater monitoring activities were performed during this PRR reporting period to assess Site conditions:

- groundwater sample collection from monitoring wells MW-03, MW-07, and MW-08 using low-flow sampling techniques;
- analysis of field parameters (pH, oxidation-reduction potential, temperature, turbidity, and specific conductivity) at each monitoring well during the low-flow sampling procedure;
- analysis of the collected samples for TCL SVOCs and TAL Metals by a New York State Department of Health (NYSDEC) environmental laboratory approval program (ELAP)-certified laboratory;
- inspection and documentation of the structural integrity of the monitoring wells; and,
- collection of groundwater elevation data from the sampled monitoring wells (MW-03, MW-07, and MW-08).

Groundwater level monitoring and sampling was performed on December 6 and 9, 2019 at monitoring wells MW-03, MW-07, and MW-08. Table 1 provides a summary of the groundwater elevation data for the Site monitoring wells.

Monitoring wells were purged and sampled using standard low-flow techniques. A “blind” duplicate sample (MW-D) was collected from monitoring well MW-08 as a quality assurance/quality control (QA/QC) check.

Purged groundwater was collected and contained in 5-gallon plastic buckets until the completion of sampling. The collected groundwater was discharged to the interceptor trench collection system after sample collection.

Field parameters measured at each of the sampled monitoring wells are summarized in Table 2. TCL SVOC analytical results are presented in Table 3. TAL metals analytical results are presented in Table 4. Monitoring well purge and sample logs are provided in Appendix D. Laboratory analytical reports are provided in Appendix E. M3etals concentration trend charts are provided in Appendix F.

## 3.2 Institutional and Engineering Control Requirements and Compliance

The following engineering and institutional controls (IC/ECs) are to be maintained as a requirement of the SAC for the Site:

- **Engineering Controls**: Engineering controls (ECs) for the Site consist of a soil cover system and a groundwater containment system.

  The Site soil cover system and Site groundwater containment system are operating as designed and are being maintained and monitored as required.

- **Institutional Controls**: Institutional controls (ICs) for the Site consist of a groundwater use restriction, an IC/EC plan, a land use restriction, a monitoring plan, a SMP, and a soil management plan.

The monitoring and maintenance activities are being conducted.

### 3.2.1 Corrective Actions

The submittal of the 2020 PRR and replacement of monitoring well MW-05 were delayed due to COVID-related funding constraints. The Corrective Action Work Plan for MW-05 is attached. It is anticipated that the well will be replaced during the 2021 reporting period and that the 2021 sampling and reporting will be conducted on schedule.

# 4.0 Conclusions and Recommendations

Conclusions from the monitoring, maintenance, and inspection activities performed during the current PRR reporting period are as follows.

- At the time of the Site inspection, the Site was in compliance with the ECs/ICs including: groundwater monitoring, inspection, and maintenance of the groundwater monitoring wells; inspection and maintenance of the groundwater containment system; and, inspection and maintenance of the Site soil cover system. Monitoring well MW-05, which has not been located since 2017, will be replaced with monitoring well MW-05R.

- TCL SVOC analytical results obtained from monitoring wells MW-03, MW-07, and MW-08 indicate that detectable concentrations of phenol are present in monitoring wells MW-03 and MW-07.

- TAL metals analytical results obtained from monitoring wells MW-03, MW-07, and MW-08 indicate detectable concentrations of metals in each of the monitoring wells sampled. Antimony, beryllium, cadmium, iron, lead, magnesium, manganese, nickel, sodium, and thallium were detected at concentrations exceeding the Class "GA" AWQSGVs in monitoring well MW-03. Antimony, manganese, and selenium were detected at concentrations exceeding the Class "GA" AWQSGVs in monitoring well MW-07. Antimony, iron, magnesium, manganese, and selenium were detected at concentrations exceeding the Class "GA" AWQSGVs in monitoring well MW-08.

- Based on visual inspection, the groundwater monitoring wells were observed to be structurally sound.

- Based on physical inspection, the groundwater monitoring wells were found to be free of obstructions and a minimal amount of silt accumulation was observed in each of the inspected wells.

Based on the conclusions presented above, the Site has been in operation and in compliance with the SMP since the Certificate of Completion was issued by NYSDEC on June 15, 2016. LiRo recommends the following with regards to the operation, maintenance, and monitoring at the Site.

- Additional wood chips should be added in low spots within the swing set area;

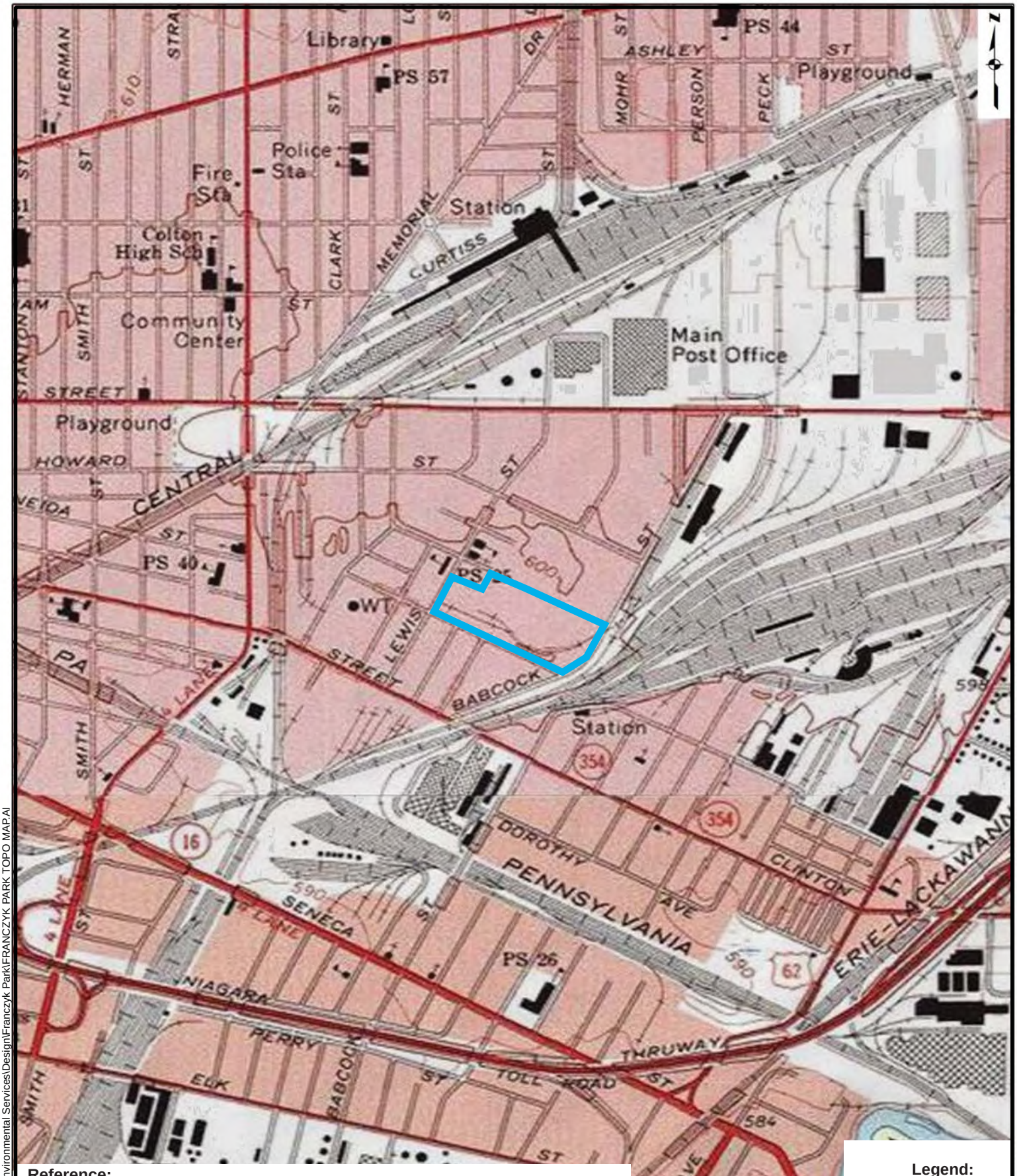
- The ruts in the play area will be filled in;

- The replacement well for MW-05 should be installed;

- Site inspections should continue to be performed annually; and,

- Groundwater monitoring should continue to be performed annually.

# Figures




**Reference:**
**UNITED STATES GEOLOGIC SURVEY 42078-H7 1968 BUFFALO NE QUAD, NY**
**Copyright © 2013 National Geographic Society ~ SCALE: 1:2,000**

**Legend:**
**Site Area**



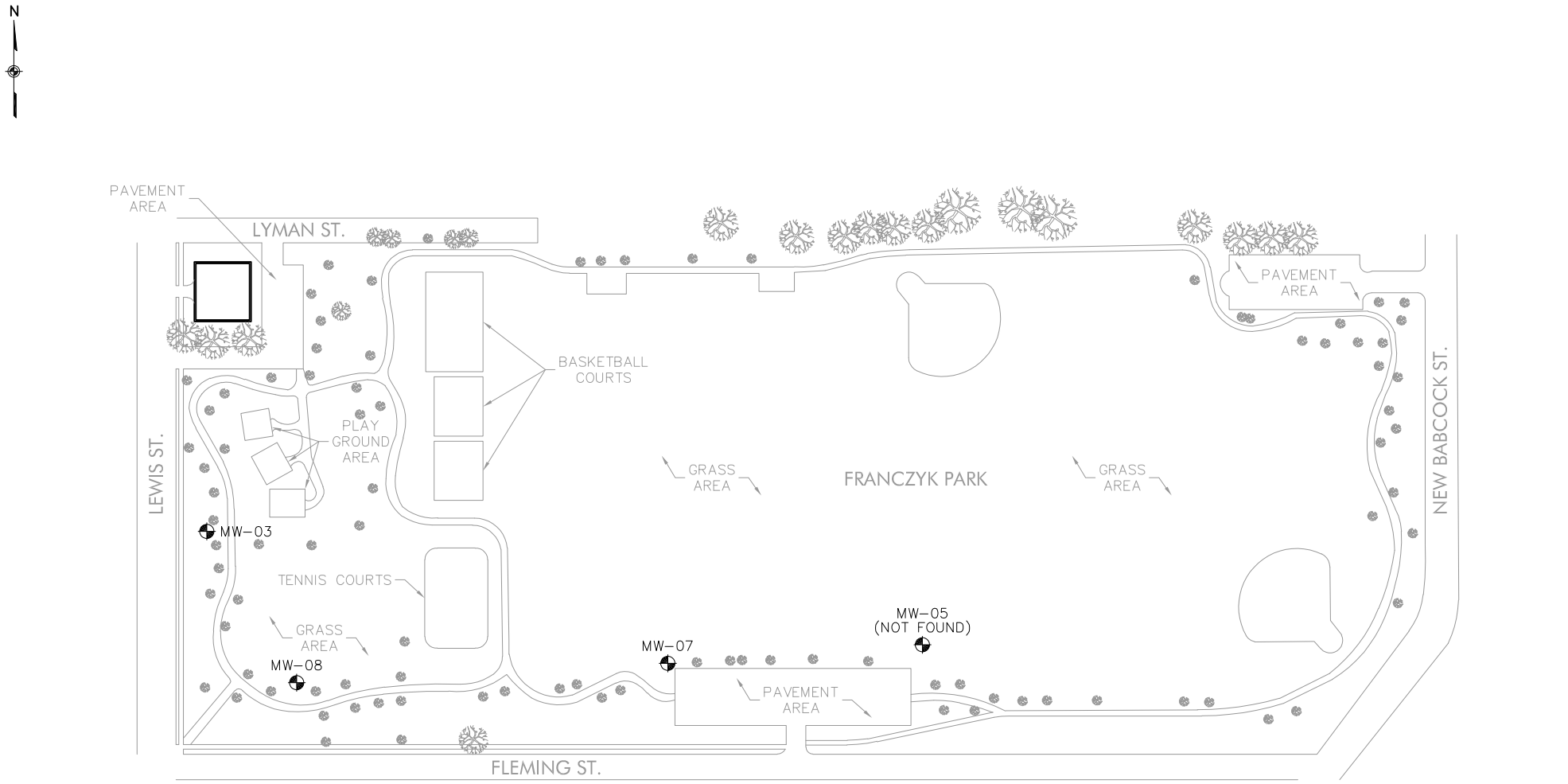
*LiRo-Engineers, Inc.*
*690 Delaware Ave.*
*Buffalo, New York*

# FRANCZYK PARK
# SITE TOPOGRAPHIC LOCATION MAP

FIGURE NO.

1

V:\City of Buffalo\17-039-1144 - Environmental Services\Design\Franczyk Park\FRANCZYK PARK TOPO MAP.AI

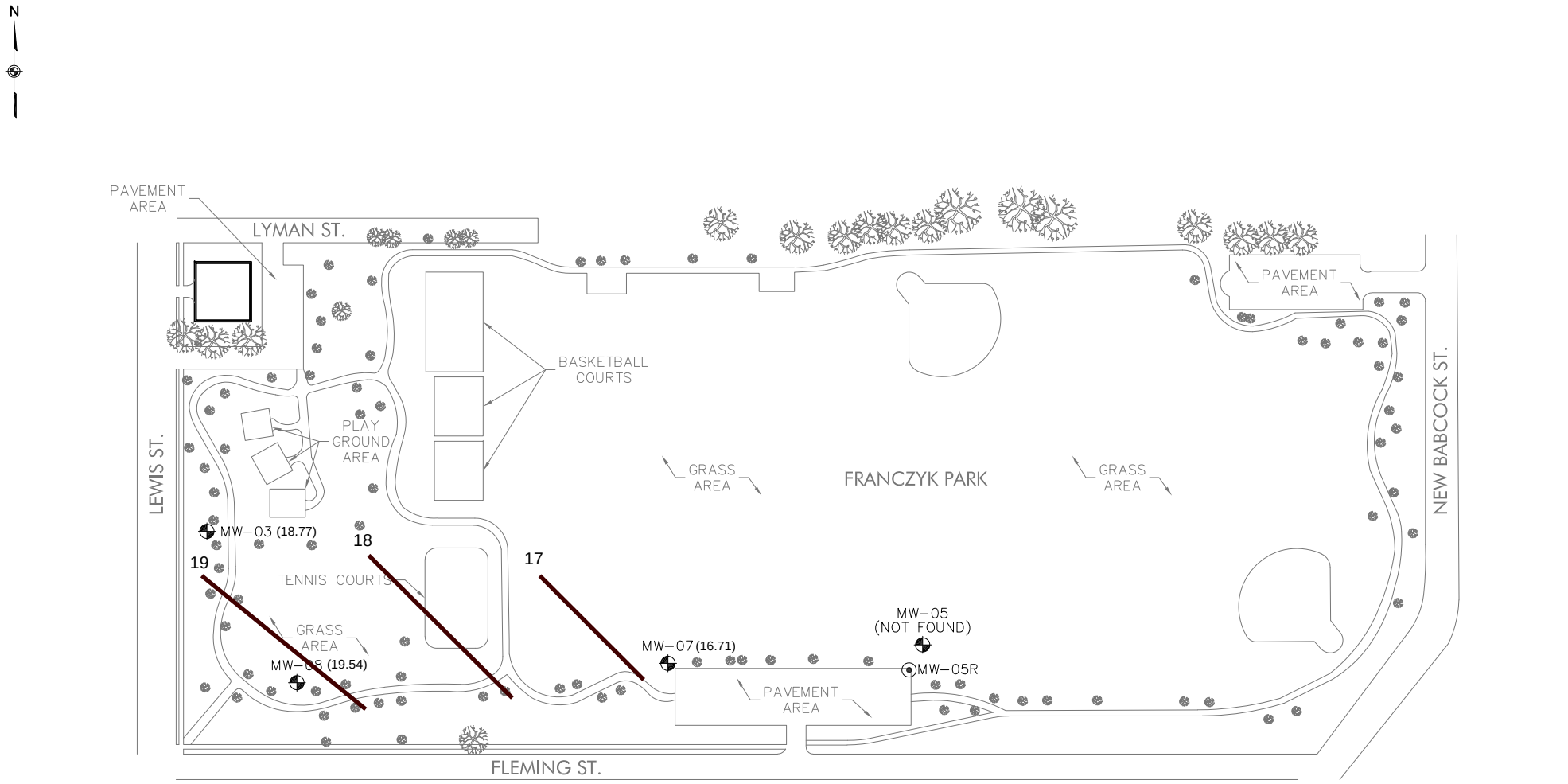



LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

# FRANCZYK PARK
# SITE PLAN

FIGURE NO.

2

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Buffalo, New York

# FRANCZYK PARK
# GROUNDWATER CONTOUR MAP - 12/06 and 12/09, 2019

FIGURE NO.

3

# Tables

**TABLE 1**

**SUMMARY OF GROUNDWATER ELEVATIONS**
**DECEMBER 2019 MONITORING EVENT**

**Franczyk Park Site (B00174)**
**City of Buffalo, New York**

| Well ID | Date | Top of Casing Elevation[1] | Depth to Water (ft. BTOC) | Groundwater Elevation[1] |
|---|---|---|---|---|
| MW-03 | 12/9/2019 | 21.86 | 3.09 | 18.77 |
| MW-05 | Not Found | 23.11 | NM | NA |
| MW-07 | 12/9/2019 | 19.7 | 2.99 | 16.71 |
| MW-08 | 12/6/2019 | 21.34 | 1.80 | 19.54 |

Notes:
1 - City of Buffalo Datum
ft. BTOC - feet below top of casing.
NM - Not measured
NA - Not available

**TABLE 2**

**SUMMARY OF GROUNDWATER FIELD PARAMETERS**
**DECEMBER 2019 MONITORING EVENT**
**FRANCZYK PARK SITE (B00174)**
**CITY OF BUFFALO, NEW YORK**

| PARAMETER | Class "GA" AWQSGVs[1] | Monitoring Location | | | |
|---|---|---|---|---|---|
| | | MW-03 | MW-05 | MW-07 | MW-08 |
| ***Field Measurements*** | | | | | |
| pH (standard units) | 6.5 - 8.5 | 7.56 | NM | 8.43 | 8.25 |
| Temperature (°C) | NS | 11.56 | NM | 8.81 | 7.59 |
| Specific Conductance (mS/cm) | NS | 6.800 | NM | 0.551 | 1.260 |
| Turbidity (NTU) | 5 | **40.4** | NM | **37.3** | **31.5** |
| ORP (mV) | NS | 28 | NM | -38 | -95 |
| Dissolved Oxygen (mg/L) | NS | 9.37 | NM | 11.91 | 12.6 |
| Appearance (visual) | NS | Clear | NM | Clear | Clear |
| Odor (olfactory) | NS | None | NM | None | None |

Notes:

1 - NYSDEC Class "GA" Ambient Groundwater Quality Standards/Guidance Values (AWQSGVs) as per 6 NYCRR Part 703.3

**Bold - Concentration exceeds NYS Technical and Operational Guidance Series (TOGS 1.1.1) Ambient Water Quality**

NM - Not measured.

NS - No Standard; an AWQSGV has not been established for this parameter.

**TABLE 3**

**SUMMARY OF GROUNDWATER SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) RESULTS**
**DECEMBER 2019 MONITORING EVENT**
**FRANCZYK PARK SITE (B00174)**
**CITY OF BUFFALO, NEW YORK**

| TCL SVOC | Class "GA" AWQSGVs[1] | Well ID, Sample ID, & Date Collected | | |
|---|---|---|---|---|
| | | MW-03 | MW-07 | MW-08[2] |
| | | MW-3 | MW-7 | MW-8/MW-DUP |
| | | 12/9/2019 | 12/9/2019 | 12/6/2019 |
| Benzaldehyde | NS | 10 UQ | 10 UQ | 10 UQ |
| 1,1-Biphenyl | 5 | 10 U | 10 U | 10 U |
| 1,2,4,5-Tetrachlorobenzene | 5 | 10 U | 10 U | 10 U |
| 2,2-oxybis(1-Chloropropane) | NS | 10 U | 10 U | 10 U |
| 2,3,4,6-Tetrachlorophenol | NS | 10 U | 10 U | 10 U |
| 2,4,5-Trichlorophenol | NS | 10 U | 10 U | 10 U |
| 2,4,6-Trichlorophenol | NS | 10 U | 10 U | 10 U |
| 2,4-Dichlorophenol | 5 | 10 U | 10 U | 10 U |
| 2,4-Dimethylphenol | 50 | 10 U | 10 U | 10 U |
| 2,4-Dinitrophenol | 10 | 10 U | 10 U | 10 U |
| 2,4-Dinitrotoluene | 5 | 10 U | 10 U | 10 U |
| 2,6-Dinitrotoluene | 5 | 10 U | 10 U | 10 U |
| 2-Chloronaphthalene | 10 | 10 U | 10 U | 10 U |
| 2-Chlorophenol | NS | 10 U | 10 U | 10 U |
| 2-Methylnaphthalene | NS | 10 U | 10 U | 10 U |
| 2-Methylphenol | NS | 10 U | 10 U | 10 U |
| 2-Nitroaniline | 5 | 10 U | 10 U | 10 U |
| 2-Nitrophenol | NS | 10 U | 10 U | 10 U |
| 3,3-Dichlorobenzidine | 5 | 10 U | 10 U | 10 U |
| 3+4-Methylphenols | NS | 10 U | 10 U | 10 U |
| 3-Nitroaniline | 5 | 10 U | 10 U | 10 U |
| 4,6-Dinitro-2-methylphenol | NS | 10 U | 10 U | 10 U |
| 4-Bromophenyl-phenylether | NS | 10 U | 10 U | 10 U |
| 4-Chloro-3-methylphenol | NS | 10 U | 10 U | 10 U |
| 4-Chloroaniline | 5 | 10 U | 10 U | 10 U |
| 4-Chlorophenyl-phenylether | NS | 10 U | 10 U | 10 U |
| 4-Nitroaniline | 5 | 10 U | 10 U | 10 U |
| 4-Nitrophenol | NS | 10 U | 10 U | 10 U |
| Acenaphthene | 20 | 10 U | 10 U | 10 U |
| Acenaphthylene | NS | 10 U | 10 U | 10 U |
| Acetophenone | NS | 10 U | 10 U | 10 U |
| Anthracene | 50 | 10 U | 10 U | 10 U |
| Atrazine | 7.5 | 10 U | 10 U | 10 U |
| Benzo(a)anthracene | 0.002 | 10 U | 10 U | 10 U |
| Benzo(a)pyrene | ND | 10 U | 10 U | 10 U |
| Benzo(b)fluoranthene | 0.002 | 10 U | 10 U | 10 U |

**TABLE 3**

**SUMMARY OF GROUNDWATER SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) RESULTS**
**DECEMBER 2019 MONITORING EVENT**
**FRANCZYK PARK SITE (B00174)**
**CITY OF BUFFALO, NEW YORK**

| TCL SVOC | Class "GA" AWQSGVs[1] | Well ID, Sample ID, & Date Collected | | |
|---|---|---|---|---|
| | | MW-03 | MW-07 | MW-08[2] |
| | | MW-3 | MW-7 | MW-8/MW-DUP |
| | | 12/9/2019 | 12/9/2019 | 12/6/2019 |
| Benzo(g,h,i)perylene | NS | 10 U | 10 U | 10 U |
| Benzo(k)fluoranthene | 0.002 | 10 U | 10 U | 10 U |
| bis(2-Chloroethoxy)methane | 5 | 10 U | 10 U | 10 U |
| bis(2-Chloroethyl)ether | 1 | 10 U | 10 U | 10 U |
| Bis(2-ethylhexyl)phthalate | 5 | 10 U | 10 U | 10 U |
| Butylbenzylphthalate | 50 | 10 U | 10 U | 10 U |
| Caprolactam | NS | 10 U | 10 U | 10 U |
| Carbazole | NS | 10 U | 10 U | 10 U |
| Chrysene | 0.002 | 10 U | 10 U | 10 U |
| Dibenzo(a,h)anthracene | NS | 10 U | 10 U | 10 U |
| Dibenzofuran | NS | 10 U | 10 U | 10 U |
| Diethylphthalate | 50 | 10 U | 10 U | 10 U |
| Dimethylphthalate | 50 | 10 U | 10 U | 10 U |
| Di-n-butylphthalate | 50 | 10 U | 10 U | 10 U |
| Di-n-octyl phthalate | 50 | 10 U | 10 U | 10 U |
| Fluoranthene | 50 | 10 U | 10 U | 10 U |
| Fluorene | 50 | 10 U | 10 U | 10 U |
| Hexachlorobenzene | 0.04 | 10 U | 10 U | 10 U |
| Hexachlorobutadiene | 0.5 | 10 U | 10 U | 10 U |
| Hexachlorocyclopentadiene | 5 | 10 U | 10 U | 10 U |
| Hexachloroethane | 5 | 10 U | 10 U | 10 U |
| Indeno(1,2,3-cd)pyrene | 0.002 | 10 U | 10 U | 10 U |
| Isophorone | 50 | 10 U | 10 U | 10 U |
| Naphthalene | 10 | 10 U | 10 U | 10 U |
| Nitrobenzene | 0.4 | 10 U | 10 U | 10 U |
| n-Nitroso-di-n-propylamine | NS | 10 U | 10 U | 10 U |
| n-Nitrosodiphenylamine | NS | 10 U | 10 U | 10 U |
| Pentachlorophenol | 1 | 10 U | 10 U | 10 U |
| Phenanthrene | 50 | 10 U | 10 U | 10 U |
| Phenol | 1 | **2.6 J** | **2.6 J** | 10 U |
| Pyrene | 50 | 10 U | 10 U | 10 U |
| Total SVOCs | NS | ND | ND | ND |

Notes:

1 - NYS Ambient Water Quality Standards/Guidance Values (AWQSGVs) for Class GA Waterbody

2 - Reported values represent the average value of sample and duplicate sample results.

**All concentrations reported in parts per billion (ppb or µg/L)**

U - Analyte not detected at the associated reporting limit

NS - No Standard; an AWQSGV has not been established for this parameter

ND - Not Detected

**TABLE 4**

**TAL METALS ANALYTICAL RESULTS**
**DECEMBER 2019 MONITORING EVENT**
**FRANCZYK PARK SITE (B00174)**
**CITY OF BUFFALO, NEW YORK**

| TAL Metal | Class "GA" AWQSGVs[1] | Well ID, Sample ID, & Date Collected | | |
|---|---|---|---|---|
| | | MW-03 | MW-07 | MW-08[2] |
| | | MW-3 | MW-7 | MW-8/MW-DUP |
| | | 12/9/2019 | 12/9/2019 | 12/6/2019 |
| Silver | 50 | 5 UN | 5 UN | 5 UN |
| Aluminum | NS | 130,000 | 101 | 50 U |
| Arsenic | 25 | 10 U | 2.53 J | 9.19 J |
| Barium | 1,000 | 18.7 J | 23.5 J | 116.0 |
| Beryllium | 3 | **23.5** | 3 U | 3 U |
| Calcium Metal | NS | 349,000 | 98,000 | 266,500 |
| Cadmium | 5 | **61.2** | 3 U | 0.3 J |
| Cobalt | NS | 79.4 | 2.06 J | 2.66 J |
| Chromium, total | 50 | 4.85 J | 5 UN | 5 U |
| Copper | 200 | 10 UN | 10.2 | 5.66 J |
| Iron | 300 | **811,000** | 200 | **2,135** |
| Potassium | NS | 125,000 | 6,740 | 13,700 |
| Magnesium | 35,000 | **384,000** | 18,300 | **47,300** |
| Manganese | 300 | **9,440** | **465** | **398** |
| Sodium | 20,000 | **95,000** | 8,130 | 8,815 |
| Nickel | 100 | **181** | 2.9 J | 5.73 J |
| Lead | 25 | **132** | 6 U | 3.82 J |
| Antimony | 3 | **17 J** | **18.8 J** | **23.9 J** |
| Selenium | 10 | 10 U | **39** | **50** |
| Thallium | 0.5 | **125** | 20 U | 20 U |
| Vanadium | NS | 20 U | 2.32 J | 20 U |
| Zinc | 2,000 | 85.7 | 86.5 | 136 |
| Mercury | 0.7 | 0.19 J | 0.2 U | 0.2 U |

Notes:

1 - NYS Ambient Water Quality Standards/Guidance Values for Class GA Waterbody

2 - Reported values represent the average value of sample and duplicate sample results.

**All concentrations are reported in parts per billion (ppb or µg/L)**

U - Compound not detected above the associated reporting limit

N - Indicates the spiked sample recovery is not within control limits

J - Estimated value

NS - No Standard; an AWQSGV has not been established for this parameter.

**Bold - Concentration exceeds NYS Technical and Operational Guidance Series (TOGS 1.1.1) Ambient Water Quality Standards/Guidance Values - Class GA Waters**

# Appendix A
# PRR Certification Form

Enclosure 2

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

**Site Management Periodic Review Report Notice**

**Institutional and Engineering Controls Certification Form**

**Site Details** **Box 1**

**Site No.** **B00174**

**Site Name Franczyk Park Investigation**

Site Address: 550 and 564 New Babcock Street Zip Code: 14206-
City/Town: Buffalo (C)
County: Erie
Site Acreage: 15.490

Reporting Period: September 15, 2019 to September 15, 2020

| | YES | NO |
|---|---|---|
| 1. Is the information above correct? | X | ☐ |
| If NO, include handwritten above or on a separate sheet. | | |
| 2. Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period? | ☐ | X |
| 3. Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))? | ☐ | X |
| 4. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period? | ☐ | X |
| **If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.** | | |
| 5. Is the site currently undergoing development? | ☐ | X |

**Box 2**

| | YES | NO |
|---|---|---|
| 6. Is the current site use consistent with the use(s) listed below? Restricted-Residential, Commercial, and Industrial | X | ☐ |
| 7. Are all ICs in place and functioning as designed? | ☐ | X |

**IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.**

**A Corrective Measures Work Plan must be submitted along with this form to address these issues.**

Stephen Franek

Signature of Owner, Remedial Party or Designated Representative

11/05/2020

Date

**SITE NO. B00174** **Box 3**

**Description of Institutional Controls**

| Parcel | Owner | Institutional Control |
|---|---|---|
| **112.17-1-10** | City of Buffalo | Ground Water Use Restriction<br>Landuse Restriction<br>Site Management Plan |
| | | Ground Water Use Restriction<br>Soil Management Plan<br>Landuse Restriction<br>Monitoring Plan<br>Site Management Plan<br>IC/EC Plan |
| | | O&M Plan |
| **112.17-1-11** | City of Buffalo | O&M Plan<br>Ground Water Use Restriction<br>Soil Management Plan<br>Landuse Restriction<br>Monitoring Plan<br>Site Management Plan<br>IC/EC Plan |

**Box 4**

**Description of Engineering Controls**

| Parcel | Engineering Control |
|---|---|
| **112.17-1-10** | Cover System<br>Cover System<br>Groundwater Containment |
| **112.17-1-11** | Cover System |

**Box 5**

**Periodic Review Report (PRR) Certification Statements**

1. I certify by checking "YES" below that:

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the Engineering Control certification;

   b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.

| YES | NO |
|---|---|
| X | |

2. For each Engineering control listed in Box 4, I certify by checking "YES" below that all of the following statements are true:

   (a) The Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   (d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   (e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

| YES | NO |
|---|---|
| X | |

**IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.**

**A Corrective Measures Work Plan must be submitted along with this form to address these issues.**

Signature of Owner, Remedial Party or Designated Representative

Date

**IC CERTIFICATIONS**
**SITE NO. B00174**

**Box 6**

**SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE**

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Stephen Frank (print name) at 690 Delaware Ave (print business address),

am certifying as Remedial Party (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

Stephen Frank

Signature of Owner, Remedial Party, or Designated Representative Rendering Certification

11/05/2020

Date

**EC CERTIFICATIONS**

**Box 7**

**Qualified Environmental Professional Signature**

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Stephen Frank (print name) at 690 Delaware Ave (print business address),

am certifying as a Qualified Environmental Professional for the Remedial Party (Owner or Remedial Party)

Stephen Frank

Signature of Qualified Environmental Professional, for the Owner or Remedial Party, Rendering Certification

Stamp (Required for PE)

11/05/2020
Date

# Appendix B
# Site Inspection Form

# SITE INSPECTION FORM
## FRANCZYK PARK

Property Name: Franczyk Park Inspection Date:

Property Address: 564 Babcock Street

City: Buffalo State: NY Zip Code: 14206

Property ID: (Tax Assessment Map)

Section: 112.17 Block: 1 Lot(s): 10 and 11

Total Acreage: 16.5 acres

Weather (during inspection): Temperature: ~40° Conditions: Partly cloudy

SIGNATURE:

The findings of this inspection were discussed with appropriate personnel, corrective actions were identified and implementation was mutually agreed upon:

Inspector: _____ Date: 12/9/19

Next Scheduled Inspection Date: _____

### COVER & VEGETATION

| | Yes | No |
|---|---|---|
| 4. Final cover in acceptable condition? | X | |
| Is there evidence of sloughing, erosion, ponding or settlement? | | X |
| Is there evidence of unintended traffic; rutting? | X | |
| Is there evidence of distressed vegetation/turf? | | X |

Rutting adjacent to basketball courts ~4" deep (lawnmower)

| | Yes | No |
|---|---|---|
| 5. Final cover sufficiently covers soil/fill material? | X | |
| Are there cracks visible in the soil or pavement? | | X |
| Is there evidence of erosion in the stormwater channels or swales? | | X |
| Is the synthetic erosion control fabric visible or damaged in the playground and/or athletic field area? | X | |

Visible in swing set area - no damage

### INTERCEPTOR TRENCH AND MONITORING WELLS

| | Yes | No |
|---|---|---|
| 6. Interceptor trench in acceptable condition? | | |
| Are the cleanout caps secured and not buried? | X | |
| Are the interceptor pipes obstructed (check the manholes where the interceptor trench connects to the sanitary sewer) | | X |

What is the condition of the monitoring wells?

MW-7 Good

MW-8 Good

MW-3 Good

MW-5 – Not found

## ACTIVITY ON SITE

| | Yes | No |
|---|---|---|
| 7. Any activity on site that disturbed the soil cover? | ____ | X |

## ACCESS CONTROLS

| | Yes | No |
|---|---|---|
| 1. Is access controlled by barriers (i.e. fencing, boulders, etc? | X | ____ |
| Are there sections of the access controls damaged or missing? | ____ | X |
| 2. Is there evidence of the operation of vehicles on the site? | X | ____ |
| Is there evidence of damage to the cover or access controls resulting from vehicle use on the project site? Lawnmowing tractor | ____ | X |

## ADDITIONAL FACILITY INFORMATION

Has there been any any development on or near the site? (Specify size and type: e.g., residential, 40 acres, well and septic)

## COMMENTS

Item #

No new development near the site

Overall site condition is excellent, should add new mulch in swingset area

# Appendix C
# Site Photographs

**Site Photos**

Photo No. 1 – Monitoring Well MW-07.

Photo No. 2 – View towards southwest corner of Site.

**Site Photos**

Photo No. 3 – View across the Site towards the east.

Photo No. 4 – View towards tennis courts.

**Site Photos**

Photo No. 5 – Monitoring Well MW-08.

Photo No. 6 – View of Site from the west.

## Site Photos

Photo No. 7 – Monitoring Well MW-03.

Photo No. 8 – Playground Area.

**Site Photos**

Photo No. 9 – Swing set Area

Photo No. 10 – Slide Area.

**Site Photos**

Photo No. 11 – Ruts in field

# Appendix D
# Monitoring Well Purge and Stabilization Logs

# WELL PURGE LOG

***LiRo Engineers, Inc.***

Project Title: City of Buffalo - Franczyk Park

Well Number: **MW-3**

Site Name: Franczyk Park

Date: 12/9/19

Staff: Kris Charney

A). Total casing and screen length in feet: 16.41

B). Water level below top of casing in feet: 3.09

C). Number of feet standing water [A-B]: 13.32

D). Volume of water/foot of casing (gal.): 0.17

E). Volume of water in casing (gal. [CxD]: 2.2644

F). Volume of water to remove (gal.) [Ex5]: 6.7932

G). Volume of water actually removed (gal.): 5.00

| Well ID | Volume (gal/ft) |
|---|---|
| 1" | 0.04 |
| 2" | 0.17 |
| 3" | 0.38 |
| 4" | 0.66 |
| 5" | 1.04 |
| 6" | 1.50 |
| 8" | 2.60 |

**PURGE DATA**

| Time | Temperature (˚C) | pH (SU) | ORP (mV) | Conductivity (ms/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Salinity | Appearance |
|---|---|---|---|---|---|---|---|---|
| 11:24 AM | 9.87 | 8.62 | 25 | 9.730 | - | 19.64 | NR | muddy |
| 11:28 AM | 8.63 | 8.50 | 34 | 8.460 | 1000.0 | 12.51 | NR | muddy |
| 11:34 AM | 11.05 | 8.12 | 38 | 7.410 | 191.0 | 10.37 | NR | cloudy |
| 11:38 AM | 11.43 | 7.92 | 37 | 7.210 | 126.0 | 10.33 | NR | cloudy |
| 11:42 AM | 11.48 | 7.88 | 33 | 7.090 | 126.0 | 10.19 | NR | cloudy |
| 11:46 AM | 11.49 | 7.83 | 32 | 7.030 | 64.3 | 10.09 | NR | clear |
| 11:50 AM | 11.50 | 7.74 | 30 | 6.950 | 52.4 | 9.88 | NR | clear |
| 11:54 AM | 11.49 | 7.66 | 29 | 6.890 | 45.2 | 9.68 | NR | clear |
| 11:58 AM | 11.51 | 7.61 | 28 | 6.840 | 42.0 | 9.50 | NR | clear |
| 12:02 PM | 11.56 | 7.56 | 28 | 6.800 | 40.4 | 9.37 | NR | clear |

**Comments:** Sample MW-3 @ 11:45 AM on 12/9/19
TCL SVOCs, TAL Metals, & Mercury

42º 52' 49.0759" N
78º 49' 58.6074" W

# WELL PURGE LOG

***LiRo Engineers, Inc.***

Project Title: City of Buffalo - Franczyk Park

Well Number: **MW-7**

Site Name: Franczyk Park

Date: 12/9/19

Staff: Kris Charney

| | |
|---|---|
| A). Total casing and screen length in feet: | 7.81 |
| B). Water level below top of casing in feet: | 2.99 |
| C). Number of feet standing water [A-B]: | 4.82 |
| D). Volume of water/foot of casing (gal.): | 0.17 |
| E). Volume of water in casing (gal. [CxD]: | 0.8194 |
| F). Volume of water to remove (gal.) [Ex5]: | 2.4582 |
| G). Volume of water actually removed (gal.): | 3.00 |

| Well ID | Volume (gal/ft) |
|---|---|
| 1" | 0.04 |
| 2" | 0.17 |
| 3" | 0.38 |
| 4" | 0.66 |
| 5" | 1.04 |
| 6" | 1.50 |
| 8" | 2.60 |

**PURGE DATA**

| Time | Temperature (˚C) | pH (SU) | ORP (mV) | Conductivity (ms/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Salinity | Appearance |
|---|---|---|---|---|---|---|---|---|
| 10:16 AM | 14.86 | 8.47 | -175 | 0.822 | - | 21.22 | NR | muddy |
| 10:20 AM | 9.92 | 8.22 | -139 | 0.521 | 831.0 | 15.60 | NR | muddy |
| 10:24 AM | 9.02 | 8.22 | -102 | 0.447 | 463.0 | 13.30 | NR | muddy |
| 10:28 AM | 8.70 | 8.19 | -67 | 0.454 | 145.0 | 12.68 | NR | cloudy |
| 10:32 AM | 8.82 | 8.41 | -54 | 0.515 | 72.5 | 12.19 | NR | clear |
| 10:36 AM | 8.83 | 8.46 | -44 | 0.535 | 48.7 | 12.01 | NR | clear |
| 10:40 AM | 8.81 | 8.43 | -38 | 0.551 | 37.3 | 11.91 | NR | clear |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

**Comments:** Sample MW-7 @ 11:00 AM on 12/9/19
TCL SVOCs, TAL Metals, & Mercury

42º 52' 45.7094" N
78º 49' 53.6758" W

# WELL PURGE LOG

***LiRo Engineers, Inc.***

Project Title: City of Buffalo - Franczyk Park

Well Number: **MW-8**

Site Name: Franczyk Park

Date: 12/6/19

Staff: Kris Charney

A). Total casing and screen length in feet: 7.80

B). Water level below top of casing in feet: 1.80

C). Number of feet standing water [A-B]: 6.00

D). Volume of water/foot of casing (gal.): 0.17

E). Volume of water in casing (gal. [CxD]: 1.02

F). Volume of water to remove (gal.) [Ex5]: 3.06

G). Volume of water actually removed (gal.): 3.50

| Well ID | Volume (gal/ft) |
|---|---|
| 1" | 0.04 |
| 2" | 0.17 |
| 3" | 0.38 |
| 4" | 0.66 |
| 5" | 1.04 |
| 6" | 1.50 |
| 8" | 2.60 |

**PURGE DATA**

| Time | Temperature (°C) | pH (SU) | ORP (mV) | Conductivity (ms/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | Salinity | Appearance |
|---|---|---|---|---|---|---|---|---|
| 12:30 PM | 7.74 | 8.20 | -73 | 3.580 | 435.0 | 17.02 | NR | turbid |
| 12:34 PM | 7.13 | 8.08 | -79 | 1.080 | 101.0 | 15.12 | NR | turbid |
| 12:38 PM | 6.96 | 8.07 | -73 | 0.798 | 58.5 | 14.12 | NR | clear |
| 12:42 PM | 6.71 | 8.20 | -78 | 1.010 | 36.3 | 13.47 | NR | clear |
| 12:46 PM | 7.42 | 8.10 | -76 | 0.884 | 42.7 | 12.68 | NR | clear |
| Batteries died on Horiba, had to replace. | | | | | | | | |
| 12:54 PM | 7.50 | 8.21 | -88 | 1.030 | 33.5 | 23.54 | NR | clear |
| 12:58 PM | 7.51 | 8.24 | -93 | 1.150 | 31.3 | 13.40 | NR | clear |
| 1:00 PM | 7.59 | 8.25 | -95 | 1.260 | 31.5 | 12.60 | NR | clear |
| | | | | | | | | |

**Comments:** Sample MW-8 @ 1:00 PM on 12/6/19
TCL SVOCs, TAL Metals, & Mercury
Duplicate sample collected here
42° 52' 47.1216" N
78° 49' 58.4237" W

# Appendix E
# Laboratory Analytical Reports
(Included on Attached CD)

CHEMTECH

# ANALYTICAL RESULTS SUMMARY

METALS
SEMI-VOLATILE ORGANICS

**PROJECT NAME : CITY OF BUFFALO - FRANCZYK PARK SITE**

**LIRO ENGINEERS, INC.**

**690 Delaware Ave.**

**Buffalo, NY - 14209**

**Phone No: 716-882-5476**

**ORDER ID : K6235**

**ATTENTION : Jon Williams**

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORM S-I

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

| NYSDEC Sample ID/Code | Laboratory Sampl ID/Code | VOA GC/MS (Method #) | BNA GC/MS (Method #) | VOA GC (Method #) | Pest PCBs (Method #) | Metals (Method #) | Other (Method #) |
|---|---|---|---|---|---|---|---|
| MW-08 | K6235-01 | | 8270D | | | 6010D, 7470A | |
| MW-07 | K6235-02 | | 8270D | | | 6010D, 7470A | |
| MW-03 | K6235-03 | | 8270D | | | 6010D, 7470A | |
| DUP | K6235-04 | | 8270D | | | 6010D, 7470A | |

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-IIa

SAMPLE PREPARATION AND ANALYSIS SUMMARY SEMIVOLATILE (BNA) ANALYSES

| Laboratory Sample ID | Matrix | Date Collected | Date Rec'd at Lab | Date Extracted | Date Analyzed |
|---|---|---|---|---|---|
| K6235-01 | Water | 12/06/19 | 12/10/19 | 12/11/19 | 12/13/19 |
| K6235-02 | Water | 12/09/19 | 12/10/19 | 12/11/19 | 12/13/19 |
| K6235-03 | Water | 12/09/19 | 12/10/19 | 12/11/19 | 12/13/19 |
| K6235-04 | Water | 12/09/19 | 12/10/19 | 12/11/19 | 12/13/19 |

*** Details For Test :** SVOCMS Group1

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-IV

SAMPLE PREPARATION AND ANALYSIS SUMMARY INORGANIC ANALYSES

| Laboratory Sample ID | Matrix | Analytical Protocol | Extraction Method | Auxiliary Cleanup | Dil/Conc Factor |
|---|---|---|---|---|---|
| K6235-01 | Water | Mercury | 12/10/19 | 12/12/19 | 12/13/19 |
| K6235-02 | Water | Mercury | 12/10/19 | 12/12/19 | 12/13/19 |
| K6235-03 | Water | Mercury | 12/10/19 | 12/12/19 | 12/13/19 |
| K6235-04 | Water | Mercury | 12/10/19 | 12/12/19 | 12/13/19 |

*** Details For Test :** Mercury

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-III

SAMPLE PREPARATION AND ANALYSIS SUMMARY MISCELLANEOUS ORGANIC ANALYSES

| Laboratory Sample ID | Matrix | Analytical Protocol | Extraction Method | Auxiliary Cleanup | Dil/Conc Factor |
|---|---|---|---|---|---|
| K6235-01 | Water | 8270D | NA | | |
| K6235-02 | Water | 8270D | NA | | |
| K6235-03 | Water | 8270D | NA | | |
| K6235-04 | Water | 8270D | NA | | |

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-IV

SAMPLE PREPARATION AND ANALYSIS SUMMARY INORGANIC ANALYSES

| Laboratory Sample ID | Matrix | Analytical Protocol | Extraction Method | Auxiliary Cleanup | Dil/Conc Factor |
|---|---|---|---|---|---|
| K6235-01 | Water | Metals ICP-TAL | 12/10/19 | 12/11/19 | 12/11/19 |
| K6235-02 | Water | Metals ICP-TAL | 12/10/19 | 12/11/19 | 12/11/19 |
| K6235-03 | Water | Metals ICP-TAL | 12/10/19 | 12/11/19 | 12/11/19 |
| K6235-04 | Water | Metals ICP-TAL | 12/10/19 | 12/11/19 | 12/11/19 |

*** Details For Test :** Metals ICP-TAL

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

# Cover Page

**Order ID :** K6235

**Project ID :** City of Buffalo - Franczyk Park Site

**Client :** LiRo Engineers, Inc.

| Lab Sample Number | Client Sample Number |
|---|---|
| K6235-01 | MW-08 |
| K6235-02 | MW-07 |
| K6235-03 | MW-03 |
| K6235-04 | DUP |

I certify that the data package is in compliance with the terms and conditions of the contract,both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Signature : N. N. Pandya

APPROVED

*By Nimisha Pandya, QA QC Supervisor at 3:05 pm, Dec 23, 2019*

NYDOH CERTIFICATION NO - 11376

NJDEP CERTIFICATION NO - 20012

CHEMTECH
284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

# CASE NARRATIVE

**LiRo Engineers, Inc.**
**Project Name: City of Buffalo - Franczyk Park Site**
**Project # N/A**
**Chemtech Project # K6235**
**Test Name: SVOCMS Group1**

**A. Number of Samples and Date of Receipt:**
4 Water samples were received on 12/10/2019.

**B. Parameters**
According to the Chain of Custody document, the following analyses were requested: Mercury, Metals ICP-TAL, METALS-TAL and SVOCMS Group1. This data package contains results for SVOCMS Group1.

**C. Analytical Techniques:**
The samples were analyzed on instrument BNA_F using GC Column DB-UI 8270D which is 20 meters, 0.18 mm ID, 0.36 um dfThe analysis of SVOCMS Group1 was based on method 8270D and extraction was done based on method 3510.

**D. QA/ QC Samples:**
The Holding Times were met for all analysis.
The Surrogate recoveries met the acceptable criteria.
The Internal Standards Areas met the acceptable requirements.
The Retention Times were acceptable for all samples.

The RPD met criteria.
The Blank Spike for {PB125387BS} with File ID: BF118179.D recoveries met requirements for all Compounds except for Benzaldehyde [118%].
The Blank Spike Duplicate with File ID: BF118180.D recoveries met requirements for all Compounds except for Benzaldehyde [125%].
The above BS & BSD Duplicate recoveries were not within the acceptance criteria for benzaldehyde. As the associated sample has no positive hit for this Compound, therefore no corrective action was taken.

The Blank analysis did not indicate the presence of lab contamination.

The %RSD is greater than 15% in the Initial Calibration (Method 8270-BF120619.M) for Benzaldehyde, Atrazine these compounds are passing on Quadratic regression.
The Continuous Calibration met the requirements.
The Tuning criteria met requirements.

CHEMTECH
284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

**E. Additional Comments:**
The Form 6 is not included in the data package because the Initial Calibration was performed using 7 points.

Please use %D calculated based on Avg RF and CCRF for all compounds using Average Response Factor when the %RSD value for a compound is <15% for the Initial Calibration curve and use %D calculated based on Amount added and Calculated amount for all compounds using Linear Regression when the %RSD value for a compound is > 15% for the Initial Calibration curve for SW-846 analysis.

**F. Manual Integration Comments:**
Please refer to the Manual integration Report included with the Run Logs for information on the manual integrations performed.

---

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Signature_ N. N. Pandya

**APPROVED**
*By Nimisha Pandya, QA QC Supervisor at 3:06 pm, Dec 23, 2019*

CHEMTECH
284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

# CASE NARRATIVE

**LiRo Engineers, Inc.**
**Project Name: City of Buffalo - Franczyk Park Site**
**Project # N/A**
**Chemtech Project # K6235**
**Test Name: Metals ICP-TAL,Mercury**

**A. Number of Samples and Date of Receipt:**
4 Water samples were received on 12/10/2019.

**B. Parameters:**
According to the Chain of Custody document, the following analyses were requested: Mercury, Metals ICP-TAL, METALS-TAL and SVOCMS Group1. This data package contains results for Metals ICP-TAL,Mercury.

**C. Analytical Techniques:**
The analysis of Metals ICP-TAL was based on method 6010D, digestion based on method 3010 (waters). The analysis and digestion of Mercury was based on method 7470A.

**D. QA/ QC Samples:**
The Holding Times were met for all analysis.
Sample MW-03 was diluted due to high concentrations for Iron.
The Blank Spike met requirements for all samples.
The Duplicate analysis met criteria for all samples.
The Matrix Spike analysis met criteria for all samples.
The Matrix Spike Duplicate analysis met criteria for all samples.
The Blank analysis did not indicate the presence of lab contamination.
The Calibration met the requirements.
The Serial Dilution met the acceptable requirements.

**E. Additional Comments:**

---

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Signature_ N. N. Pandya

**APPROVED**
*By Nimisha Pandya, QA QC Supervisor at 3:06 pm, Dec 23, 2019*

# DATA REPORTING QUALIFIERS- INORGANIC

For reporting results, the following " Results Qualifiers" are used:

| | |
|---|---|
| **J** | Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL). |
| **U** | Indicates the analyte was analyzed for, but not detected. |
| **ND** | Indicates the analyte was analyzed for, but not detected |
| **E** | Indicates the reported value is estimated because of the presence of interference |
| **M** | Indicates Duplicate injection precision not met. |
| **N** | Indicates the spiked sample recovery is not within control limits. |
| **S** | Indicates the reported value was determined by the Method of Standard Addition (MSA). |
| * | Indicates that the duplicate analysis is not within control limits. |
| + | Indicates the correlation coefficient for the MSA is less than 0.995. |
| **D** | Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range. |
| **M** | Method qualifiers<br>**"P"** for ICP instrument<br>**"PM"** for ICP when Microwave Digestion is used<br>**"CV"** for Manual Cold Vapor AA<br>**"AV"** for automated Cold Vapor AA<br>**"CA"** for MIDI-Distillation Spectrophotometric<br>**"AS"** for Semi –Automated Spectrophotometric<br>**"C"** for Manual Spectrophotometric<br>**"T"** for Titrimetric<br>**"NR"** for analyte not required to be analyzed |
| **OR** | Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis. |
| **Q** | Indicates the LCS did not meet the control limits requirements |
| H | Sample Analysis Out Of Hold Time |

## DATA REPORTING QUALIFIERS- ORGANIC

For reporting results, the following " Results Qualifiers" are used:

| | |
|---|---|
| Value | If the result is a value greater than or equal to the detection limit, report the value |
| **U** | Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10 U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required. |
| **ND** | Indicates the analyte was analyzed for, but not detected |
| **J** | Indicates an estimated value**.** This flag is used:<br>(1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.)<br>(2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3 ug/L was calculated report as 3 J. This is flag is used when similar situation arise on any organic parameter i.e. Pest, PCB and others. |
| **B** | Indicates the analyte was found in the blank as well as the sample report as "12 B". |
| **E** | Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis. |
| **D** | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| **P** | This flag is used for Pesticide/PCB target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form 1 and flagged with a "P". |
| **N** | This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used. |
| **A** | This flag indicates that a Tentatively Identified Compound is a suspected aldol-condensation product. |
| **Q** | Indicates the LCS did not meet the control limits requirements |

## APPENDIX A

## QA REVIEW GENERAL DOCUMENTATION

**Project #:** K6235

| | Completed |
|---|---|
| **For thorough review, the report must have the following:** | |
| **GENERAL:** | |
| **Are all original paperwork present (chain of custody, record of communication,airbill, sample management lab chronicle, login page)** | ✓ |
| **Check chain-of-custody for proper relinquish/return of samples** | ✓ |
| **Is the chain of custody signed and complete** | ✓ |
| **Check internal chain-of-custody for proper relinquish/return of samples /sample extracts** | ✓ |
| **Collect information for each project id from server. Were all requirements followed** | ✓ |
| **COVER PAGE:** | |
| **Do numbers of samples correspond to the number of samples in the Chain of Custody on login page** | ✓ |
| **Do lab numbers and client Ids on cover page agree with the Chain of Custody** | ✓ |
| **CHAIN OF CUSTODY:** | |
| **Do requested analyses on Chain of Custody agree with form I results** | ✓ |
| **Do requested analyses on Chain of Custody agree with the log-in page** | ✓ |
| **Were the correct method log-in for analysis according to the Analytical Request and Chain of Castody** | ✓ |
| **Were the samples received within hold time** | ✓ |
| **Were any problems found with the samples at arrival recorded in the Sample Management Laboratory Chronicle** | ✓ |
| **ANALYTICAL:** | |
| **Was method requirement followed?** | ✓ |
| **Was client requirement followed?** | ✓ |
| **Does the case narrative summarize all QC failure?** | ✓ |
| **All runlogs and manual integration are reviewed for requirements** | ✓ |
| **All manual calculations and /or hand notations verified** | ✓ |

**1st Level QA Review Signature:** APARNA SONI **Date:** 12/23/2019

**2nd Level QA Review Signature:** N. N. Pandya Date:

APPROVED
By Nimisha Pandya, QA QC Supervisor at 3:06 pm, Dec 23, 2019

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey - 07092

Phone: (908) 789 8900 Fax: (908) 789 8922



# LAB CHRONICLE

| | | | |
|---|---|---|---|
| **OrderID:** | K6235 | **OrderDate:** | 12/10/2019 11:02:38 AM |
| **Client:** | LiRo Engineers, Inc. | **Project:** | City of Buffalo - Franczyk Park Site |
| **Contact:** | Jon Williams | **Location:** | B31 |

| LabID | ClientID | Matrix | Test | Method | Sample Date | Prep Date | Anal Date | Received |
|---|---|---|---|---|---|---|---|---|
| **K6235-01** | **MW-08** | **Water** | | | **12/06/19** | | | **12/10/19** |
| | | | SVOCMS Group1 | 8270D | | 12/11/19 | 12/13/19 | |
| **K6235-02** | **MW-07** | **Water** | | | **12/09/19** | | | **12/10/19** |
| | | | SVOCMS Group1 | 8270D | | 12/11/19 | 12/13/19 | |
| **K6235-03** | **MW-03** | **Water** | | | **12/09/19** | | | **12/10/19** |
| | | | SVOCMS Group1 | 8270D | | 12/11/19 | 12/13/19 | |
| **K6235-04** | **DUP** | **Water** | | | **12/09/19** | | | **12/10/19** |
| | | | SVOCMS Group1 | 8270D | | 12/11/19 | 12/13/19 | |

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922



# Hit Summary Sheet
## SW-846

**SDG No.:** K6235

**Client:** LiRo Engineers, Inc.

| Sample ID | Client ID | | Parameter | Concentration | C | MDL | RDL | Units |
|---|---|---|---|---|---|---|---|---|
| **Client ID : MW-07** | | | | | | | | |
| K6235-02 | MW-07 | WATER | Phenol | 2.600 | J | 2.2 | 10 | ug/L |
| | | | **Total Svoc :** | **2.60** | | | | |
| | | | **Total Concentration:** | **2.60** | | | | |
| **Client ID : MW-03** | | | | | | | | |
| K6235-03 | MW-03 | WATER | Phenol | 2.600 | J | 2.2 | 10 | ug/L |
| | | | **Total Svoc :** | **2.60** | | | | |
| | | | **Total Concentration:** | **2.60** | | | | |

# SAMPLE DATA

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/06/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-08 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-01 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118188.D | 1 | 12/11/19 08:36 | 12/13/19 16:11 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| **TARGETS** | | | | | | |
| 100-52-7 | Benzaldehyde | 10.0 | UQ | 2.90 | 10.0 | ug/L |
| 108-95-2 | Phenol | 10.0 | U | 2.20 | 10.0 | ug/L |
| 111-44-4 | bis(2-Chloroethyl)ether | 10.0 | U | 3.40 | 10.0 | ug/L |
| 95-57-8 | 2-Chlorophenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 95-48-7 | 2-Methylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 108-60-1 | 2,2-oxybis(1-Chloropropane) | 10.0 | U | 3.00 | 10.0 | ug/L |
| 98-86-2 | Acetophenone | 10.0 | U | 3.20 | 10.0 | ug/L |
| 65794-96-9 | 3+4-Methylphenols | 10.0 | U | 3.40 | 10.0 | ug/L |
| 621-64-7 | n-Nitroso-di-n-propylamine | 10.0 | U | 4.70 | 10.0 | ug/L |
| 67-72-1 | Hexachloroethane | 10.0 | U | 2.90 | 10.0 | ug/L |
| 98-95-3 | Nitrobenzene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 78-59-1 | Isophorone | 10.0 | U | 2.20 | 10.0 | ug/L |
| 88-75-5 | 2-Nitrophenol | 10.0 | U | 3.60 | 10.0 | ug/L |
| 105-67-9 | 2,4-Dimethylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-83-2 | 2,4-Dichlorophenol | 10.0 | U | 2.30 | 10.0 | ug/L |
| 91-20-3 | Naphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 106-47-8 | 4-Chloroaniline | 10.0 | U | 4.50 | 10.0 | ug/L |
| 87-68-3 | Hexachlorobutadiene | 10.0 | U | 3.20 | 10.0 | ug/L |
| 105-60-2 | Caprolactam | 10.0 | U | 3.40 | 10.0 | ug/L |
| 59-50-7 | 4-Chloro-3-methylphenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 91-57-6 | 2-Methylnaphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 77-47-4 | Hexachlorocyclopentadiene | 10.0 | U | 7.60 | 10.0 | ug/L |
| 88-06-2 | 2,4,6-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 95-95-4 | 2,4,5-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 92-52-4 | 1,1-Biphenyl | 10.0 | U | 3.30 | 10.0 | ug/L |
| 91-58-7 | 2-Chloronaphthalene | 10.0 | U | 3.00 | 10.0 | ug/L |
| 88-74-4 | 2-Nitroaniline | 10.0 | U | 3.10 | 10.0 | ug/L |
| 131-11-3 | Dimethylphthalate | 10.0 | U | 2.70 | 10.0 | ug/L |
| 208-96-8 | Acenaphthylene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 606-20-2 | 2,6-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/06/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-08 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-01 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118188.D | 1 | 12/11/19 08:36 | 12/13/19 16:11 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 10.0 | U | 4.20 | 10.0 | ug/L |
| 83-32-9 | Acenaphthene | 10.0 | U | 2.80 | 10.0 | ug/L |
| 51-28-5 | 2,4-Dinitrophenol | 10.0 | U | 4.20 | 10.0 | ug/L |
| 100-02-7 | 4-Nitrophenol | 10.0 | U | 3.40 | 10.0 | ug/L |
| 132-64-9 | Dibenzofuran | 10.0 | U | 3.20 | 10.0 | ug/L |
| 121-14-2 | 2,4-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 84-66-2 | Diethylphthalate | 10.0 | U | 2.90 | 10.0 | ug/L |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 10.0 | U | 3.30 | 10.0 | ug/L |
| 86-73-7 | Fluorene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 100-01-6 | 4-Nitroaniline | 10.0 | U | 3.40 | 10.0 | ug/L |
| 534-52-1 | 4,6-Dinitro-2-methylphenol | 10.0 | U | 3.50 | 10.0 | ug/L |
| 86-30-6 | n-Nitrosodiphenylamine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 101-55-3 | 4-Bromophenyl-phenylether | 10.0 | U | 2.60 | 10.0 | ug/L |
| 118-74-1 | Hexachlorobenzene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 1912-24-9 | Atrazine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 87-86-5 | Pentachlorophenol | 10.0 | U | 4.30 | 10.0 | ug/L |
| 85-01-8 | Phenanthrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-12-7 | Anthracene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 86-74-8 | Carbazole | 10.0 | U | 3.20 | 10.0 | ug/L |
| 84-74-2 | Di-n-butylphthalate | 10.0 | U | 3.70 | 10.0 | ug/L |
| 206-44-0 | Fluoranthene | 10.0 | U | 2.90 | 10.0 | ug/L |
| 129-00-0 | Pyrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 85-68-7 | Butylbenzylphthalate | 10.0 | U | 3.10 | 10.0 | ug/L |
| 91-94-1 | 3,3-Dichlorobenzidine | 10.0 | U | 5.00 | 10.0 | ug/L |
| 56-55-3 | Benzo(a)anthracene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 218-01-9 | Chrysene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 10.0 | U | 3.60 | 10.0 | ug/L |
| 117-84-0 | Di-n-octyl phthalate | 10.0 | U | 3.30 | 10.0 | ug/L |
| 205-99-2 | Benzo(b)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 207-08-9 | Benzo(k)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 50-32-8 | Benzo(a)pyrene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 10.0 | U | 3.30 | 10.0 | ug/L |
| 53-70-3 | Dibenzo(a,h)anthracene | 10.0 | U | 2.60 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/06/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-08 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-01 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : N | PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118188.D | 1 | 12/11/19 08:36 | 12/13/19 16:11 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 191-24-2 | Benzo(g,h,i)perylene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | 10.0 | U | 2.60 | 10.0 | ug/L |
| **SURROGATES** | | | | | | |
| 367-12-4 | 2-Fluorophenol | 56.2 | | 10 - 130 | 37% | SPK: 150 |
| 13127-88-3 | Phenol-d6 | 35.2 | | 10 - 130 | 23% | SPK: 150 |
| 4165-60-0 | Nitrobenzene-d5 | 85.4 | | 36 - 131 | 85% | SPK: 100 |
| 321-60-8 | 2-Fluorobiphenyl | 87.9 | | 39 - 131 | 88% | SPK: 100 |
| 118-79-6 | 2,4,6-Tribromophenol | 138 | | 25 - 155 | 92% | SPK: 150 |
| 1718-51-0 | Terphenyl-d14 | 105 | | 23 - 130 | 105% | SPK: 100 |
| **INTERNAL STANDARDS** | | | | | | |
| 3855-82-1 | 1,4-Dichlorobenzene-d4 | 123000 | 6.87 | | | |
| 1146-65-2 | Naphthalene-d8 | 476000 | 8.15 | | | |
| 15067-26-2 | Acenaphthene-d10 | 245000 | 9.92 | | | |
| 1517-22-2 | Phenanthrene-d10 | 433000 | 11.4 | | | |
| 1719-03-5 | Chrysene-d12 | 261000 | 14.06 | | | |
| 1520-96-3 | Perylene-d12 | 265000 | 15.55 | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit
A = Aldol-Condensation Reaction Products

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-07 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-02 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118189.D | 1 | 12/11/19 08:36 | 12/13/19 16:39 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| **TARGETS** | | | | | | |
| 100-52-7 | Benzaldehyde | 10.0 | UQ | 2.90 | 10.0 | ug/L |
| 108-95-2 | Phenol | 2.60 | J | 2.20 | 10.0 | ug/L |
| 111-44-4 | bis(2-Chloroethyl)ether | 10.0 | U | 3.40 | 10.0 | ug/L |
| 95-57-8 | 2-Chlorophenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 95-48-7 | 2-Methylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 108-60-1 | 2,2-oxybis(1-Chloropropane) | 10.0 | U | 3.00 | 10.0 | ug/L |
| 98-86-2 | Acetophenone | 10.0 | U | 3.20 | 10.0 | ug/L |
| 65794-96-9 | 3+4-Methylphenols | 10.0 | U | 3.40 | 10.0 | ug/L |
| 621-64-7 | n-Nitroso-di-n-propylamine | 10.0 | U | 4.70 | 10.0 | ug/L |
| 67-72-1 | Hexachloroethane | 10.0 | U | 2.90 | 10.0 | ug/L |
| 98-95-3 | Nitrobenzene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 78-59-1 | Isophorone | 10.0 | U | 2.20 | 10.0 | ug/L |
| 88-75-5 | 2-Nitrophenol | 10.0 | U | 3.60 | 10.0 | ug/L |
| 105-67-9 | 2,4-Dimethylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-83-2 | 2,4-Dichlorophenol | 10.0 | U | 2.30 | 10.0 | ug/L |
| 91-20-3 | Naphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 106-47-8 | 4-Chloroaniline | 10.0 | U | 4.50 | 10.0 | ug/L |
| 87-68-3 | Hexachlorobutadiene | 10.0 | U | 3.20 | 10.0 | ug/L |
| 105-60-2 | Caprolactam | 10.0 | U | 3.40 | 10.0 | ug/L |
| 59-50-7 | 4-Chloro-3-methylphenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 91-57-6 | 2-Methylnaphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 77-47-4 | Hexachlorocyclopentadiene | 10.0 | U | 7.60 | 10.0 | ug/L |
| 88-06-2 | 2,4,6-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 95-95-4 | 2,4,5-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 92-52-4 | 1,1-Biphenyl | 10.0 | U | 3.30 | 10.0 | ug/L |
| 91-58-7 | 2-Chloronaphthalene | 10.0 | U | 3.00 | 10.0 | ug/L |
| 88-74-4 | 2-Nitroaniline | 10.0 | U | 3.10 | 10.0 | ug/L |
| 131-11-3 | Dimethylphthalate | 10.0 | U | 2.70 | 10.0 | ug/L |
| 208-96-8 | Acenaphthylene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 606-20-2 | 2,6-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-07 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-02 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118189.D | 1 | 12/11/19 08:36 | 12/13/19 16:39 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 10.0 | U | 4.20 | 10.0 | ug/L |
| 83-32-9 | Acenaphthene | 10.0 | U | 2.80 | 10.0 | ug/L |
| 51-28-5 | 2,4-Dinitrophenol | 10.0 | U | 4.20 | 10.0 | ug/L |
| 100-02-7 | 4-Nitrophenol | 10.0 | U | 3.40 | 10.0 | ug/L |
| 132-64-9 | Dibenzofuran | 10.0 | U | 3.20 | 10.0 | ug/L |
| 121-14-2 | 2,4-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 84-66-2 | Diethylphthalate | 10.0 | U | 2.90 | 10.0 | ug/L |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 10.0 | U | 3.30 | 10.0 | ug/L |
| 86-73-7 | Fluorene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 100-01-6 | 4-Nitroaniline | 10.0 | U | 3.40 | 10.0 | ug/L |
| 534-52-1 | 4,6-Dinitro-2-methylphenol | 10.0 | U | 3.50 | 10.0 | ug/L |
| 86-30-6 | n-Nitrosodiphenylamine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 101-55-3 | 4-Bromophenyl-phenylether | 10.0 | U | 2.60 | 10.0 | ug/L |
| 118-74-1 | Hexachlorobenzene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 1912-24-9 | Atrazine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 87-86-5 | Pentachlorophenol | 10.0 | U | 4.30 | 10.0 | ug/L |
| 85-01-8 | Phenanthrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-12-7 | Anthracene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 86-74-8 | Carbazole | 10.0 | U | 3.20 | 10.0 | ug/L |
| 84-74-2 | Di-n-butylphthalate | 10.0 | U | 3.70 | 10.0 | ug/L |
| 206-44-0 | Fluoranthene | 10.0 | U | 2.90 | 10.0 | ug/L |
| 129-00-0 | Pyrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 85-68-7 | Butylbenzylphthalate | 10.0 | U | 3.10 | 10.0 | ug/L |
| 91-94-1 | 3,3-Dichlorobenzidine | 10.0 | U | 5.00 | 10.0 | ug/L |
| 56-55-3 | Benzo(a)anthracene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 218-01-9 | Chrysene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 10.0 | U | 3.60 | 10.0 | ug/L |
| 117-84-0 | Di-n-octyl phthalate | 10.0 | U | 3.30 | 10.0 | ug/L |
| 205-99-2 | Benzo(b)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 207-08-9 | Benzo(k)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 50-32-8 | Benzo(a)pyrene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 10.0 | U | 3.30 | 10.0 | ug/L |
| 53-70-3 | Dibenzo(a,h)anthracene | 10.0 | U | 2.60 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-07 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-02 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118189.D | 1 | 12/11/19 08:36 | 12/13/19 16:39 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 191-24-2 | Benzo(g,h,i)perylene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | 10.0 | U | 2.60 | 10.0 | ug/L |
| **SURROGATES** | | | | | | |
| 367-12-4 | 2-Fluorophenol | 56.1 | | 10 - 130 | 37% | SPK: 150 |
| 13127-88-3 | Phenol-d6 | 33.9 | | 10 - 130 | 23% | SPK: 150 |
| 4165-60-0 | Nitrobenzene-d5 | 89.0 | | 36 - 131 | 89% | SPK: 100 |
| 321-60-8 | 2-Fluorobiphenyl | 88.1 | | 39 - 131 | 88% | SPK: 100 |
| 118-79-6 | 2,4,6-Tribromophenol | 137 | | 25 - 155 | 91% | SPK: 150 |
| 1718-51-0 | Terphenyl-d14 | 104 | | 23 - 130 | 104% | SPK: 100 |
| **INTERNAL STANDARDS** | | | | | | |
| 3855-82-1 | 1,4-Dichlorobenzene-d4 | 118000 | 6.87 | | | |
| 1146-65-2 | Naphthalene-d8 | 450000 | 8.15 | | | |
| 15067-26-2 | Acenaphthene-d10 | 240000 | 9.92 | | | |
| 1517-22-2 | Phenanthrene-d10 | 444000 | 11.4 | | | |
| 1719-03-5 | Chrysene-d12 | 283000 | 14.06 | | | |
| 1520-96-3 | Perylene-d12 | 278000 | 15.55 | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit
A = Aldol-Condensation Reaction Products

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-03 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-03 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118190.D | 1 | 12/11/19 08:36 | 12/13/19 17:07 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| **TARGETS** | | | | | | |
| 100-52-7 | Benzaldehyde | 10.0 | UQ | 2.90 | 10.0 | ug/L |
| 108-95-2 | Phenol | 2.60 | J | 2.20 | 10.0 | ug/L |
| 111-44-4 | bis(2-Chloroethyl)ether | 10.0 | U | 3.40 | 10.0 | ug/L |
| 95-57-8 | 2-Chlorophenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 95-48-7 | 2-Methylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 108-60-1 | 2,2-oxybis(1-Chloropropane) | 10.0 | U | 3.00 | 10.0 | ug/L |
| 98-86-2 | Acetophenone | 10.0 | U | 3.20 | 10.0 | ug/L |
| 65794-96-9 | 3+4-Methylphenols | 10.0 | U | 3.40 | 10.0 | ug/L |
| 621-64-7 | n-Nitroso-di-n-propylamine | 10.0 | U | 4.70 | 10.0 | ug/L |
| 67-72-1 | Hexachloroethane | 10.0 | U | 2.90 | 10.0 | ug/L |
| 98-95-3 | Nitrobenzene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 78-59-1 | Isophorone | 10.0 | U | 2.20 | 10.0 | ug/L |
| 88-75-5 | 2-Nitrophenol | 10.0 | U | 3.60 | 10.0 | ug/L |
| 105-67-9 | 2,4-Dimethylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-83-2 | 2,4-Dichlorophenol | 10.0 | U | 2.30 | 10.0 | ug/L |
| 91-20-3 | Naphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 106-47-8 | 4-Chloroaniline | 10.0 | U | 4.50 | 10.0 | ug/L |
| 87-68-3 | Hexachlorobutadiene | 10.0 | U | 3.20 | 10.0 | ug/L |
| 105-60-2 | Caprolactam | 10.0 | U | 3.40 | 10.0 | ug/L |
| 59-50-7 | 4-Chloro-3-methylphenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 91-57-6 | 2-Methylnaphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 77-47-4 | Hexachlorocyclopentadiene | 10.0 | U | 7.60 | 10.0 | ug/L |
| 88-06-2 | 2,4,6-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 95-95-4 | 2,4,5-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 92-52-4 | 1,1-Biphenyl | 10.0 | U | 3.30 | 10.0 | ug/L |
| 91-58-7 | 2-Chloronaphthalene | 10.0 | U | 3.00 | 10.0 | ug/L |
| 88-74-4 | 2-Nitroaniline | 10.0 | U | 3.10 | 10.0 | ug/L |
| 131-11-3 | Dimethylphthalate | 10.0 | U | 2.70 | 10.0 | ug/L |
| 208-96-8 | Acenaphthylene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 606-20-2 | 2,6-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-03 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-03 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118190.D | 1 | 12/11/19 08:36 | 12/13/19 17:07 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 10.0 | U | 4.20 | 10.0 | ug/L |
| 83-32-9 | Acenaphthene | 10.0 | U | 2.80 | 10.0 | ug/L |
| 51-28-5 | 2,4-Dinitrophenol | 10.0 | U | 4.20 | 10.0 | ug/L |
| 100-02-7 | 4-Nitrophenol | 10.0 | U | 3.40 | 10.0 | ug/L |
| 132-64-9 | Dibenzofuran | 10.0 | U | 3.20 | 10.0 | ug/L |
| 121-14-2 | 2,4-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 84-66-2 | Diethylphthalate | 10.0 | U | 2.90 | 10.0 | ug/L |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 10.0 | U | 3.30 | 10.0 | ug/L |
| 86-73-7 | Fluorene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 100-01-6 | 4-Nitroaniline | 10.0 | U | 3.40 | 10.0 | ug/L |
| 534-52-1 | 4,6-Dinitro-2-methylphenol | 10.0 | U | 3.50 | 10.0 | ug/L |
| 86-30-6 | n-Nitrosodiphenylamine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 101-55-3 | 4-Bromophenyl-phenylether | 10.0 | U | 2.60 | 10.0 | ug/L |
| 118-74-1 | Hexachlorobenzene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 1912-24-9 | Atrazine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 87-86-5 | Pentachlorophenol | 10.0 | U | 4.30 | 10.0 | ug/L |
| 85-01-8 | Phenanthrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-12-7 | Anthracene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 86-74-8 | Carbazole | 10.0 | U | 3.20 | 10.0 | ug/L |
| 84-74-2 | Di-n-butylphthalate | 10.0 | U | 3.70 | 10.0 | ug/L |
| 206-44-0 | Fluoranthene | 10.0 | U | 2.90 | 10.0 | ug/L |
| 129-00-0 | Pyrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 85-68-7 | Butylbenzylphthalate | 10.0 | U | 3.10 | 10.0 | ug/L |
| 91-94-1 | 3,3-Dichlorobenzidine | 10.0 | U | 5.00 | 10.0 | ug/L |
| 56-55-3 | Benzo(a)anthracene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 218-01-9 | Chrysene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 10.0 | U | 3.60 | 10.0 | ug/L |
| 117-84-0 | Di-n-octyl phthalate | 10.0 | U | 3.30 | 10.0 | ug/L |
| 205-99-2 | Benzo(b)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 207-08-9 | Benzo(k)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 50-32-8 | Benzo(a)pyrene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 10.0 | U | 3.30 | 10.0 | ug/L |
| 53-70-3 | Dibenzo(a,h)anthracene | 10.0 | U | 2.60 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-03 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-03 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118190.D | 1 | 12/11/19 08:36 | 12/13/19 17:07 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 191-24-2 | Benzo(g,h,i)perylene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | 10.0 | U | 2.60 | 10.0 | ug/L |
| **SURROGATES** | | | | | | |
| 367-12-4 | 2-Fluorophenol | 81.9 | | 10 - 130 | 55% | SPK: 150 |
| 13127-88-3 | Phenol-d6 | 54.4 | | 10 - 130 | 36% | SPK: 150 |
| 4165-60-0 | Nitrobenzene-d5 | 83.6 | | 36 - 131 | 84% | SPK: 100 |
| 321-60-8 | 2-Fluorobiphenyl | 86.7 | | 39 - 131 | 87% | SPK: 100 |
| 118-79-6 | 2,4,6-Tribromophenol | 139 | | 25 - 155 | 93% | SPK: 150 |
| 1718-51-0 | Terphenyl-d14 | 101 | | 23 - 130 | 101% | SPK: 100 |
| **INTERNAL STANDARDS** | | | | | | |
| 3855-82-1 | 1,4-Dichlorobenzene-d4 | 115000 | 6.86 | | | |
| 1146-65-2 | Naphthalene-d8 | 437000 | 8.15 | | | |
| 15067-26-2 | Acenaphthene-d10 | 227000 | 9.92 | | | |
| 1517-22-2 | Phenanthrene-d10 | 421000 | 11.4 | | | |
| 1719-03-5 | Chrysene-d12 | 273000 | 14.06 | | | |
| 1520-96-3 | Perylene-d12 | 279000 | 15.55 | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit
A = Aldol-Condensation Reaction Products

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | DUP | SDG No.: | K6235 |
| Lab Sample ID: | K6235-04 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118186.D | 1 | 12/11/19 08:36 | 12/13/19 15:15 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| **TARGETS** | | | | | | |
| 100-52-7 | Benzaldehyde | 10.0 | UQ | 2.90 | 10.0 | ug/L |
| 108-95-2 | Phenol | 10.0 | U | 2.20 | 10.0 | ug/L |
| 111-44-4 | bis(2-Chloroethyl)ether | 10.0 | U | 3.40 | 10.0 | ug/L |
| 95-57-8 | 2-Chlorophenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 95-48-7 | 2-Methylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 108-60-1 | 2,2-oxybis(1-Chloropropane) | 10.0 | U | 3.00 | 10.0 | ug/L |
| 98-86-2 | Acetophenone | 10.0 | U | 3.20 | 10.0 | ug/L |
| 65794-96-9 | 3+4-Methylphenols | 10.0 | U | 3.40 | 10.0 | ug/L |
| 621-64-7 | n-Nitroso-di-n-propylamine | 10.0 | U | 4.70 | 10.0 | ug/L |
| 67-72-1 | Hexachloroethane | 10.0 | U | 2.90 | 10.0 | ug/L |
| 98-95-3 | Nitrobenzene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 78-59-1 | Isophorone | 10.0 | U | 2.20 | 10.0 | ug/L |
| 88-75-5 | 2-Nitrophenol | 10.0 | U | 3.60 | 10.0 | ug/L |
| 105-67-9 | 2,4-Dimethylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-83-2 | 2,4-Dichlorophenol | 10.0 | U | 2.30 | 10.0 | ug/L |
| 91-20-3 | Naphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 106-47-8 | 4-Chloroaniline | 10.0 | U | 4.50 | 10.0 | ug/L |
| 87-68-3 | Hexachlorobutadiene | 10.0 | U | 3.20 | 10.0 | ug/L |
| 105-60-2 | Caprolactam | 10.0 | U | 3.40 | 10.0 | ug/L |
| 59-50-7 | 4-Chloro-3-methylphenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 91-57-6 | 2-Methylnaphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 77-47-4 | Hexachlorocyclopentadiene | 10.0 | U | 7.60 | 10.0 | ug/L |
| 88-06-2 | 2,4,6-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 95-95-4 | 2,4,5-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 92-52-4 | 1,1-Biphenyl | 10.0 | U | 3.30 | 10.0 | ug/L |
| 91-58-7 | 2-Chloronaphthalene | 10.0 | U | 3.00 | 10.0 | ug/L |
| 88-74-4 | 2-Nitroaniline | 10.0 | U | 3.10 | 10.0 | ug/L |
| 131-11-3 | Dimethylphthalate | 10.0 | U | 2.70 | 10.0 | ug/L |
| 208-96-8 | Acenaphthylene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 606-20-2 | 2,6-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | DUP | SDG No.: | K6235 |
| Lab Sample ID: | K6235-04 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : N | PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118186.D | 1 | 12/11/19 08:36 | 12/13/19 15:15 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 10.0 | U | 4.20 | 10.0 | ug/L |
| 83-32-9 | Acenaphthene | 10.0 | U | 2.80 | 10.0 | ug/L |
| 51-28-5 | 2,4-Dinitrophenol | 10.0 | U | 4.20 | 10.0 | ug/L |
| 100-02-7 | 4-Nitrophenol | 10.0 | U | 3.40 | 10.0 | ug/L |
| 132-64-9 | Dibenzofuran | 10.0 | U | 3.20 | 10.0 | ug/L |
| 121-14-2 | 2,4-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 84-66-2 | Diethylphthalate | 10.0 | U | 2.90 | 10.0 | ug/L |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 10.0 | U | 3.30 | 10.0 | ug/L |
| 86-73-7 | Fluorene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 100-01-6 | 4-Nitroaniline | 10.0 | U | 3.40 | 10.0 | ug/L |
| 534-52-1 | 4,6-Dinitro-2-methylphenol | 10.0 | U | 3.50 | 10.0 | ug/L |
| 86-30-6 | n-Nitrosodiphenylamine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 101-55-3 | 4-Bromophenyl-phenylether | 10.0 | U | 2.60 | 10.0 | ug/L |
| 118-74-1 | Hexachlorobenzene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 1912-24-9 | Atrazine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 87-86-5 | Pentachlorophenol | 10.0 | U | 4.30 | 10.0 | ug/L |
| 85-01-8 | Phenanthrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-12-7 | Anthracene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 86-74-8 | Carbazole | 10.0 | U | 3.20 | 10.0 | ug/L |
| 84-74-2 | Di-n-butylphthalate | 10.0 | U | 3.70 | 10.0 | ug/L |
| 206-44-0 | Fluoranthene | 10.0 | U | 2.90 | 10.0 | ug/L |
| 129-00-0 | Pyrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 85-68-7 | Butylbenzylphthalate | 10.0 | U | 3.10 | 10.0 | ug/L |
| 91-94-1 | 3,3-Dichlorobenzidine | 10.0 | U | 5.00 | 10.0 | ug/L |
| 56-55-3 | Benzo(a)anthracene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 218-01-9 | Chrysene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 10.0 | U | 3.60 | 10.0 | ug/L |
| 117-84-0 | Di-n-octyl phthalate | 10.0 | U | 3.30 | 10.0 | ug/L |
| 205-99-2 | Benzo(b)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 207-08-9 | Benzo(k)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 50-32-8 | Benzo(a)pyrene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 10.0 | U | 3.30 | 10.0 | ug/L |
| 53-70-3 | Dibenzo(a,h)anthracene | 10.0 | U | 2.60 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | DUP | SDG No.: | K6235 |
| Lab Sample ID: | K6235-04 | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118186.D | 1 | 12/11/19 08:36 | 12/13/19 15:15 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 191-24-2 | Benzo(g,h,i)perylene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | 10.0 | U | 2.60 | 10.0 | ug/L |
| **SURROGATES** | | | | | | |
| 367-12-4 | 2-Fluorophenol | 60.7 | | 10 - 130 | 40% | SPK: 150 |
| 13127-88-3 | Phenol-d6 | 37.3 | | 10 - 130 | 25% | SPK: 150 |
| 4165-60-0 | Nitrobenzene-d5 | 86.5 | | 36 - 131 | 87% | SPK: 100 |
| 321-60-8 | 2-Fluorobiphenyl | 89.7 | | 39 - 131 | 90% | SPK: 100 |
| 118-79-6 | 2,4,6-Tribromophenol | 141 | | 25 - 155 | 94% | SPK: 150 |
| 1718-51-0 | Terphenyl-d14 | 102 | | 23 - 130 | 102% | SPK: 100 |
| **INTERNAL STANDARDS** | | | | | | |
| 3855-82-1 | 1,4-Dichlorobenzene-d4 | 121000 | 6.87 | | | |
| 1146-65-2 | Naphthalene-d8 | 466000 | 8.15 | | | |
| 15067-26-2 | Acenaphthene-d10 | 244000 | 9.92 | | | |
| 1517-22-2 | Phenanthrene-d10 | 450000 | 11.4 | | | |
| 1719-03-5 | Chrysene-d12 | 295000 | 14.06 | | | |
| 1520-96-3 | Perylene-d12 | 270000 | 15.55 | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit
A = Aldol-Condensation Reaction Products

# QC SUMMARY

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## Surrogate Summary

**SW-846**

**SDG No.:** K6235

**Client:** LiRo Engineers, Inc.

**Analytical Method:** 8270D

| Lab Sample ID | Client ID | Parameter | Spike (PPM) | Result (PPM) | Recovery (%) | Qual | Limits (%) Low | Limits (%) High |
|---|---|---|---|---|---|---|---|---|
| K6235-01 | MW-08 | 2-Fluorophenol | 150 | 56.2 | 37 | | 10 | 130 |
| | | Phenol-d6 | 150 | 35.2 | 23 | | 10 | 130 |
| | | Nitrobenzene-d5 | 100 | 85.4 | 85 | | 36 | 131 |
| | | 2-Fluorobiphenyl | 100 | 87.9 | 88 | | 39 | 131 |
| | | 2,4,6-Tribromophenol | 150 | 138 | 92 | | 25 | 155 |
| | | Terphenyl-d14 | 100 | 105 | 105 | | 23 | 130 |
| K6235-02 | MW-07 | 2-Fluorophenol | 150 | 56.1 | 37 | | 10 | 130 |
| | | Phenol-d6 | 150 | 33.9 | 23 | | 10 | 130 |
| | | Nitrobenzene-d5 | 100 | 89.0 | 89 | | 36 | 131 |
| | | 2-Fluorobiphenyl | 100 | 88.1 | 88 | | 39 | 131 |
| | | 2,4,6-Tribromophenol | 150 | 137 | 91 | | 25 | 155 |
| | | Terphenyl-d14 | 100 | 104 | 104 | | 23 | 130 |
| K6235-03 | MW-03 | 2-Fluorophenol | 150 | 81.9 | 55 | | 10 | 130 |
| | | Phenol-d6 | 150 | 54.4 | 36 | | 10 | 130 |
| | | Nitrobenzene-d5 | 100 | 83.6 | 84 | | 36 | 131 |
| | | 2-Fluorobiphenyl | 100 | 86.7 | 87 | | 39 | 131 |
| | | 2,4,6-Tribromophenol | 150 | 139 | 93 | | 25 | 155 |
| | | Terphenyl-d14 | 100 | 101 | 101 | | 23 | 130 |
| K6235-04 | DUP | 2-Fluorophenol | 150 | 60.7 | 40 | | 10 | 130 |
| | | Phenol-d6 | 150 | 37.3 | 25 | | 10 | 130 |
| | | Nitrobenzene-d5 | 100 | 86.5 | 87 | | 36 | 131 |
| | | 2-Fluorobiphenyl | 100 | 89.7 | 90 | | 39 | 131 |
| | | 2,4,6-Tribromophenol | 150 | 141 | 94 | | 25 | 155 |
| | | Terphenyl-d14 | 100 | 102 | 102 | | 23 | 130 |
| PB125387BL | PB125387BL | 2-Fluorophenol | 150 | 135 | 90 | | 10 | 130 |
| | | Phenol-d6 | 150 | 139 | 93 | | 10 | 130 |
| | | Nitrobenzene-d5 | 100 | 83.5 | 84 | | 36 | 131 |
| | | 2-Fluorobiphenyl | 100 | 86.5 | 87 | | 39 | 131 |
| | | 2,4,6-Tribromophenol | 150 | 134 | 89 | | 25 | 155 |
| | | Terphenyl-d14 | 100 | 89.5 | 89 | | 23 | 130 |
| PB125387BS | PB125387BS | 2-Fluorophenol | 150 | 107 | 71 | | 10 | 130 |
| | | Phenol-d6 | 150 | 106 | 71 | | 10 | 130 |
| | | Nitrobenzene-d5 | 100 | 68.9 | 69 | | 36 | 131 |
| | | 2-Fluorobiphenyl | 100 | 72.7 | 73 | | 39 | 131 |
| | | 2,4,6-Tribromophenol | 150 | 102 | 68 | | 25 | 155 |
| | | Terphenyl-d14 | 100 | 74.2 | 74 | | 23 | 130 |
| PB125387BSD | PB125387BSD | 2-Fluorophenol | 150 | 111 | 74 | | 10 | 130 |
| | | Phenol-d6 | 150 | 112 | 75 | | 10 | 130 |
| | | Nitrobenzene-d5 | 100 | 71.5 | 72 | | 36 | 131 |
| | | 2-Fluorobiphenyl | 100 | 75.3 | 75 | | 39 | 131 |
| | | 2,4,6-Tribromophenol | 150 | 108 | 72 | | 25 | 155 |
| | | Terphenyl-d14 | 100 | 74.9 | 75 | | 23 | 130 |

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# Laboratory Control Sample/Laboratory Control Sample Duplicate Summary
SW-846

**SDG No.:** K6235

**Client:** LiRo Engineers, Inc.

**Analytical Method:** 8270D **DataFile:** BF118179.D

| Lab Sample ID | Parameter | Spike | Result | Unit | Rec | RPD | Qual | RPD Qual | Limits Low | Limits High | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PB125387BS | Benzaldehyde | 50 | 58.8 | ug/L | 118 | | * | | 10 | 109 | |
| | Phenol | 50 | 40.5 | ug/L | 81 | | | | 10 | 130 | |
| | bis(2-Chloroethyl)ether | 50 | 41.1 | ug/L | 82 | | | | 46 | 116 | |
| | 2-Chlorophenol | 50 | 42.1 | ug/L | 84 | | | | 40 | 105 | |
| | 2-Methylphenol | 50 | 41.9 | ug/L | 84 | | | | 32 | 94 | |
| | 2,2-oxybis(1-Chloropropane) | 50 | 39.6 | ug/L | 79 | | | | 60 | 113 | |
| | Acetophenone | 50 | 37.3 | ug/L | 75 | | | | 64 | 120 | |
| | 3+4-Methylphenols | 50 | 41.8 | ug/L | 84 | | | | 24 | 91 | |
| | N-Nitroso-di-n-propylamine | 50 | 42.4 | ug/L | 85 | | | | 61 | 115 | |
| | Hexachloroethane | 50 | 39.4 | ug/L | 79 | | | | 52 | 104 | |
| | Nitrobenzene | 50 | 38.0 | ug/L | 76 | | | | 49 | 120 | |
| | Isophorone | 50 | 39.2 | ug/L | 78 | | | | 65 | 114 | |
| | 2-Nitrophenol | 50 | 39.6 | ug/L | 79 | | | | 57 | 116 | |
| | 2,4-Dimethylphenol | 50 | 45.3 | ug/L | 91 | | | | 43 | 108 | |
| | bis(2-Chloroethoxy)methane | 50 | 36.8 | ug/L | 74 | | | | 65 | 111 | |
| | 2,4-Dichlorophenol | 50 | 39.0 | ug/L | 78 | | | | 49 | 113 | |
| | Naphthalene | 50 | 39.2 | ug/L | 78 | | | | 61 | 107 | |
| | 4-Chloroaniline | 50 | 16.6 | ug/L | 33 | | | | 10 | 93 | |
| | Hexachlorobutadiene | 50 | 36.3 | ug/L | 73 | | | | 35 | 120 | |
| | Caprolactam | 50 | 39.1 | ug/L | 78 | | | | 10 | 130 | |
| | 4-Chloro-3-methylphenol | 50 | 39.0 | ug/L | 78 | | | | 51 | 109 | |
| | 2-Methylnaphthalene | 50 | 39.8 | ug/L | 80 | | | | 63 | 110 | |
| | Hexachlorocyclopentadiene | 100 | 91.8 | ug/L | 92 | | | | 42 | 121 | |
| | 2,4,6-Trichlorophenol | 50 | 38.0 | ug/L | 76 | | | | 62 | 114 | |
| | 2,4,5-Trichlorophenol | 50 | 39.1 | ug/L | 78 | | | | 58 | 116 | |
| | 1,1-Biphenyl | 50 | 38.2 | ug/L | 76 | | | | 65 | 117 | |
| | 2-Chloronaphthalene | 50 | 37.0 | ug/L | 74 | | | | 65 | 111 | |
| | 2-Nitroaniline | 50 | 35.9 | ug/L | 72 | | | | 63 | 119 | |
| | Dimethylphthalate | 50 | 37.1 | ug/L | 74 | | | | 68 | 112 | |
| | Acenaphthylene | 50 | 39.8 | ug/L | 80 | | | | 65 | 110 | |
| | 2,6-Dinitrotoluene | 50 | 37.7 | ug/L | 75 | | | | 68 | 115 | |
| | 3-Nitroaniline | 50 | 21.1 | ug/L | 42 | | | | 16 | 104 | |
| | Acenaphthene | 50 | 37.4 | ug/L | 75 | | | | 66 | 114 | |
| | 2,4-Dinitrophenol | 100 | 75.1 | ug/L | 75 | | | | 35 | 129 | |
| | 4-Nitrophenol | 100 | 73.9 | ug/L | 74 | | | | 10 | 130 | |
| | Dibenzofuran | 50 | 39.0 | ug/L | 78 | | | | 66 | 111 | |
| | 2,4-Dinitrotoluene | 50 | 39.0 | ug/L | 78 | | | | 65 | 119 | |
| | Diethylphthalate | 50 | 38.5 | ug/L | 77 | | | | 66 | 116 | |
| | 4-Chlorophenyl-phenylether | 50 | 38.1 | ug/L | 76 | | | | 66 | 113 | |
| | Fluorene | 50 | 39.0 | ug/L | 78 | | | | 66 | 112 | |
| | 4-Nitroaniline | 50 | 31.2 | ug/L | 62 | | | | 53 | 115 | |
| | 4,6-Dinitro-2-methylphenol | 50 | 41.4 | ug/L | 83 | | | | 47 | 137 | |
| | N-Nitrosodiphenylamine | 50 | 38.8 | ug/L | 78 | | | | 65 | 116 | |
| | 4-Bromophenyl-phenylether | 50 | 37.3 | ug/L | 75 | | | | 66 | 119 | |
| | Hexachlorobenzene | 50 | 36.7 | ug/L | 73 | | | | 57 | 121 | |
| | Atrazine | 50 | 54.7 | ug/L | 109 | | | | 53 | 130 | |

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# Laboratory Control Sample/Laboratory Control Sample Duplicate Summary
SW-846

**SDG No.:** K6235

**Client:** LiRo Engineers, Inc.

**Analytical Method:** 8270D **DataFile:** BF118179.D

| Lab Sample ID | Parameter | Spike | Result | Unit | Rec | RPD | Qual | RPD Qual | Limits Low | Limits High | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PB125387BS | Pentachlorophenol | 100 | 83.2 | ug/L | 83 | | | | 51 | 128 | |
| | Phenanthrene | 50 | 38.9 | ug/L | 78 | | | | 68 | 112 | |
| | Anthracene | 50 | 40.3 | ug/L | 81 | | | | 69 | 112 | |
| | Carbazole | 50 | 37.8 | ug/L | 76 | | | | 65 | 115 | |
| | Di-n-butylphthalate | 50 | 39.9 | ug/L | 80 | | | | 67 | 117 | |
| | Fluoranthene | 50 | 39.0 | ug/L | 78 | | | | 67 | 115 | |
| | Pyrene | 50 | 38.5 | ug/L | 77 | | | | 67 | 116 | |
| | Butylbenzylphthalate | 50 | 39.3 | ug/L | 79 | | | | 66 | 121 | |
| | 3,3-Dichlorobenzidine | 50 | 29.3 | ug/L | 59 | | | | 13 | 119 | |
| | Benzo(a)anthracene | 50 | 38.0 | ug/L | 76 | | | | 64 | 117 | |
| | Chrysene | 50 | 37.8 | ug/L | 76 | | | | 65 | 116 | |
| | bis(2-Ethylhexyl)phthalate | 50 | 41.8 | ug/L | 84 | | | | 61 | 123 | |
| | Di-n-octyl phthalate | 50 | 42.9 | ug/L | 86 | | | | 63 | 123 | |
| | Benzo(b)fluoranthene | 50 | 37.0 | ug/L | 74 | | | | 62 | 122 | |
| | Benzo(k)fluoranthene | 50 | 39.0 | ug/L | 78 | | | | 60 | 123 | |
| | Benzo(a)pyrene | 50 | 36.5 | ug/L | 73 | | | | 65 | 118 | |
| | Indeno(1,2,3-cd)pyrene | 50 | 34.3 | ug/L | 69 | | | | 50 | 133 | |
| | Dibenz(a,h)anthracene | 50 | 36.2 | ug/L | 72 | | | | 45 | 150 | |
| | Benzo(g,h,i)perylene | 50 | 36.0 | ug/L | 72 | | | | 64 | 123 | |
| | 1,2,4,5-Tetrachlorobenzene | 50 | 36.3 | ug/L | 73 | | | | 60 | 105 | |
| | 2,3,4,6-Tetrachlorophenol | 50 | 39.7 | ug/L | 79 | | | | 66 | 110 | |

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# Laboratory Control Sample/Laboratory Control Sample Duplicate Summary
SW-846

**SDG No.:** K6235

**Client:** LiRo Engineers, Inc.

**Analytical Method:** 8270D **DataFile:** BF118180.D

| Lab Sample ID | Parameter | Spike | Result | Unit | Rec | RPD | Qual | RPD Qual | Limits Low | Limits High | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PB125387BSD | Benzaldehyde | 50 | 62.5 | ug/L | 125 | 6 | * | | 10 | 109 | 20 |
| | Phenol | 50 | 42.4 | ug/L | 85 | 5 | | | 10 | 130 | 20 |
| | bis(2-Chloroethyl)ether | 50 | 41.9 | ug/L | 84 | 2 | | | 46 | 116 | 20 |
| | 2-Chlorophenol | 50 | 43.8 | ug/L | 88 | 4 | | | 40 | 105 | 20 |
| | 2-Methylphenol | 50 | 44.1 | ug/L | 88 | 5 | | | 32 | 94 | 20 |
| | 2,2-oxybis(1-Chloropropane) | 50 | 40.5 | ug/L | 81 | 2 | | | 60 | 113 | 20 |
| | Acetophenone | 50 | 38.9 | ug/L | 78 | 4 | | | 64 | 120 | 20 |
| | 3+4-Methylphenols | 50 | 44.1 | ug/L | 88 | 5 | | | 24 | 91 | 20 |
| | N-Nitroso-di-n-propylamine | 50 | 43.5 | ug/L | 87 | 3 | | | 61 | 115 | 20 |
| | Hexachloroethane | 50 | 41.1 | ug/L | 82 | 4 | | | 52 | 104 | 20 |
| | Nitrobenzene | 50 | 39.2 | ug/L | 78 | 3 | | | 49 | 120 | 20 |
| | Isophorone | 50 | 41.2 | ug/L | 82 | 5 | | | 65 | 114 | 20 |
| | 2-Nitrophenol | 50 | 41.7 | ug/L | 83 | 5 | | | 57 | 116 | 20 |
| | 2,4-Dimethylphenol | 50 | 47.8 | ug/L | 96 | 5 | | | 43 | 108 | 20 |
| | bis(2-Chloroethoxy)methane | 50 | 38.4 | ug/L | 77 | 4 | | | 65 | 111 | 20 |
| | 2,4-Dichlorophenol | 50 | 40.3 | ug/L | 81 | 3 | | | 49 | 113 | 20 |
| | Naphthalene | 50 | 40.8 | ug/L | 82 | 4 | | | 61 | 107 | 20 |
| | 4-Chloroaniline | 50 | 18.8 | ug/L | 38 | 12 | | | 10 | 93 | 20 |
| | Hexachlorobutadiene | 50 | 37.0 | ug/L | 74 | 2 | | | 35 | 120 | 20 |
| | Caprolactam | 50 | 42.4 | ug/L | 85 | 8 | | | 10 | 130 | 20 |
| | 4-Chloro-3-methylphenol | 50 | 41.3 | ug/L | 83 | 6 | | | 51 | 109 | 20 |
| | 2-Methylnaphthalene | 50 | 41.8 | ug/L | 84 | 5 | | | 63 | 110 | 20 |
| | Hexachlorocyclopentadiene | 100 | 94.3 | ug/L | 94 | 3 | | | 42 | 121 | 20 |
| | 2,4,6-Trichlorophenol | 50 | 39.3 | ug/L | 79 | 3 | | | 62 | 114 | 20 |
| | 2,4,5-Trichlorophenol | 50 | 41.4 | ug/L | 83 | 6 | | | 58 | 116 | 20 |
| | 1,1-Biphenyl | 50 | 39.8 | ug/L | 80 | 4 | | | 65 | 117 | 20 |
| | 2-Chloronaphthalene | 50 | 38.4 | ug/L | 77 | 4 | | | 65 | 111 | 20 |
| | 2-Nitroaniline | 50 | 38.3 | ug/L | 77 | 6 | | | 63 | 119 | 20 |
| | Dimethylphthalate | 50 | 39.4 | ug/L | 79 | 6 | | | 68 | 112 | 20 |
| | Acenaphthylene | 50 | 42.1 | ug/L | 84 | 6 | | | 65 | 110 | 20 |
| | 2,6-Dinitrotoluene | 50 | 40.6 | ug/L | 81 | 7 | | | 68 | 115 | 20 |
| | 3-Nitroaniline | 50 | 23.2 | ug/L | 46 | 9 | | | 16 | 104 | 20 |
| | Acenaphthene | 50 | 39.5 | ug/L | 79 | 5 | | | 66 | 114 | 20 |
| | 2,4-Dinitrophenol | 100 | 81.5 | ug/L | 82 | 8 | | | 35 | 129 | 20 |
| | 4-Nitrophenol | 100 | 79.3 | ug/L | 79 | 7 | | | 10 | 130 | 20 |
| | Dibenzofuran | 50 | 41.3 | ug/L | 83 | 6 | | | 66 | 111 | 20 |
| | 2,4-Dinitrotoluene | 50 | 41.5 | ug/L | 83 | 6 | | | 65 | 119 | 20 |
| | Diethylphthalate | 50 | 40.5 | ug/L | 81 | 5 | | | 66 | 116 | 20 |
| | 4-Chlorophenyl-phenylether | 50 | 40.0 | ug/L | 80 | 5 | | | 66 | 113 | 20 |
| | Fluorene | 50 | 41.0 | ug/L | 82 | 5 | | | 66 | 112 | 20 |
| | 4-Nitroaniline | 50 | 34.2 | ug/L | 68 | 9 | | | 53 | 115 | 20 |
| | 4,6-Dinitro-2-methylphenol | 50 | 43.7 | ug/L | 87 | 5 | | | 47 | 137 | 20 |
| | N-Nitrosodiphenylamine | 50 | 40.4 | ug/L | 81 | 4 | | | 65 | 116 | 20 |
| | 4-Bromophenyl-phenylether | 50 | 38.8 | ug/L | 78 | 4 | | | 66 | 119 | 20 |
| | Hexachlorobenzene | 50 | 38.7 | ug/L | 77 | 5 | | | 57 | 121 | 20 |
| | Atrazine | 50 | 59.9 | ug/L | 120 | 9 | | | 53 | 130 | 20 |

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# Laboratory Control Sample/Laboratory Control Sample Duplicate Summary
SW-846

**SDG No.:** K6235

**Client:** LiRo Engineers, Inc.

**Analytical Method:** 8270D **DataFile:** BF118180.D

| Lab Sample ID | Parameter | Spike | Result | Unit | Rec | RPD | Qual | RPD Qual | Limits Low | Limits High | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PB125387BSD | Pentachlorophenol | 100 | 87.4 | ug/L | 87 | 5 | | | 51 | 128 | 20 |
| | Phenanthrene | 50 | 40.4 | ug/L | 81 | 4 | | | 68 | 112 | 20 |
| | Anthracene | 50 | 42.3 | ug/L | 85 | 5 | | | 69 | 112 | 20 |
| | Carbazole | 50 | 40.1 | ug/L | 80 | 6 | | | 65 | 115 | 20 |
| | Di-n-butylphthalate | 50 | 41.6 | ug/L | 83 | 4 | | | 67 | 117 | 20 |
| | Fluoranthene | 50 | 41.2 | ug/L | 82 | 5 | | | 67 | 115 | 20 |
| | Pyrene | 50 | 39.5 | ug/L | 79 | 3 | | | 67 | 116 | 20 |
| | Butylbenzylphthalate | 50 | 39.4 | ug/L | 79 | 0 | | | 66 | 121 | 20 |
| | 3,3-Dichlorobenzidine | 50 | 28.7 | ug/L | 57 | 2 | | | 13 | 119 | 20 |
| | Benzo(a)anthracene | 50 | 38.8 | ug/L | 78 | 2 | | | 64 | 117 | 20 |
| | Chrysene | 50 | 37.9 | ug/L | 76 | 0 | | | 65 | 116 | 20 |
| | bis(2-Ethylhexyl)phthalate | 50 | 41.0 | ug/L | 82 | 2 | | | 61 | 123 | 20 |
| | Di-n-octyl phthalate | 50 | 42.3 | ug/L | 85 | 1 | | | 63 | 123 | 20 |
| | Benzo(b)fluoranthene | 50 | 40.5 | ug/L | 81 | 9 | | | 62 | 122 | 20 |
| | Benzo(k)fluoranthene | 50 | 40.5 | ug/L | 81 | 4 | | | 60 | 123 | 20 |
| | Benzo(a)pyrene | 50 | 39.0 | ug/L | 78 | 7 | | | 65 | 118 | 20 |
| | Indeno(1,2,3-cd)pyrene | 50 | 33.7 | ug/L | 67 | 2 | | | 50 | 133 | 20 |
| | Dibenz(a,h)anthracene | 50 | 38.5 | ug/L | 77 | 6 | | | 45 | 150 | 20 |
| | Benzo(g,h,i)perylene | 50 | 38.7 | ug/L | 77 | 7 | | | 64 | 123 | 20 |
| | 1,2,4,5-Tetrachlorobenzene | 50 | 37.7 | ug/L | 75 | 4 | | | 60 | 105 | 20 |
| | 2,3,4,6-Tetrachlorophenol | 50 | 41.6 | ug/L | 83 | 5 | | | 66 | 110 | 20 |

4B

SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

PB125387BL

Lab Name: CHEMTECH Contract: LIRO01

Lab Code: CHEM Case No.: K6235 SAS No.: K6235 SDG NO.: K6235

Lab File ID: BF118181.D Lab Sample ID: PB125387BL

Instrument ID: BNA_F Date Extracted: 12/11/2019

Matrix: (soil/water) Water Date Analyzed: 12/13/2019

Level: (low/med) LOW Time Analyzed: 12:49

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

| EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED |
|---|---|---|---|
| DUP | K6235-04 | BF118186.D | 12/13/2019 |
| MW-03 | K6235-03 | BF118190.D | 12/13/2019 |
| PB125387BSD | PB125387BSD | BF118180.D | 12/13/2019 |
| MW-08 | K6235-01 | BF118188.D | 12/13/2019 |
| MW-07 | K6235-02 | BF118189.D | 12/13/2019 |
| PB125387BS | PB125387BS | BF118179.D | 12/13/2019 |

COMMENTS:

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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: CHEMTECH Contract: LIRO01

Lab Code: CHEM SAS No.: K6235 SDG NO.: K6235

Lab File ID: BF118111.D DFTPP Injection Date: 12/06/2019

Instrument ID: BNA_F DFTPP Injection Time: 13:32

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 51 | 10.0 - 80.0% of mass 198 | 32.8 |
| 68 | Less than 2.0% of mass 69 | 0.7 ( 1.9 ) 1 |
| 69 | Mass 69 relative abundance | 34.5 |
| 70 | Less than 2.0% of mass 69 | 0.1 ( 0.3 ) 1 |
| 127 | 10.0 - 80.0% of mass 198 | 51.2 |
| 197 | Less than 2.0% of mass 198 | 0.5 |
| 198 | Base Peak, 100% relative abundance | 100 |
| 199 | 5.0 to 9.0% of mass 198 | 7 |
| 275 | 10.0 - 60.0% of mass 198 | 30.3 |
| 365 | Greater than 1% of mass 198 | 4.6 |
| 441 | Present, but less than mass 443 | 16.3 |
| 442 | Greater than 50% of mass 198 | 98.1 |
| 443 | 15.0 - 24.0% of mass 442 | 19 (19.4) 2 |

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|
| SSTDICC010 | SSTDICC010 | BF118112.D | 12/06/2019 | 14:05 |
| SSTDICC020 | SSTDICC020 | BF118113.D | 12/06/2019 | 14:32 |
| SSTDICCC040 | SSTDICCC040 | BF118114.D | 12/06/2019 | 14:59 |
| SSTDICC050 | SSTDICC050 | BF118115.D | 12/06/2019 | 15:27 |
| SSTDICC060 | SSTDICC060 | BF118116.D | 12/06/2019 | 15:55 |
| SSTDICC080 | SSTDICC080 | BF118117.D | 12/06/2019 | 16:22 |
| SSTDICC100 | SSTDICC100 | BF118118.D | 12/06/2019 | 16:50 |

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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: CHEMTECH Contract: LIRO01

Lab Code: CHEM SAS No.: K6235 SDG NO.: K6235

Lab File ID: BF118177.D DFTPP Injection Date: 12/13/2019

Instrument ID: BNA_F DFTPP Injection Time: 10:14

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 51 | 10.0 - 80.0% of mass 198 | 34.6 |
| 68 | Less than 2.0% of mass 69 | 0.5 ( 1.5 ) 1 |
| 69 | Mass 69 relative abundance | 37.1 |
| 70 | Less than 2.0% of mass 69 | 0.0 ( 0.0 ) 1 |
| 127 | 10.0 - 80.0% of mass 198 | 52 |
| 197 | Less than 2.0% of mass 198 | 0.3 |
| 198 | Base Peak, 100% relative abundance | 100 |
| 199 | 5.0 to 9.0% of mass 198 | 6.6 |
| 275 | 10.0 - 60.0% of mass 198 | 29.3 |
| 365 | Greater than 1% of mass 198 | 4.3 |
| 441 | Present, but less than mass 443 | 14.5 |
| 442 | Greater than 50% of mass 198 | 89.8 |
| 443 | 15.0 - 24.0% of mass 442 | 16.9 (18.9) 2 |

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|
| SSTDCCC040 | SSTDCCC040 | BF118178.D | 12/13/2019 | 10:41 |
| PB125387BS | PB125387BS | BF118179.D | 12/13/2019 | 11:53 |
| PB125387BSD | PB125387BSD | BF118180.D | 12/13/2019 | 12:21 |
| PB125387BL | PB125387BL | BF118181.D | 12/13/2019 | 12:49 |
| DUP | K6235-04 | BF118186.D | 12/13/2019 | 15:15 |
| MW-08 | K6235-01 | BF118188.D | 12/13/2019 | 16:11 |
| MW-07 | K6235-02 | BF118189.D | 12/13/2019 | 16:39 |
| MW-03 | K6235-03 | BF118190.D | 12/13/2019 | 17:07 |

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8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CHEMTECH

Lab Code: CHEM Case No.: K6235 SAS No.: K6235 SDG NO.: K6235

EPA Sample No.: SSTDCCC040 Date Analyzed: 12/13/2019

Lab File ID: BF118178.D Time Analyzed: 10:41

Instrument ID: BNA_F GC Column: DB-UI ID: 0.18 (mm)

| | | IS1 (DCB) AREA # | RT # | IS2 (NPT) AREA # | RT # | IS3 (ANT) AREA # | RT # |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 146321 | 6.87 | 561093 | 8.16 | 300351 | 9.92 |
| | UPPER LIMIT | 292642 | 7.37 | 1122190 | 8.66 | 600702 | 10.42 |
| | LOWER LIMIT | 73160.5 | 6.37 | 280547 | 7.66 | 150176 | 9.42 |
| | EPA SAMPLE NO. | | | | | | |
| 01 | PB125387BS | 115726 | 6.87 | 474449 | 8.16 | 255675 | 9.92 |
| 02 | PB125387BSD | 112594 | 6.87 | 460885 | 8.16 | 248287 | 9.92 |
| 03 | PB125387BL | 135935 | 6.87 | 536310 | 8.15 | 288132 | 9.92 |
| 04 | DUP | 120728 | 6.87 | 466019 | 8.15 | 243889 | 9.92 |
| 05 | MW-08 | 123402 | 6.87 | 476288 | 8.15 | 245339 | 9.92 |
| 06 | MW-07 | 117915 | 6.87 | 450388 | 8.15 | 239778 | 9.92 |
| 07 | MW-03 | 114709 | 6.86 | 437317 | 8.15 | 227297 | 9.92 |

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT UPPER LIMIT = -0.50 minutes of internal standard RT

# Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

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8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CHEMTECH

Lab Code: CHEM Case No.: K6235 SAS No.: K6235 SDG NO.: K6235

EPA Sample No.: SSTDCCC040 Date Analyzed: 12/13/2019

Lab File ID: BF118178.D Time Analyzed: 10:41

Instrument ID: BNA_F GC Column: DB-UI ID: 0.18 (mm)

| | | IS4 (PHN) AREA # | RT # | IS5 (CRY) AREA # | RT # | IS6 (PRY) AREA # | RT # |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 562336 | 11.41 | 388149 | 14.07 | 338782 | 15.56 |
| | UPPER LIMIT | 1124670 | 11.91 | 776298 | 14.57 | 677564 | 16.06 |
| | LOWER LIMIT | 281168 | 10.91 | 194075 | 13.57 | 169391 | 15.06 |
| | EPA SAMPLE NO. | | | | | | |
| 01 | PB125387BS | 478530 | 11.41 | 339238 | 14.07 | 299873 | 15.56 |
| 02 | PB125387BSD | 470848 | 11.41 | 340735 | 14.06 | 278934 | 15.56 |
| 03 | PB125387BL | 561082 | 11.41 | 406060 | 14.06 | 349790 | 15.55 |
| 04 | DUP | 450115 | 11.40 | 294937 | 14.06 | 269610 | 15.55 |
| 05 | MW-08 | 432942 | 11.40 | 260516 | 14.06 | 265405 | 15.55 |
| 06 | MW-07 | 444180 | 11.40 | 283469 | 14.06 | 278175 | 15.55 |
| 07 | MW-03 | 421124 | 11.40 | 272834 | 14.06 | 278710 | 15.55 |

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT UPPER LIMIT = -0.50 minutes of internal standard RT

# Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

# QC SAMPLE DATA

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | |
| Client Sample ID: | PB125387BL | SDG No.: | K6235 |
| Lab Sample ID: | PB125387BL | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118181.D | 1 | 12/11/19 08:36 | 12/13/19 12:49 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| **TARGETS** | | | | | | |
| 100-52-7 | Benzaldehyde | 10.0 | U | 2.90 | 10.0 | ug/L |
| 108-95-2 | Phenol | 10.0 | U | 2.20 | 10.0 | ug/L |
| 111-44-4 | bis(2-Chloroethyl)ether | 10.0 | U | 3.40 | 10.0 | ug/L |
| 95-57-8 | 2-Chlorophenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 95-48-7 | 2-Methylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 108-60-1 | 2,2-oxybis(1-Chloropropane) | 10.0 | U | 3.00 | 10.0 | ug/L |
| 98-86-2 | Acetophenone | 10.0 | U | 3.20 | 10.0 | ug/L |
| 65794-96-9 | 3+4-Methylphenols | 10.0 | U | 3.40 | 10.0 | ug/L |
| 621-64-7 | n-Nitroso-di-n-propylamine | 10.0 | U | 4.70 | 10.0 | ug/L |
| 67-72-1 | Hexachloroethane | 10.0 | U | 2.90 | 10.0 | ug/L |
| 98-95-3 | Nitrobenzene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 78-59-1 | Isophorone | 10.0 | U | 2.20 | 10.0 | ug/L |
| 88-75-5 | 2-Nitrophenol | 10.0 | U | 3.60 | 10.0 | ug/L |
| 105-67-9 | 2,4-Dimethylphenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-83-2 | 2,4-Dichlorophenol | 10.0 | U | 2.30 | 10.0 | ug/L |
| 91-20-3 | Naphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 106-47-8 | 4-Chloroaniline | 10.0 | U | 4.50 | 10.0 | ug/L |
| 87-68-3 | Hexachlorobutadiene | 10.0 | U | 3.20 | 10.0 | ug/L |
| 105-60-2 | Caprolactam | 10.0 | U | 3.40 | 10.0 | ug/L |
| 59-50-7 | 4-Chloro-3-methylphenol | 10.0 | U | 2.50 | 10.0 | ug/L |
| 91-57-6 | 2-Methylnaphthalene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 77-47-4 | Hexachlorocyclopentadiene | 10.0 | U | 7.60 | 10.0 | ug/L |
| 88-06-2 | 2,4,6-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 95-95-4 | 2,4,5-Trichlorophenol | 10.0 | U | 2.80 | 10.0 | ug/L |
| 92-52-4 | 1,1-Biphenyl | 10.0 | U | 3.30 | 10.0 | ug/L |
| 91-58-7 | 2-Chloronaphthalene | 10.0 | U | 3.00 | 10.0 | ug/L |
| 88-74-4 | 2-Nitroaniline | 10.0 | U | 3.10 | 10.0 | ug/L |
| 131-11-3 | Dimethylphthalate | 10.0 | U | 2.70 | 10.0 | ug/L |
| 208-96-8 | Acenaphthylene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 606-20-2 | 2,6-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | |
| Client Sample ID: | PB125387BL | SDG No.: | K6235 |
| Lab Sample ID: | PB125387BL | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118181.D | 1 | 12/11/19 08:36 | 12/13/19 12:49 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 10.0 | U | 4.20 | 10.0 | ug/L |
| 83-32-9 | Acenaphthene | 10.0 | U | 2.80 | 10.0 | ug/L |
| 51-28-5 | 2,4-Dinitrophenol | 10.0 | U | 4.20 | 10.0 | ug/L |
| 100-02-7 | 4-Nitrophenol | 10.0 | U | 3.40 | 10.0 | ug/L |
| 132-64-9 | Dibenzofuran | 10.0 | U | 3.20 | 10.0 | ug/L |
| 121-14-2 | 2,4-Dinitrotoluene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 84-66-2 | Diethylphthalate | 10.0 | U | 2.90 | 10.0 | ug/L |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 10.0 | U | 3.30 | 10.0 | ug/L |
| 86-73-7 | Fluorene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 100-01-6 | 4-Nitroaniline | 10.0 | U | 3.40 | 10.0 | ug/L |
| 534-52-1 | 4,6-Dinitro-2-methylphenol | 10.0 | U | 3.50 | 10.0 | ug/L |
| 86-30-6 | n-Nitrosodiphenylamine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 101-55-3 | 4-Bromophenyl-phenylether | 10.0 | U | 2.60 | 10.0 | ug/L |
| 118-74-1 | Hexachlorobenzene | 10.0 | U | 2.70 | 10.0 | ug/L |
| 1912-24-9 | Atrazine | 10.0 | U | 2.90 | 10.0 | ug/L |
| 87-86-5 | Pentachlorophenol | 10.0 | U | 4.30 | 10.0 | ug/L |
| 85-01-8 | Phenanthrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 120-12-7 | Anthracene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 86-74-8 | Carbazole | 10.0 | U | 3.20 | 10.0 | ug/L |
| 84-74-2 | Di-n-butylphthalate | 10.0 | U | 3.70 | 10.0 | ug/L |
| 206-44-0 | Fluoranthene | 10.0 | U | 2.90 | 10.0 | ug/L |
| 129-00-0 | Pyrene | 10.0 | U | 2.50 | 10.0 | ug/L |
| 85-68-7 | Butylbenzylphthalate | 10.0 | U | 3.10 | 10.0 | ug/L |
| 91-94-1 | 3,3-Dichlorobenzidine | 10.0 | U | 5.00 | 10.0 | ug/L |
| 56-55-3 | Benzo(a)anthracene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 218-01-9 | Chrysene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 10.0 | U | 3.60 | 10.0 | ug/L |
| 117-84-0 | Di-n-octyl phthalate | 10.0 | U | 3.30 | 10.0 | ug/L |
| 205-99-2 | Benzo(b)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 207-08-9 | Benzo(k)fluoranthene | 10.0 | U | 2.30 | 10.0 | ug/L |
| 50-32-8 | Benzo(a)pyrene | 10.0 | U | 2.40 | 10.0 | ug/L |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 10.0 | U | 3.30 | 10.0 | ug/L |
| 53-70-3 | Dibenzo(a,h)anthracene | 10.0 | U | 2.60 | 10.0 | ug/L |

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# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | |
| Client Sample ID: | PB125387BL | SDG No.: | K6235 |
| Lab Sample ID: | PB125387BL | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118181.D | 1 | 12/11/19 08:36 | 12/13/19 12:49 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 191-24-2 | Benzo(g,h,i)perylene | 10.0 | U | 2.60 | 10.0 | ug/L |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | 10.0 | U | 3.10 | 10.0 | ug/L |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | 10.0 | U | 2.60 | 10.0 | ug/L |
| **SURROGATES** | | | | | | |
| 367-12-4 | 2-Fluorophenol | 135 | | 10 - 130 | 90% | SPK: 150 |
| 13127-88-3 | Phenol-d6 | 139 | | 10 - 130 | 93% | SPK: 150 |
| 4165-60-0 | Nitrobenzene-d5 | 83.5 | | 36 - 131 | 84% | SPK: 100 |
| 321-60-8 | 2-Fluorobiphenyl | 86.5 | | 39 - 131 | 87% | SPK: 100 |
| 118-79-6 | 2,4,6-Tribromophenol | 134 | | 25 - 155 | 89% | SPK: 150 |
| 1718-51-0 | Terphenyl-d14 | 89.5 | | 23 - 130 | 89% | SPK: 100 |
| **INTERNAL STANDARDS** | | | | | | |
| 3855-82-1 | 1,4-Dichlorobenzene-d4 | 136000 | 6.87 | | | |
| 1146-65-2 | Naphthalene-d8 | 536000 | 8.15 | | | |
| 15067-26-2 | Acenaphthene-d10 | 288000 | 9.92 | | | |
| 1517-22-2 | Phenanthrene-d10 | 561000 | 11.41 | | | |
| 1719-03-5 | Chrysene-d12 | 406000 | 14.06 | | | |
| 1520-96-3 | Perylene-d12 | 350000 | 15.55 | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit
A = Aldol-Condensation Reaction Products

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# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | |
| Client Sample ID: | PB125387BS | SDG No.: | K6235 |
| Lab Sample ID: | PB125387BS | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118179.D | 1 | 12/11/19 08:36 | 12/13/19 11:53 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| **TARGETS** | | | | | | |
| 100-52-7 | Benzaldehyde | 58.8 | | 2.90 | 10.0 | ug/L |
| 108-95-2 | Phenol | 40.5 | | 2.20 | 10.0 | ug/L |
| 111-44-4 | bis(2-Chloroethyl)ether | 41.1 | | 3.40 | 10.0 | ug/L |
| 95-57-8 | 2-Chlorophenol | 42.1 | | 2.50 | 10.0 | ug/L |
| 95-48-7 | 2-Methylphenol | 41.9 | | 2.80 | 10.0 | ug/L |
| 108-60-1 | 2,2-oxybis(1-Chloropropane) | 39.6 | | 3.00 | 10.0 | ug/L |
| 98-86-2 | Acetophenone | 37.3 | | 3.20 | 10.0 | ug/L |
| 65794-96-9 | 3+4-Methylphenols | 41.8 | | 3.40 | 10.0 | ug/L |
| 621-64-7 | n-Nitroso-di-n-propylamine | 42.4 | | 4.70 | 10.0 | ug/L |
| 67-72-1 | Hexachloroethane | 39.4 | | 2.90 | 10.0 | ug/L |
| 98-95-3 | Nitrobenzene | 38.0 | | 2.60 | 10.0 | ug/L |
| 78-59-1 | Isophorone | 39.2 | | 2.20 | 10.0 | ug/L |
| 88-75-5 | 2-Nitrophenol | 39.6 | | 3.60 | 10.0 | ug/L |
| 105-67-9 | 2,4-Dimethylphenol | 45.3 | | 2.80 | 10.0 | ug/L |
| 111-91-1 | bis(2-Chloroethoxy)methane | 36.8 | | 2.50 | 10.0 | ug/L |
| 120-83-2 | 2,4-Dichlorophenol | 39.0 | | 2.30 | 10.0 | ug/L |
| 91-20-3 | Naphthalene | 39.2 | | 2.50 | 10.0 | ug/L |
| 106-47-8 | 4-Chloroaniline | 16.6 | | 4.50 | 10.0 | ug/L |
| 87-68-3 | Hexachlorobutadiene | 36.3 | | 3.20 | 10.0 | ug/L |
| 105-60-2 | Caprolactam | 39.1 | | 3.40 | 10.0 | ug/L |
| 59-50-7 | 4-Chloro-3-methylphenol | 39.0 | | 2.50 | 10.0 | ug/L |
| 91-57-6 | 2-Methylnaphthalene | 39.8 | | 2.50 | 10.0 | ug/L |
| 77-47-4 | Hexachlorocyclopentadiene | 91.8 | | 7.60 | 10.0 | ug/L |
| 88-06-2 | 2,4,6-Trichlorophenol | 38.0 | | 2.80 | 10.0 | ug/L |
| 95-95-4 | 2,4,5-Trichlorophenol | 39.1 | | 2.80 | 10.0 | ug/L |
| 92-52-4 | 1,1-Biphenyl | 38.2 | | 3.30 | 10.0 | ug/L |
| 91-58-7 | 2-Chloronaphthalene | 37.0 | | 3.00 | 10.0 | ug/L |
| 88-74-4 | 2-Nitroaniline | 35.9 | | 3.10 | 10.0 | ug/L |
| 131-11-3 | Dimethylphthalate | 37.1 | | 2.70 | 10.0 | ug/L |
| 208-96-8 | Acenaphthylene | 39.8 | | 2.70 | 10.0 | ug/L |
| 606-20-2 | 2,6-Dinitrotoluene | 37.7 | | 3.10 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | |
| Client Sample ID: | PB125387BS | SDG No.: | K6235 |
| Lab Sample ID: | PB125387BS | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118179.D | 1 | 12/11/19 08:36 | 12/13/19 11:53 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 21.1 | | 4.20 | 10.0 | ug/L |
| 83-32-9 | Acenaphthene | 37.4 | | 2.80 | 10.0 | ug/L |
| 51-28-5 | 2,4-Dinitrophenol | 75.1 | | 4.20 | 10.0 | ug/L |
| 100-02-7 | 4-Nitrophenol | 73.9 | | 3.40 | 10.0 | ug/L |
| 132-64-9 | Dibenzofuran | 39.0 | | 3.20 | 10.0 | ug/L |
| 121-14-2 | 2,4-Dinitrotoluene | 39.0 | | 3.10 | 10.0 | ug/L |
| 84-66-2 | Diethylphthalate | 38.5 | | 2.90 | 10.0 | ug/L |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 38.1 | | 3.30 | 10.0 | ug/L |
| 86-73-7 | Fluorene | 39.0 | | 2.50 | 10.0 | ug/L |
| 100-01-6 | 4-Nitroaniline | 31.2 | | 3.40 | 10.0 | ug/L |
| 534-52-1 | 4,6-Dinitro-2-methylphenol | 41.4 | | 3.50 | 10.0 | ug/L |
| 86-30-6 | n-Nitrosodiphenylamine | 38.8 | | 2.90 | 10.0 | ug/L |
| 101-55-3 | 4-Bromophenyl-phenylether | 37.3 | | 2.60 | 10.0 | ug/L |
| 118-74-1 | Hexachlorobenzene | 36.7 | | 2.70 | 10.0 | ug/L |
| 1912-24-9 | Atrazine | 54.7 | | 2.90 | 10.0 | ug/L |
| 87-86-5 | Pentachlorophenol | 83.2 | | 4.30 | 10.0 | ug/L |
| 85-01-8 | Phenanthrene | 38.9 | | 2.50 | 10.0 | ug/L |
| 120-12-7 | Anthracene | 40.3 | | 2.50 | 10.0 | ug/L |
| 86-74-8 | Carbazole | 37.8 | | 3.20 | 10.0 | ug/L |
| 84-74-2 | Di-n-butylphthalate | 39.9 | | 3.70 | 10.0 | ug/L |
| 206-44-0 | Fluoranthene | 39.0 | | 2.90 | 10.0 | ug/L |
| 129-00-0 | Pyrene | 38.5 | | 2.50 | 10.0 | ug/L |
| 85-68-7 | Butylbenzylphthalate | 39.3 | | 3.10 | 10.0 | ug/L |
| 91-94-1 | 3,3-Dichlorobenzidine | 29.3 | | 5.00 | 10.0 | ug/L |
| 56-55-3 | Benzo(a)anthracene | 38.0 | | 2.30 | 10.0 | ug/L |
| 218-01-9 | Chrysene | 37.8 | | 2.40 | 10.0 | ug/L |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 41.8 | | 3.60 | 10.0 | ug/L |
| 117-84-0 | Di-n-octyl phthalate | 42.9 | | 3.30 | 10.0 | ug/L |
| 205-99-2 | Benzo(b)fluoranthene | 37.0 | | 2.30 | 10.0 | ug/L |
| 207-08-9 | Benzo(k)fluoranthene | 39.0 | | 2.30 | 10.0 | ug/L |
| 50-32-8 | Benzo(a)pyrene | 36.5 | | 2.40 | 10.0 | ug/L |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 34.3 | | 3.30 | 10.0 | ug/L |
| 53-70-3 | Dibenzo(a,h)anthracene | 36.2 | | 2.60 | 10.0 | ug/L |

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | |
| Client Sample ID: | PB125387BS | SDG No.: | K6235 |
| Lab Sample ID: | PB125387BS | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : N | PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118179.D | 1 | 12/11/19 08:36 | 12/13/19 11:53 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 191-24-2 | Benzo(g,h,i)perylene | 36.0 | | 2.60 | 10.0 | ug/L |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | 36.3 | | 3.10 | 10.0 | ug/L |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | 39.7 | | 2.60 | 10.0 | ug/L |
| **SURROGATES** | | | | | | |
| 367-12-4 | 2-Fluorophenol | 107 | | 10 - 130 | 71% | SPK: 150 |
| 13127-88-3 | Phenol-d6 | 106 | | 10 - 130 | 71% | SPK: 150 |
| 4165-60-0 | Nitrobenzene-d5 | 68.9 | | 36 - 131 | 69% | SPK: 100 |
| 321-60-8 | 2-Fluorobiphenyl | 72.7 | | 39 - 131 | 73% | SPK: 100 |
| 118-79-6 | 2,4,6-Tribromophenol | 102 | | 25 - 155 | 68% | SPK: 150 |
| 1718-51-0 | Terphenyl-d14 | 74.2 | | 23 - 130 | 74% | SPK: 100 |
| **INTERNAL STANDARDS** | | | | | | |
| 3855-82-1 | 1,4-Dichlorobenzene-d4 | 116000 | 6.87 | | | |
| 1146-65-2 | Naphthalene-d8 | 474000 | 8.16 | | | |
| 15067-26-2 | Acenaphthene-d10 | 256000 | 9.92 | | | |
| 1517-22-2 | Phenanthrene-d10 | 479000 | 11.41 | | | |
| 1719-03-5 | Chrysene-d12 | 339000 | 14.07 | | | |
| 1520-96-3 | Perylene-d12 | 300000 | 15.56 | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit
A = Aldol-Condensation Reaction Products

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | |
| Client Sample ID: | PB125387BSD | SDG No.: | K6235 |
| Lab Sample ID: | PB125387BSD | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118180.D | 1 | 12/11/19 08:36 | 12/13/19 12:21 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| **TARGETS** | | | | | | |
| 100-52-7 | Benzaldehyde | 62.5 | | 2.90 | 10.0 | ug/L |
| 108-95-2 | Phenol | 42.4 | | 2.20 | 10.0 | ug/L |
| 111-44-4 | bis(2-Chloroethyl)ether | 41.9 | | 3.40 | 10.0 | ug/L |
| 95-57-8 | 2-Chlorophenol | 43.8 | | 2.50 | 10.0 | ug/L |
| 95-48-7 | 2-Methylphenol | 44.1 | | 2.80 | 10.0 | ug/L |
| 108-60-1 | 2,2-oxybis(1-Chloropropane) | 40.5 | | 3.00 | 10.0 | ug/L |
| 98-86-2 | Acetophenone | 38.9 | | 3.20 | 10.0 | ug/L |
| 65794-96-9 | 3+4-Methylphenols | 44.1 | | 3.40 | 10.0 | ug/L |
| 621-64-7 | n-Nitroso-di-n-propylamine | 43.5 | | 4.70 | 10.0 | ug/L |
| 67-72-1 | Hexachloroethane | 41.1 | | 2.90 | 10.0 | ug/L |
| 98-95-3 | Nitrobenzene | 39.2 | | 2.60 | 10.0 | ug/L |
| 78-59-1 | Isophorone | 41.2 | | 2.20 | 10.0 | ug/L |
| 88-75-5 | 2-Nitrophenol | 41.7 | | 3.60 | 10.0 | ug/L |
| 105-67-9 | 2,4-Dimethylphenol | 47.8 | | 2.80 | 10.0 | ug/L |
| 111-91-1 | bis(2-Chloroethoxy)methane | 38.4 | | 2.50 | 10.0 | ug/L |
| 120-83-2 | 2,4-Dichlorophenol | 40.3 | | 2.30 | 10.0 | ug/L |
| 91-20-3 | Naphthalene | 40.8 | | 2.50 | 10.0 | ug/L |
| 106-47-8 | 4-Chloroaniline | 18.8 | | 4.50 | 10.0 | ug/L |
| 87-68-3 | Hexachlorobutadiene | 37.0 | | 3.20 | 10.0 | ug/L |
| 105-60-2 | Caprolactam | 42.4 | | 3.40 | 10.0 | ug/L |
| 59-50-7 | 4-Chloro-3-methylphenol | 41.3 | | 2.50 | 10.0 | ug/L |
| 91-57-6 | 2-Methylnaphthalene | 41.8 | | 2.50 | 10.0 | ug/L |
| 77-47-4 | Hexachlorocyclopentadiene | 94.3 | | 7.60 | 10.0 | ug/L |
| 88-06-2 | 2,4,6-Trichlorophenol | 39.3 | | 2.80 | 10.0 | ug/L |
| 95-95-4 | 2,4,5-Trichlorophenol | 41.4 | | 2.80 | 10.0 | ug/L |
| 92-52-4 | 1,1-Biphenyl | 39.8 | | 3.30 | 10.0 | ug/L |
| 91-58-7 | 2-Chloronaphthalene | 38.4 | | 3.00 | 10.0 | ug/L |
| 88-74-4 | 2-Nitroaniline | 38.3 | | 3.10 | 10.0 | ug/L |
| 131-11-3 | Dimethylphthalate | 39.4 | | 2.70 | 10.0 | ug/L |
| 208-96-8 | Acenaphthylene | 42.1 | | 2.70 | 10.0 | ug/L |
| 606-20-2 | 2,6-Dinitrotoluene | 40.6 | | 3.10 | 10.0 | ug/L |

# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | |
| Client Sample ID: | PB125387BSD | SDG No.: | K6235 |
| Lab Sample ID: | PB125387BSD | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : | N PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118180.D | 1 | 12/11/19 08:36 | 12/13/19 12:21 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 23.2 | | 4.20 | 10.0 | ug/L |
| 83-32-9 | Acenaphthene | 39.5 | | 2.80 | 10.0 | ug/L |
| 51-28-5 | 2,4-Dinitrophenol | 81.5 | | 4.20 | 10.0 | ug/L |
| 100-02-7 | 4-Nitrophenol | 79.3 | | 3.40 | 10.0 | ug/L |
| 132-64-9 | Dibenzofuran | 41.3 | | 3.20 | 10.0 | ug/L |
| 121-14-2 | 2,4-Dinitrotoluene | 41.5 | | 3.10 | 10.0 | ug/L |
| 84-66-2 | Diethylphthalate | 40.5 | | 2.90 | 10.0 | ug/L |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 40.0 | | 3.30 | 10.0 | ug/L |
| 86-73-7 | Fluorene | 41.0 | | 2.50 | 10.0 | ug/L |
| 100-01-6 | 4-Nitroaniline | 34.2 | | 3.40 | 10.0 | ug/L |
| 534-52-1 | 4,6-Dinitro-2-methylphenol | 43.7 | | 3.50 | 10.0 | ug/L |
| 86-30-6 | n-Nitrosodiphenylamine | 40.4 | | 2.90 | 10.0 | ug/L |
| 101-55-3 | 4-Bromophenyl-phenylether | 38.8 | | 2.60 | 10.0 | ug/L |
| 118-74-1 | Hexachlorobenzene | 38.7 | | 2.70 | 10.0 | ug/L |
| 1912-24-9 | Atrazine | 59.9 | | 2.90 | 10.0 | ug/L |
| 87-86-5 | Pentachlorophenol | 87.4 | | 4.30 | 10.0 | ug/L |
| 85-01-8 | Phenanthrene | 40.4 | | 2.50 | 10.0 | ug/L |
| 120-12-7 | Anthracene | 42.3 | | 2.50 | 10.0 | ug/L |
| 86-74-8 | Carbazole | 40.1 | | 3.20 | 10.0 | ug/L |
| 84-74-2 | Di-n-butylphthalate | 41.6 | | 3.70 | 10.0 | ug/L |
| 206-44-0 | Fluoranthene | 41.2 | | 2.90 | 10.0 | ug/L |
| 129-00-0 | Pyrene | 39.5 | | 2.50 | 10.0 | ug/L |
| 85-68-7 | Butylbenzylphthalate | 39.4 | | 3.10 | 10.0 | ug/L |
| 91-94-1 | 3,3-Dichlorobenzidine | 28.7 | | 5.00 | 10.0 | ug/L |
| 56-55-3 | Benzo(a)anthracene | 38.8 | | 2.30 | 10.0 | ug/L |
| 218-01-9 | Chrysene | 37.9 | | 2.40 | 10.0 | ug/L |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 41.0 | | 3.60 | 10.0 | ug/L |
| 117-84-0 | Di-n-octyl phthalate | 42.3 | | 3.30 | 10.0 | ug/L |
| 205-99-2 | Benzo(b)fluoranthene | 40.5 | | 2.30 | 10.0 | ug/L |
| 207-08-9 | Benzo(k)fluoranthene | 40.5 | | 2.30 | 10.0 | ug/L |
| 50-32-8 | Benzo(a)pyrene | 39.0 | | 2.40 | 10.0 | ug/L |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 33.7 | | 3.30 | 10.0 | ug/L |
| 53-70-3 | Dibenzo(a,h)anthracene | 38.5 | | 2.60 | 10.0 | ug/L |

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# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | |
| Client Sample ID: | PB125387BSD | SDG No.: | K6235 |
| Lab Sample ID: | PB125387BSD | Matrix: | Water |
| Analytical Method: | SW8270 | % Moisture: | 100 |
| Sample Wt/Vol: | 1000 Units: mL | Final Vol: | 1000 uL |
| Soil Aliquot Vol: | uL | Test: | SVOCMS Group1 |
| Extraction Type : | Decanted : N | Level : | LOW |
| Injection Volume : | GPC Factor : 1.0 | GPC Cleanup : N | PH : |

| File ID/Qc Batch: | Dilution: | Prep Date | Date Analyzed | Prep Batch ID |
|---|---|---|---|---|
| BF118180.D | 1 | 12/11/19 08:36 | 12/13/19 12:21 | PB125387 |

| CAS Number | Parameter | Conc. | Qualifier | MDL | LOQ / CRQL | Units |
|---|---|---|---|---|---|---|
| 191-24-2 | Benzo(g,h,i)perylene | 38.7 | | 2.60 | 10.0 | ug/L |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | 37.7 | | 3.10 | 10.0 | ug/L |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | 41.6 | | 2.60 | 10.0 | ug/L |
| **SURROGATES** | | | | | | |
| 367-12-4 | 2-Fluorophenol | 111 | | 10 - 130 | 74% | SPK: 150 |
| 13127-88-3 | Phenol-d6 | 112 | | 10 - 130 | 75% | SPK: 150 |
| 4165-60-0 | Nitrobenzene-d5 | 71.5 | | 36 - 131 | 72% | SPK: 100 |
| 321-60-8 | 2-Fluorobiphenyl | 75.3 | | 39 - 131 | 75% | SPK: 100 |
| 118-79-6 | 2,4,6-Tribromophenol | 108 | | 25 - 155 | 72% | SPK: 150 |
| 1718-51-0 | Terphenyl-d14 | 74.9 | | 23 - 130 | 75% | SPK: 100 |
| **INTERNAL STANDARDS** | | | | | | |
| 3855-82-1 | 1,4-Dichlorobenzene-d4 | 113000 | 6.87 | | | |
| 1146-65-2 | Naphthalene-d8 | 461000 | 8.16 | | | |
| 15067-26-2 | Acenaphthene-d10 | 248000 | 9.92 | | | |
| 1517-22-2 | Phenanthrene-d10 | 471000 | 11.41 | | | |
| 1719-03-5 | Chrysene-d12 | 341000 | 14.06 | | | |
| 1520-96-3 | Perylene-d12 | 279000 | 15.56 | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit
A = Aldol-Condensation Reaction Products

# CALIBRATION SUMMARY

Method Path : Z:\SVOASRV\HPCHEM1\BNA_F\METHODS\
Method File : 8270-BF120619.M
Title : ASP BNA STANDARDS FOR 5 POINT CALIBRATION
Last Update : Mon Dec 03 04:47:00 2018
Response Via : Initial Calibration

Calibration Files
10 =BF118112.D 20 =BF118113.D 40 =BF118114.D 50 =BF118115.D 60 =BF118116.D 80 =BF118117.D 100 =BF118118.D

| | | Compound | 10 | 20 | 40 | 50 | 60 | 80 | 100 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) | I | 1,4-Dichlorobenzen... | ----------ISTD---------- | | | | | | | | |
| 2) | | 1,4-Dioxane | 0.534 | 0.495 | 0.478 | 0.488 | 0.466 | 0.461 | 0.449 | 0.481 | 5.80 |
| 3) | | Pyridine | 1.348 | 1.315 | 1.246 | 1.241 | 1.217 | 1.185 | 1.144 | 1.242 | 5.69 |
| 4) | | n-Nitrosodimet... | 0.568 | 0.537 | 0.527 | 0.544 | 0.522 | 0.522 | 0.520 | 0.534 | 3.20 |
| 5) | S | 2-Fluorophenol | 1.307 | 1.234 | 1.144 | 1.136 | 1.096 | 1.056 | 1.020 | 1.142 | 8.78 |
| 6) | | Aniline | 1.997 | 1.903 | 1.796 | 1.768 | 1.697 | 1.643 | 1.564 | 1.767 | 8.45 |
| 7) | S | Phenol-d6 | 1.589 | 1.483 | 1.391 | 1.373 | 1.316 | 1.280 | 1.237 | 1.381 | 8.82 |
| 8) | | 2-Chlorophenol | 1.484 | 1.399 | 1.293 | 1.279 | 1.236 | 1.184 | 1.138 | 1.288 | 9.34 |
| 9) | | Benzaldehyde | 1.014 | 0.894 | 0.725 | 0.669 | 0.611 | 0.540 | 0.464 | 0.702 | 27.70 |
| 10) | C | Phenol | 1.786 | 1.684 | 1.593 | 1.561 | 1.513 | 1.468 | 1.422 | 1.575 | 8.01 |
| 11) | | bis(2-Chloroet... | 1.276 | 1.199 | 1.123 | 1.138 | 1.104 | 1.075 | 1.059 | 1.139 | 6.64 |
| 12) | | 1,3-Dichlorobe... | 1.737 | 1.606 | 1.512 | 1.488 | 1.449 | 1.393 | 1.343 | 1.504 | 8.84 |
| 13) | C | 1,4-Dichlorobe... | 1.742 | 1.630 | 1.529 | 1.523 | 1.444 | 1.401 | 1.334 | 1.515 | 9.16 |
| 14) | | 1,2-Dichlorobe... | 1.653 | 1.542 | 1.439 | 1.420 | 1.364 | 1.298 | 1.240 | 1.422 | 9.96 |
| 15) | | Benzyl Alcohol | 1.213 | 1.156 | 1.098 | 1.070 | 1.039 | 1.007 | 0.964 | 1.078 | 7.97 |
| 16) | | 2,2'-oxybis(1-... | 1.560 | 1.472 | 1.383 | 1.370 | 1.312 | 1.272 | 1.218 | 1.370 | 8.57 |
| 17) | | 2-Methylphenol | 1.164 | 1.074 | 1.020 | 1.020 | 0.991 | 0.961 | 0.939 | 1.024 | 7.40 |
| 18) | | Hexachloroethane | 0.634 | 0.589 | 0.560 | 0.558 | 0.540 | 0.521 | 0.505 | 0.558 | 7.74 |
| 19) | P | n-Nitroso-di-n... | 0.953 | 0.900 | 0.836 | 0.831 | 0.807 | 0.785 | 0.764 | 0.839 | 7.89 |
| 20) | | 3+4-Methylphenols | 1.496 | 1.420 | 1.318 | 1.264 | 1.224 | 1.178 | 1.105 | 1.286 | 10.62 |
| 21) | I | Naphthalene-d8 | ----------ISTD---------- | | | | | | | | |
| 22) | | Acetophenone | 0.544 | 0.502 | 0.467 | 0.476 | 0.465 | 0.463 | 0.447 | 0.480 | 6.83 |
| 23) | S | Nitrobenzene-d5 | 0.385 | 0.364 | 0.342 | 0.358 | 0.349 | 0.349 | 0.342 | 0.356 | 4.28 |
| 24) | | Nitrobenzene | 0.382 | 0.359 | 0.337 | 0.347 | 0.340 | 0.345 | 0.335 | 0.349 | 4.69 |
| 25) | | Isophorone | 0.652 | 0.617 | 0.578 | 0.600 | 0.590 | 0.596 | 0.586 | 0.603 | 4.11 |
| 26) | C | 2-Nitrophenol | 0.190 | 0.189 | 0.181 | 0.192 | 0.185 | 0.187 | 0.183 | 0.187 | 1.95 |
| 27) | | 2,4-Dimethylph... | 0.266 | 0.254 | 0.240 | 0.251 | 0.245 | 0.245 | 0.242 | 0.249 | 3.51 |
| 28) | | bis(2-Chloroet... | 0.431 | 0.412 | 0.379 | 0.392 | 0.386 | 0.382 | 0.374 | 0.394 | 5.23 |
| 29) | C | 2,4-Dichloroph... | 0.316 | 0.302 | 0.283 | 0.292 | 0.283 | 0.282 | 0.274 | 0.290 | 5.02 |
| 30) | | 1,2,4-Trichlor... | 0.374 | 0.357 | 0.329 | 0.337 | 0.330 | 0.327 | 0.321 | 0.339 | 5.62 |
| 31) | | Naphthalene | 1.126 | 1.067 | 0.982 | 1.005 | 0.976 | 0.952 | 0.922 | 1.004 | 6.98 |
| 32) | | Benzoic acid | 0.196 | 0.213 | 0.222 | 0.236 | 0.231 | 0.240 | 0.237 | 0.225 | 7.17 |
| 33) | | 4-Chloroaniline | 0.472 | 0.450 | 0.413 | 0.432 | 0.425 | 0.428 | 0.417 | 0.434 | 4.73 |
| 34) | C | Hexachlorobuta... | 0.219 | 0.213 | 0.200 | 0.203 | 0.199 | 0.198 | 0.192 | 0.203 | 4.69 |
| 35) | | Caprolactam | 0.095 | 0.092 | 0.087 | 0.090 | 0.090 | 0.090 | 0.082 | 0.090 | 4.50 |
| 36) | C | 4-Chloro-3-met... | 0.334 | 0.318 | 0.297 | 0.304 | 0.299 | 0.298 | 0.289 | 0.305 | 5.08 |
| 37) | | 2-Methylnaphth... | 0.764 | 0.721 | 0.661 | 0.674 | 0.664 | 0.655 | 0.621 | 0.680 | 7.00 |
| 38) | | 1-Methylnaphth... | 0.725 | 0.680 | 0.624 | 0.629 | 0.620 | 0.612 | 0.581 | 0.638 | 7.54 |

Method Path : Z:\SVOASRV\HPCHEM1\BNA_F\METHODS\
Method File : 8270-BF120619.M

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 39) | I | Acenaphthene-d10 | ----------ISTD---------- | | | | | | | | |
| 40) | | 1,2,4,5-Tetrac... | 0.665 | 0.630 | 0.592 | 0.607 | 0.591 | 0.579 | 0.577 | 0.606 | 5.29 |
| 41) | P | Hexachlorocycl... | 0.197 | 0.246 | 0.269 | 0.291 | 0.294 | 0.299 | 0.305 | 0.271 | 14.29 |
| 42) | S | 2,4,6-Tribromo... | 0.266 | 0.253 | 0.235 | 0.241 | 0.240 | 0.233 | 0.232 | 0.243 | 5.12 |
| 43) | C | 2,4,6-Trichlor... | 0.426 | 0.420 | 0.399 | 0.410 | 0.399 | 0.391 | 0.388 | 0.405 | 3.57 |
| 44) | | 2,4,5-Trichlor... | 0.457 | 0.439 | 0.406 | 0.416 | 0.412 | 0.405 | 0.400 | 0.419 | 4.95 |
| 45) | S | 2-Fluorobiphenyl | 1.565 | 1.441 | 1.276 | 1.291 | 1.257 | 1.191 | 1.179 | 1.314 | 10.67 |
| 46) | | 1,1'-Biphenyl | 1.791 | 1.665 | 1.545 | 1.578 | 1.522 | 1.482 | 1.457 | 1.577 | 7.36 |
| 47) | | 2-Chloronaphth... | 1.403 | 1.329 | 1.241 | 1.257 | 1.248 | 1.214 | 1.190 | 1.269 | 5.77 |
| 48) | | 2-Nitroaniline | 0.375 | 0.370 | 0.348 | 0.366 | 0.363 | 0.357 | 0.353 | 0.362 | 2.71 |
| 49) | | Acenaphthylene | 2.137 | 1.996 | 1.835 | 1.844 | 1.814 | 1.782 | 1.692 | 1.871 | 7.92 |
| 50) | | Dimethylphthalate | 1.641 | 1.534 | 1.426 | 1.446 | 1.446 | 1.425 | 1.423 | 1.477 | 5.54 |
| 51) | | 2,6-Dinitrotol... | 0.343 | 0.328 | 0.309 | 0.320 | 0.315 | 0.318 | 0.314 | 0.321 | 3.55 |
| 52) | C | Acenaphthene | 1.296 | 1.204 | 1.106 | 1.122 | 1.119 | 1.084 | 1.065 | 1.142 | 7.07 |
| 53) | | 3-Nitroaniline | 0.400 | 0.385 | 0.370 | 0.377 | 0.381 | 0.372 | 0.361 | 0.378 | 3.30 |
| 54) | P | 2,4-Dinitrophenol | 0.117 | 0.146 | 0.153 | 0.168 | 0.174 | 0.178 | 0.183 | 0.160 | 14.50 |
| 55) | | Dibenzofuran | 1.946 | 1.797 | 1.626 | 1.662 | 1.615 | 1.563 | 1.508 | 1.674 | 8.97 |
| 56) | P | 4-Nitrophenol | 0.254 | 0.262 | 0.253 | 0.271 | 0.269 | 0.263 | 0.264 | 0.262 | 2.63 |
| 57) | | 2,4-Dinitrotol... | 0.457 | 0.435 | 0.418 | 0.433 | 0.435 | 0.419 | 0.406 | 0.429 | 3.83 |
| 58) | | Fluorene | 1.537 | 1.429 | 1.299 | 1.299 | 1.287 | 1.256 | 1.203 | 1.330 | 8.59 |
| 59) | | 2,3,4,6-Tetrac... | 0.386 | 0.363 | 0.338 | 0.342 | 0.345 | 0.327 | 0.320 | 0.346 | 6.47 |
| 60) | | Diethylphthalate | 1.629 | 1.537 | 1.405 | 1.425 | 1.427 | 1.390 | 1.376 | 1.455 | 6.37 |
| 61) | | 4-Chlorophenyl... | 0.774 | 0.725 | 0.657 | 0.657 | 0.646 | 0.625 | 0.602 | 0.669 | 8.91 |
| 62) | | 4-Nitroaniline | 0.415 | 0.412 | 0.385 | 0.392 | 0.388 | 0.388 | 0.380 | 0.394 | 3.44 |
| 63) | | Azobenzene | 1.400 | 1.312 | 1.203 | 1.212 | 1.224 | 1.181 | 1.165 | 1.243 | 6.74 |
| 64) | I | Phenanthrene-d10 | ----------ISTD---------- | | | | | | | | |
| 65) | | 4,6-Dinitro-2-... | 0.091 | 0.105 | 0.110 | 0.116 | 0.116 | 0.119 | 0.118 | 0.110 | 9.09 |
| 66) | c | n-Nitrosodiphe... | 0.687 | 0.662 | 0.604 | 0.629 | 0.599 | 0.608 | 0.583 | 0.625 | 5.98 |
| 67) | | 4-Bromophenyl-... | 0.245 | 0.240 | 0.222 | 0.230 | 0.223 | 0.221 | 0.217 | 0.228 | 4.66 |
| 68) | | Hexachlorobenzene | 0.286 | 0.281 | 0.261 | 0.269 | 0.264 | 0.265 | 0.256 | 0.269 | 3.97 |
| 69) | | Atrazine | 0.215 | 0.201 | 0.172 | 0.156 | 0.145 | 0.127 | 0.093 | 0.158 | 26.59 |
| 70) | C | Pentachlorophenol | 0.116 | 0.123 | 0.128 | 0.133 | 0.131 | 0.130 | 0.122 | 0.126 | 4.67 |
| 71) | | Phenanthrene | 1.204 | 1.151 | 1.039 | 1.050 | 1.026 | 1.004 | 0.969 | 1.063 | 7.86 |
| 72) | | Anthracene | 1.203 | 1.158 | 1.032 | 1.054 | 1.021 | 0.993 | 0.964 | 1.061 | 8.26 |
| 73) | | Carbazole | 1.075 | 1.028 | 0.927 | 0.940 | 0.923 | 0.896 | 0.871 | 0.952 | 7.68 |
| 74) | | Di-n-butylphth... | 1.363 | 1.295 | 1.172 | 1.172 | 1.154 | 1.108 | 1.074 | 1.191 | 8.60 |
| 75) | C | Fluoranthene | 1.243 | 1.183 | 1.062 | 1.072 | 1.065 | 1.022 | 0.964 | 1.087 | 8.75 |
| 76) | I | Chrysene-d12 | ----------ISTD---------- | | | | | | | | |
| 77) | | Benzidine | 0.611 | 0.527 | 0.523 | 0.549 | 0.531 | 0.417 | | 0.527 | 11.89 |
| 78) | | Pyrene | 1.612 | 1.560 | 1.486 | 1.601 | 1.561 | 1.592 | 1.619 | 1.576 | 2.91 |
| 79) | S | Terphenyl-d14 | 1.275 | 1.193 | 1.104 | 1.166 | 1.116 | 1.137 | 1.150 | 1.163 | 4.97 |
| 80) | | Butylbenzylpht... | 0.717 | 0.706 | 0.688 | 0.720 | 0.711 | 0.726 | 0.727 | 0.714 | 1.91 |
| 81) | | Benzo(a)anthra... | 1.518 | 1.431 | 1.335 | 1.386 | 1.354 | 1.354 | 1.303 | 1.383 | 5.19 |
| 82) | | 3,3'-Dichlorob... | 0.554 | 0.499 | 0.440 | 0.434 | 0.417 | 0.382 | | 0.454 | 13.61 |
| 83) | | Chrysene | 1.459 | 1.390 | 1.274 | 1.311 | 1.292 | 1.280 | 1.242 | 1.321 | 5.79 |
| 84) | | Bis(2-ethylhex... | 0.974 | 0.953 | 0.912 | 0.941 | 0.949 | 0.934 | 0.926 | 0.941 | 2.12 |
| 85) | c | Di-n-octyl pht... | 1.576 | 1.493 | 1.395 | 1.426 | 1.421 | 1.373 | 1.297 | 1.426 | 6.23 |
| 86) | | Indeno(1,2,3-c... | 1.339 | 1.072 | 0.950 | 1.035 | 1.051 | 1.123 | 1.210 | 1.112 | 11.54 |

Method Path : Z:\SVOASRV\HPCHEM1\BNA_F\METHODS\
Method File : 8270-BF120619.M

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 87) | I | Perylene-d12 | ----------ISTD---------- | | | | | | | |
| 88) | | Benzo(b)fluora... | 1.335 | 1.352 | 1.351 | 1.320 | 1.305 | 1.301 | 1.296 | 1.323 | 1.79 |
| 89) | | Benzo(k)fluora... | 1.380 | 1.317 | 1.198 | 1.300 | 1.285 | 1.269 | 1.145 | 1.271 | 6.12 |
| 90) | C | Benzo(a)pyrene | 1.237 | 1.187 | 1.132 | 1.166 | 1.158 | 1.171 | 1.129 | 1.168 | 3.14 |
| 91) | | Dibenzo(a,h)an... | 1.061 | 0.926 | 0.892 | 0.982 | 1.002 | 1.067 | 1.084 | 1.002 | 7.36 |
| 92) | | Benzo(g,h,i)pe... | 0.983 | 0.837 | 0.841 | 0.960 | 0.970 | 1.057 | 1.092 | 0.963 | 10.12 |

(#) = Out of Range

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7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CHEMTECH Contract: LIRO01

Lab Code: CHEM Case No.: K6235 SAS No.: K6235 SDG No.: K6235

Instrument ID: BNA_F Calibration Date/Time: 12/13/2019 10:41

Lab File ID: BF118178.D Init. Calib. Date(s): 12/06/2019 12/06/2019

EPA Sample No.: SSTDCCC040 Init. Calib. Time(s): 14:05 16:50

GC Column: DB-UI ID: 0.18 (mm)

| COMPOUND | RRF | RRF040 | MIN RRF | %D | MAX%D |
|---|---|---|---|---|---|
| 2-Fluorophenol | 1.142 | 1.080 | | -5.4 | |
| Benzaldehyde | 0.702 | 0.695 | | -1.0 | |
| Phenol-d6 | 1.381 | 1.315 | | -4.8 | |
| Phenol | 1.575 | 1.489 | | -5.5 | 20.0 |
| bis(2-Chloroethyl)ether | 1.139 | 1.087 | | -4.6 | |
| 2-Chlorophenol | 1.288 | 1.236 | | -4.0 | |
| 2-Methylphenol | 1.024 | 0.974 | | -4.9 | |
| 2,2-oxybis(1-Chloropropane) | 1.370 | 1.347 | | -1.7 | |
| Acetophenone | 0.480 | 0.455 | | -5.2 | |
| 3+4-Methylphenols | 1.286 | 1.238 | | -3.7 | |
| n-Nitroso-di-n-propylamine | 0.839 | 0.831 | 0.050 | -1.0 | |
| Nitrobenzene-d5 | 0.356 | 0.335 | | -5.9 | |
| Hexachloroethane | 0.558 | 0.548 | | -1.8 | |
| Nitrobenzene | 0.349 | 0.326 | | -6.6 | |
| Isophorone | 0.603 | 0.569 | | -5.6 | |
| 2-Nitrophenol | 0.187 | 0.178 | | -4.8 | 20.0 |
| 2,4-Dimethylphenol | 0.249 | 0.233 | | -6.4 | |
| bis(2-Chloroethoxy)methane | 0.394 | 0.381 | | -3.3 | |
| 2,4-Dichlorophenol | 0.290 | 0.279 | | -3.8 | 20.0 |
| Naphthalene | 1.004 | 0.961 | | -4.3 | |
| 4-Chloroaniline | 0.434 | 0.406 | | -6.5 | |
| Hexachlorobutadiene | 0.203 | 0.200 | | -1.5 | 20.0 |
| Caprolactam | 0.090 | 0.084 | | -6.7 | |
| 4-Chloro-3-methylphenol | 0.305 | 0.289 | | -5.2 | 20.0 |
| 2-Methylnaphthalene | 0.680 | 0.655 | | -3.7 | |
| Hexachlorocyclopentadiene | 0.271 | 0.232 | 0.050 | -14.4 | |
| 2,4,6-Trichlorophenol | 0.405 | 0.381 | | -5.9 | 20.0 |
| 2-Fluorobiphenyl | 1.314 | 1.281 | | -2.5 | |
| 2,4,5-Trichlorophenol | 0.419 | 0.400 | | -4.5 | |
| 1,1-Biphenyl | 1.577 | 1.523 | | -3.4 | |
| 2-Chloronaphthalene | 1.269 | 1.206 | | -5.0 | |
| 2-Nitroaniline | 0.362 | 0.339 | | -6.4 | |
| Dimethylphthalate | 1.477 | 1.421 | | -3.8 | |
| Acenaphthylene | 1.871 | 1.788 | | -4.4 | |
| 2,6-Dinitrotoluene | 0.321 | 0.302 | | -5.9 | |
| 3-Nitroaniline | 0.378 | 0.355 | | -6.1 | |
| Acenaphthene | 1.142 | 1.086 | | -4.9 | 20.0 |
| 2,4-Dinitrophenol | 0.160 | 0.148 | 0.050 | -7.5 | |
| 4-Nitrophenol | 0.262 | 0.220 | 0.050 | -16.0 | |
| Dibenzofuran | 1.674 | 1.596 | | -4.7 | |
| 2,4-Dinitrotoluene | 0.429 | 0.415 | | -3.3 | |

Form VII SV-1

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7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: CHEMTECH Contract: LIRO01

Lab Code: CHEM Case No.: K6235 SAS No.: K6235 SDG No.: K6235

Instrument ID: BNA_F Calibration Date/Time: 12/13/2019 10:41

Lab File ID: BF118178.D Init. Calib. Date(s): 12/06/2019 12/06/2019

EPA Sample No.: SSTDCCC040 Init. Calib. Time(s): 14:05 16:50

GC Column: DB-UI ID: 0.18 (mm)

| COMPOUND | RRF | RRF040 | MIN RRF | %D | MAX%D |
|---|---|---|---|---|---|
| Diethylphthalate | 1.456 | 1.429 | | -1.9 | |
| 4-Chlorophenyl-phenylether | 0.669 | 0.656 | | -1.9 | |
| Fluorene | 1.330 | 1.291 | | -2.9 | |
| 4-Nitroaniline | 0.394 | 0.362 | | -8.1 | |
| 4,6-Dinitro-2-methylphenol | 0.110 | 0.102 | | -7.3 | |
| n-Nitrosodiphenylamine | 0.625 | 0.595 | | -4.8 | 20.0 |
| 2,4,6-Tribromophenol | 0.243 | 0.236 | | -2.9 | |
| 4-Bromophenyl-phenylether | 0.228 | 0.222 | | -2.6 | |
| Hexachlorobenzene | 0.269 | 0.259 | | -3.7 | |
| Atrazine | 0.158 | 0.162 | | 2.5 | |
| Pentachlorophenol | 0.126 | 0.117 | | -7.1 | 20.0 |
| Phenanthrene | 1.063 | 1.009 | | -5.1 | |
| Anthracene | 1.061 | 1.023 | | -3.6 | |
| Carbazole | 0.952 | 0.897 | | -5.8 | |
| Di-n-butylphthalate | 1.191 | 1.236 | | 3.8 | |
| Fluoranthene | 1.087 | 1.028 | | -5.4 | 20.0 |
| Pyrene | 1.576 | 1.499 | | -4.9 | |
| Terphenyl-d14 | 1.163 | 1.152 | | -0.9 | |
| Butylbenzylphthalate | 0.714 | 0.743 | | 4.1 | |
| 3,3-Dichlorobenzidine | 0.454 | 0.434 | | -4.4 | |
| Benzo(a)anthracene | 1.383 | 1.308 | | -5.4 | |
| Chrysene | 1.321 | 1.238 | | -6.3 | |
| Bis(2-ethylhexyl)phthalate | 0.941 | 1.037 | | 10.2 | |
| Di-n-octyl phthalate | 1.426 | 1.572 | | 10.2 | 20.0 |
| Benzo(b)fluoranthene | 1.323 | 1.249 | | -5.6 | |
| Benzo(k)fluoranthene | 1.271 | 1.213 | | -4.6 | |
| Benzo(a)pyrene | 1.168 | 1.097 | | -6.1 | 20.0 |
| Indeno(1,2,3-cd)pyrene | 1.112 | 0.989 | | -11.1 | |
| Dibenzo(a,h)anthracene | 1.002 | 0.946 | | -5.6 | |
| Benzo(g,h,i)perylene | 0.963 | 0.867 | | -10.0 | |
| 1,2,4,5-Tetrachlorobenzene | 0.606 | 0.575 | | -5.1 | |
| 2,3,4,6-Tetrachlorophenol | 0.346 | 0.331 | | -4.3 | |

All other compounds must meet a minimum RRF of 0.010.

Form VII SV-1

CHEMTECH

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# LAB CHRONICLE

| | | | |
|---|---|---|---|
| **OrderID:** | K6235 | **OrderDate:** | 12/10/2019 11:02:38 AM |
| **Client:** | LiRo Engineers, Inc. | **Project:** | City of Buffalo - Franczyk Park Site |
| **Contact:** | Jon Williams | **Location:** | B31 |

| LabID | ClientID | Matrix | Test | Method | Sample Date | Prep Date | Anal Date | Received |
|---|---|---|---|---|---|---|---|---|
| **K6235-01** | **MW-08** | **Water** | | | **12/06/19** | | | **12/10/19** |
| | | | Mercury | 7470A | | 12/12/19 | 12/13/19 | |
| | | | Metals ICP-TAL | 6010D | | 12/11/19 | 12/11/19 | |
| **K6235-02** | **MW-07** | **Water** | | | **12/09/19** | | | **12/10/19** |
| | | | Mercury | 7470A | | 12/12/19 | 12/13/19 | |
| | | | Metals ICP-TAL | 6010D | | 12/11/19 | 12/11/19 | |
| **K6235-03** | **MW-03** | **Water** | | | **12/09/19** | | | **12/10/19** |
| | | | Mercury | 7470A | | 12/12/19 | 12/13/19 | |
| | | | Metals ICP-TAL | 6010D | | 12/11/19 | 12/11/19 | |
| | | | Metals ICP-TAL | 6010D | | 12/11/19 | 12/12/19 | |
| **K6235-04** | **DUP** | **Water** | | | **12/09/19** | | | **12/10/19** |
| | | | Mercury | 7470A | | 12/12/19 | 12/13/19 | |
| | | | Metals ICP-TAL | 6010D | | 12/11/19 | 12/11/19 | |

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# Hit Summary Sheet
## SW-846

**SDG No.:** K6235 **Order ID:** K6235

**Client:** LiRo Engineers, Inc. **Project ID:** City of Buffalo - Franczyk Park Site

| Sample ID | Client ID | Matrix | Parameter | Concentration | C | MDL | RDL | Units |
|---|---|---|---|---|---|---|---|---|
| **Client ID : MW-08** | | | | | | | | |
| K6235-01 | MW-08 | Water | Antimony | 23.600 | J | 2.03 | 25.0 | ug/L |
| K6235-01 | MW-08 | Water | Arsenic | 8.820 | J | 0.68 | 10.0 | ug/L |
| K6235-01 | MW-08 | Water | Barium | 116.000 | | 3.99 | 50.0 | ug/L |
| K6235-01 | MW-08 | Water | Cadmium | 0.300 | J | 0.17 | 3.00 | ug/L |
| K6235-01 | MW-08 | Water | Calcium | 268,000.000 | | 88.5 | 1000 | ug/L |
| K6235-01 | MW-08 | Water | Cobalt | 2.640 | J | 1.09 | 15.0 | ug/L |
| K6235-01 | MW-08 | Water | Copper | 5.510 | J | 0.49 | 10.0 | ug/L |
| K6235-01 | MW-08 | Water | Iron | 2,140.000 | | 7.85 | 50.0 | ug/L |
| K6235-01 | MW-08 | Water | Lead | 2.330 | J | 1.43 | 6.00 | ug/L |
| K6235-01 | MW-08 | Water | Magnesium | 47,600.000 | | 104 | 1000 | ug/L |
| K6235-01 | MW-08 | Water | Manganese | 401.000 | | 0.98 | 10.0 | ug/L |
| K6235-01 | MW-08 | Water | Nickel | 5.960 | J | 1.69 | 20.0 | ug/L |
| K6235-01 | MW-08 | Water | Potassium | 13,800.000 | | 179 | 1000 | ug/L |
| K6235-01 | MW-08 | Water | Selenium | 50.200 | | 2.79 | 10.0 | ug/L |
| K6235-01 | MW-08 | Water | Sodium | 8,850.000 | | 169 | 1000 | ug/L |
| K6235-01 | MW-08 | Water | Zinc | 137.000 | | 4.81 | 20.0 | ug/L |
| **Client ID : MW-07** | | | | | | | | |
| K6235-02 | MW-07 | Water | Aluminum | 101.000 | | 5.29 | 50.0 | ug/L |
| K6235-02 | MW-07 | Water | Antimony | 18.800 | J | 2.03 | 25.0 | ug/L |
| K6235-02 | MW-07 | Water | Arsenic | 2.530 | J | 0.68 | 10.0 | ug/L |
| K6235-02 | MW-07 | Water | Barium | 23.500 | J | 3.99 | 50.0 | ug/L |
| K6235-02 | MW-07 | Water | Calcium | 98,000.000 | | 88.5 | 1000 | ug/L |
| K6235-02 | MW-07 | Water | Cobalt | 2.060 | J | 1.09 | 15.0 | ug/L |
| K6235-02 | MW-07 | Water | Copper | 10.200 | | 0.49 | 10.0 | ug/L |
| K6235-02 | MW-07 | Water | Iron | 200.000 | | 7.85 | 50.0 | ug/L |
| K6235-02 | MW-07 | Water | Magnesium | 18,300.000 | | 104 | 1000 | ug/L |
| K6235-02 | MW-07 | Water | Manganese | 465.000 | | 0.98 | 10.0 | ug/L |
| K6235-02 | MW-07 | Water | Nickel | 2.900 | J | 1.69 | 20.0 | ug/L |
| K6235-02 | MW-07 | Water | Potassium | 6,740.000 | | 179 | 1000 | ug/L |
| K6235-02 | MW-07 | Water | Selenium | 39.000 | | 2.79 | 10.0 | ug/L |
| K6235-02 | MW-07 | Water | Sodium | 8,130.000 | | 169 | 1000 | ug/L |
| K6235-02 | MW-07 | Water | Vanadium | 2.320 | J | 1.39 | 20.0 | ug/L |
| K6235-02 | MW-07 | Water | Zinc | 86.500 | | 4.81 | 20.0 | ug/L |
| **Client ID : MW-03** | | | | | | | | |
| K6235-03 | MW-03 | Water | Aluminum | 130,000.000 | | 5.29 | 50.0 | ug/L |
| K6235-03 | MW-03 | Water | Antimony | 17.000 | J | 2.03 | 25.0 | ug/L |
| K6235-03 | MW-03 | Water | Barium | 18.700 | J | 3.99 | 50.0 | ug/L |
| K6235-03 | MW-03 | Water | Beryllium | 23.500 | | 0.20 | 3.00 | ug/L |

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# Hit Summary Sheet
**SW-846**



**SDG No.:** K6235 **Order ID:** K6235

**Client:** LiRo Engineers, Inc. **Project ID:** City of Buffalo - Franczyk Park Site

| Sample ID | Client ID | Matrix | Parameter | Concentration | C | MDL | RDL | Units |
|---|---|---|---|---|---|---|---|---|
| K6235-03 | MW-03 | Water | Cadmium | 61.200 | | 0.17 | 3.00 | ug/L |
| K6235-03 | MW-03 | Water | Calcium | 349,000.000 | | 88.5 | 1000 | ug/L |
| K6235-03 | MW-03 | Water | Chromium | 4.850 | J | 1.33 | 5.00 | ug/L |
| K6235-03 | MW-03 | Water | Cobalt | 79.400 | | 1.09 | 15.0 | ug/L |
| K6235-03 | MW-03 | Water | Iron | 811,000.000 | D | 78.5 | 500 | ug/L |
| K6235-03 | MW-03 | Water | Lead | 132.000 | | 1.43 | 6.00 | ug/L |
| K6235-03 | MW-03 | Water | Magnesium | 384,000.000 | | 104 | 1000 | ug/L |
| K6235-03 | MW-03 | Water | Manganese | 9,440.000 | | 0.98 | 10.0 | ug/L |
| K6235-03 | MW-03 | Water | Mercury | 0.190 | J | 0.043 | 0.20 | ug/L |
| K6235-03 | MW-03 | Water | Nickel | 181.000 | | 1.69 | 20.0 | ug/L |
| K6235-03 | MW-03 | Water | Potassium | 125,000.000 | | 179 | 1000 | ug/L |
| K6235-03 | MW-03 | Water | Sodium | 95,000.000 | | 169 | 1000 | ug/L |
| K6235-03 | MW-03 | Water | Thallium | 125.000 | | 2.88 | 20.0 | ug/L |
| K6235-03 | MW-03 | Water | Zinc | 85.700 | | 4.81 | 20.0 | ug/L |
| **Client ID : DUP** | | | | | | | | |
| K6235-04 | DUP | Water | Antimony | 24.200 | J | 2.03 | 25.0 | ug/L |
| K6235-04 | DUP | Water | Arsenic | 9.550 | J | 0.68 | 10.0 | ug/L |
| K6235-04 | DUP | Water | Barium | 115.000 | | 3.99 | 50.0 | ug/L |
| K6235-04 | DUP | Water | Cadmium | 0.200 | J | 0.17 | 3.00 | ug/L |
| K6235-04 | DUP | Water | Calcium | 265,000.000 | | 88.5 | 1000 | ug/L |
| K6235-04 | DUP | Water | Cobalt | 2.680 | J | 1.09 | 15.0 | ug/L |
| K6235-04 | DUP | Water | Copper | 5.810 | J | 0.49 | 10.0 | ug/L |
| K6235-04 | DUP | Water | Iron | 2,130.000 | | 7.85 | 50.0 | ug/L |
| K6235-04 | DUP | Water | Lead | 5.310 | J | 1.43 | 6.00 | ug/L |
| K6235-04 | DUP | Water | Magnesium | 47,000.000 | | 104 | 1000 | ug/L |
| K6235-04 | DUP | Water | Manganese | 394.000 | | 0.98 | 10.0 | ug/L |
| K6235-04 | DUP | Water | Nickel | 5.500 | J | 1.69 | 20.0 | ug/L |
| K6235-04 | DUP | Water | Potassium | 13,600.000 | | 179 | 1000 | ug/L |
| K6235-04 | DUP | Water | Selenium | 49.800 | | 2.79 | 10.0 | ug/L |
| K6235-04 | DUP | Water | Sodium | 8,780.000 | | 169 | 1000 | ug/L |
| K6235-04 | DUP | Water | Zinc | 135.000 | | 4.81 | 20.0 | ug/L |

# SAMPLE DATA

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922



# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/06/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-08 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-01 | Matrix: | Water |
| Level (low/med): | low | % Solid: | 0 |

| Cas | Parameter | Conc. | Qua. | DF | MDL | LOQ / CRQL | Units | Prep Date | Date Ana. | Ana Met. |
|---|---|---|---|---|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 50.0 | U | 1 | 5.29 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-36-0 | Antimony | 23.6 | J | 1 | 2.03 | 25.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-38-2 | Arsenic | 8.82 | J | 1 | 0.68 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-39-3 | Barium | 116 | | 1 | 3.99 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-41-7 | Beryllium | 3.00 | U | 1 | 0.20 | 3.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-43-9 | Cadmium | 0.30 | J | 1 | 0.17 | 3.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-70-2 | Calcium | 268000 | | 1 | 88.5 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-47-3 | Chromium | 5.00 | U | 1 | 1.33 | 5.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-48-4 | Cobalt | 2.64 | J | 1 | 1.09 | 15.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-50-8 | Copper | 5.51 | J | 1 | 0.49 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7439-89-6 | Iron | 2140 | | 1 | 7.85 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7439-92-1 | Lead | 2.33 | J | 1 | 1.43 | 6.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7439-95-4 | Magnesium | 47600 | | 1 | 104 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7439-96-5 | Manganese | 401 | | 1 | 0.98 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7439-97-6 | Mercury | 0.20 | U | 1 | 0.043 | 0.20 | ug/L | 12/12/19 14:30 | 12/13/19 11:06 | SW7470A |
| 7440-02-0 | Nickel | 5.96 | J | 1 | 1.69 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-09-7 | Potassium | 13800 | | 1 | 179 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7782-49-2 | Selenium | 50.2 | | 1 | 2.79 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-22-4 | Silver | 5.00 | U | 1 | 0.17 | 5.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-23-5 | Sodium | 8850 | | 1 | 169 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-28-0 | Thallium | 20.0 | U | 1 | 2.88 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-62-2 | Vanadium | 20.0 | U | 1 | 1.39 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |
| 7440-66-6 | Zinc | 137 | | 1 | 4.81 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:14 | SW6010 |

| | | | | | |
|---|---|---|---|---|---|
| Color Before: | Colorless | Clarity Before: | Clear | Texture: | |
| Color After: | Colorless | Clarity After: | Clear | Artifacts: | |
| Comments: | METALS-TAL | | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-07 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-02 | Matrix: | Water |
| Level (low/med): | low | % Solid: | 0 |

| Cas | Parameter | Conc. | Qua. | DF | MDL | LOQ / CRQL | Units | Prep Date | Date Ana. | Ana Met. |
|---|---|---|---|---|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 101 | | 1 | 5.29 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-36-0 | Antimony | 18.8 | J | 1 | 2.03 | 25.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-38-2 | Arsenic | 2.53 | J | 1 | 0.68 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-39-3 | Barium | 23.5 | J | 1 | 3.99 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-41-7 | Beryllium | 3.00 | U | 1 | 0.20 | 3.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-43-9 | Cadmium | 3.00 | U | 1 | 0.17 | 3.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-70-2 | Calcium | 98000 | | 1 | 88.5 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-47-3 | Chromium | 5.00 | U | 1 | 1.33 | 5.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-48-4 | Cobalt | 2.06 | J | 1 | 1.09 | 15.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-50-8 | Copper | 10.2 | | 1 | 0.49 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7439-89-6 | Iron | 200 | | 1 | 7.85 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7439-92-1 | Lead | 6.00 | U | 1 | 1.43 | 6.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7439-95-4 | Magnesium | 18300 | | 1 | 104 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7439-96-5 | Manganese | 465 | | 1 | 0.98 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7439-97-6 | Mercury | 0.20 | U | 1 | 0.043 | 0.20 | ug/L | 12/12/19 14:30 | 12/13/19 11:08 | SW7470A |
| 7440-02-0 | Nickel | 2.90 | J | 1 | 1.69 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-09-7 | Potassium | 6740 | | 1 | 179 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7782-49-2 | Selenium | 39.0 | | 1 | 2.79 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-22-4 | Silver | 5.00 | U | 1 | 0.17 | 5.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-23-5 | Sodium | 8130 | | 1 | 169 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-28-0 | Thallium | 20.0 | U | 1 | 2.88 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-62-2 | Vanadium | 2.32 | J | 1 | 1.39 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |
| 7440-66-6 | Zinc | 86.5 | | 1 | 4.81 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:46 | SW6010 |

| | | | | | |
|---|---|---|---|---|---|
| Color Before: | Colorless | Clarity Before: | Clear | Texture: | |
| Color After: | Colorless | Clarity After: | Clear | Artifacts: | |
| Comments: | METALS-TAL | | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | MW-03 | SDG No.: | K6235 |
| Lab Sample ID: | K6235-03 | Matrix: | Water |
| Level (low/med): | low | % Solid: | 0 |

| Cas | Parameter | Conc. | Qua. | DF | MDL | LOQ / CRQL | Units | Prep Date | Date Ana. | Ana Met. |
|---|---|---|---|---|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 130000 | | 1 | 5.29 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-36-0 | Antimony | 17.0 | J | 1 | 2.03 | 25.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-38-2 | Arsenic | 10.0 | U | 1 | 0.68 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-39-3 | Barium | 18.7 | J | 1 | 3.99 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-41-7 | Beryllium | 23.5 | | 1 | 0.20 | 3.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-43-9 | Cadmium | 61.2 | | 1 | 0.17 | 3.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-70-2 | Calcium | 349000 | | 1 | 88.5 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-47-3 | Chromium | 4.85 | J | 1 | 1.33 | 5.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-48-4 | Cobalt | 79.4 | | 1 | 1.09 | 15.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-50-8 | Copper | 10.0 | U | 1 | 0.49 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7439-89-6 | Iron | 811000 | D | 10 | 78.5 | 500 | ug/L | 12/11/19 09:26 | 12/12/19 14:05 | SW6010 |
| 7439-92-1 | Lead | 132 | | 1 | 1.43 | 6.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7439-95-4 | Magnesium | 384000 | | 1 | 104 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7439-96-5 | Manganese | 9440 | | 1 | 0.98 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7439-97-6 | Mercury | 0.19 | J | 1 | 0.043 | 0.20 | ug/L | 12/12/19 14:30 | 12/13/19 11:10 | SW7470A |
| 7440-02-0 | Nickel | 181 | | 1 | 1.69 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-09-7 | Potassium | 125000 | | 1 | 179 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7782-49-2 | Selenium | 10.0 | U | 1 | 2.79 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-22-4 | Silver | 5.00 | U | 1 | 0.17 | 5.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-23-5 | Sodium | 95000 | | 1 | 169 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-28-0 | Thallium | 125 | | 1 | 2.88 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-62-2 | Vanadium | 20.0 | U | 1 | 1.39 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |
| 7440-66-6 | Zinc | 85.7 | | 1 | 4.81 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:50 | SW6010 |

| | | | | | |
|---|---|---|---|---|---|
| Color Before: | Colorless | Clarity Before: | Clear | Texture: | |
| Color After: | Colorless | Clarity After: | Clear | Artifacts: | |
| Comments: | METALS-TAL | | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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# Report of Analysis

| | | | |
|---|---|---|---|
| Client: | LiRo Engineers, Inc. | Date Collected: | 12/09/19 |
| Project: | City of Buffalo - Franczyk Park Site | Date Received: | 12/10/19 |
| Client Sample ID: | DUP | SDG No.: | K6235 |
| Lab Sample ID: | K6235-04 | Matrix: | Water |
| Level (low/med): | low | % Solid: | 0 |

| Cas | Parameter | Conc. | Qua. | DF | MDL | LOQ / CRQL | Units | Prep Date | Date Ana. | Ana Met. |
|---|---|---|---|---|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 50.0 | U | 1 | 5.29 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-36-0 | Antimony | 24.2 | J | 1 | 2.03 | 25.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-38-2 | Arsenic | 9.55 | J | 1 | 0.68 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-39-3 | Barium | 115 | | 1 | 3.99 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-41-7 | Beryllium | 3.00 | U | 1 | 0.20 | 3.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-43-9 | Cadmium | 0.20 | J | 1 | 0.17 | 3.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-70-2 | Calcium | 265000 | | 1 | 88.5 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-47-3 | Chromium | 5.00 | U | 1 | 1.33 | 5.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-48-4 | Cobalt | 2.68 | J | 1 | 1.09 | 15.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-50-8 | Copper | 5.81 | J | 1 | 0.49 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7439-89-6 | Iron | 2130 | | 1 | 7.85 | 50.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7439-92-1 | Lead | 5.31 | J | 1 | 1.43 | 6.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7439-95-4 | Magnesium | 47000 | | 1 | 104 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7439-96-5 | Manganese | 394 | | 1 | 0.98 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7439-97-6 | Mercury | 0.20 | U | 1 | 0.043 | 0.20 | ug/L | 12/12/19 14:30 | 12/13/19 11:12 | SW7470A |
| 7440-02-0 | Nickel | 5.50 | J | 1 | 1.69 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-09-7 | Potassium | 13600 | | 1 | 179 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7782-49-2 | Selenium | 49.8 | | 1 | 2.79 | 10.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-22-4 | Silver | 5.00 | U | 1 | 0.17 | 5.00 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-23-5 | Sodium | 8780 | | 1 | 169 | 1000 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-28-0 | Thallium | 20.0 | U | 1 | 2.88 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-62-2 | Vanadium | 20.0 | U | 1 | 1.39 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |
| 7440-66-6 | Zinc | 135 | | 1 | 4.81 | 20.0 | ug/L | 12/11/19 09:26 | 12/11/19 18:54 | SW6010 |

| | | | | | |
|---|---|---|---|---|---|
| Color Before: | Colorless | Clarity Before: | Clear | Texture: | |
| Color After: | Colorless | Clarity After: | Clear | Artifacts: | |
| Comments: | METALS-TAL | | | | |

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

# METAL CALIBRATION DATA

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** PLASMA-PURE

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| ICV28 | Mercury | 3.93 | 4.0 | 98 | 90 - 110 | CV | 12/13/2019 | 10:16 | LB106736 |

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** PLASMA-PURE

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV16 | Mercury | 4.99 | 5.0 | 100 | 90 - 110 | CV | 12/13/2019 | 10:20 | LB106736 |
| CCV17 | Mercury | 5.10 | 5.0 | 102 | 90 - 110 | CV | 12/13/2019 | 10:51 | LB106736 |
| CCV18 | Mercury | 4.67 | 5.0 | 93 | 90 - 110 | CV | 12/13/2019 | 11:16 | LB106736 |
| CCV19 | Mercury | 4.93 | 5.0 | 98 | 90 - 110 | CV | 12/13/2019 | 11:33 | LB106736 |

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| ICV01 | Aluminum | 2610 | 2520 | 104 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Antimony | 1010 | 1010 | 100 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Arsenic | 1000 | 997 | 100 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Barium | 534 | 518 | 103 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Beryllium | 520 | 514 | 101 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Cadmium | 505 | 514 | 98 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Calcium | 10200 | 10000 | 102 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Chromium | 530 | 517 | 102 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Cobalt | 519 | 521 | 100 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Copper | 519 | 505 | 103 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Iron | 10000 | 10100 | 99 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Lead | 1010 | 1030 | 98 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Magnesium | 6030 | 5990 | 101 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Manganese | 529 | 524 | 101 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Nickel | 518 | 525 | 99 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Potassium | 9840 | 9940 | 99 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Selenium | 975 | 1030 | 95 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Silver | 254 | 252 | 101 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Sodium | 9810 | 10100 | 97 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Thallium | 1020 | 1040 | 98 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Vanadium | 502 | 504 | 100 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |
| | Zinc | 1030 | 1010 | 102 | 95 - 105 | P | 12/11/2019 | 11:50 | LB106689 |

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| LLICV01 | Aluminum | 113 | 100 | 113 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Antimony | 58.3 | 50.0 | 117 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Arsenic | 19.6 | 20.0 | 98 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Barium | 108 | 100 | 108 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Beryllium | 6.66 | 6.0 | 111 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Cadmium | 5.93 | 6.0 | 99 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Calcium | 2120 | 2000 | 106 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Chromium | 10.4 | 10.0 | 104 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Cobalt | 31.5 | 30.0 | 105 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Copper | 20.2 | 20.0 | 101 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Iron | 109 | 100 | 110 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Lead | 12.0 | 12.0 | 100 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Magnesium | 2150 | 2000 | 108 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Manganese | 22.6 | 20.0 | 113 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Nickel | 42.3 | 40.0 | 106 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Potassium | 2040 | 2000 | 102 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Selenium | 23.4 | 20.0 | 117 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Silver | 10.6 | 10.0 | 106 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Sodium | 2050 | 2000 | 103 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Thallium | 42.6 | 40.0 | 107 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Vanadium | 38.3 | 40.0 | 96 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |
| | Zinc | 44.3 | 40.0 | 111 | 80 - 120 | P | 12/11/2019 | 11:55 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV01 | Aluminum | 10100 | 10000 | 101 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Antimony | 4990 | 5000 | 100 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Arsenic | 4990 | 5000 | 100 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Barium | 10100 | 10000 | 100 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Beryllium | 247 | 250 | 99 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Cadmium | 2480 | 2500 | 99 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Calcium | 25200 | 25000 | 101 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Chromium | 1030 | 1000 | 103 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Cobalt | 2490 | 2500 | 100 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Copper | 1230 | 1250 | 99 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Iron | 5120 | 5000 | 102 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Lead | 4990 | 5000 | 100 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Magnesium | 25100 | 25000 | 100 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Manganese | 2450 | 2500 | 98 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Nickel | 2500 | 2500 | 100 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Potassium | 25800 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Selenium | 4950 | 5000 | 99 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Silver | 1290 | 1250 | 103 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Sodium | 25400 | 25000 | 102 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Thallium | 5000 | 5000 | 100 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Vanadium | 2510 | 2500 | 100 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |
| | Zinc | 2540 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 12:15 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| LLCCV01 | Aluminum | 105 | 100 | 105 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Antimony | 52.6 | 50.0 | 105 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Arsenic | 19.2 | 20.0 | 96 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Barium | 103 | 100 | 103 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Beryllium | 6.14 | 6.0 | 102 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Cadmium | 5.74 | 6.0 | 96 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Calcium | 2010 | 2000 | 100 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Chromium | 9.92 | 10.0 | 99 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Cobalt | 29.3 | 30.0 | 98 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Copper | 19.4 | 20.0 | 97 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Iron | 102 | 100 | 102 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Lead | 10.2 | 12.0 | 85 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Magnesium | 2030 | 2000 | 101 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Manganese | 21.6 | 20.0 | 108 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Nickel | 40.3 | 40.0 | 101 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Potassium | 1970 | 2000 | 98 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Selenium | 20.3 | 20.0 | 101 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Silver | 9.74 | 10.0 | 97 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Sodium | 1950 | 2000 | 97 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Thallium | 39.2 | 40.0 | 98 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Vanadium | 37.0 | 40.0 | 92 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |
| | Zinc | 42.7 | 40.0 | 107 | 80 - 120 | P | 12/11/2019 | 12:19 | LB106689 |

# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV02 | Aluminum | 10600 | 10000 | 106 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Antimony | 5350 | 5000 | 107 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Arsenic | 5330 | 5000 | 107 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Barium | 10500 | 10000 | 105 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Beryllium | 253 | 250 | 101 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Cadmium | 2540 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Calcium | 26000 | 25000 | 104 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Chromium | 1050 | 1000 | 105 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Cobalt | 2580 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Copper | 1350 | 1250 | 108 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Iron | 5400 | 5000 | 108 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Lead | 5150 | 5000 | 103 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Magnesium | 26000 | 25000 | 104 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Manganese | 2500 | 2500 | 100 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Nickel | 2600 | 2500 | 104 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Potassium | 26600 | 25000 | 106 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Selenium | 5140 | 5000 | 103 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Silver | 1320 | 1250 | 106 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Sodium | 26900 | 25000 | 107 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Thallium | 5230 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Vanadium | 2620 | 2500 | 105 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| | Zinc | 2620 | 2500 | 105 | 90 - 110 | P | 12/11/2019 | 15:29 | LB106689 |
| CCV03 | Aluminum | 10300 | 10000 | 103 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Antimony | 5270 | 5000 | 105 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Arsenic | 5190 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Barium | 10200 | 10000 | 102 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Beryllium | 247 | 250 | 99 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Cadmium | 2470 | 2500 | 99 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Calcium | 25200 | 25000 | 101 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Chromium | 1010 | 1000 | 101 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Cobalt | 2520 | 2500 | 101 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Copper | 1340 | 1250 | 107 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Iron | 5170 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Lead | 5000 | 5000 | 100 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV03 | Magnesium | 25200 | 25000 | 101 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Manganese | 2420 | 2500 | 97 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Nickel | 2540 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Potassium | 25300 | 25000 | 101 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Selenium | 4950 | 5000 | 99 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Silver | 1270 | 1250 | 101 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Sodium | 26000 | 25000 | 104 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Thallium | 5090 | 5000 | 102 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Vanadium | 2540 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| | Zinc | 2550 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 16:49 | LB106689 |
| CCV04 | Aluminum | 10300 | 10000 | 103 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Antimony | 5260 | 5000 | 105 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Arsenic | 5210 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Barium | 10200 | 10000 | 102 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Beryllium | 249 | 250 | 100 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Cadmium | 2480 | 2500 | 99 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Calcium | 25300 | 25000 | 101 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Chromium | 1030 | 1000 | 103 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Cobalt | 2530 | 2500 | 101 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Copper | 1340 | 1250 | 107 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Iron | 5220 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Lead | 5050 | 5000 | 101 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Magnesium | 25700 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Manganese | 2420 | 2500 | 97 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Nickel | 2550 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Potassium | 25400 | 25000 | 102 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Selenium | 4940 | 5000 | 99 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Silver | 1290 | 1250 | 103 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Sodium | 25900 | 25000 | 104 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Thallium | 5110 | 5000 | 102 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Vanadium | 2570 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| | Zinc | 2570 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 17:42 | LB106689 |
| CCV05 | Aluminum | 10300 | 10000 | 103 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Antimony | 5210 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV05 | Arsenic | 5190 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Barium | 10000 | 10000 | 100 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Beryllium | 246 | 250 | 98 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Cadmium | 2480 | 2500 | 99 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Calcium | 25200 | 25000 | 101 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Chromium | 1050 | 1000 | 105 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Cobalt | 2530 | 2500 | 101 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Copper | 1330 | 1250 | 106 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Iron | 5280 | 5000 | 106 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Lead | 5040 | 5000 | 101 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Magnesium | 25900 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Manganese | 2390 | 2500 | 96 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Nickel | 2550 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Potassium | 25600 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Selenium | 4980 | 5000 | 100 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Silver | 1300 | 1250 | 104 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Sodium | 25900 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Thallium | 5090 | 5000 | 102 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Vanadium | 2570 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| | Zinc | 2570 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 18:30 | LB106689 |
| CCV06 | Aluminum | 10400 | 10000 | 104 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Antimony | 5230 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Arsenic | 5210 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Barium | 10300 | 10000 | 103 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Beryllium | 254 | 250 | 102 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Cadmium | 2490 | 2500 | 100 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Calcium | 25600 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Chromium | 1050 | 1000 | 105 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Cobalt | 2550 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Copper | 1330 | 1250 | 106 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Iron | 5240 | 5000 | 105 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Lead | 5050 | 5000 | 101 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Magnesium | 25800 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Manganese | 2450 | 2500 | 98 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV06 | Nickel | 2560 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Potassium | 25700 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Selenium | 4970 | 5000 | 99 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Silver | 1300 | 1250 | 104 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Sodium | 25900 | 25000 | 104 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Thallium | 5110 | 5000 | 102 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Vanadium | 2590 | 2500 | 104 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| | Zinc | 2580 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 19:17 | LB106689 |
| CCV07 | Aluminum | 10400 | 10000 | 104 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Antimony | 5240 | 5000 | 105 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Arsenic | 5200 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Barium | 10200 | 10000 | 102 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Beryllium | 253 | 250 | 101 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Cadmium | 2510 | 2500 | 100 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Calcium | 25600 | 25000 | 102 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Chromium | 1050 | 1000 | 105 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Cobalt | 2560 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Copper | 1340 | 1250 | 107 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Iron | 5280 | 5000 | 106 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Lead | 5080 | 5000 | 102 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Magnesium | 26000 | 25000 | 104 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Manganese | 2440 | 2500 | 98 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Nickel | 2570 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Potassium | 25500 | 25000 | 102 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Selenium | 4980 | 5000 | 100 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Silver | 1310 | 1250 | 105 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Sodium | 25800 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Thallium | 5130 | 5000 | 103 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Vanadium | 2580 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| | Zinc | 2550 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 20:04 | LB106689 |
| CCV08 | Aluminum | 10300 | 10000 | 103 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Antimony | 5280 | 5000 | 106 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Arsenic | 5170 | 5000 | 103 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Barium | 10000 | 10000 | 100 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV08 | Beryllium | 255 | 250 | 102 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Cadmium | 2480 | 2500 | 99 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Calcium | 25400 | 25000 | 102 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Chromium | 1040 | 1000 | 104 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Cobalt | 2530 | 2500 | 101 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Copper | 1340 | 1250 | 107 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Iron | 5150 | 5000 | 103 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Lead | 5030 | 5000 | 101 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Magnesium | 25900 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Manganese | 2410 | 2500 | 96 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Nickel | 2550 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Potassium | 25100 | 25000 | 100 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Selenium | 4880 | 5000 | 98 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Silver | 1290 | 1250 | 103 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Sodium | 25400 | 25000 | 101 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Thallium | 5110 | 5000 | 102 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Vanadium | 2570 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| | Zinc | 2540 | 2500 | 101 | 90 - 110 | P | 12/11/2019 | 20:52 | LB106689 |
| CCV09 | Aluminum | 10400 | 10000 | 104 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Antimony | 5320 | 5000 | 106 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Arsenic | 5220 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Barium | 10200 | 10000 | 102 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Beryllium | 258 | 250 | 103 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Cadmium | 2500 | 2500 | 100 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Calcium | 25600 | 25000 | 102 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Chromium | 1040 | 1000 | 104 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Cobalt | 2560 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Copper | 1360 | 1250 | 109 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Iron | 5160 | 5000 | 103 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Lead | 5060 | 5000 | 101 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Magnesium | 25900 | 25000 | 104 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Manganese | 2430 | 2500 | 97 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Nickel | 2580 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Potassium | 24800 | 25000 | 99 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV09 | Selenium | 4900 | 5000 | 98 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Silver | 1290 | 1250 | 103 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Sodium | 25400 | 25000 | 102 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Thallium | 5140 | 5000 | 103 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Vanadium | 2590 | 2500 | 104 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| | Zinc | 2570 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 21:39 | LB106689 |
| CCV10 | Aluminum | 10500 | 10000 | 105 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Antimony | 5380 | 5000 | 108 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Arsenic | 5300 | 5000 | 106 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Barium | 10200 | 10000 | 102 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Beryllium | 263 | 250 | 105 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Cadmium | 2520 | 2500 | 101 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Calcium | 25900 | 25000 | 104 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Chromium | 1050 | 1000 | 105 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Cobalt | 2590 | 2500 | 104 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Copper | 1370 | 1250 | 110 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Iron | 5190 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Lead | 5120 | 5000 | 102 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Magnesium | 26500 | 25000 | 106 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Manganese | 2460 | 2500 | 98 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Nickel | 2590 | 2500 | 104 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Potassium | 24800 | 25000 | 99 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Selenium | 4930 | 5000 | 99 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Silver | 1300 | 1250 | 104 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Sodium | 25500 | 25000 | 102 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Thallium | 5200 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Vanadium | 2620 | 2500 | 105 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| | Zinc | 2590 | 2500 | 104 | 90 - 110 | P | 12/11/2019 | 22:28 | LB106689 |
| CCV11 | Aluminum | 10400 | 10000 | 104 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Antimony | 5330 | 5000 | 107 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Arsenic | 5220 | 5000 | 104 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Barium | 10200 | 10000 | 102 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Beryllium | 263 | 250 | 105 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Cadmium | 2490 | 2500 | 100 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV11 | Calcium | 25800 | 25000 | 103 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Chromium | 1040 | 1000 | 104 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Cobalt | 2560 | 2500 | 102 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Copper | 1360 | 1250 | 109 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Iron | 5100 | 5000 | 102 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Lead | 5070 | 5000 | 101 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Magnesium | 26400 | 25000 | 106 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Manganese | 2450 | 2500 | 98 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Nickel | 2570 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Potassium | 24400 | 25000 | 98 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Selenium | 4880 | 5000 | 98 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Silver | 1280 | 1250 | 103 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Sodium | 25100 | 25000 | 100 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Thallium | 5140 | 5000 | 103 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Vanadium | 2610 | 2500 | 105 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |
| | Zinc | 2570 | 2500 | 103 | 90 - 110 | P | 12/11/2019 | 23:18 | LB106689 |

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| ICV01 | Aluminum | 2520 | 2520 | 100 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Antimony | 993 | 1010 | 98 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Arsenic | 971 | 997 | 97 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Barium | 509 | 518 | 98 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Beryllium | 502 | 514 | 98 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Cadmium | 490 | 514 | 95 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Calcium | 9880 | 10000 | 99 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Chromium | 517 | 517 | 100 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Cobalt | 501 | 521 | 96 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Copper | 513 | 505 | 102 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Iron | 9820 | 10100 | 97 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Lead | 979 | 1030 | 95 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Magnesium | 5910 | 5990 | 99 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Manganese | 515 | 524 | 98 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Nickel | 502 | 525 | 96 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Potassium | 9630 | 9940 | 97 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Selenium | 949 | 1030 | 92 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Silver | 248 | 252 | 98 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Sodium | 9550 | 10100 | 95 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Thallium | 991 | 1040 | 95 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Vanadium | 487 | 504 | 97 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |
| | Zinc | 997 | 1010 | 99 | 95 - 105 | P | 12/12/2019 | 13:09 | LB106729 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| LLICV01 | Aluminum | 103 | 100 | 103 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Antimony | 55.0 | 50.0 | 110 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Arsenic | 16.8 | 20.0 | 84 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Barium | 106 | 100 | 106 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Beryllium | 6.55 | 6.0 | 109 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Cadmium | 6.07 | 6.0 | 101 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Calcium | 2140 | 2000 | 107 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Chromium | 10.6 | 10.0 | 106 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Cobalt | 30.9 | 30.0 | 103 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Copper | 21.7 | 20.0 | 108 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Iron | 104 | 100 | 104 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Lead | 10.9 | 12.0 | 91 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Magnesium | 2140 | 2000 | 107 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Manganese | 23.1 | 20.0 | 115 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Nickel | 42.4 | 40.0 | 106 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Potassium | 1990 | 2000 | 99 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Selenium | 21.0 | 20.0 | 105 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Silver | 11.0 | 10.0 | 110 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Sodium | 2040 | 2000 | 102 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Thallium | 44.4 | 40.0 | 111 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Vanadium | 38.0 | 40.0 | 95 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |
| | Zinc | 44.6 | 40.0 | 112 | 80 - 120 | P | 12/12/2019 | 13:15 | LB106729 |

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV01 | Aluminum | 10100 | 10000 | 101 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Antimony | 4960 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Arsenic | 4960 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Barium | 10100 | 10000 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Beryllium | 251 | 250 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Cadmium | 2460 | 2500 | 98 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Calcium | 25000 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Chromium | 1010 | 1000 | 101 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Cobalt | 2470 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Copper | 1240 | 1250 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Iron | 5060 | 5000 | 101 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Lead | 4960 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Magnesium | 25100 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Manganese | 2510 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Nickel | 2480 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Potassium | 24800 | 25000 | 99 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Selenium | 4940 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Silver | 1250 | 1250 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Sodium | 24800 | 25000 | 99 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Thallium | 4990 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Vanadium | 2500 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |
| | Zinc | 2500 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 13:36 | LB106729 |

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| LLCCV01 | Aluminum | 100 | 100 | 100 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Antimony | 51.1 | 50.0 | 102 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Arsenic | 19.8 | 20.0 | 99 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Barium | 101 | 100 | 101 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Beryllium | 6.31 | 6.0 | 105 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Cadmium | 6.02 | 6.0 | 100 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Calcium | 2010 | 2000 | 100 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Chromium | 10.2 | 10.0 | 102 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Cobalt | 29.6 | 30.0 | 99 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Copper | 20.7 | 20.0 | 103 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Iron | 110 | 100 | 110 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Lead | 10.8 | 12.0 | 90 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Magnesium | 2030 | 2000 | 101 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Manganese | 22.1 | 20.0 | 110 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Nickel | 40.3 | 40.0 | 101 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Potassium | 1910 | 2000 | 95 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Selenium | 20.0 | 20.0 | 100 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Silver | 10.9 | 10.0 | 109 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Sodium | 1940 | 2000 | 97 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Thallium | 42.7 | 40.0 | 107 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Vanadium | 38.3 | 40.0 | 96 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |
| | Zinc | 41.7 | 40.0 | 104 | 80 - 120 | P | 12/12/2019 | 13:40 | LB106729 |

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV02 | Aluminum | 9850 | 10000 | 98 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Antimony | 4980 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Arsenic | 5000 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Barium | 9730 | 10000 | 97 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Beryllium | 248 | 250 | 99 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Cadmium | 2450 | 2500 | 98 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Calcium | 24500 | 25000 | 98 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Chromium | 1020 | 1000 | 102 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Cobalt | 2460 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Copper | 1250 | 1250 | 100 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Iron | 5080 | 5000 | 102 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Lead | 4960 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Magnesium | 24900 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Manganese | 2470 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Nickel | 2480 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Potassium | 25300 | 25000 | 101 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Selenium | 4950 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Silver | 1270 | 1250 | 101 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Sodium | 24800 | 25000 | 99 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Thallium | 4990 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Vanadium | 2480 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| | Zinc | 2490 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 14:36 | LB106729 |
| CCV03 | Aluminum | 9890 | 10000 | 99 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Antimony | 4980 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Arsenic | 4970 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Barium | 9870 | 10000 | 99 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Beryllium | 251 | 250 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Cadmium | 2450 | 2500 | 98 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Calcium | 24700 | 25000 | 99 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Chromium | 1010 | 1000 | 101 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Cobalt | 2470 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Copper | 1250 | 1250 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Iron | 5010 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Lead | 4960 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |

# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV03 | Magnesium | 24900 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Manganese | 2490 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Nickel | 2480 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Potassium | 24900 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Selenium | 4960 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Silver | 1250 | 1250 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Sodium | 24500 | 25000 | 98 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Thallium | 4970 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Vanadium | 2480 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| | Zinc | 2500 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 15:43 | LB106729 |
| CCV04 | Aluminum | 9950 | 10000 | 100 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Antimony | 4970 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Arsenic | 4960 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Barium | 9780 | 10000 | 98 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Beryllium | 250 | 250 | 100 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Cadmium | 2440 | 2500 | 98 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Calcium | 24700 | 25000 | 99 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Chromium | 1010 | 1000 | 101 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Cobalt | 2460 | 2500 | 98 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Copper | 1250 | 1250 | 100 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Iron | 5030 | 5000 | 101 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Lead | 4950 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Magnesium | 24900 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Manganese | 2500 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Nickel | 2460 | 2500 | 98 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Potassium | 25000 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Selenium | 4910 | 5000 | 98 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Silver | 1260 | 1250 | 101 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Sodium | 24600 | 25000 | 98 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Thallium | 4960 | 5000 | 99 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Vanadium | 2480 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| | Zinc | 2510 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 17:19 | LB106729 |
| CCV05 | Aluminum | 9960 | 10000 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Antimony | 5040 | 5000 | 101 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |

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# Metals

## - 2a -

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV05 | Arsenic | 5000 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Barium | 9890 | 10000 | 99 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Beryllium | 250 | 250 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Cadmium | 2480 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Calcium | 24700 | 25000 | 99 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Chromium | 1020 | 1000 | 102 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Cobalt | 2490 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Copper | 1260 | 1250 | 101 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Iron | 5120 | 5000 | 102 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Lead | 5010 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Magnesium | 25000 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Manganese | 2500 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Nickel | 2490 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Potassium | 25400 | 25000 | 102 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Selenium | 4990 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Silver | 1280 | 1250 | 102 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Sodium | 25100 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Thallium | 5020 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Vanadium | 2500 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| | Zinc | 2530 | 2500 | 101 | 90 - 110 | P | 12/12/2019 | 18:11 | LB106729 |
| CCV06 | Aluminum | 9970 | 10000 | 100 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Antimony | 5020 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Arsenic | 4970 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Barium | 9800 | 10000 | 98 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Beryllium | 249 | 250 | 99 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Cadmium | 2470 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Calcium | 24700 | 25000 | 99 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Chromium | 1010 | 1000 | 102 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Cobalt | 2490 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Copper | 1260 | 1250 | 101 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Iron | 5090 | 5000 | 102 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Lead | 4990 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Magnesium | 25100 | 25000 | 100 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Manganese | 2490 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION VERIFICATION

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:** EPA

**Continuing Calibration Source:** Inorganic Ventures

| Sample ID | Analyte | Result ug/L | True Value | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCV06 | Nickel | 2470 | 2500 | 99 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Potassium | 25700 | 25000 | 103 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Selenium | 4980 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Silver | 1280 | 1250 | 102 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Sodium | 28100 | 25000 | 112 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Thallium | 5010 | 5000 | 100 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Vanadium | 2490 | 2500 | 100 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |
| | Zinc | 2530 | 2500 | 101 | 90 - 110 | P | 12/12/2019 | 18:47 | LB106729 |

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# Metals

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## CRDL STANDARD FOR AA & ICP

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:**

**Continuing Calibration Source:**

| Sample ID | Analyte | Result ug/L | True Value ug/L | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CRI01 | Aluminum | 114 | 100 | 114 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Antimony | 56.2 | 50.0 | 112 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Arsenic | 19.3 | 20.0 | 97 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Barium | 111 | 100 | 111 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Beryllium | 6.67 | 6.0 | 111 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Cadmium | 6.09 | 6.0 | 102 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Calcium | 2160 | 2000 | 108 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Chromium | 11.0 | 10.0 | 110 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Cobalt | 32.0 | 30.0 | 107 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Copper | 21.9 | 20.0 | 110 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Iron | 130 | 100 | 130 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Lead | 11.6 | 12.0 | 96 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Magnesium | 2160 | 2000 | 108 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Manganese | 22.7 | 20.0 | 114 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Nickel | 43.4 | 40.0 | 108 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Potassium | 2080 | 2000 | 104 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Selenium | 24.6 | 20.0 | 123 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Silver | 10.4 | 10.0 | 104 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Sodium | 2090 | 2000 | 104 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Thallium | 42.7 | 40.0 | 107 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Vanadium | 43.5 | 40.0 | 109 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| | Zinc | 46.8 | 40.0 | 117 | 40 - 160 | P | 12/11/2019 | 12:03 | LB106689 |
| CRI01 | Aluminum | 113 | 100 | 114 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Antimony | 52.1 | 50.0 | 104 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Arsenic | 20.9 | 20.0 | 104 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Barium | 106 | 100 | 106 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Beryllium | 6.60 | 6.0 | 110 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Cadmium | 5.88 | 6.0 | 98 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Calcium | 2120 | 2000 | 106 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Chromium | 10.5 | 10.0 | 106 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Cobalt | 31.2 | 30.0 | 104 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Copper | 22.1 | 20.0 | 110 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Iron | 107 | 100 | 107 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Lead | 10.0 | 12.0 | 83 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Magnesium | 2140 | 2000 | 107 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |

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# Metals

## - 2b -

## CRDL STANDARD FOR AA & ICP

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Initial Calibration Source:**

**Continuing Calibration Source:**

| Sample ID | Analyte | Result ug/L | True Value ug/L | % Recovery | Acceptance Window (%R) | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CRI01 | Manganese | 22.7 | 20.0 | 114 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Nickel | 42.3 | 40.0 | 106 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Potassium | 1920 | 2000 | 96 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Selenium | 22.9 | 20.0 | 114 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Silver | 11.1 | 10.0 | 111 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Sodium | 2030 | 2000 | 101 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Thallium | 43.7 | 40.0 | 109 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Vanadium | 39.9 | 40.0 | 100 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| | Zinc | 44.6 | 40.0 | 112 | 40 - 160 | P | 12/12/2019 | 13:23 | LB106729 |
| CRA | Mercury | 0.23 | 0.2 | 113 | 40 - 160 | CV | 12/13/2019 | 10:24 | LB106736 |

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## Metals

### - 3a -

### INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| **ICB28** | Mercury | 0.20 | +/-0.20 | U | 0.20 | CV | 12/13/2019 | 10:18 | LB106736 |

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# Metals

## - 3a -

## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| **CCB16** | Mercury | 0.20 | +/-0.20 | U | 0.20 | CV | 12/13/2019 | 10:22 | LB106736 |
| **CCB17** | Mercury | 0.20 | +/-0.20 | U | 0.20 | CV | 12/13/2019 | 10:53 | LB106736 |
| **CCB18** | Mercury | 0.20 | +/-0.20 | U | 0.20 | CV | 12/13/2019 | 11:18 | LB106736 |
| **CCB19** | Mercury | 0.20 | +/-0.20 | U | 0.20 | CV | 12/13/2019 | 11:35 | LB106736 |

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# Metals

## - 3a -

## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| ICB01 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 11:59 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 11:59 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 11:59 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 11:59 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 11:59 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 11:59 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 11:59 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 11:59 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 11:59 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 11:59 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 11:59 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB01 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 12:27 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 12:27 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 12:27 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 12:27 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 12:27 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 12:27 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 12:27 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 12:27 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 12:27 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 12:27 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 12:27 | LB106689 |
| CCB02 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 15:33 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 15:33 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 15:33 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 15:33 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 15:33 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Copper | 1.01 | +/-20.0 | J | 20.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 15:33 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 15:33 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 15:33 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 15:33 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB02 | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 15:33 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 15:33 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 15:33 | LB106689 |
| CCB03 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 16:53 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 16:53 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 16:53 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 16:53 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 16:53 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 16:53 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 16:53 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 16:53 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 16:53 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 16:53 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 16:53 | LB106689 |
| CCB04 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 17:46 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 17:46 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 17:46 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 17:46 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 17:46 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 17:46 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 17:46 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 17:46 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB04 | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 17:46 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 17:46 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 17:46 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 17:46 | LB106689 |
| CCB05 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 18:34 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 18:34 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 18:34 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 18:34 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 18:34 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 18:34 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 18:34 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 18:34 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 18:34 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 18:34 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 18:34 | LB106689 |
| CCB06 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 19:21 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 19:21 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 19:21 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 19:21 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 19:21 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 19:21 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB06 | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 19:21 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 19:21 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 19:21 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 19:21 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 19:21 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 19:21 | LB106689 |
| CCB07 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 20:08 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Barium | 41.7 | +/-100 | J | 100 | P | 12/11/2019 | 20:08 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 20:08 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 20:08 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 20:08 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 20:08 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 20:08 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 20:08 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 20:08 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 20:08 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 20:08 | LB106689 |
| CCB08 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 20:56 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 20:56 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 20:56 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 20:56 | LB106689 |

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY



**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| **CCB08** | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 20:56 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 20:56 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 20:56 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 20:56 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Silver | 0.91 | +/-10.0 | J | 10.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 20:56 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 20:56 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 20:56 | LB106689 |
| **CCB09** | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 21:43 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 21:43 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 21:43 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 21:43 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 21:43 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 21:43 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 21:43 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 21:43 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Silver | 0.57 | +/-10.0 | J | 10.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 21:43 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 21:43 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 21:43 | LB106689 |
| **CCB10** | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 22:32 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 22:32 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB10 | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 22:32 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 22:32 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 22:32 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 22:32 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 22:32 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 22:32 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 22:32 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 22:32 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 22:32 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 22:32 | LB106689 |
| CCB11 | Aluminum | 100 | +/-100 | U | 100 | P | 12/11/2019 | 23:22 | LB106689 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/11/2019 | 23:22 | LB106689 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 23:22 | LB106689 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/11/2019 | 23:22 | LB106689 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 23:22 | LB106689 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/11/2019 | 23:22 | LB106689 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 23:22 | LB106689 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 23:22 | LB106689 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/11/2019 | 23:22 | LB106689 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 23:22 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB11 | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 23:22 | LB106689 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/11/2019 | 23:22 | LB106689 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| ICB01 | Aluminum | 100 | +/-100 | U | 100 | P | 12/12/2019 | 13:19 | LB106729 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/12/2019 | 13:19 | LB106729 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 13:19 | LB106729 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 13:19 | LB106729 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 13:19 | LB106729 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/12/2019 | 13:19 | LB106729 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 13:19 | LB106729 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 13:19 | LB106729 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 13:19 | LB106729 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 13:19 | LB106729 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 13:19 | LB106729 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB01 | Aluminum | 100 | +/-100 | U | 100 | P | 12/12/2019 | 13:44 | LB106729 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/12/2019 | 13:44 | LB106729 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 13:44 | LB106729 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 13:44 | LB106729 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 13:44 | LB106729 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/12/2019 | 13:44 | LB106729 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 13:44 | LB106729 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 13:44 | LB106729 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 13:44 | LB106729 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 13:44 | LB106729 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 13:44 | LB106729 |
| CCB02 | Aluminum | 100 | +/-100 | U | 100 | P | 12/12/2019 | 14:59 | LB106729 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/12/2019 | 14:59 | LB106729 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 14:59 | LB106729 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 14:59 | LB106729 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 14:59 | LB106729 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/12/2019 | 14:59 | LB106729 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 14:59 | LB106729 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 14:59 | LB106729 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 14:59 | LB106729 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB02 | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 14:59 | LB106729 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 14:59 | LB106729 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 14:59 | LB106729 |
| CCB03 | Aluminum | 100 | +/-100 | U | 100 | P | 12/12/2019 | 15:47 | LB106729 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Arsenic | 2.94 | +/-20.0 | J | 20.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/12/2019 | 15:47 | LB106729 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 15:47 | LB106729 |
| | Cadmium | 0.40 | +/-6.00 | J | 6.00 | P | 12/12/2019 | 15:47 | LB106729 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 15:47 | LB106729 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/12/2019 | 15:47 | LB106729 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 15:47 | LB106729 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 15:47 | LB106729 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Silver | 0.39 | +/-10.0 | J | 10.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 15:47 | LB106729 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 15:47 | LB106729 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 15:47 | LB106729 |
| CCB04 | Aluminum | 100 | +/-100 | U | 100 | P | 12/12/2019 | 17:23 | LB106729 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/12/2019 | 17:23 | LB106729 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 17:23 | LB106729 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 17:23 | LB106729 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 17:23 | LB106729 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/12/2019 | 17:23 | LB106729 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 17:23 | LB106729 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 17:23 | LB106729 |

# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB04 | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 17:23 | LB106729 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 17:23 | LB106729 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 17:23 | LB106729 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 17:23 | LB106729 |
| CCB05 | Aluminum | 100 | +/-100 | U | 100 | P | 12/12/2019 | 18:15 | LB106729 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Arsenic | 1.61 | +/-20.0 | J | 20.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/12/2019 | 18:15 | LB106729 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 18:15 | LB106729 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 18:15 | LB106729 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 18:15 | LB106729 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Iron | 100 | +/-100 | U | 100 | P | 12/12/2019 | 18:15 | LB106729 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 18:15 | LB106729 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 18:15 | LB106729 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Sodium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 18:15 | LB106729 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 18:15 | LB106729 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 18:15 | LB106729 |
| CCB06 | Aluminum | 100 | +/-100 | U | 100 | P | 12/12/2019 | 18:51 | LB106729 |
| | Antimony | 50.0 | +/-50.0 | U | 50.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Arsenic | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Barium | 100 | +/-100 | U | 100 | P | 12/12/2019 | 18:51 | LB106729 |
| | Beryllium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 18:51 | LB106729 |
| | Cadmium | 6.00 | +/-6.00 | U | 6.00 | P | 12/12/2019 | 18:51 | LB106729 |
| | Calcium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 18:51 | LB106729 |
| | Chromium | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Cobalt | 30.0 | +/-30.0 | U | 30.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Copper | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 18:51 | LB106729 |

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# Metals

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## INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Analyte | Result ug/L | Acceptance Limit | Conc Qual | CRQL | M | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| CCB06 | Iron | 100 | +/-100 | U | 100 | P | 12/12/2019 | 18:51 | LB106729 |
| | Lead | 12.0 | +/-12.0 | U | 12.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Magnesium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 18:51 | LB106729 |
| | Manganese | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Nickel | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Potassium | 2000 | +/-2000 | U | 2000 | P | 12/12/2019 | 18:51 | LB106729 |
| | Selenium | 20.0 | +/-20.0 | U | 20.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Silver | 10.0 | +/-10.0 | U | 10.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Sodium | 437 | +/-2000 | J | 2000 | P | 12/12/2019 | 18:51 | LB106729 |
| | Thallium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Vanadium | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 18:51 | LB106729 |
| | Zinc | 40.0 | +/-40.0 | U | 40.0 | P | 12/12/2019 | 18:51 | LB106729 |

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**Metals**
**- 3b -**
**PREPARATION BLANK SUMMARY**

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Instrument:** CV1

| Sample ID | Analyte | Result (ug/L) | Acceptance Limit | Conc Qual | CRQL ug/L | M | Analysis Date | Analysis Time | Run |
|---|---|---|---|---|---|---|---|---|---|
| **PB125428BL** | | **WATER** | | **Batch Number:** | **PB125428** | | **Prep Date:** | **12/12/2019** | |
| | Mercury | 0.20 | <0.20 | U | 0.20 | CV | 12/13/2019 | 10:57 | LB106736 |

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# Metals
## - 3b -
## PREPARATION BLANK SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Instrument:** P4

| Sample ID | Analyte | Result (ug/L) | Acceptance Limit | Conc Qual | CRQL ug/L | M | Analysis Date | Analysis Time | Run |
|---|---|---|---|---|---|---|---|---|---|
| **PB125377BL** | | **WATER** | | **Batch Number:** | **PB125377** | | **Prep Date:** | **12/11/2019** | |
| | Aluminum | 50.0 | <50.0 | U | 50.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Antimony | 25.0 | <25.0 | U | 25.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Arsenic | 10.0 | <10.0 | U | 10.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Barium | 50.0 | <50.0 | U | 50.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Beryllium | 3.00 | <3.00 | U | 3.00 | P | 12/11/2019 | 16:41 | LB106689 |
| | Cadmium | 3.00 | <3.00 | U | 3.00 | P | 12/11/2019 | 16:41 | LB106689 |
| | Calcium | 1000 | <1000 | U | 1000 | P | 12/11/2019 | 16:41 | LB106689 |
| | Chromium | 5.00 | <5.00 | U | 5.00 | P | 12/11/2019 | 16:41 | LB106689 |
| | Cobalt | 15.0 | <15.0 | U | 15.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Copper | 10.0 | <10.0 | U | 10.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Iron | 50.0 | <50.0 | U | 50.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Lead | 6.00 | <6.00 | U | 6.00 | P | 12/11/2019 | 16:41 | LB106689 |
| | Magnesium | 1000 | <1000 | U | 1000 | P | 12/11/2019 | 16:41 | LB106689 |
| | Manganese | 10.0 | <10.0 | U | 10.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Nickel | 20.0 | <20.0 | U | 20.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Potassium | 1000 | <1000 | U | 1000 | P | 12/11/2019 | 16:41 | LB106689 |
| | Selenium | 10.0 | <10.0 | U | 10.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Silver | 5.00 | <5.00 | U | 5.00 | P | 12/11/2019 | 16:41 | LB106689 |
| | Sodium | 1000 | <1000 | U | 1000 | P | 12/11/2019 | 16:41 | LB106689 |
| | Thallium | 20.0 | <20.0 | U | 20.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Vanadium | 20.0 | <20.0 | U | 20.0 | P | 12/11/2019 | 16:41 | LB106689 |
| | Zinc | 20.0 | <20.0 | U | 20.0 | P | 12/11/2019 | 16:41 | LB106689 |

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# Metals
## - 4 -
## INTERFERENCE CHECK SAMPLE

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**ICS Source:** EPA **Instrument ID:** P4

| Sample ID | Analyte | Result ug/L | True Value ug/L | % Recovery | Low Limit (ug/L) | High Limit (ug/L) | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| **ICSA01** | Aluminum | 270000 | 254900 | 106 | 203920 | 305880 | 12/11/2019 | 12:07 | LB106689 |
| | Antimony | 39.5 | | | -50 | 50 | 12/11/2019 | 12:07 | LB106689 |
| | Arsenic | 18.5 | | | -20 | 20 | 12/11/2019 | 12:07 | LB106689 |
| | Barium | 8.33 | 6.0 | 139 | -94 | 106 | 12/11/2019 | 12:07 | LB106689 |
| | Beryllium | 3.03 | | | -6 | 6 | 12/11/2019 | 12:07 | LB106689 |
| | Cadmium | 4.99 | 1.0 | 499 | -5 | 7 | 12/11/2019 | 12:07 | LB106689 |
| | Calcium | 250000 | 244500 | 102 | 195600 | 293400 | 12/11/2019 | 12:07 | LB106689 |
| | Chromium | 61.3 | 52.0 | 118 | 42 | 62 | 12/11/2019 | 12:07 | LB106689 |
| | Cobalt | 6.10 | | | -30 | 30 | 12/11/2019 | 12:07 | LB106689 |
| | Copper | -4.16 | 2.0 | 208 | -18 | 22 | 12/11/2019 | 12:07 | LB106689 |
| | Iron | 104000 | 100700 | 103 | 80560 | 120840 | 12/11/2019 | 12:07 | LB106689 |
| | Lead | 2.96 | | | -12 | 12 | 12/11/2019 | 12:07 | LB106689 |
| | Magnesium | 267000 | 255400 | 104 | 204320 | 306480 | 12/11/2019 | 12:07 | LB106689 |
| | Manganese | 15.0 | 7.0 | 214 | -13 | 27 | 12/11/2019 | 12:07 | LB106689 |
| | Nickel | 18.0 | 2.0 | 900 | -38 | 42 | 12/11/2019 | 12:07 | LB106689 |
| | Potassium | -35.1 | | | 0 | 0 | 12/11/2019 | 12:07 | LB106689 |
| | Selenium | 1.67 | | | -20 | 20 | 12/11/2019 | 12:07 | LB106689 |
| | Silver | -0.099 | | | -10 | 10 | 12/11/2019 | 12:07 | LB106689 |
| | Sodium | 47.9 | | | 0 | 0 | 12/11/2019 | 12:07 | LB106689 |
| | Thallium | 1.54 | | | -40 | 40 | 12/11/2019 | 12:07 | LB106689 |
| | Vanadium | -9.80 | | | -40 | 40 | 12/11/2019 | 12:07 | LB106689 |
| | Zinc | 5.12 | | | -40 | 40 | 12/11/2019 | 12:07 | LB106689 |
| **ICSAB01** | Aluminum | 261000 | 246800 | 106 | 197440 | 296160 | 12/11/2019 | 12:11 | LB106689 |
| | Antimony | 638 | 618 | 103 | 494 | 742 | 12/11/2019 | 12:11 | LB106689 |
| | Arsenic | 121 | 104 | 116 | 83 | 125 | 12/11/2019 | 12:11 | LB106689 |
| | Barium | 507 | 537 | 94 | 337 | 737 | 12/11/2019 | 12:11 | LB106689 |
| | Beryllium | 477 | 495 | 96 | 396 | 594 | 12/11/2019 | 12:11 | LB106689 |
| | Cadmium | 983 | 972 | 101 | 778 | 1166 | 12/11/2019 | 12:11 | LB106689 |
| | Calcium | 241000 | 234900 | 103 | 187920 | 281880 | 12/11/2019 | 12:11 | LB106689 |
| | Chromium | 550 | 542 | 102 | 434 | 650 | 12/11/2019 | 12:11 | LB106689 |
| | Cobalt | 503 | 476 | 106 | 381 | 571 | 12/11/2019 | 12:11 | LB106689 |
| | Copper | 464 | 511 | 91 | 409 | 613 | 12/11/2019 | 12:11 | LB106689 |
| | Iron | 102000 | 99320 | 103 | 79456 | 119184 | 12/11/2019 | 12:11 | LB106689 |
| | Lead | 50.9 | 49.0 | 104 | 39 | 59 | 12/11/2019 | 12:11 | LB106689 |
| | Magnesium | 258000 | 248000 | 104 | 198400 | 297600 | 12/11/2019 | 12:11 | LB106689 |
| | Manganese | 487 | 507 | 96 | 406 | 608 | 12/11/2019 | 12:11 | LB106689 |
| | Nickel | 1000 | 954 | 105 | 763 | 1145 | 12/11/2019 | 12:11 | LB106689 |
| | Potassium | -19.4 | | | 0 | 0 | 12/11/2019 | 12:11 | LB106689 |
| | Selenium | 55.4 | 46.0 | 120 | 11 | 81 | 12/11/2019 | 12:11 | LB106689 |
| | Silver | 207 | 201 | 103 | 161 | 241 | 12/11/2019 | 12:11 | LB106689 |
| | Sodium | 63.8 | | | 0 | 0 | 12/11/2019 | 12:11 | LB106689 |
| | Thallium | 85.6 | 108 | 79 | 83 | 133 | 12/11/2019 | 12:11 | LB106689 |
| | Vanadium | 471 | 491 | 96 | 393 | 589 | 12/11/2019 | 12:11 | LB106689 |
| | Zinc | 1000 | 952 | 105 | 762 | 1142 | 12/11/2019 | 12:11 | LB106689 |
| **ICSA01** | Aluminum | 252000 | 254900 | 99 | 203920 | 305880 | 12/12/2019 | 13:29 | LB106729 |

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# Metals
## - 4 -
## INTERFERENCE CHECK SAMPLE

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**ICS Source:** EPA **Instrument ID:** P4

| Sample ID | Analyte | Result ug/L | True Value ug/L | % Recovery | Low Limit (ug/L) | High Limit (ug/L) | Analysis Date | Analysis Time | Run Number |
|---|---|---|---|---|---|---|---|---|---|
| ICSA01 | Antimony | 32.1 | | | -50 | 50 | 12/12/2019 | 13:29 | LB106729 |
| | Arsenic | 17.5 | | | -20 | 20 | 12/12/2019 | 13:29 | LB106729 |
| | Barium | 5.93 | 6.0 | 99 | -94 | 106 | 12/12/2019 | 13:29 | LB106729 |
| | Beryllium | 5.05 | | | -6 | 6 | 12/12/2019 | 13:29 | LB106729 |
| | Cadmium | -1.14 | 1.0 | 114 | -5 | 7 | 12/12/2019 | 13:29 | LB106729 |
| | Calcium | 235000 | 244500 | 96 | 195600 | 293400 | 12/12/2019 | 13:29 | LB106729 |
| | Chromium | 57.5 | 52.0 | 111 | 42 | 62 | 12/12/2019 | 13:29 | LB106729 |
| | Cobalt | 4.94 | | | -30 | 30 | 12/12/2019 | 13:29 | LB106729 |
| | Copper | 1.49 | 2.0 | 74 | -18 | 22 | 12/12/2019 | 13:29 | LB106729 |
| | Iron | 97900 | 100700 | 97 | 80560 | 120840 | 12/12/2019 | 13:29 | LB106729 |
| | Lead | -1.61 | | | -12 | 12 | 12/12/2019 | 13:29 | LB106729 |
| | Magnesium | 250000 | 255400 | 98 | 204320 | 306480 | 12/12/2019 | 13:29 | LB106729 |
| | Manganese | 10.3 | 7.0 | 148 | -13 | 27 | 12/12/2019 | 13:29 | LB106729 |
| | Nickel | 17.5 | 2.0 | 875 | -38 | 42 | 12/12/2019 | 13:29 | LB106729 |
| | Potassium | -92.8 | | | 0 | 0 | 12/12/2019 | 13:29 | LB106729 |
| | Selenium | -6.50 | | | -20 | 20 | 12/12/2019 | 13:29 | LB106729 |
| | Silver | -0.42 | | | -10 | 10 | 12/12/2019 | 13:29 | LB106729 |
| | Sodium | 33.3 | | | 0 | 0 | 12/12/2019 | 13:29 | LB106729 |
| | Thallium | 4.09 | | | -40 | 40 | 12/12/2019 | 13:29 | LB106729 |
| | Vanadium | -7.88 | | | -40 | 40 | 12/12/2019 | 13:29 | LB106729 |
| | Zinc | 1.49 | | | -40 | 40 | 12/12/2019 | 13:29 | LB106729 |
| ICSAB01 | Aluminum | 265000 | 246800 | 107 | 197440 | 296160 | 12/12/2019 | 13:33 | LB106729 |
| | Antimony | 666 | 618 | 108 | 494 | 742 | 12/12/2019 | 13:33 | LB106729 |
| | Arsenic | 118 | 104 | 114 | 83 | 125 | 12/12/2019 | 13:33 | LB106729 |
| | Barium | 538 | 537 | 100 | 337 | 737 | 12/12/2019 | 13:33 | LB106729 |
| | Beryllium | 530 | 495 | 107 | 396 | 594 | 12/12/2019 | 13:33 | LB106729 |
| | Cadmium | 1030 | 972 | 106 | 778 | 1166 | 12/12/2019 | 13:33 | LB106729 |
| | Calcium | 248000 | 234900 | 106 | 187920 | 281880 | 12/12/2019 | 13:33 | LB106729 |
| | Chromium | 584 | 542 | 108 | 434 | 650 | 12/12/2019 | 13:33 | LB106729 |
| | Cobalt | 529 | 476 | 111 | 381 | 571 | 12/12/2019 | 13:33 | LB106729 |
| | Copper | 509 | 511 | 100 | 409 | 613 | 12/12/2019 | 13:33 | LB106729 |
| | Iron | 102000 | 99320 | 103 | 79456 | 119184 | 12/12/2019 | 13:33 | LB106729 |
| | Lead | 45.1 | 49.0 | 92 | 39 | 59 | 12/12/2019 | 13:33 | LB106729 |
| | Magnesium | 264000 | 248000 | 106 | 198400 | 297600 | 12/12/2019 | 13:33 | LB106729 |
| | Manganese | 527 | 507 | 104 | 406 | 608 | 12/12/2019 | 13:33 | LB106729 |
| | Nickel | 1050 | 954 | 110 | 763 | 1145 | 12/12/2019 | 13:33 | LB106729 |
| | Potassium | -49.9 | | | 0 | 0 | 12/12/2019 | 13:33 | LB106729 |
| | Selenium | 63.6 | 46.0 | 138 | 11 | 81 | 12/12/2019 | 13:33 | LB106729 |
| | Silver | 220 | 201 | 110 | 161 | 241 | 12/12/2019 | 13:33 | LB106729 |
| | Sodium | 62.5 | | | 0 | 0 | 12/12/2019 | 13:33 | LB106729 |
| | Thallium | 83.1 | 108 | 77 | 83 | 133 | 12/12/2019 | 13:33 | LB106729 |
| | Vanadium | 510 | 491 | 104 | 393 | 589 | 12/12/2019 | 13:33 | LB106729 |
| | Zinc | 1070 | 952 | 112 | 762 | 1142 | 12/12/2019 | 13:33 | LB106729 |

# METAL QC DATA

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# metals
## - 5a -
## MATRIX SPIKE SUMMARY

**client:** LiRo Engineers, Inc. **level:** low **sdg no.:** K6235

**contract:** LIRO01 **lab code:** CHEM **case no.:** K6235 **sas no.:** K6235

**matrix:** Water **sample id:** K6235-01 **client id:** MW-08MS

**Percent Solids for Sample:** NA **Spiked ID:** K6235-01MS **Percent Solids for Spike Sample:** NA

| Analyte | Units | Acceptance Limit %R | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75 - 125 | 977 | | 50.0 | U | 1000 | 98 | | P |
| Antimony | ug/L | 75 - 125 | 470 | | 23.6 | J | 400 | 111 | | P |
| Arsenic | ug/L | 75 - 125 | 455 | | 8.82 | J | 400 | 112 | | P |
| Barium | ug/L | 75 - 125 | 223 | | 116 | | 100 | 107 | | P |
| Beryllium | ug/L | 75 - 125 | 96.6 | | 3.00 | U | 100 | 97 | | P |
| Cadmium | ug/L | 75 - 125 | 102 | | 0.30 | J | 100 | 101 | | P |
| Calcium | ug/L | 75 - 125 | 267000 | | 268000 | | 500 | -133 | | P |
| Chromium | ug/L | 75 - 125 | 218 | | 5.00 | U | 200 | 109 | | P |
| Cobalt | ug/L | 75 - 125 | 109 | | 2.64 | J | 100 | 106 | | P |
| Copper | ug/L | 75 - 125 | 168 | | 5.51 | J | 150 | 108 | | P |
| Iron | ug/L | 75 - 125 | 3780 | | 2140 | | 1500 | 109 | | P |
| Lead | ug/L | 75 - 125 | 521 | | 2.33 | J | 500 | 104 | | P |
| Magnesium | ug/L | 75 - 125 | 48000 | | 47600 | | 1000 | 41 | | P |
| Manganese | ug/L | 75 - 125 | 489 | | 401 | | 100 | 88 | | P |
| Nickel | ug/L | 75 - 125 | 268 | | 5.96 | J | 250 | 105 | | P |
| Potassium | ug/L | 75 - 125 | 19700 | | 13800 | | 5000 | 119 | | P |
| Selenium | ug/L | 75 - 125 | 1110 | | 50.2 | | 1000 | 106 | | P |
| Silver | ug/L | 75 - 125 | 41.2 | | 5.00 | U | 37.5 | 110 | | P |
| Sodium | ug/L | 75 - 125 | 10600 | | 8850 | | 1500 | 118 | | P |
| Thallium | ug/L | 75 - 125 | 1040 | | 20.0 | U | 1000 | 104 | | P |
| Vanadium | ug/L | 75 - 125 | 155 | | 20.0 | U | 150 | 103 | | P |
| Zinc | ug/L | 75 - 125 | 242 | | 137 | | 100 | 105 | | P |

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**metals**
**- 5a -**
**MATRIX SPIKE DUPLICATE SUMMARY**

**client:** LiRo Engineers, Inc. **level:** low **sdg no.:** K6235

**contract:** LIRO01 **lab code:** CHEM **case no.:** K6235 **sas no.:** K6235

**matrix:** Water **sample id:** K6235-01 **client id:** MW-08MSD

**Percent Solids for Sample:** NA **Spiked ID:** K6235-01MSD **Percent Solids for Spike Sample:** NA

| Analyte | Units | Acceptance Limit %R | MSD Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75 - 125 | 946 | | 50.0 | U | 1000 | 95 | | P |
| Antimony | ug/L | 75 - 125 | 467 | | 23.6 | J | 400 | 111 | | P |
| Arsenic | ug/L | 75 - 125 | 450 | | 8.82 | J | 400 | 110 | | P |
| Barium | ug/L | 75 - 125 | 223 | | 116 | | 100 | 107 | | P |
| Beryllium | ug/L | 75 - 125 | 95.9 | | 3.00 | U | 100 | 96 | | P |
| Cadmium | ug/L | 75 - 125 | 101 | | 0.30 | J | 100 | 100 | | P |
| Calcium | ug/L | 75 - 125 | 270000 | | 268000 | | 500 | 527 | | P |
| Chromium | ug/L | 75 - 125 | 217 | | 5.00 | U | 200 | 108 | | P |
| Cobalt | ug/L | 75 - 125 | 108 | | 2.64 | J | 100 | 105 | | P |
| Copper | ug/L | 75 - 125 | 166 | | 5.51 | J | 150 | 107 | | P |
| Iron | ug/L | 75 - 125 | 3800 | | 2140 | | 1500 | 111 | | P |
| Lead | ug/L | 75 - 125 | 520 | | 2.33 | J | 500 | 104 | | P |
| Magnesium | ug/L | 75 - 125 | 48500 | | 47600 | | 1000 | 95 | | P |
| Manganese | ug/L | 75 - 125 | 494 | | 401 | | 100 | 93 | | P |
| Nickel | ug/L | 75 - 125 | 266 | | 5.96 | J | 250 | 104 | | P |
| Potassium | ug/L | 75 - 125 | 19900 | | 13800 | | 5000 | 122 | | P |
| Selenium | ug/L | 75 - 125 | 1110 | | 50.2 | | 1000 | 106 | | P |
| Silver | ug/L | 75 - 125 | 40.8 | | 5.00 | U | 37.5 | 109 | | P |
| Sodium | ug/L | 75 - 125 | 10700 | | 8850 | | 1500 | 123 | | P |
| Thallium | ug/L | 75 - 125 | 1040 | | 20.0 | U | 1000 | 104 | | P |
| Vanadium | ug/L | 75 - 125 | 155 | | 20.0 | U | 150 | 103 | | P |
| Zinc | ug/L | 75 - 125 | 242 | | 137 | | 100 | 105 | | P |

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**metals**
**- 5a -**
**MATRIX SPIKE SUMMARY**

**client:** LiRo Engineers, Inc. **level:** low **sdg no.:** K6235

**contract:** LIRO01 **lab code:** CHEM **case no.:** K6235 **sas no.:** K6235

**matrix:** Water **sample id:** K6235-04 **client id:** DUPMS

**Percent Solids for Sample:** NA **Spiked ID:** K6235-04MS **Percent Solids for Spike Sample:** NA

| Analyte | Units | Acceptance Limit %R | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75 - 125 | 3.45 | | 0.20 | U | 4.0 | 86 | | CV |

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**metals**
**- 5a -**
**MATRIX SPIKE DUPLICATE SUMMARY**

**client:** LiRo Engineers, Inc. **level:** low **sdg no.:** K6235

**contract:** LIRO01 **lab code:** CHEM **case no.:** K6235 **sas no.:** K6235

**matrix:** Water **sample id:** K6235-04 **client id:** DUPMSD

**Percent Solids for Sample:** NA **Spiked ID:** K6235-04MSD **Percent Solids for Spike Sample:** NA

| Analyte | Units | Acceptance Limit %R | MSD Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75 - 125 | 3.46 | | 0.20 | U | 4.0 | 86 | | CV |

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# Metals
## - 5b -

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Matrix:** **Level:** LOW **Client ID:**

**Sample ID:** **Spiked ID:**

| Analyte | Units | Acceptance Limit %R | C | Sample Result | C | Spike Added | % Recovery | Qual | M |
|---|---|---|---|---|---|---|---|---|---|

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## Metals

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### DUPLICATE SAMPLE SUMMARY

**Client:** LiRo Engineers, Inc. **Level:** LOW **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Matrix:** Water **Sample ID:** K6235-01 **Client ID:** MW-08DUP

**Percent Solids for Sample:** NA **Duplicate ID** K6235-01DUP **Percent Solids for Spike Sample:** NA

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 20 | 50.0 | U | 50.0 | U | | | P |
| Antimony | ug/L | 20 | 23.6 | J | 23.9 | J | 1 | | P |
| Arsenic | ug/L | 20 | 8.82 | J | 9.96 | J | 12 | | P |
| Barium | ug/L | 20 | 116 | | 116 | | 0 | | P |
| Beryllium | ug/L | 20 | 3.00 | U | 3.00 | U | | | P |
| Cadmium | ug/L | 20 | 0.30 | J | 0.30 | J | 2 | | P |
| Calcium | ug/L | 20 | 268000 | | 268000 | | 0 | | P |
| Chromium | ug/L | 20 | 5.00 | U | 5.00 | U | | | P |
| Cobalt | ug/L | 20 | 2.64 | J | 2.69 | J | 2 | | P |
| Copper | ug/L | 20 | 5.51 | J | 6.31 | J | 14 | | P |
| Iron | ug/L | 20 | 2140 | | 2140 | | 0 | | P |
| Lead | ug/L | 20 | 2.33 | J | 3.64 | J | 44 | | P |
| Magnesium | ug/L | 20 | 47600 | | 47400 | | 0 | | P |
| Manganese | ug/L | 20 | 401 | | 402 | | 0 | | P |
| Nickel | ug/L | 20 | 5.96 | J | 5.48 | J | 8 | | P |
| Potassium | ug/L | 20 | 13800 | | 13700 | | 1 | | P |
| Selenium | ug/L | 20 | 50.2 | | 49.3 | | 2 | | P |
| Silver | ug/L | 20 | 5.00 | U | 5.00 | U | | | P |
| Sodium | ug/L | 20 | 8850 | | 8840 | | 0 | | P |
| Thallium | ug/L | 20 | 20.0 | U | 20.0 | U | | | P |
| Vanadium | ug/L | 20 | 20.0 | U | 20.0 | U | | | P |
| Zinc | ug/L | 20 | 137 | | 136 | | 1 | | P |

"A control limit of ±20% RPD for each matrix applies for sample values greater than 10 times Detection Limit"

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## Metals

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### DUPLICATE SAMPLE SUMMARY

**Client:** LiRo Engineers, Inc. **Level:** LOW **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Matrix:** Water **Sample ID:** K6235-01MS **Client ID:** MW-08MSD

**Percent Solids for Sample:** NA **Duplicate ID** K6235-01MSD **Percent Solids for Spike Sample:** NA

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 20 | 977 | | 946 | | 3 | | P |
| Antimony | ug/L | 20 | 470 | | 467 | | 1 | | P |
| Arsenic | ug/L | 20 | 455 | | 450 | | 1 | | P |
| Barium | ug/L | 20 | 223 | | 223 | | 0 | | P |
| Beryllium | ug/L | 20 | 96.6 | | 95.9 | | 1 | | P |
| Cadmium | ug/L | 20 | 102 | | 101 | | 1 | | P |
| Calcium | ug/L | 20 | 267000 | | 270000 | | 1 | | P |
| Chromium | ug/L | 20 | 218 | | 217 | | 0 | | P |
| Cobalt | ug/L | 20 | 109 | | 108 | | 1 | | P |
| Copper | ug/L | 20 | 168 | | 166 | | 1 | | P |
| Iron | ug/L | 20 | 3780 | | 3800 | | 1 | | P |
| Lead | ug/L | 20 | 521 | | 520 | | 0 | | P |
| Magnesium | ug/L | 20 | 48000 | | 48500 | | 1 | | P |
| Manganese | ug/L | 20 | 489 | | 494 | | 1 | | P |
| Nickel | ug/L | 20 | 268 | | 266 | | 1 | | P |
| Potassium | ug/L | 20 | 19700 | | 19900 | | 1 | | P |
| Selenium | ug/L | 20 | 1110 | | 1110 | | 0 | | P |
| Silver | ug/L | 20 | 41.2 | | 40.8 | | 1 | | P |
| Sodium | ug/L | 20 | 10600 | | 10700 | | 1 | | P |
| Thallium | ug/L | 20 | 1040 | | 1040 | | 0 | | P |
| Vanadium | ug/L | 20 | 155 | | 155 | | 0 | | P |
| Zinc | ug/L | 20 | 242 | | 242 | | 0 | | P |

"A control limit of ±20% RPD for each matrix applies for sample values greater than 10 times Detection Limit"

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## Metals

**- 6 -**

**DUPLICATE SAMPLE SUMMARY**

**Client:** LiRo Engineers, Inc. **Level:** LOW **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Matrix:** Water **Sample ID:** K6235-04 **Client ID:** DUPDUP

**Percent Solids for Sample:** NA **Duplicate ID** K6235-04DUP **Percent Solids for Spike Sample:** NA

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 20 | 0.20 | U | 0.20 | U | | | CV |

"A control limit of ±20% RPD for each matrix applies for sample values greater than 10 times Detection Limit"

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## Metals

**- 6 -**

**DUPLICATE SAMPLE SUMMARY**

**Client:** LiRo Engineers, Inc. **Level:** LOW **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Matrix:** Water **Sample ID:** K6235-04MS **Client ID:** DUPMSD

**Percent Solids for Sample:** NA **Duplicate ID** K6235-04MSD **Percent Solids for Spike Sample:** NA

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 20 | 3.45 | | 3.46 | | 0 | | CV |

"A control limit of ±20% RPD for each matrix applies for sample values greater than 10 times Detection Limit"

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## Metals



### LABORATORY CONTROL SAMPLE SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limits | M |
|---|---|---|---|---|---|---|---|
| PB125377BS | | | | | | | |
| Aluminum | ug/L | 1000 | 1100 | | 110 | 80 - 120 | P |
| Antimony | ug/L | 400 | 433 | | 108 | 80 - 120 | P |
| Arsenic | ug/L | 400 | 414 | | 104 | 80 - 120 | P |
| Barium | ug/L | 100 | 114 | | 114 | 80 - 120 | P |
| Beryllium | ug/L | 100 | 101 | | 101 | 80 - 120 | P |
| Cadmium | ug/L | 100 | 98.5 | | 98 | 80 - 120 | P |
| Calcium | ug/L | 500 | 554 | J | 111 | 80 - 120 | P |
| Chromium | ug/L | 200 | 218 | | 109 | 80 - 120 | P |
| Cobalt | ug/L | 100 | 105 | | 105 | 80 - 120 | P |
| Copper | ug/L | 150 | 172 | | 115 | 80 - 120 | P |
| Iron | ug/L | 1500 | 1620 | | 108 | 80 - 120 | P |
| Lead | ug/L | 500 | 509 | | 102 | 80 - 120 | P |
| Magnesium | ug/L | 1000 | 1070 | | 107 | 80 - 120 | P |
| Manganese | ug/L | 100 | 105 | | 105 | 80 - 120 | P |
| Nickel | ug/L | 250 | 265 | | 106 | 80 - 120 | P |
| Potassium | ug/L | 5000 | 5170 | | 103 | 80 - 120 | P |
| Selenium | ug/L | 1000 | 918 | | 92 | 80 - 120 | P |
| Silver | ug/L | 37.5 | 39.3 | | 105 | 80 - 120 | P |
| Sodium | ug/L | 1500 | 1640 | | 109 | 80 - 120 | P |
| Thallium | ug/L | 1000 | 1070 | | 107 | 80 - 120 | P |
| Vanadium | ug/L | 150 | 161 | | 107 | 80 - 120 | P |
| Zinc | ug/L | 100 | 110 | | 110 | 80 - 120 | P |

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## Metals



### LABORATORY CONTROL SAMPLE SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

| Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limits | M |
|---|---|---|---|---|---|---|---|
| PB125428BS | | | | | | | |
| Mercury | ug/L | 4.0 | 3.79 | | 95 | 80 - 120 | CV |

# Metals

## -9 -

## ICP SERIAL DILUTIONS

SAMPLE NO.

MW-08L

**Lab Name:** Chemtech Consulting Group **Contract:** LIRO01

**Lab Code:** CHEM **Lb No.:** lb106689 **Lab Sample ID :** K6235-01L **SDG No.:** K6235

**Matrix (soil/water):** Water **Level (low/med):** LOW

**Concentration Units:** ug/L

| Analyte | Initial Sample Result (I) | C | Serial Dilution Result (S) | C | % Difference | Q | M |
|---|---|---|---|---|---|---|---|
| Aluminum | 50.0 | U | 250 | U | | | P |
| Antimony | 23.6 | J | 67.1 | J | 184 | | P |
| Arsenic | 8.82 | J | 50.0 | U | 100.0 | | P |
| Barium | 116 | | 126 | J | 9 | | P |
| Beryllium | 3.00 | U | 15.0 | U | | | P |
| Cadmium | 0.30 | J | 15.0 | U | 100.0 | | P |
| Calcium | 268000 | | 278000 | | 4 | | P |
| Chromium | 5.00 | U | 25.0 | U | | | P |
| Cobalt | 2.64 | J | 6.76 | J | 156 | | P |
| Copper | 5.51 | J | 16.6 | J | 201 | | P |
| Iron | 2140 | | 2120 | | 1 | | P |
| Lead | 2.33 | J | 30.0 | U | 100.0 | | P |
| Magnesium | 47600 | | 50200 | | 5 | | P |
| Manganese | 401 | | 425 | | 6 | | P |
| Nickel | 5.96 | J | 100 | U | 100.0 | | P |
| Potassium | 13800 | | 12700 | | 8 | | P |
| Selenium | 50.2 | | 172 | | 243 | | P |
| Silver | 5.00 | U | 25.0 | U | | | P |
| Sodium | 8850 | | 8370 | | 5 | | P |
| Thallium | 20.0 | U | 100 | U | | | P |
| Vanadium | 20.0 | U | 100 | U | | | P |
| Zinc | 137 | | 136 | | 1 | | P |

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# Metals

## -9 -

## ICP SERIAL DILUTIONS

| SAMPLE NO. |
|---|
| DUPL |

**Lab Name:** Chemtech Consulting Group **Contract:** LIRO01

**Lab Code:** CHEM **Lb No.:** lb106736 **Lab Sample ID :** K6235-04L **SDG No.:** K6235

**Matrix (soil/water):** Water **Level (low/med):** LOW

**Concentration Units:** ug/L

| Analyte | Initial Sample Result (I) | C | Serial Dilution Result (S) | C | % Difference | Q | M |
|---|---|---|---|---|---|---|---|
| Mercury | 0.20 | U | 1.00 | U | | | CV |

# METAL PREPARATION & INSTRUMENT DATA

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# Metals



**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Instrument ID:** P4 **Preparation Method:**

| Analyte | Wave- length (nm) | MDL | LOQ/CRQL | Date: |
|---|---|---|---|---|
| **LIQUID** | | | | |
| **Method:** | **6010D** | | | |
| Aluminum | 396 | 5.29 | 50.0 | |
| Antimony | 207 | 2.03 | 25.0 | |
| Arsenic | 189 | 0.68 | 10.0 | |
| Barium | 493 | 3.99 | 50.0 | |
| Beryllium | 235 | 0.20 | 3.00 | |
| Cadmium | 227 | 0.17 | 3.00 | |
| Calcium | 374 | 88.5 | 1000 | |
| Chromium | 268 | 1.33 | 5.00 | |
| Cobalt | 229 | 1.09 | 15.0 | |
| Copper | 225 | 0.49 | 10.0 | |
| Iron | 240 | 7.85 | 50.0 | |
| Lead | 220 | 1.43 | 6.00 | |
| Magnesium | 279 | 104 | 1000 | |
| Manganese | 258 | 0.98 | 10.0 | |
| Nickel | 232 | 1.69 | 20.0 | |
| Potassium | 766 | 179 | 1000 | |
| Selenium | 196 | 2.79 | 10.0 | |
| Silver | 328 | 0.17 | 5.00 | |
| Sodium | 590 | 169 | 1000 | |
| Thallium | 191 | 2.88 | 20.0 | |
| Vanadium | 292 | 1.39 | 20.0 | |
| Zinc | 214 | 4.81 | 20.0 | |

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# Metals

**- 10 -**

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Instrument ID:** CV1 **Preparation Method:**

| Analyte | Wave- length (nm) | MDL | LOQ/CRQL | Date: |
|---|---|---|---|---|
| **LIQUID** | | | | |
| **Method:** | **7470A** | | | |
| Mercury | 254 | 0.043 | 0.20 | |

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# Metals
## - 11 -
## ICP INTERELEMENT CORRECTION FACTORS

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Instrument ID:** **Date:**

**Interelement Correction Factors (apparent ppb analyte/ppm interferent )**

| Analyte | Wave-Length (nm) | ICP Interelement Correction Factors For: Al | Ca | Fe | Mg | Ag |
|---|---|---|---|---|---|---|
| Aluminum | 396.100 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Antimony | 206.833 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Arsenic | 193.759 | 0.0000000 | 0.0000000 | -0.0001030 | 0.0000000 | 0.0000000 |
| Barium | 493.409 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Beryllium | 234.861 | 0.0000000 | 0.0000000 | 0.0000090 | 0.0000000 | 0.0000000 |
| Cadmium | 226.502 | 0.0000000 | 0.0000000 | 0.0000840 | 0.0000000 | 0.0000000 |
| Calcium | 373.690 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Chromium | 267.716 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Cobalt | 228.616 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Copper | 224.700 | 0.0000000 | 0.0000000 | 0.0001620 | 0.0000000 | 0.0000000 |
| Iron | 240.488 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Lead | 220.353 | -0.0001070 | 0.0000000 | 0.0000280 | 0.0000000 | 0.0000000 |
| Magnesium | 279.079 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Manganese | 257.610 | 0.0000000 | 0.0000000 | -0.0000440 | 0.0000000 | 0.0000000 |
| Nickel | 231.604 | 0.0000000 | 0.0000000 | 0.0000200 | 0.0000000 | 0.0000000 |
| Potassium | 766.490 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Selenium | 196.090 | 0.0000000 | 0.0000000 | -0.0001280 | 0.0000000 | 0.0000000 |
| Silver | 328.068 | 0.0000000 | 0.0000000 | -0.0001170 | 0.0000000 | 0.0000000 |
| Sodium | 589.592 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Thallium | 190.856 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Vanadium | 292.402 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Zinc | 213.800 | 0.0000000 | 0.0000000 | 0.0001900 | 0.0000000 | 0.0000000 |

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# Metals
## - 11 -
## ICP INTERELEMENT CORRECTION FACTORS

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Instrument ID:** **Date:**

**Interelement Correction Factors (apparent ppb analyte/ppm interferent )**

| Analyte | Wave-Length (nm) | ICP Interelement Correction Factors For: As | Ba | Be | Cd | Co |
|---|---|---|---|---|---|---|
| Aluminum | 396.100 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Antimony | 206.833 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Arsenic | 193.759 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Barium | 493.409 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Beryllium | 234.861 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Cadmium | 226.502 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Calcium | 373.690 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Chromium | 267.716 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Cobalt | 228.616 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Copper | 224.700 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0001570 |
| Iron | 240.488 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Lead | 220.353 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Magnesium | 279.079 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Manganese | 257.610 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Nickel | 231.604 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0004170 |
| Potassium | 766.490 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Selenium | 196.090 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | -0.0002660 |
| Silver | 328.068 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Sodium | 589.592 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Thallium | 190.856 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0018500 |
| Vanadium | 292.402 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Zinc | 213.800 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |

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# Metals
## - 11 -
## ICP INTERELEMENT CORRECTION FACTORS

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Instrument ID:** **Date:**

**Interelement Correction Factors (apparent ppb analyte/ppm interferent )**

| Analyte | Wave-Length (nm) | ICP Interelement Correction Factors For: Cr | Cu | K | Mn | Mo |
|---|---|---|---|---|---|---|
| Aluminum | 396.100 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0308240 |
| Antimony | 206.833 | 0.0013816 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Arsenic | 193.759 | -0.0011220 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0015300 |
| Barium | 493.409 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Beryllium | 234.861 | 0.0000000 | 0.0000000 | 0.0000000 | -0.0000740 | -0.0003180 |
| Cadmium | 226.502 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | -0.0000600 |
| Calcium | 373.690 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Chromium | 267.716 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0002280 | 0.0000000 |
| Cobalt | 228.616 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | -0.0011900 |
| Copper | 224.700 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0014660 |
| Iron | 240.488 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Lead | 220.353 | -0.0003060 | 0.0000000 | 0.0000000 | 0.0001250 | -0.0013650 |
| Magnesium | 279.079 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | -0.0137700 |
| Manganese | 257.610 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Nickel | 231.604 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0020550 |
| Potassium | 766.490 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Selenium | 196.090 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0006680 | 0.0000000 |
| Silver | 328.068 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Sodium | 589.592 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Thallium | 190.856 | 0.0002250 | 0.0000000 | 0.0000000 | 0.0011640 | 0.0000000 |
| Vanadium | 292.402 | -0.0032600 | 0.0000000 | 0.0000000 | -0.0220050 | -0.0003720 |
| Zinc | 213.800 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |

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# Metals
## - 11 -
## ICP INTERELEMENT CORRECTION FACTORS

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Instrument ID:** **Date:**

**Interelement Correction Factors (apparent ppb analyte/ppm interferent )**

| Analyte | Wave-Length (nm) | ICP Interelement Correction Factors For: Na | Ni | Pb | Sb | Se |
|---|---|---|---|---|---|---|
| Aluminum | 396.100 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Antimony | 206.833 | 0.0000000 | -0.0004160 | 0.0000000 | 0.0000000 | 0.0000000 |
| Arsenic | 193.759 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Barium | 493.409 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Beryllium | 234.861 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Cadmium | 226.502 | 0.0000000 | -0.0000930 | 0.0000000 | 0.0000000 | 0.0000000 |
| Calcium | 373.690 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Chromium | 267.716 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Cobalt | 228.616 | 0.0000000 | 0.0001600 | 0.0000000 | 0.0000000 | 0.0000000 |
| Copper | 224.700 | 0.0000000 | -0.0049290 | 0.0000000 | 0.0000000 | 0.0000000 |
| Iron | 240.488 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Lead | 220.353 | 0.0000000 | 0.0002444 | 0.0000000 | 0.0000000 | 0.0000000 |
| Magnesium | 279.079 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Manganese | 257.610 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Nickel | 231.604 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Potassium | 766.490 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Selenium | 196.090 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Silver | 328.068 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Sodium | 589.592 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Thallium | 190.856 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Vanadium | 292.402 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Zinc | 213.800 | 0.0000000 | 0.0057000 | 0.0000000 | 0.0000000 | 0.0000000 |

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# Metals
## - 11 -
## ICP INTERELEMENT CORRECTION FACTORS

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Case No.:** K6235 **SAS No.:** K6235

**Instrument ID:** **Date:**

**Interelement Correction Factors (apparent ppb analyte/ppm interferent )**

| Analyte | Wave-Length (nm) | ICP Interelement Correction Factors For: Sn | Ti | Tl | V | Zn |
|---|---|---|---|---|---|---|
| Aluminum | 396.100 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Antimony | 206.833 | 0.0000000 | 0.0000000 | 0.0000000 | -0.0018200 | 0.0000000 |
| Arsenic | 193.759 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Barium | 493.409 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Beryllium | 234.861 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Cadmium | 226.502 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Calcium | 373.690 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Chromium | 267.716 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Cobalt | 228.616 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Copper | 224.700 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Iron | 240.488 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Lead | 220.353 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Magnesium | 279.079 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Manganese | 257.610 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Nickel | 231.604 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Potassium | 766.490 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Selenium | 196.090 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Silver | 328.068 | 0.0000000 | 0.0000000 | 0.0000000 | -0.0040370 | 0.0000000 |
| Sodium | 589.592 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Thallium | 190.856 | 0.0000000 | 0.0000000 | 0.0000000 | -0.0346560 | 0.0000000 |
| Vanadium | 292.402 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Zinc | 213.800 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |

# METAL PREPARATION & ANALYICAL SUMMARY

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# Metals
## - 13 -
## SAMPLE PREPARATION SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Method:**

**Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Client ID | Sample Type | Matrix | Prep Date | Initial Sample Size(mL) | Final Sample Volume (mL) | Percent Solids |
|---|---|---|---|---|---|---|---|
| **Batch Number:** | **PB125377** | | | | | | |
| K6235-01 | MW-08 | SAM | WATER | 12/11/2019 | 50.0 | 25.0 | |
| K6235-01DUP | MW-08DUP | DUP | WATER | 12/11/2019 | 50.0 | 25.0 | |
| K6235-01MS | MW-08MS | MS | WATER | 12/11/2019 | 50.0 | 25.0 | |
| K6235-01MSD | MW-08MSD | MSD | WATER | 12/11/2019 | 50.0 | 25.0 | |
| K6235-02 | MW-07 | SAM | WATER | 12/11/2019 | 50.0 | 25.0 | |
| K6235-03 | MW-03 | SAM | WATER | 12/11/2019 | 50.0 | 25.0 | |
| K6235-04 | DUP | SAM | WATER | 12/11/2019 | 50.0 | 25.0 | |
| PB125377BL | PB125377BL | MB | WATER | 12/11/2019 | 50.0 | 25.0 | |
| PB125377BS | PB125377BS | LCS | WATER | 12/11/2019 | 50.0 | 25.0 | |

# Metals
## - 13 -
## SAMPLE PREPARATION SUMMARY

**Client:** LiRo Engineers, Inc. **SDG No.:** K6235

**Contract:** LIRO01 **Lab Code:** CHEM **Method:**

**Case No.:** K6235 **SAS No.:** K6235

| Sample ID | Client ID | Sample Type | Matrix | Prep Date | Initial Sample Size(mL) | Final Sample Volume (mL) | Percent Solids |
|---|---|---|---|---|---|---|---|
| **Batch Number:** | **PB125428** | | | | | | |
| K6235-01 | MW-08 | SAM | WATER | 12/12/2019 | 30.0 | 30.0 | |
| K6235-02 | MW-07 | SAM | WATER | 12/12/2019 | 30.0 | 30.0 | |
| K6235-03 | MW-03 | SAM | WATER | 12/12/2019 | 30.0 | 30.0 | |
| K6235-04 | DUP | SAM | WATER | 12/12/2019 | 30.0 | 30.0 | |
| K6235-04DUP | DUPDUP | DUP | WATER | 12/12/2019 | 30.0 | 30.0 | |
| K6235-04MS | DUPMS | MS | WATER | 12/12/2019 | 30.0 | 30.0 | |
| K6235-04MSD | DUPMSD | MSD | WATER | 12/12/2019 | 30.0 | 30.0 | |
| PB125428BL | PB125428BL | MB | WATER | 12/12/2019 | 30.0 | 30.0 | |
| PB125428BS | PB125428BS | LCS | WATER | 12/12/2019 | 30.0 | 30.0 | |

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**metals**
**- 14 -**
**ANALYSIS RUN LOG**

**Client:** LiRo Engineers, Inc. **Contract:** LIRO01

**Lab code:** CHEM **Case no.:** K6235 **Sas no.:** K6235 **Sdg no.:** K6235

**Instrument id number:** **Method:** **Run number:** LB106689

**Start date:** 12/11/2019 **End date:** 12/11/2019

| Lab sample id. | Client Sample Id | d/f | Time | Parameter list |
|---|---|---|---|---|
| S0 | S0 | 1 | 1127 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| S1 | S1 | 1 | 1131 | Ag,Al,As,Ba,Be,Cd,Co,Cr,Cu,Fe,Mn,Ni,Pb,Sb,Se,Tl,V,Zn |
| S2 | S2 | 1 | 1135 | Ca,K,Mg,Na |
| S3 | S3 | 1 | 1139 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| S4 | S4 | 1 | 1142 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| S5 | S5 | 1 | 1146 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| ICV01 | ICV01 | 1 | 1150 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| LLICV01 | LLICV01 | 1 | 1155 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| ICB01 | ICB01 | 1 | 1159 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CRI01 | CRI01 | 1 | 1203 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| ICSA01 | ICSA01 | 1 | 1207 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| ICSAB01 | ICSAB01 | 1 | 1211 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV01 | CCV01 | 1 | 1215 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| LLCCV01 | LLCCV01 | 1 | 1219 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB01 | CCB01 | 1 | 1227 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV02 | CCV02 | 1 | 1529 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB02 | CCB02 | 1 | 1533 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| PB125377BL | PB125377BL | 1 | 1641 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| PB125377BS | PB125377BS | 1 | 1645 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV03 | CCV03 | 1 | 1649 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB03 | CCB03 | 1 | 1653 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV04 | CCV04 | 1 | 1742 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB04 | CCB04 | 1 | 1746 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| K6235-01 | MW-08 | 1 | 1814 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| K6235-01DUP | MW-08DUP | 1 | 1818 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| K6235-01L | MW-08L | 5 | 1822 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| K6235-01MS | MW-08MS | 1 | 1826 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV05 | CCV05 | 1 | 1830 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB05 | CCB05 | 1 | 1834 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| K6235-01MSD | MW-08MSD | 1 | 1838 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| K6235-02 | MW-07 | 1 | 1846 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| K6235-03 | MW-03 | 1 | 1850 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| K6235-04 | DUP | 1 | 1854 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV06 | CCV06 | 1 | 1917 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB06 | CCB06 | 1 | 1921 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV07 | CCV07 | 1 | 2004 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB07 | CCB07 | 1 | 2008 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV08 | CCV08 | 1 | 2052 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB08 | CCB08 | 1 | 2056 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV09 | CCV09 | 1 | 2139 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB09 | CCB09 | 1 | 2143 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV10 | CCV10 | 1 | 2228 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB10 | CCB10 | 1 | 2232 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |

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**metals**
**- 14 -**
**ANALYSIS RUN LOG**

**Client:** LiRo Engineers, Inc. **Contract:** LIRO01

**Lab code:** CHEM **Case no.:** K6235 **Sas no.:** K6235 **Sdg no.:** K6235

**Instrument id number:** **Method:** **Run number:** LB106689

**Start date:** 12/11/2019 **End date:** 12/11/2019

| Lab sample id. | Client Sample Id | d/f | Time | Parameter list |
|---|---|---|---|---|
| CCV11 | CCV11 | 1 | 2318 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB11 | CCB11 | 1 | 2322 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |

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**metals**
**- 14 -**
**ANALYSIS RUN LOG**

**Client:** LiRo Engineers, Inc. **Contract:** LIRO01

**Lab code:** CHEM **Case no.:** K6235 **Sas no.:** K6235 **Sdg no.:** K6235

**Instrument id number:** **Method:** **Run number:** LB106729

**Start date:** 12/12/2019 **End date:** 12/12/2019

| Lab sample id. | Client Sample Id | d/f | Time | Parameter list |
|---|---|---|---|---|
| S0 | S0 | 1 | 1241 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| S1 | S1 | 1 | 1245 | Ag,Al,As,Ba,Be,Cd,Co,Cr,Cu,Fe,Mn,Ni,Pb,Sb,Se,Tl,V,Zn |
| S2 | S2 | 1 | 1249 | Ca,K,Mg,Na |
| S3 | S3 | 1 | 1253 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| S4 | S4 | 1 | 1257 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| S5 | S5 | 1 | 1301 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| ICV01 | ICV01 | 1 | 1309 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| LLICV01 | LLICV01 | 1 | 1315 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| ICB01 | ICB01 | 1 | 1319 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CRI01 | CRI01 | 1 | 1323 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| ICSA01 | ICSA01 | 1 | 1329 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| ICSAB01 | ICSAB01 | 1 | 1333 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV01 | CCV01 | 1 | 1336 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| LLCCV01 | LLCCV01 | 1 | 1340 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB01 | CCB01 | 1 | 1344 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| K6235-03 | MW-03 | 10 | 1405 | Fe |
| CCV02 | CCV02 | 1 | 1436 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB02 | CCB02 | 1 | 1459 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV03 | CCV03 | 1 | 1543 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB03 | CCB03 | 1 | 1547 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV04 | CCV04 | 1 | 1719 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB04 | CCB04 | 1 | 1723 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV05 | CCV05 | 1 | 1811 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB05 | CCB05 | 1 | 1815 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCV06 | CCV06 | 1 | 1847 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |
| CCB06 | CCB06 | 1 | 1851 | Ag,Al,As,Ba,Be,Ca,Cd,Co,Cr,Cu,Fe,K,Mg,Mn,Na,Ni,Pb,Sb,Se,Tl,V,Zn |

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**metals**
**- 14 -**
**ANALYSIS RUN LOG**

**Client:** LiRo Engineers, Inc. **Contract:** LIRO01

**Lab code:** CHEM **Case no.:** K6235 **Sas no.:** K6235 **Sdg no.:** K6235

**Instrument id number:** **Method:** **Run number:** LB106736

**Start date:** 12/13/2019 **End date:** 12/13/2019

| Lab sample id. | Client Sample Id | d/f | Time | Parameter list |
|---|---|---|---|---|
| S0 | S0 | 1 | 1000 | HG |
| S0.2 | S0.2 | 1 | 1002 | HG |
| S2.5 | S2.5 | 1 | 1004 | HG |
| S5 | S5 | 1 | 1006 | HG |
| S7.5 | S7.5 | 1 | 1008 | HG |
| S10 | S10 | 1 | 1013 | HG |
| ICV28 | ICV28 | 1 | 1016 | HG |
| ICB28 | ICB28 | 1 | 1018 | HG |
| CCV16 | CCV16 | 1 | 1020 | HG |
| CCB16 | CCB16 | 1 | 1022 | HG |
| CRA | CRA | 1 | 1024 | HG |
| CCV17 | CCV17 | 1 | 1051 | HG |
| CCB17 | CCB17 | 1 | 1053 | HG |
| PB125428BL | PB125428BL | 1 | 1057 | HG |
| PB125428BS | PB125428BS | 1 | 1059 | HG |
| K6235-01 | MW-08 | 1 | 1106 | HG |
| K6235-02 | MW-07 | 1 | 1108 | HG |
| K6235-03 | MW-03 | 1 | 1110 | HG |
| K6235-04 | DUP | 1 | 1112 | HG |
| K6235-04DUP | DUPDUP | 1 | 1114 | HG |
| CCV18 | CCV18 | 1 | 1116 | HG |
| CCB18 | CCB18 | 1 | 1118 | HG |
| K6235-04MS | DUPMS | 1 | 1123 | HG |
| K6235-04MSD | DUPMSD | 1 | 1125 | HG |
| K6235-04L | DUPL | 5 | 1129 | HG |
| CCV19 | CCV19 | 1 | 1133 | HG |
| CCB19 | CCB19 | 1 | 1135 | HG |

# SHIPPING DOCUMENTS

# CHEMTECH
## CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

Chemtech Project Number: K6235
COC Number: 2027320

### CLIENT INFORMATION

Report to be sent to:
COMPANY: LIRO
ADDRESS: 690 Delaware AVE.
CITY: Buffalo STATE: NY ZIP: 14209
ATTENTION: Jon Williams
PHONE: 716 882 5476 FAX:

### PROJECT INFORMATION

PROJECT NAME: COB-Franczak Park
PROJECT #: LOCATION:
PROJECT MANAGER: Jon Williams
E-MAIL: williamsJ@liro.com
PHONE: FAX:

### BILLING INFORMATION

BILL TO: SAME PO#
ADDRESS:
CITY: STATE: ZIP:
ATTENTION:
PHONE:

### DATA TURNAROUND INFORMATION

FAX (RUSH) _____ DAYS*
HARDCOPY (DATA PACKAGE): 10 DAYS*
EDD: _____ DAYS*
*TO BE APPROVED BY CHEMTECH
STANDARD HARDCOPY TURNAROUND TIME IS 10 BUSINESS DAYS

### DATA DELIVERABLE INFORMATION

- ☐ Level 1 (Results Only)
- ☐ Level 2 (Results + QC)
- ☐ Level 3 (Results + QC + Raw Data)
- ☐ EDD FORMAT _____
- ☐ Level 4 (QC + Full Raw Data)
- ☐ NJ Reduced ☐ US EPA CLP
- ☐ NYS ASP A ☒ NYS ASP B
- ☐ Other EQuIS V4 EDD

### ANALYSIS

1 TCL VOCs
2 TAL metals + mercury
3
4
5
6
7
8
9

| CHEMTECH SAMPLE ID | PROJECT SAMPLE IDENTIFICATION | SAMPLE MATRIX | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE COLLECTION DATE | SAMPLE COLLECTION TIME | # of Bottles | PRESERVATIVES 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | E | E/B | | | | | | | | <—Specify Preservatives A-HCl D-NaOH B-HNO3 E-ICE C-H2SO4 F-OTHER |
| 1. MW-08 | | water | | X | 12.6.19 | 1300 | 2 | X | X | | | | | | | | |
| 2. MW-07 | | | | | 12.9.19 | 1100 | 2 | X | X | | | | | | | | |
| 3. MW-03 | | | | | ↓ | 1145 | 2 | X | X | | | | | | | | |
| 4. Dup | | ↓ | | ↓ | ↓ | | 2 | X | X | | | | | | | | |
| 5. | | | | | | | | | | | | | | | | | |
| 6. | | | | | | | | | | | | | | | | | |
| 7. | | | | | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | | | |

### SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE PROSSESSION INCLUDING COURIER DELIVERY

| RELINQUISHED BY SAMPLER | DATE/TIME | RECEIVED BY |
|---|---|---|
| 1. K. Clark | 12.9.19 1430 | 1. |
| RELINQUISHED BY 2. | DATE/TIME 12.10.19 9:18 | RECEIVED BY 2. CR |
| RELINQUISHED BY 3. | DATE/TIME | RECEIVED FOR LAB BY 3. |

Conditions of bottles or coilers at receipt: ☐ COMPLIANT ☐ NON COMPLIANT ☐ COOLER TEMP 3.3°C
Comments: IR Gun #1

Page _____ of _____

CLIENT: ☐ Hand Delivered ☐ Other: _____
CHEMTECH: ☐ Picked Up

Shipment Complete ☐ YES ☐ NO

10/2018

**WHITE** - CHEMTECH COPY FOR RETURN TO CLIENT **YELLOW** - CHEMTECH COPY **PINK** - SAMPLER COPY

ORIGIN ID:BUFA (716) 882-5476
JON WILLIAMS
LIRO ENGINEERS
690 DELAWARE AVE

BUFFALO, NY 14209
UNITED STATES US

SHIP DATE: 07MAR19
ACTWGT: 1.00 LB
CAD: 107979030/INET4100
DIMS: 10x12x10 IN

TO **SAMPLE MANAGEMENT**
**CHEMTECH**
**284 SHEFFIELD ST**

**MOUNTAINSIDE NJ 07092**
(908) 789-8900 REF: LIRO01-BUFFALO
INV:
PO: DEPT:

565J1/46D3/23AD

K6235

RMA:

FedEx Express

J191019010701uv

**RETURNS MON-FRI**
**STANDARD OVERNIGHT**

TRK# 0221 **7909 3818 5361**

**07092**

**NJ-US**

12-10-19 9:18 33

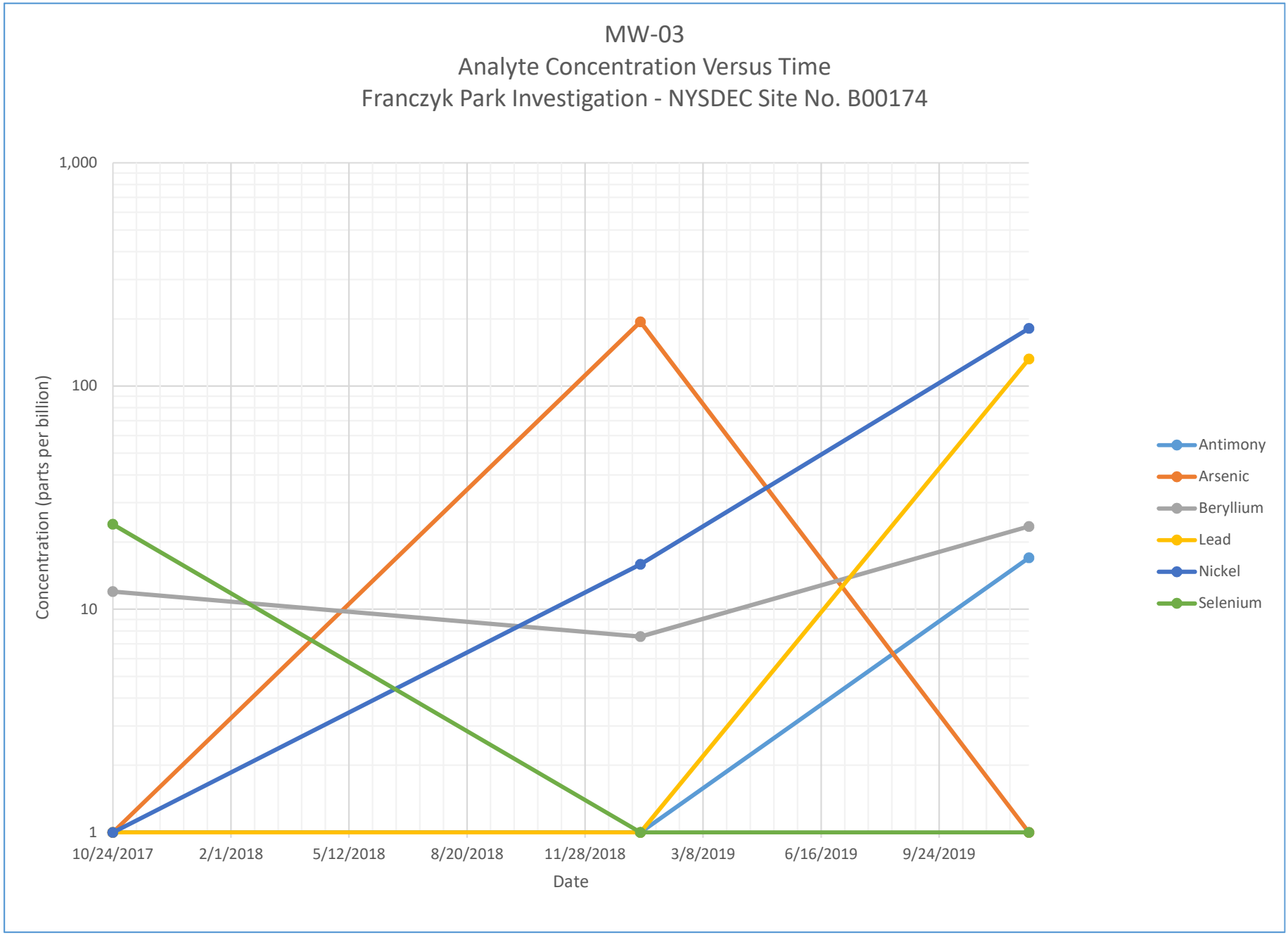
After printing this label:
**CONSIGNEE COPY - PLEASE PLACE IN FRONT OF POUCH**
1. Fold the printed page along the horizontal line.
2. Place label in shipping pouch and affix it to your shipment.

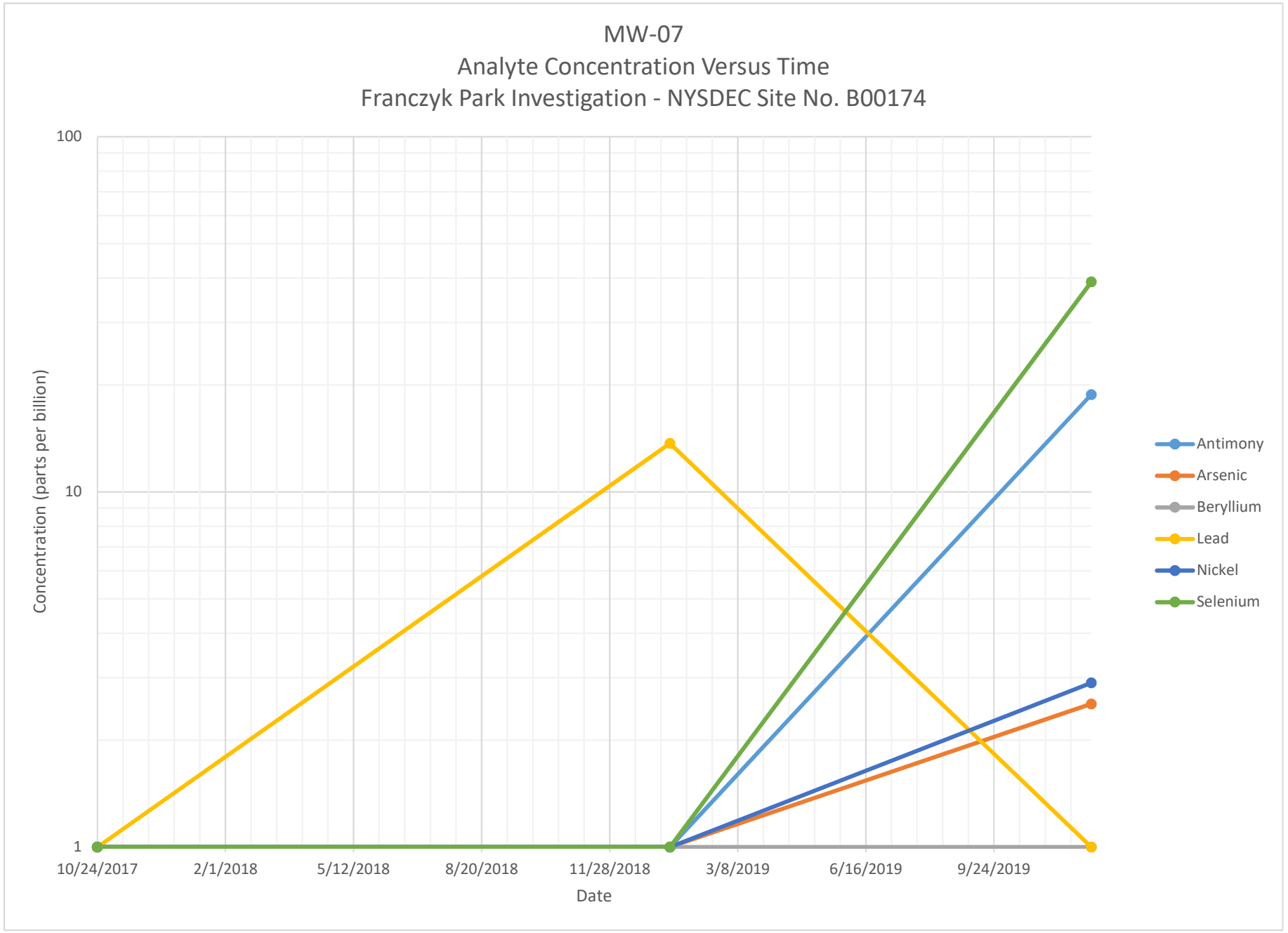
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

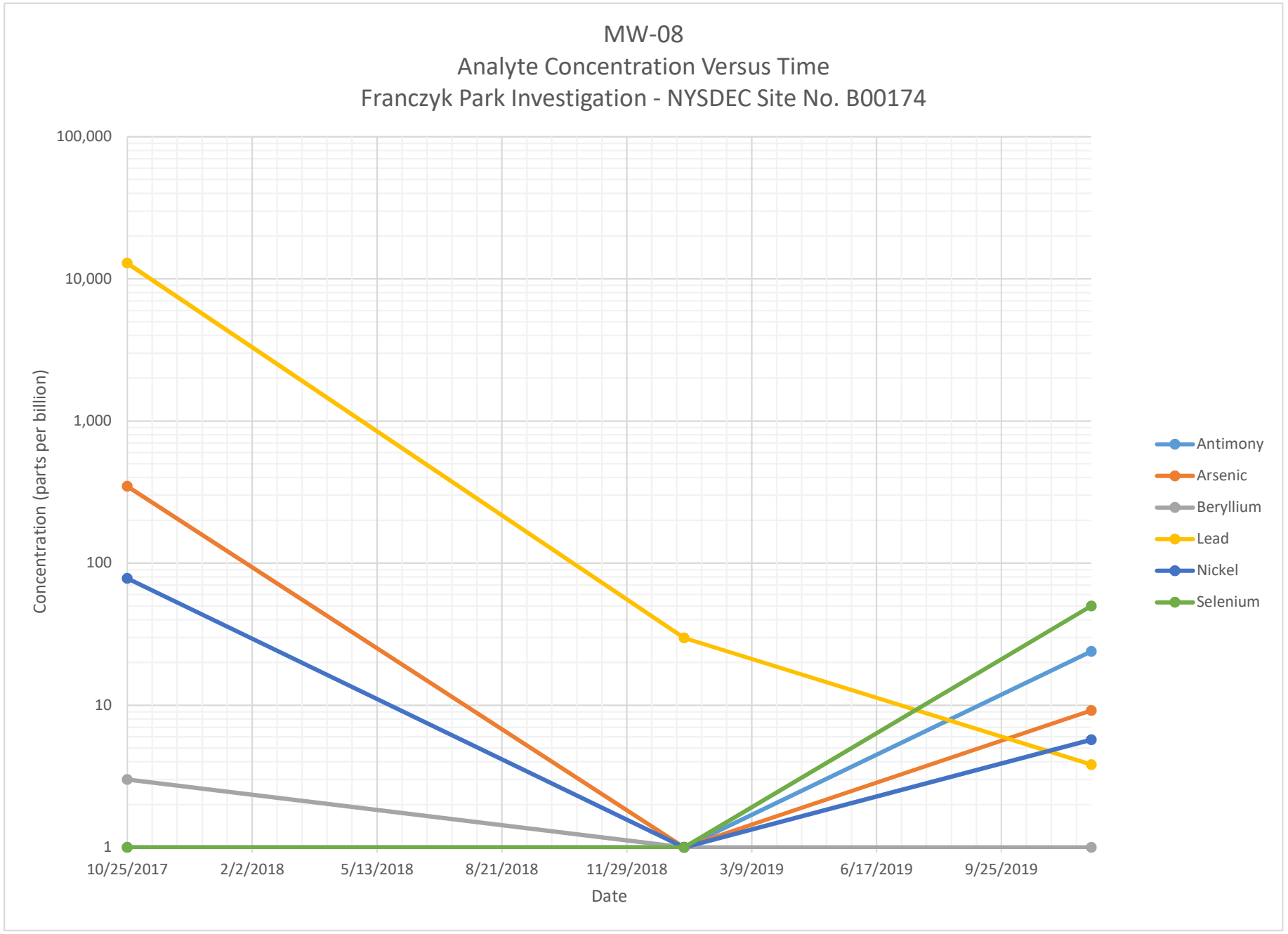
# Laboratory Certification

| Certified By | License No. |
|---|---|
| CAS EPA CLP Contract | EP-W-14-030 |
| Connecticut | PH-0649 |
| DOD ELAP (L-A-B) | L2219 |
| Florida | E87935 |
| Maine | 2012025 |
| Maryland | 296 |
| New Hampshire | 255413 |
| New Jersey | 20012 |
| New York | 11376 |
| Pennsylvania | 68-00548 |
| Soil Permit | P330-13-00380 |
| Texas | T104704488-13-5 |

# Appendix F
# Concentration Versus Time Plots for Selected Metals


MW-03
Analyte Concentration Versus Time
Franczyk Park Investigation - NYSDEC Site No. B00174
1,000
100
10
1
Concentration (parts per billion)
10/24/2017
2/1/2018
5/12/2018
8/20/2018
11/28/2018
3/8/2019
6/16/2019
9/24/2019
Date
Antimony
Arsenic
Beryllium
Lead
Nickel
Selenium


MW-07
Analyte Concentration Versus Time
Franczyk Park Investigation - NYSDEC Site No. B00174
100
10
1
Concentration (parts per billion)
10/24/2017
2/1/2018
5/12/2018
8/20/2018
11/28/2018
3/8/2019
6/16/2019
9/24/2019
Date
Antimony
Arsenic
Beryllium
Lead
Nickel
Selenium


MW-08
Analyte Concentration Versus Time
Franczyk Park Investigation - NYSDEC Site No. B00174
100,000
10,000
1,000
100
10
1
Concentration (parts per billion)
10/25/2017
2/2/2018
5/13/2018
8/21/2018
11/29/2018
3/9/2019
6/17/2019
9/25/2019
Date
Antimony
Arsenic
Beryllium
Lead
Nickel
Selenium

# Appendix G
# Corrective Action Report

LiRo Engineers, Inc.
A LiRo Group Company
690 Delaware Avenue, Buffalo, NY 14209 Telephone 716.882.5476 Facsimile 716.882.9640 www.liro.com

February 7, 2020
Updated November 2, 2020

Megan Kuczka
Division of Environmental Remediation
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

**Re: Corrective Action Work Plan**
**Replacement of Monitoring Well MW-05**
**Franczyk Park Site (B00174)**
**Buffalo, New York**

Dear Ms. Kuczka:

On behalf of the City of Buffalo, LiRo Engineers, Inc. (LiRo) is submitting this Work Plan for the replacement of monitoring well MW-05 at the Franczyk Park site (Figure 1)The .

**Background**

During a routine Site inspection conducted in October 2017, monitoring well MW-05 could not be located. Several attempts were made to locate the well including with the use of a metal detector. A monitoring well lid was located in the reported vicinity of the reported well location. Subsequent excavation using a hand shovel did not identify the presence of a monitoring well and no further attempts to locate the well were performed.

**Proposed Replacement Monitoring Well**

LiRo is proposing to install a new monitoring well to replace monitoring well MW-05. Monitoring well MW-05R will be installed in the general vicinity of the original MW-05. The location has been moved in order to provide better protection for the new monitoring well. The proposed location for MW-05R is shown on Figure 2. The replacement monitoring well will be installed to the same approximate depth as MW-05. The well construction log for monitoring well MW-05 is attached as Attachment 1.

**Monitoring Well Construction**

A truck mounted drill rig will be used to advance 4-1/4-inch diameter (ID) hollow stem augers to a depth of approximately 12.5 feet below ground surface (ftbg). Continuous sampling using a split-spoon sampler will be completed through the overburden and will be supervised by LiRo's on-site geologist. The LiRo geologist will review the soil stratigraphy information to determine the final depth of MW-05R. Once the final depth of the boring is determined a monitoring well consisting of 2-inch diameter PVC well screen and riser will be installed within the borehole. The well screen will be 5-feet long and will have a #10 slot size.

Once the screen and riser are installed, a number 1 sandpack will be installed to depth of approximately 2 feet above the well screen. A 2-foot thick bentonite pellet seal will be placed above the sandpack and the remainder of the boring will be backfilled with cement/bentonite grout. The monitoring well will be completed with a lockable, expandable well plug and an at-grade protective cover.

**Well Development**

Following a minimum of 24 hours after installation, the replacement monitoring well will be developed using surging and pumping techniques. The well will be developed until water removed from the well is reasonably free of sediment. The well development water will be contained in 5-gallon buckets until the completion of development. At the completion of development, the contained water will be disposed into the Site interceptor trench system.

**Waste Handling**

Soil cuttings will be containerized in 55-gallon drums and will be properly disposed of off-site.

**Groundwater Gauging and Sampling**

After completion of the installation and development of MW-05R, LiRo will collect a groundwater level measurement and collect a sample for laboratory analysis. The groundwater sample will be analyzed for target compound list (TCL) semi-volatile organic compounds (SVOCs) and target analyte list (TAL) metals which are the chemicals of concern at the Site.

**Schedule**

It had been anticipated that the installation of replacement monitoring well MW-05 would be performed during the spring of 2020 contingent upon City of Buffalo funding and availability of a drilling contractor. However, due to the COVID pandemic, the work could not be funded. The well will be replaced as soon as possible after funding is available.

**Reporting**

Following completion of the replacement, development, and sampling of monitoring well MW-05R, LiRo will prepare a letter report to summarize the field activities and report the well construction details and analytical results.

Please contact me at 716-970-4136 if you have any questions regarding this work plan.

Sincerely,

**LiRo Engineers, Inc.**

Jon Williams
Senior Geologist

**Attachments**

| | |
|---|---|
| Figure 1 | Topographic Site Location Map |
| Figure 2 | Site Plan with Proposed MW-05R Location |
| Attachment 1 | Well Installation Report – MW-05 |

# Figures

# Attachment 1