Prepared for

US Ecology Nevada, Inc.
Beatty Facility
EPA ID# NVT330010000

Petition for Site-Specific Treatability Variance for Elemental Mercury Wastes (D009 and U151) under the Land Disposal Restrictions

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PETITIONER CERTIFICATION PER 40 CFR 268.44(c)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this petition and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

1. INTRODUCTION

US Ecology Nevada, Inc. is providing this petition to EPA under 40 CFR §268.42(b) to apply for a treatability variance (treatability variance or variance) for **elemental mercury** (CAS #7439-97-6). This application includes a demonstration that the proposed alternative treatment method can achieve a measure of performance equivalent to that achieved by methods specified in 40 CFR §268.42(a).

2. TREATABILITY VARIANCE PETITION APPLICATION

Purpose:

Demonstrate variance for **elemental mercury** for treatment and final disposal at the US Ecology Nevada, located in Beatty, Nevada.

Methodology under this variance will convert waste elemental mercury to mercuric sulfide, which is a stable mineral that is naturally occurring in the environment. The converted mercury will be managed with a treatment train and final disposal location that is demonstrated to be in compliance with federal, state, and local requirements and is as or more protective of human health and the environment as current regulatory pathways for this waste today.

Applicant: US Ecology Nevada, Inc., a Republic Services Company

Name and Facility Identification Number:

US Ecology Nevada, Inc. (Beatty Facility)

EPA ID# NVT330010000

Nevada Division of Environmental Protection (NDEP) Permit # NEVHW0025

The Beatty Facility Location is shown in Figure 1.

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3. BACKGROUND

3.1 Mercury History and Usage

Mercury is a naturally occurring element that poses serious risk to human and ecological health through both natural and anthropogenic releases into the environment. While the economic use of mercury has steadily declined with growing concerns posed by its toxicity, mercury continues to be released through industrial practices and re-released through disruption of historically deposited mercury waste. Some of the primary sources of mercury released through industries in the United States today include mercury produced as a byproduct from the extraction process of gold in mining, the production of sodium hydroxide using mercury cells in chloralkali plants, and through combustion of fossil fuels (EPA, 2016). Most mercury uses have been phased out (e.g., paints and batteries) or rely on recycled/reused material (chloralkali plants). Small amounts of mercury continue to be used in commercial products such as light bulbs, thermometric devices, switches, and dental amalgams.

3.2 Excess Mercury

The current best demonstrated available technology (BDAT) specified by EPA for high-level mercury waste is retort and reuse. The distillation of mercury from the retort process produces high-purity elemental mercury of at least 99.9999 percent by volume, which is suitable for reuse in commercial applications (DOE, 2011). However, as excess elemental mercury was present in the market prior to the 2008 Mercury Export Ban Act (MEBA) and with little market for retorted mercury in the U.S., retorted mercury is currently being stockpiled/stored at various facilities across the U.S. or shipped to Canada for disposal. There is immediate need in the U.S. for a long-term management solution for the mercury stockpile, namely permanent disposal in an engineered hazardous waste landfill.

4. REGULATORY HISTORY

Excess elemental mercury management and storage are currently regulated by the Resource Conservation and Recovery Act (RCRA; amendment of the Solid Waste Disposal Act of 1965), the Land Disposal Restrictions (LDR) program, and MEBA. Only high-purity elemental mercury recovered from current treatment standards is acceptable for storage under these regulations.

Due to provisions of the LDR program, which prohibits the disposal of hazardous wastes with high levels (≥260 mg/kg) of mercury (D009 and U151 wastes), these wastes must first be treated to remove the elemental mercury (e.g., retorting) prior to disposal (DOE, 2013). While these treatment methods have been proven effective at reclaiming the

elemental mercury and thus allowing the waste to be sent to a suitable landfill, the extracted elemental mercury must then be temporarily stockpiled at a Subtitle C (hazardous waste) facility regulated under RCRA. The elemental mercury stored at a designated retention facility under section 3005(c) of RCRA assumes that the facility also meets all requirements of the 2008 MEBA. Under MEBA, the Department of Energy (DOE) was tasked to establish and operate a facility specifically *"for the purpose of long-term management and storage of elemental mercury generated within the United States."* DOE evaluated eight facilities that have met requirements to store excess elemental mercury for the 2011 Draft Environmental Impact Statement (EIS), with three additional facilities evaluated in the 2013 Supplemental EIS (SEIS; DOE, 2013). In 2019, DOE issued a Supplement Analysis in June 2019 (DOE, 2019a) and subsequent Record of Decision (ROD) in December 2019 for the Long-Term Management and Storage of Elemental Mercury (DOE, 2019b) that kept the DOE preferred alternative as the Waste Control Specialists (WCS) Facility near Andrews, Texas. As part of permit obligations, private facilities agree that their stored elemental mercury stockpiles will be shipped to the designated DOE facility when it becomes operational.

The primary objective of MEBA prohibits export of elemental mercury, including that which is produced from the current treatment methods for D009 and U151 wastes. Only mercury compounds may be exported. Shipping mercury compounds to Canada or other locations is not a long-term solution for the growing stockpile of domestic mercury from industrial sources and retorts. The 2016 Lautenberg Act[1], effective 1 January 2020, clarifies and strengthens export prohibitions on elemental mercury and some mercury compounds and addresses DOE's responsibility for designation of a long-term storage facility for mercury.

4.1 Mercury Disposal History

Mercury usage in the U.S. has steadily declined with increased regulation and advances in technology. Primary demand for mercury in the U.S. initially included batteries, thermometric devices, chloralkali manufacturing, and paint (DOE, 2011). Today, mercury usage in these industries has either been phased out (batteries and paint) or become self-sufficient through recycling and reuse (chloralkali).

When EPA declared mercury a toxic substance and began setting regulation standards in the 1970s, mercury demand in the U.S. began to decrease (USGS 2013). The addition of the RCRA amendment in 1978 established more significant regulations in terms of

[1] H.R. 2576, PUBLIC LAW 114–182, June 22, 2016, Frank R. Lautenberg Chemical Safety for the 21st Century Act.

disposal of mercury-bearing waste, leading to further reductions in mercury demand in the U.S. The decreased demand for mercury and addition of new technologies in lighting has shifted primary U.S. mercury usage to switches and relays and dental amalgam (Wienert, 2009, *in* USGS, 2013).

Anthropogenic disposal of mercury predating EPA regulations largely resulted in releases of mercury wastes from mining and industrial processes. However, with the addition of RCRA and LDR, mercury wastes are categorized based on total mercury, set at a threshold value of 260 mg/kg total mercury. Low mercury wastes (<260 mg/kg total mercury), while subject to treatment to prevent leaching of mercury, are allowed disposal to a designated Subtitle C landfill. High mercury wastes (≥260 mg/kg total mercury) are subject to removal through retort/roasting or incineration if organics are present. As discussed in Section 3, excess elemental mercury removed from this process is currently stockpiled/stored at designated facilities across the U.S. until DOE establishes a long-term storage facility as required by MEBA. The 2019 Final EIS released by DOE examined seven private and government sites and in December 2019, DOE issued a ROD that designated the retention facility as the WCS Facility in Texas (DOE, 2019b). DOE retracted the ROD in 2020, completed a Supplemental EIS (Mercury Storage SEIS-II) in 2024 (DOE/EIS-0423-S2), and issued a ROD in December 2024 (2024-27859 [89 FR 95189]) that kept the WCS Facility as its preferred alternative for long-term mercury storage (DOE 2024a, 2024b).

As no treatment or disposal standards for high-purity mercury have been established by EPA, no disposal alternatives have been considered by DOE for high-purity mercury. The stockpiles of high-purity (or elemental) mercury continue to grow and will only increase in the future without a permanent disposal solution.

4.2 Mercury Retort and Recycling

The treatment of high-purity mercury falls to retort/roasting or incineration, depending on the presence of organics in the mercury waste. Retorting of mercury wastes uses a thermal processing unit to volatilize mercury and distill the condensate, which results in the generation of elemental mercury (DOE, 2011). Therefore, the process is most effective for high-level mercury containing wastes.

Retorted mercury is either reused/recycled/reclaimed or stockpiled at various facilities across the U.S. Chloralkali plants, including facility closures, were once one of the largest consumers of mercury in the U.S.; however, as of late 2012 (USGS, 2013) only two chloralkali plants remained in operation in the U.S. Production of elemental mercury from these facilities decreased with the shift to mercury-free alternatives. Other industries using the mercury from retort process include pharmaceutical, fungicides/bactericides,

and gold mining (mercury byproduct) (USGS, 2013). Mercury that is recovered from closure and cleanup of chloralkali properties was available for export or use in these other industries, such as gold mining, although after 2013 the chloralkali plants have been required to store mercury at a site approved by the EPA for long-term mercury storage under MEBA.

While the retort process is effective at reclamation of elemental mercury, it is no longer a viable treatment for mercury as the product derived from this process no longer has a market. Rather, the retort process is a technology specific LDR standard that is not a final or permanent treatment method. The reclaimed elemental mercury that is not recycled requires long-term storage under MEBA, and the Lautenberg Act further restricts export of some mercury compounds that had previously been exported for long-term storage. As the domestic market for elemental mercury continues to decline, stockpiles will continue to grow.

Therefore, other options are necessary to facilitate treatment and permanent disposal of mercury. Permanent disposal of treated mercury in a designated hazardous waste monofill could provide a final solution to the problem of growing mercury stockpiles.

5. PROPOSED ACTION FOR VARIANCE

US Ecology Nevada, Inc. proposes to reduce the growing elemental mercury stockpiles by providing a permanent disposal solution. The proposed action will include a multi-step process beginning with the retort and distillation of mercury-contaminated waste, followed by the conversion of elemental mercury into the more stable form of mercuric sulfide, encapsulation of mercuric sulfide with linear low-density polyethylene (LLDPE), packaging the encapsulated waste within non-reactive containers or drums, and final disposal of the containers or drums in a mercuric sulfide monofill at the Beatty Facility. The Beatty Facility is located in Beatty, Nevada, an arid environment, where only small amounts of leachate are intermittently generated in existing RCRA Subtitle C landfill cells at the facility. The proposed mercury disposal process flow diagram is provided as Figure 2, and the proposed monofill and landfill schematic is provided in Figure 3. The process and monofill design will be described in more detail in Sections 8 and 9.

This proposed action combines a treatment solution for elemental mercury that is permanent and secure, with a disposal solution that is functionally superior to stockpiling, while providing a high level of protection for human health and the environment.

6. APPLICABLE WASTE CODES

Mercury waste codes applicable for this application are D009 and U151 (elemental mercury) for source materials. Mercuric sulfide is produced using elemental mercury from retorted and distilled mercury-bearing waste. This variance application focuses on the waste (elemental mercury) received after retort and distillation others, followed by conversion of elemental mercury into mercuric sulfide and encapsulation with LLDPE.

7. ENGINEERING DISCUSSION LDR TREATMENT STANDARDS

This section discusses current LDR treatment standards for mercury waste and presents an overview of the waste management options for mercury waste where current LDR treatment standards are inappropriate and cannot be met.

7.1 Applicable LDR Standards

Current mercury treatment in the U.S. is based on two basic LDR Standards:

- Technology-specific standards that require the use of specific treatment technology (e.g., RMERC - retorting for high mercury wastes); and
- Numerical standards (concentration-based) thresholds for the concentration of hazardous constituents in the treated residuals.

Where a waste cannot meet the LDR standards, EPA established equivalent treatment and treatability variance procedures, including the following:

- Equivalency petition: Determination of Equivalent Treatment (DET), applicable to LDR standards expressed as a specific technology (e.g., retorting, containment, stabilization); requirements in 40 CFR 268.42(b): treatment standards expressed as specified technologies.
- Treatability variance: applicable to numerical LDR standards (e.g., different treatment or analytical method for the leachate tests). The requirements for treatability variance petitions are contained in 40 CFR 268.44.

This application will focus on the treatability variance for elemental mercury since mercury generated from the retort process (RMERC) is no longer re-used and is accumulating in storage/stockpiles. As summarized in Giannotto and Brewer (2014), "*There is no concentration-based treatment LDR for elemental mercury. See 40 C.F.R. § 268.40. Theoretically, there is a technology-based LDR for high-mercury waste with a concentration of greater than 260 ppm total mercury… While RMERC works for removing mercury from wastes that contain high, but less than 100%, concentrations of mercury, retorting or roasting elemental mercury can only produce more elemental*

mercury, which, under the regulations, would then have to be retorted or roasted again, ad infinitum." The concentration based LDR standards for treated mercury (i.e., encapsulated mercuric sulfide) can be subject to compliance with the numerical standards by conducting leaching tests on the encapsulated mercuric sulfide and evaluating the concentration of mercury in the leachate.

This variance application demonstrates:

- That the proposed alternative treatment technology — conversion, encapsulation, and containment within a hazardous waste monofill — can achieve a measure of performance equivalent to that of the treatment standards specified in 40 CFR 268.40; and
- Compliance with federal, state, and local requirements that are protective of human health and environment.

7.2 Basis for EPA Treatability Standards

Non-wastewater mercury wastes have two concentration-based universal treatment standards (UTS) found in 40 CFR 268.48:

- Residues from retort (RMERC) - 0.20 milligrams per liter (mg/L) Toxicity Characteristic Leaching Procedure (TCLP); and
- All other mercury – 0.025 mg/L TCLP.

These non-mercury UTSs are evaluated by analysis of leachate generated by TCLP. Retort residues are required to be treated such that the concentrations of mercury in the waste leachate produced from TCLP is less than 0.20 mg/L, where other low-mercury wastes must be treated to leach less than 0.025 mg/L. The performance standard of 0.025 mg/L for mercury in leachate is used as a threshold in this variance to evaluate the stabilized and encapsulated mercuric sulfide, based on the laboratory results that show leachate from encapsulated mercuric sulfide well below this threshold (Tables 1 through 5). These results were validated by EPA's confirmation testing. The 0.20 mg/L is the threshold used by other mercury treatment variances approved by EPA (EPA, 1999).

8. CHARACTERIZATION OF INITIAL WASTE STREAM AND TREATMENT RESIDUALS

This section provides an overview of current mercury waste generation, how that waste is characterized, the rate it is generated, and how it is currently treated and stored.

8.1 Current Mercury Waste Generation Process and Rates

The primary sources of mercury waste in the United States are from gold mining, chloralkali plants, dental uses, and recycling (lights, switches, batteries, paint) (USGS, 2013). A brief summary of each waste source and quantities of the U.S. supply of primary and secondary mercury in 2000 and 2010, as summarized in the 2013 USGS report, are described in the following sections. In addition, the waste generation rates for each industry are summarized in the following sections , with more details documented in the 2013 USGS study (USGS, 2013). More recently (2019), USGS also summarized mercury domestic production, use, and import and export quantities in the mineral commodity summary (USGS, 2019).

8.1.1 Nevada Gold Mines

Several gold mines in Nevada contain mercury as part of the mineral assemblages in their respective ore complex. When roasting ore to remove sulfides and carbon, mercury is produced as a byproduct. Elemental mercury is then recovered from pollution control devices and mercury condensate from the retort process (USGS, 2013). Depending on the mine and nature of the processing method, mercury-bearing wastes and sludges are also produced, requiring further treatment to extract elemental mercury.

Current gold mines show varied concentrations of mercury, but on average contain 1 gram per ton (g/t) of mercury (Miller, 2007). With Nevada gold production included as one of the world's top producers, mercury will continue to be generated annually from active mining, with an average annual production of 96 metric tons (USGS, 2013) although more recent production data are not reported (USGS, 2019) and likely declined. Extracted mercury from mining is typically sent to U.S. mercury recyclers, although some mercury-containing mining waste (e.g., calomel) is also shipped to Canada for treatment and disposal.

8.1.2 Chloralkali Plants

Most chloralkali plants have transitioned to mercury-free options or closed due to changing regulations and costs. Mercury use in chloralkali plants decreased up to 98% from 1996 to 2010 through plant closures, technology advancements, and recycling (USGS, 2013). However, plant closures and transitioning to new technology resulted in mercury generation from the plants' existing mercury supply. Only two mercury cell chloralkali facilities in the U.S. were in operation as of 2018, with the facilities committed to transition to alternative methods by 2020 (USGS, 2019; UNEP, 2019; EPA 2009). One of these facilities was closed by 2020, resulting in a significant decrease in mercury use in manufacturing processes (EPA, 2023).

8.1.3 Dental Amalgam

Dental amalgams remain a source of mercury, although technological advances are reducing the use of mercury. Mercury from dental amalgams can enter the environment from poor waste practices at dental offices and consequently treated wastewater from the improperly disposed mercury waste. One of the largest sources of mercury waste, however, are the fillings themselves, which are estimated at 290 metric tons in the U.S. population (Concorde East/West Sprl, 2012). Projected deaths and cremations of individuals with mercury amalgam fillings account for the largest contributor of mercury waste into the environment as a result of dental amalgam use. Despite the steady decrease in usage, a 2010 estimate by Concorde showed an estimated annual usage of 30 metric tons of mercury in the dental practice and up to a 33% disposal rate of purchased mercury due to inefficiencies in application and the volume of prepackaged ampoules (Concorde East/West Sprl, 2012).

8.1.4 Recycling

Companies nationwide have continued to reduce the amount of mercury-containing products in their supply and thus recycle more products containing mercury described above. Overall, annual production of mercury from recycling and reclamation is estimated to be 5 metric tons per year (DOE, 2019a), although prior documents estimated between 50 to 265 metric tons per year (USGS, 2013), and these numbers are estimated to continue to decline with implementation of MEBA in recent years. Recycled products have historically included both domestic and imported goods, with most imported products ceasing in 2008 with the enactment of MEBA.

In 2018, materials collected for recycling and mercury reclamation via retorting included automobile switches, barometers, dental amalgam, fluorescent bulbs, computers, and medical devices (USGS, 2019). Since mercury is no longer present in most paints and batteries, recycling of these products has declined. The recycling rate for mercury-containing materials has been low and is declining (10% in the U.S. and <10% worldwide; USGS, 2013), and storage costs may have further disincentivized recycling. However, with the enactment of the European Union mercury export trade ban in 2011 and MEBA in 2013, recycling rates may increase, although storage will still be a consideration. Reuse of recycled/retorted mercury in the U.S. markets is declining, and there is an excess supply, and some mercury must remain in long-term storage (EPA, 2020 and 2023).

8.2 Waste Characterization

Waste characterization and analytical methods for mercury waste typically include one or more of the following:

- SW846 Test Method 1311: Toxicity Characteristic Leaching Procedure;
- SW846 Test Methods 1313, 1314, and 1315 for Leaching Environmental Assessment Framework (LEAF);
- SW846 Test Method 7470A/7471 for Mercury in Liquid Waste (Manual Cold-Vapor Technique);
- SW846 Test Method 6010D/6020B for inductively coupled plasma and ICP-MS
- SW846 Test Method 9040D for pH Electrometric Measurement

A Quality Assurance Project Plan (QAPP) was developed for this variance to present specific quality assurance and quality control activities associated with encapsulation of mercuric sulfide and placement into a dedicated RCRA Subtitle C landfill monofill. The QAPP specifies analytical procedures, methods, and reporting and validation requirements for the test methods listed above (Appendix A).

8.2.1 Description of Current Waste Treatment Process

Waste treatment processes for mercury include recycling of materials as noted above, through collection and processing of mercury-containing equipment; disassembly; and retorting (or roasting) to recover elemental mercury. Wastes containing higher concentrations of elemental mercury have been treated by retorting, with some quantities exported for disposal (i.e., to Canada). Conceptual schematics depicting the current mercury waste generation, collection, and treatment/storage processes in the U.S. are provided in Figures 4 and 5.

Following retorting, the waste goes through a distillation process to recover elemental mercury. Historically, this was a triple distillation process, but current single distillation methods can achieve a purity of 99.9999% mercury. For more complex mercury waste streams, such as calomel, additional treatment is required prior to distillation.

Following distillation, elemental mercury is converted to mercuric sulfide in conversion blenders. The mixing process is computer controlled to achieve the exact conditions within narrow thresholds for complete and consistent reaction of the mercury and sulfur. Distilled, converted mercuric sulfide is either stockpiled or sent to Canada for disposal. Retorted and converted mercury can be stabilized by mixing with cement or a cement

slurry that can be placed to harden in a landfill. In Canada, this slurry can be land applied; whereas, in the U.S., the material is limited to recycling and long-term storage.

Implementation of the Lautenberg Act (passed 2016, effective 1 January 2020) prohibits the export of some mercury compounds, including mercuric sulfide, although it does allow export of the mercury compounds to Organization for Economic Co-operation and Development (OECD) member countries for environmentally sound disposal (2019 TSCA) Even with export options, the disposal, storage, and stabilization solutions for retorted mercury are not as secure as the permanent disposal presented in this variance. Canada could cease importing mercury at any time, leaving the U.S. with a growing mercury stockpile.

8.3 Proposed Mercury Waste Treatment

The proposed mercury waste treatment process described in this petition begins with elemental mercury residues produced by retorting or roasting that are converted to mercuric sulfide through a proprietary, patented process. The mercury conversion process steps are outlined in Figure 6 and described in Section 8.2.1, below. The proposed overall waste treatment process steps are shown in Figure 2.

The mercuric sulfide will be encapsulated with LLDPE by mixing, and the encapsulated mercuric sulfide will be extruded into a Department of Transportation (DOT)-rated non-reactive container or drum. The container or drum of encapsulated mercuric sulfide will be disposed of as hazardous waste in a dedicated mercuric sulfide monofill. The monofill liner system and final cover system will be designed to meet the 40 CFR 264 Subpart N requirements.

The proposed monofill location and design further minimize the potential for mercury migration or leaching. Monofill facilities at semi-arid or arid sites are being considered, which are similar to the findings in the DOE EIS (DOE, 2019a) and SEIS-II (DOE, 2024a). The Beatty Facility is currently proposed herein. The overall process steps are discussed further in the following sections.

8.3.1 Mercury Treatment Process

The mercuric sulfide treatment process is accomplished by introducing elemental mercury and elemental sulfur into a proprietary, computer-controlled blender where precise temperatures, vacuum, and dispensing occur in a sealed unit. This process produces a pure mercury sulfide with a chemical signature equivalent to naturally occurring mercuric sulfide, “cinnabar,” minus the trace minerals.

As an example, the conversion would functionally work as follows. A batch contains approximately 670 pounds of mercury, and each blender operated can produce a minimum of 40 tons of mercuric sulfide per year. The quality and purity of each batch produced is controlled by maintaining the chemical reaction under vacuum for 18 hours, vaporizing and condensing any excess elemental mercury. The treatment process is schematically illustrated in a flow chart in Figure 6.

8.3.2 Mercuric Sulfide Encapsulation

The mercuric sulfide will be encapsulated through a three-step process. First, the mercuric sulfide will be thoroughly mixed with LLDPE powder. Second, the mixed product will be heated to the melting point of the LLDPE, ensuring a homogenous mixture. In the final step, the heated and homogenous mixture will be extruded into a non-reactive container or drum, which becomes a monolith. The monolith is referred to throughout this document as LLDPE-encapsulated mercuric sulfide.

Particle size: The mercuric sulfide and LLDPE are stored as dry, powdered materials in separate containers in a temperature and humidity-controlled room. The powdered materials are very fine and do not clump, and no control method is needed to maintain the particle size of either material. These dry materials are conveyed into a hopper attached to the mixer.

Mixing: The mercuric sulfide is combined with LLDPE by blending and mixing (or compounding) the two materials in a mixer (or blender). The two materials are fed into the mixer using screw feeders at specific rates to maintain optimal ratios (e.g., 6:1 LLDPE:mercuric sulfide). The mixer is operated within a specific speed and temperature range to maintain the state of the materials, so they are mixed evenly and do not produce dust.

Heating and Extrusion: The mixer is combined with the extruder machine. Once the mercuric sulfide and LLDPE are fully blended, the combined material is fed into the extruder, which heats up to soften the LLDPE such that it forms a semi-plastic solid and fully encapsulates the mercuric sulfide powder. Temperature is controlled to maintain the molten state of the LLDPE. The materials do not get hot enough to produce vapors, since mercuric sulfide is a stable compound with low vapor pressure and high sublimation temperature (583.5 degrees C). LLDPE melts at temperatures ranging from 120 to 130 degrees C, depending on the form (e.g., powder or small pellets). There are 4 temperature zones for the extruder ranging from 135 to 204 degrees C. The speed of the extruder plays a significant role in the temperature of the mixture as it leaves the extruder die. The faster it goes through, the more pressure and friction causes more heat in the extruder barrel. The warm, soft, semi-plastic material is extruded through a 3-foot-long section of pipe and metal die to shape and

control the extrusion speed. The material is extruded directly into a non-reactive container or drum, where it melds together and eventually hardens into a solid mass when cooled.

The feed rate of the mixer to the extruder is balanced by the extrusion, such that the process continues until feed stock is exhausted. A programmable logic controller (PLC) controls the entire system. Container/drum filling rates are controlled using an electronic shut off switch, so they are not overfilled. A copy of the operating manual for the mixer/extrusion machine is provided in Appendix B.

The containers or drums will be filled to capacity, and the container will be sealed. These measures will provide structural stability of the containers or drums as they are stacked.

Storage: Once full and closed, filled containers or drums are placed into storage within the Facility's RCRA storage area, with eventual placement into the dedicated monofill at the Beatty Facility.

8.3.2.1 Process Variability

To maintain the purity and limit the variability of the mercuric sulfide, the mercury used in this process will be produced from the vapor-phase process described in U.S. Patent 8,501,107 or equivalent. Production of mercuric sulfide may have some limited variability due to matrix effects (e.g., heat, time in oven, etc.) and the potential presence of other trace amounts of minerals or elements (e.g., oxides or other sulfides), but this variability is minimized by the mercury purity and computer-controlled operating parameters of the blending and conversion process as described in U.S. Patent 8,501,107. The blender and encapsulation equipment are computer controlled such that conditions stay within operating parameters and variation from this process is minimal.

The LLDPE polymer is obtained from a vendor, and material quality is within manufacturers' specifications (an SDS sheet for an example LLDPE product is provided in Appendix C). LLDPE is created by polymerization of ethylene with short-chain olefins, such as butene, hexene, or octene, to create a long-chain molecule. Similar to HDPE materials, such as geomembrane and plastic pipe, used for waste containment, the LLDPE material that would be used to encapsulate the mercuric sulfide will consist primarily of (e.g., >99% of polyethylene resin with <1% antioxidants and stabilizers to retard oxidative reduction). Variability in the LLDPE material is unlikely to include trace amounts of other constituents.

8.3.2.2 Materials Testing

A series of analytical tests were completed as requested by EPA to evaluate the LLDPE-encapsulated mercuric sulfide. The tests and results are described below and summarized

in attached Tables 1 through 5. Testing was completed by Eurofins Laboratory (Eurofins) for Republic, and Eurofins laboratory results are provided in Appendix D.

1. The mercuric sulfide was tested using leaching and analytical methods to evaluate potential trace constituents, residues, or other chemicals. The mercuric sulfide was leached using method by EPA Method 1311 with preparation by EPA Method 3010A. The testing was conducted to demonstrate that the mercuric sulfide, prior to encapsulation with LLDPE, does not exceed the toxicity characteristic limit for any additional regulated chemicals. Additional regulated chemicals were analyzed using the following EPA Methods:

   - 6010D and 7470A (RCRA 8 metals, including mercury),
   - 8270E (semivolatile organic compounds),
   - 8081B (organochlorine pesticides),
   - 8151A (chlorinated herbicides), and
   - 8260D (volatile organic compounds).

   Except for low concentrations of mercury, no other chemicals were detected. Analytical results are summarized in Table 1.

2. Different blenders for conversion and batches of the mercuric sulfide were tested to evaluate process variability in leachate concentrations. The mercuric sulfide solid was leached using EPA Method 1314 and the leachate prepared and analyzed by EPA Method 7470A. Four samples and a duplicate were tested. Low levels of mercury were detected at variable concentrations from the leachate across three orders of magnitude (0.2 to 84 mg/kg). Results are summarized in Table 2.

3. LLDPE-encapsulated mercuric sulfide as pellets were tested to evaluate different preparation methods prior to analysis. Four encapsulated material samples including duplicates were leached using Method 1314 and analyzed by SW846 EPA 7470A. Low levels of mercury were detected in each sample. Results are summarized in Table 3.

4. LLDPE-encapsulated mercuric sulfide samples as pellets were then tested using EPA Method 1314 for leachate and preparation for anion content (chloride, bromide, sulfate) by SW-846 method 9056A, organic and inorganic carbon content by Method 9060A, total sulfur content by SW846 6010D, and other conventional parameters. Results are summarized in Table 4. Sulfate was detected in only two samples (B615-1 THRU B615-5-T01 and –T02) at 0.787J and 0.749J milligrams per liter (mg/L). Chloride was detected in multiple samples from 0.870J to 14.8 mg/L. Bromide was not detected in any of the samples. Sulfur was

detected at concentrations ranging from the detection limit of 0.083 to 2.5 mg/L. Results for total organic carbon, pH, specific conductance, and oxidation reduction potential are also summarized in Table 4.

5. LLDPE-encapsulated mercuric sulfide as a monolith was tested to evaluate leaching potential of mercury as well as conventional parameters. Results for monolith samples are summarized in Table 5. Low levels of mercury were detected in five samples of the monolith that were derived from two batches. Mercury concentrations in the monolith were significantly less than the pellets. Conventional parameter results are also summarized in Table 5, but include sodium and potassium instead of bromide, chloride, and sulfate (cations and anions tested differed from the pellet testing).

Based on these results, the production of the mercuric sulfide and encapsulation with LLDPE shows some small variability but limited overall impact on leachability. Furthermore, leaching results from the monolith compared to the pellets indicated significantly less (order of magnitude less) than the pellets. These results were also validated by EPA's confirmation testing.

8.3.2.3 Geochemistry and Physical Material Treatment

The mercury distillation process described in Section 8.2.1 creates a pure and stable product that is 99.9999% mercury. This contributes to a conversion process that creates mercuric sulfide that is chemically equivalent to naturally occurring mercury sulfide, oxidation of the treated product is not anticipated. Furthermore, the LLDPE encapsulation process will limit potential exposure into the atmosphere, mitigating potential reactions. Through this process, the purity and stability of the end product are maintained.

Production of mercuric sulfide creates a very fine, red-colored powder. Leachability testing of the mercuric sulfide alone has been demonstrated to be below the 0.025 mg/L TCLP threshold. The LLDPE encapsulation process further reduces the leachability of mercury. To pilot test the LLDPE-encapsulated mercuric sulfide, US Ecology collected samples from four test batches produced in 2019, which were tested at the US Ecology Canton, Ohio Laboratory. Mercury concentrations ranged from below detection at the practical quantitation limit (PQL) of 0.0005 mg/L to 0.00133 mg/L. A summary of the 2019 study TCLP results are provided in Table 6. Low levels of mercury in these leachate test results were well below the 0.025 mg/L threshold, which was validated by EPA's confirmation testing. Even though the LLDPE-encapsulated mercuric sulfide meets the TCLP criterion, the containment of the mercuric sulfide is increased even further by placing the encapsulated product within containers or drums that are buried within the monofill.

Weathering or long-term degradation of LLDPE and HDPE material can occur by ultraviolet (UV) radiation, oxidative, and thermal mechanisms (Koerner et al., 2011). Producing the encapsulated mercuric sulfide as a monolith results in very low surface area with reduced potential for abrasion and weathering. For this variance proposal, there is little potential for exposure of the LLDPE material to UV radiation (sunlight), as the treated product will be placed into sealed containers or drums prior to transport to the landfill where it will be covered with soil. Further, when placed in the monofill, the LLDPE material should not be in contact with water (precipitation, leachate, or groundwater), and when isolated from the ambient environmental by soil cover, should be protected from thermal mechanisms of degradation. While the containers or drums may be subjected to UV radiation and potentially elevated temperatures while they are being transported and placed in the monofill, after they are covered with soil, this degradation mechanism ceases. These containers or drums should not come into contact with any significant amount of liquids. Groundwater at the site lies at about 300 feet below ground surface (bgs), which is well below the depth of the proposed monofill of up to 20 feet bgs; the only water that should contact the containers or drums will be small quantities of precipitation. As such, weathering or long-term degradation of the containers or drums and LLDPE-encapsulated mercuric sulfide will be minimized to the extent possible. Further, the antioxidants added to the LLDPE protect the materials from degradation.

8.3.2.4 Mercuric Sulfide Monofill

The landfill for the encapsulated and contained mercuric sulfide will be a nonreactive monofill that only accepts this type of waste. This operations constraint eliminates the potential for other waste to react with the mercuric sulfide. The mercuric sulfide monofill will be located at US Ecology Nevada, Inc.'s Beatty Facility, a hazardous waste treatment, storage, and disposal facility (TSDF) which is sited in an arid region of the country. The arid environment has very low precipitation rates, limiting the potential for leachate generation, and a very low chance for the introduction of other chemicals (such as organics or other materials) from rainwater. The Facility has the added advantage of being located approximately 11 miles from the nearest residence.

A facility plan showing the proposed siting for the mercuric sulfide monofill is presented in Figure 3. The proposed monofill will be constructed in an area northwest of the other Subtitle C landfills at the facility (i.e., closed Trenches 10 and 11 and active RCRA-designed Trenches 12 and 13). The existing Subtitle C landfills are double lined with a leachate collection and removal system (LCRS), HDPE geomembrane primary liner, leakage detection system (LDS), and HDPE geocomposite on compacted clay or geosynthetic clay liner (GCL) composite secondary liner. The drainage layers above the liners remove any leachate that makes its way to the liners, and the liners improve the

efficiency of the drainage layers. This type of liner system provides a very high level of long-term containment (i.e., 99.9% or more of the leachate that flows to the leachate collection system is collected and removed) and minimizes the potential for the migration of leachate through the liner system. For facilities located in arid desert climates, like the Beatty Facility, only small amounts of precipitation occur, and the potential for leakage through a double liner system that includes a composite liner is extremely low.

The proposed monofill will have a double liner system equivalent to the existing Subtitle C landfills, with a leachate collection system, 80-mil HDPE geomembrane primary liner, leakage detection system, and 60-mil HDPE geomembrane/GCL composite secondary liner. This design will be reviewed and approved under the existing RCRA Hazardous Waste Management Permit administered by the NDEP.

The existing landfills are designed to accept wastes with much higher toxicity than mercuric sulfide (e.g., other hazardous materials), and routine monitoring and reporting procedures are already in place for the landfill trenches. The active RCRA-designed landfills have been monitored since they were opened in 1990, and no releases from the landfills have been observed. The design, operation and monitoring of these modern engineered landfills effectively minimizes and mitigates potential releases of landfilled constituents into the environment.

8.3.3 Proposed Waste Generation Process

Elemental mercury used to create the mercuric sulfide is generated from the retort at Bethlehem Apparatus, Veolia, Waste Management, or other retort facilities where it is distilled to ensure its purity prior to later conversion into mercuric sulfide.

8.3.4 Proposed Compliance Testing

Each batch of LLDPE-encapsulated mercuric sulfide will be tested using Method SW-846 Method 1311 using particle size reduction (approximately one drum or more, depending on amount of mercuric sulfide produced and available). An aliquot of the LLDPE-encapsulated mercuric sulfide will be collected into a separate, small container at the same time the final containers or drums are being filled. Samples will be collected into a mold or once hardened, reduced by crushing, or cutting, so the particle size is capable of passing through a 9.5 mm (0.375 inch) standard sieve as required by SW-846 1311 methodology. This testing will be used to demonstrate that the elemental mercury was converted to the insoluble mercuric sulfide and that encapsulation with the LLDPE was successful in reducing the leachability of the monoliths. After demonstrating that the technology performance consistently meets the expectations of the variance, the encapsulated batches will be tested following the schedule below:

Step	Batch Number Range	Method 1311 Testing Schedule
1	1-20	Every batch will be tested
2	21-200	Every 10th batch will be tested
3	201+	1 test per calendar month

Testing will be performed at the analytical laboratory at the Beatty Facility or a commercial laboratory. In order to meet the requirements of this variance, the encapsulated mercuric sulfide, when tested using TCLP Method 1311, must not exceed the results of 0.025 mg/L at rate of 100% passing for the first 20 batches tested, and at a rate of 90% for the next batches. In order to graduate to the next step of the testing schedule, the pass rate of the previous step must be equal to or exceed 90% or better. If the pass rate is less than 90%, the step must be repeated, and the 90% pass rate met before moving to the lower testing frequency.

8.3.5 Proposed Waste Generation Rate

Current operations have the capacity to process approximately 160 to 200 tons of mercury per year into encapsulated mercuric sulfide. There is, if necessary, the potential to increase to 1,000 tons per year with the installation of additional blenders. This volume of waste can easily be managed at the Beatty Facility.

8.3.6 Health Risks

Potential health risks for personnel involved in the proposed process could include the potential for exposure from handling the LLDPE-encapsulated mercuric sulfide. Protective measures used during the recovery and production of the mercuric sulfide are described in their operating procedures and beyond the scope of this variance request. Similar procedures are used during the mercuric sulfide encapsulation with LLDPE. Engineering controls and personal protective equipment are used to further minimize potential exposures.

Direct contact/dermal exposure to mercuric sulfide is mitigated by LLDPE encapsulation. The LLDPE encapsulation occurs within computer-controlled equipment without direct human contact. The LLDPE-encapsulated mercuric sulfide is extruded and placed into non-reactive containers or drums, also without direct human contact due to the use of personal protective equipment. In the unlikely event of a spill or break of a

container/drum where direct contact could occur, personal protective equipment will be used by personnel involved in cleanup/response activities.

To reduce potential air/inhalation hazards, the mercuric sulfide powder will be encapsulated with LLDPE and placed within non-reactive containers or drums. Placement within containers/drums further restricts the LLDPE-encapsulated mercuric sulfide from the potential for creating airborne emissions.

Significant weathering of the LLDPE encapsulation material or containers or drums would increase the potential for exposure to mercuric sulfide; however, this scenario is unlikely as the LLDPE-encapsulated mercuric sulfide will be placed in containers or drums that will be promptly placed within the engineered containment system of the monofill and covered with native soil.

Potential health risks via exposure pathways listed above will be further mitigated and reduced during operations by placing clean soil around and over the containers or drums.

8.3.7 Stormwater

Stormwater flow will be very limited at the mercuric sulfide monofill location due to: 1) the arid climate: the recent (2010-2019) 10-year average annual precipitation is 3.8 inches, based on a site meteorological station; 2) the undisturbed unsaturated desert landscape around the proposed monofill location, which absorbs a significant amount of rainfall and limits the potential for storm-water run-on; and 3) the adjacent flat terrane, which provides little natural potential for stormwater run-on by gravity flow.

The monofill will be designed with a perimeter berm to prevent run-on to the monofill. In addition, the limited amount of stormwater falling directly on the monofill will be contained within the footprint of the monofill, precluding run-off. Based on the Beatty Facility's experience with their other RCRA landfills, it is expected that precipitation on the monofill will be fully absorbed by and then evaporated from the cover soil of the liner system and the soil material placed around the containers or drums. However, there may be times that some precipitation may flow into and be recovered from the leachate collection system. The recovered water will then be reused for dust control on the active monofill. This is only expected to occur following unusually large storm events and after normal storm events where precipitation falls on the newly constructed landfill liner or during the early stages of landfill operation when there is insufficient cover material to absorb all the precipitation.

8.3.8 Leachate

As described above, due to the arid environment, most of the precipitation will evaporate and will not flow to the leachate collection. Treatment and encapsulation of the waste, along with containerization of the waste, significantly limits the potential for the treated waste to encounter precipitation. Further, in the unlikely event that water enters a container or drum, the LLDPE-encapsulation of the mercuric sulfide would have already significantly reduced its leachability.

8.3.9 Results of Literature Review

This section presents the findings from a targeted review of documents pertaining to elemental mercury treatability. Background on mercury regulations, disposal rules, and studies were discussed in Sections 3 and 4 above. A summary of documents reviewed is provided in Tables 7, 8, and 9.

Historically, elemental mercury has been treated using stabilization, solidification, and encapsulation techniques (Chattopadhyay and Condit (Battelle), 2002). or a combination of these. Encapsulation of mercury or other wastes has been a subject of numerous studies (Table 9). Some of the materials used for stabilization, solidification, and/or encapsulation include:

- Sulfur polymer cement;
- Chemically bonded phosphate ceramics (CBPCs);
- Polyethylene encapsulation; and
- Other: asphalt, polyester and epoxy resins, synthetic elastomers, polysiloxane (ceramic silicon foam), Sol-Gels (polycerams), Dolocrete^{TM}, cements/Pozzolans/lime.

This review of prior studies was conducted to evaluate the effectiveness of mercury stabilization, solidification, and encapsulation techniques and resultant leachability of mercury. Our review identified a key critical flaw in past studies, in that mercuric sulfide stabilization is needed prior to encapsulation. Leachate was generated from treatability studies designed to test the efficacies of these materials, and mercury was detected in some leachates. The related TCLP data are summarized in Randall and Chattopadhyay, 2004, and states: "*TCLP results of stabilized/solidified sulfur polymer leachates ranged from <0.009 to >0.40 mg/L. CBPC TCLP results ranged from <0.00004–0.01 mg/L. Polyethylene encapsulation TCLP results ranged from <0.009 to 1.07 mg/L…".*

Some of this testing was completed before the reaction of elemental mercury to mercuric sulfide was complete. In these cases, the mercuric sulfide reaction was not isolated (or controlled) and the elemental mercury, sulfur compounds, and stabilization/encapsulation materials were mixed together. Therefore, several of these methods may require a pretreatment or stabilization step to chemically fix mercury into a highly insoluble form, such as mercuric sulfide, prior to encapsulation. The patented mercuric sulfide reaction described in this variance creates a stable form of mercuric sulfide prior to encapsulation.

9. PROPOSED FINAL DISPOSAL FACILITY – BEATTY, NEVADA

9.1 Beatty Facility Permit

The Beatty Facility is a TSDF operated by US Ecology Nevada, Inc. under a RCRA Hazardous Waste Management Permit administered by the NDEP. The Facility is permitted to manage wastes regulated under RCRA.

The Beatty Facility identification numbers are EPA ID# NVT330010000 and NDEP Permit # NEVHW0025. The current permit was authorized in September 2023, and a renewal application was filed in February 2025. A permit modification will be needed to build the monofill for this variance. In addition, a permit modification will be needed if the mercury conversion and encapsulation are moved to the Beatty Facility. The cover page of the facility permit is included as Appendix E.

9.2 Mercuric Sulfide Monofill Design

A dedicated monofill will be constructed in the northwest portion of the existing Beatty Facility (Figure 3). The sealed containers or drums containing the LLDPE-encapsulated mercuric sulfide will be placed into the proposed monofill constructed with RCRA compliant double liners and leachate collection/detection systems. As previously discussed in Section 8.2.2.3, the proposed monofill design will utilize a design similar to the Beatty Facility's current design for their active Subtitle C landfills, as approved under the existing RCRA Hazardous Waste Management Permit administered by the NDEP

9.3 Monofill Leachate Generation

Low volumes of leachate are generated in the active landfills at the Beatty Facility due to the low average annual precipitation and high evaporation rate in the region. The leachate generations for these landfills provide an indication of the leachate generation expected at the proposed mercuric sulfide monofill. The volume of leachate generated in the western U.S. is significantly less than leachate generation rates in the more temperate regions. In a U.S. EPA study of the performance of modern double-lined landfills in the U.S., leachate collection and removal system (LCRS) flow rates from active hazardous

waste landfills in the western U.S. included in the study ranged from approximately 0.1 to 410 gallons/acre/day (gpad) and averaged 100 gpad.

The average LCRS generation rates for the active landfills at the Beatty Facility during 2022 and 2023 monitoring periods (US Ecology, 2022., US Ecology, 2023a., US Ecology, 2023b. US Ecology, 2024), ranged from approximately 4 to 19 gpad (Table 10) and fell within the middle of the range from the EPA study. The relative hydraulic performance of the top liner for Trench 13 was calculated using the "apparent liner hydraulic efficiency" parameter, E_a, introduced by Bonaparte et al. (1996), and defined as:

$$E_a\,(\%) = (1 - \text{LDS Flow Rate/LCS Flow Rate}) \times 100$$

The higher the value of E_a, the smaller the flow rate from an LDS compared to the flow rate from an LCS. The calculated apparent efficiency of the primary liner for Trench 13 ranged from 99.0 to 100%. Based on the data presented in the EPA study, the efficiency of geomembrane/GCL composite primary liners is expected to be 99.0% or higher. This efficiency is high and indicative of very good leachate containment capability.

For the Beatty Facility, average semi-annual leachate generation rates by trench are summarized in Table 10. For Trenches 12 and 13, LCRS and LDS flow rates are combined. Leachate levels are checked weekly in the LCRS and LDS sumps of active disposal Trenches 12 and 13. Both LCRS and LDS sumps are checked in the event the facility receives more than ¼ inch of rainfall in a 24-hour period. Leachate is pumped and removed in accordance with action levels established in the Permit. Records are maintained for each pumping event and indicate leachate levels before and after pumping, the volume pumped, and the on-site dispensation of the leachate. Disposal of leachate consists of applying it for dust control from the cell of landfill from which it came (Trenches 12 and 13).

9.4 Landfill Monitoring

The Betty, Nevada Facility is currently monitored for protection of groundwater from potential landfill releases by a network of 30 monitoring wells: 25 wells in the upper aquifer and 5 wells in the lower aquifer. Four of the upper aquifer wells are considered background wells, and 21 upper aquifer wells are point of compliance (POC) wells. Potential releases from active cells are also monitored via a network of leachate sumps, one per landfill cell, for a total of seven sumps. The sump at each cell has a pair of access pipes, the upper one for the LCRS and the lower one for the LDS. The wells and sumps are sampled quarterly. Additional monitoring wells, at least one additional background and one POC, would be added to monitor the monofill prior to waste placement in this

unit. The actual number of new wells will be determined during the monofill permitting process conducted by the NDEP.

The existing RCRA Permit for the Facility requires quarterly sampling at the upper aquifer wells to assess potential releases from the existing landfill cells. Analytical data are compared to Groundwater Protection Standards (GWPS) established in the approved Permit. The GWPS values are located in (Section 10 (Groundwater Detection Monitoring) of the RCRA Permit, in Tables 10.3A through D. The Environmental Monitoring Plan (EMP) also contains the details of the required quarterly monitoring. The monitoring program allows Statistically Significant Increases (SSIs) to be identified when two consecutive concentrations of regulated analytes greater than the applicable GWPS are detected (i.e., a 1 of 2 sampling protocol is utilized). Such exceedances are evaluated to determine if they represent releases from the landfill cells or are attributable to some other source or cause, such as background chemistry or analytical variation or error. This same monitoring and evaluation process would also apply to the mercuric sulfide monofill. The EMP will be revised to include specific monitoring requirements for the monofill via the permitting process conducted by the NDEP.

Chemical concentrations monitored in groundwater are routinely compared to the GWPS values to determine if an SSI has occurred. The Permit has already established a GWPS for mercury of 0.0002 mg/L. Additionally, the potable water supply is subject to compliance with the groundwater protection standards and federal EPA maximum contaminant limit (MCL) for VOCs in drinking water (chemical specific; see Table 3-2 in US Ecology, 2023). The results of the quarterly sampling are documented in semi-annual reports (due September 30 and March 30 of each year) and submitted to both the NDEP and EPA.

The potential for air emissions and the air pathway are discussed in the Beatty Facility RCRA Permit Application (US Ecology Nevada, Inc., 2025). The Facility uses dust suppression measures and controlled operations to minimize dust emissions.

9.5 Site Characteristics – Nevada Facility

This section describes the geography, climate, and general setting of the Beatty Facility.

9.5.1 Topography

The mercuric sulfide monofill will be located on a slight rise in desert terrain formed by an alluvial fan. The topography in the immediate area of the monofill is flat. The flat desert terrain extends for long distances to bordering mountain ranges, except on the east about three miles where the terrain rises gently to the Bare Mountain range.

9.5.2 Surface Water

Surface water resources near the facility consist of ephemeral riverbeds and washes, which flow only during rare heavy rain events. The Amargosa River channel is the closest surface water body, which is approximately 1.5 miles to the west. The Amargosa River channel is dry in the vicinity of the facility, except during rare heavy rain events.

9.5.3 Climate

Nevada's main climatic features are bright sunshine with high solar radiation, low annual precipitation, and large daily temperature ranges. The average percentage of sunshine in southern Nevada is more than 80 percent. The high solar radiation, low humidity, and windy days in this region account for an average annual evaporation of approximately 70 inches of shallow open water (Huntington & Allen, 2010) up to 78 inches per year (US Ecology Nevada Inc., 2025). The monthly daily average temperature ranges from 37.4°F in December to 91.4°F in July. On average, there are 26 days of 100°F+ highs, 97 days of 90°F +, and 38 days where the high remains at or below 50°F; the average window for freezing temperatures is November 2 to April 6.

The Beatty region of Nevada is one of the driest locations in Nevada and, consequently, in the United States. On average, only 13.28 days a year have 0.1 inches of rain or more. The average number of days with rain for the State of Nevada is 22.11. The U.S. average is over 66. The Community Environmental Monitoring Program (CEMP 2025) maintains a weather station near Beatty, Nevada. Since 2014 (10-year average), Beatty has averaged 3.96 inches of rain per year (Figures 7a and 7b). The climate is Mediterranean, with most of the precipitation occurring in the winter months.

9.5.4 Geology

Details on the nature of the unconsolidated strata beneath the Facility have been determined from the various borings and well installations that have been completed at the facility since 1961. Extensive hydrogeologic investigations have been conducted to determine the soil properties and hydrologic characteristics. Stratigraphic information derived from the site characterization and monitoring well installation programs describe a sequence of sedimentary deposits consistent with alluvial fan and playa depositional processes.

Deposits from the ground surface to a depth of approximately 300 feet are alluvial sediments consisting predominantly of gravelly sands with poorly sorted gravel or discontinuous sand interbeds. The gravelly sand extends approximately 300 feet bgs beneath the Facility and extends up to 350 feet bgs at the southwestern area of the Facility.

Indurated playa deposits consisting of silt, clay, and sand underlie the gravelly sands and are approximately 50 to 150 feet in thickness, or 350 to 400 feet bgs up to 450 to 500 feet bgs. These fine-grained sediments are typical of playa deposits that may change composition relatively quickly with depth. The upper surface of the silt-clay unit appears to be relatively flat beneath the northern half of the Facility and deepens to the southwest (like the gravelly sands). Beneath the silt-clay playa deposit is an older, deeper unit consisting of gravels, cobbles, and boulders that represent a higher energy, fluvial environment.

Although the Carrara Fault has been mapped near the Facility, and USGS has not recorded any activity along this fault in the last 10,000 years. The nearest major fault zones are the Death Valley Fault Zone and the Las Vegas Fault Zone, 20 miles and 100 miles from the Facility, respectively. Published data list no record of any historic earthquake epicenter in the area around Beatty for the period (since 1800) that records have been kept. A resistivity study was conducted at the Facility in 2018 to better understand the Carrara Fault, and the results identified low-resistivity sediments and preferential groundwater flow to the SE along secondary fractures. More discussion regarding the study is provided in the First Half 2019 Environmental Monitoring Report (USE, 2019b).

Soils at and near the Facility are mapped as the Yermo, hot-Yermo-Arizo Association and Yermo-Greyeagle-Arizo association (U.S. Department of Agriculture, 2025). Soil samples from nine locations, plus one duplicate, from the Beatty Facility were collected for pH testing. The soil pH range was 8.3 to 9.4 SU (Table 11)

9.5.5 Hydrogeology

Two saturated, water bearing zones have been encountered beneath the Facility, at approximately 300 and 600 feet bgs. Drilling investigations indicate that the upper saturated zone occurs near the contact of the silt-clay playa deposits with the overlying gravelly sands. Beneath this, a confined aquifer occurs in a sandy gravel formation underlying the silt-clay deposits. This sandy gravel generally becomes coarser as it extends to depths exceeding 650 feet below ground level.

The surface drainage area of the Amargosa Desert covers about 2,600 square miles and is part of two regional groundwater systems. These two groundwater systems converge in the Amargosa Desert and likely continue to the south into Death Valley. Groundwater flow directions in the Amargosa Desert are generally to the southeast and southwest. The closest public drinking water supply well is located in Beatty, approximately 11 miles to the north of the Facility. Aside from the well that supplies process water to the Facility,

the nearest private water well is located approximately 10.5 miles north of the Facility at the Vanderbilt Mine.

Saturation begins near the top of a 50- to 150-foot-thick sequence of partially cemented to well-indurated clays, silts, and sand. The depth to saturation from the ground surface ranges from near 285 feet on the north side of the Facility to > 360 feet at the southwest corner of the Facility. The interbedding of clays and cemented silts and sands at these depths serves to separate the upper saturated zone from the confined gravel aquifer beneath into discrete hydrogeologic units.

The gravel aquifer is encountered beneath the fine-grained deposits at a depth of 380 feet or more. It consists of sandy gravel with some cobbles and boulders and is > 250 feet thick at the southern boundary of the Facility. The piezometric level measured in this aquifer occurs near 315 feet bgs, indicating a confined condition, based on wells and borings drilled into this unit. The groundwater gradient in both the upper saturated zone and confined gravel aquifer is southward, following the trend of the Amargosa Valley. This gradient is consistent with regional data.

Numerous studies conducted by US Ecology estimate hydraulic conductivities and transmissivities for this Facility. The estimated Upper water bearing zone (WBZ) hydraulic conductivity for the Facility is 57.3 feet per day (ft/day) (US Ecology, 2016), with an estimated effective porosity of 0.35. The hydraulic conductivity for the Lower WBZ is estimated to be 2.4 ft/day, also with an effective porosity of 0.35 (US Ecology, 2019). Based on these estimates, the US Ecology report states that the horizontal flow velocities in the Upper WBZ range from 1,800 to 2,500 feet per year and in the Lower WBZ, range from 0.11 to 0.12 feet per day. The measured hydraulic conductivities are consistent with sample lithologies and are considered representative of the upper and lower saturated zones.

The potential for contaminant transport by water flow through the vadose zone is minimal under the conditions observed at the facility. An environmental pathways analysis performed for the Beatty Facility used physical property data of site sediments and assumed a conservative recharge rate of 0.04 inches per year. Calculated travel times for vadose zone water from trenches to the upper saturated zone ranged from 13,000 to 24,000 years.

Pumping test data from earlier studies indicate that the confined gravel aquifer has a transmissivity ranging from about 1,900 to 3,000 gallons per day per foot. A groundwater flow velocity of about 30 to 50 ft/year is considered typical of the confined aquifer. The heterogeneity of the sediments in the confined aquifer suggests somewhat smaller or larger velocities may be possible on a local scale.

9.6 Facility Conditions Summary

The Beatty Facility is ideally suited for disposal of the encapsulated mercuric sulfide based on the arid setting, with low average annual rainfall and high evaporation, relatively flat topography, deep groundwater, and low population. The encapsulated mercuric sulfide will be placed into a monofill within the existing footprint of the facility. The Subtitle C landfills at this facility produce only small quantities of leachate, and the hydraulic performance of the containment systems for the active landfills is very high (>99%). In addition, groundwater monitoring wells and monitoring protocols are already in place.

10. PROPOSED WASTE TREATMENT PROCESS COMPARED TO BDAT CRITERIA

The existing BDAT criterion for elemental mercury is retort and reuse; however, since the U.S. domestic market no longer exists, and export criteria for treatment of waste are becoming stricter, the existing standard is no longer appropriate. Therefore, the best safeguard for human health and the environment is stabilization and secure disposal, which are proven and effective methods for containment of hazardous waste.

The BDAT criteria uses TCLP for waste with threshold values of 0.20 mg/L for residues from retort and 0.025 mg/L for other mercury waste. LLDPE-encapsulated mercuric sulfide was tested using EPA Method 1311 and leachate results are less than the BDAT criteria (<0.025 mg/L), as summarized in Tables 1 through 5.

Polyethylene materials are widely used as liquid and chemical barriers in many applications, including for containment of hazardous waste. The LLDPE polymer used for encapsulation of the mercuric sulfide is expected to have very good chemical resistance and durability under the anticipated service conditions (i.e., buried in a monofill at an arid site).The containers or drums that will be used for containment are manufactured and designed to meet Department of Transportation specifications, and would maintain durability at a range of temperatures and be UV and chemically resistant.

10.1 Long-Term Effectiveness of Treatment

The long-term effectiveness of treatment considered the potential effects of pH and temperatures on mercuric sulfide and the site-specific disposal conditions that are expected to exist at the US Ecology Beatty, Nevada, facility:

- pH – soil pH ranges from 8.3 to 9.4 SU (Table 11). This range of pH is fairly neutral and not anticipated to degrade a container or drum or the LLDPE-encapsulated mercuric sulfide. Similarly, rainwater that encounters and reacts

with this soil is unlikely to create highly acidic or highly basic conditions (e.g., less than 2 SU or greater than 12 SU) that would degrade the LLDPE material. Mercuric sulfide is stable from pH range of 0 to 12 SU, depending on redox conditions[2]. In the unlikely event that the LLDPE encapsulation, the container or drum fails, and the mercuric sulfide comes in contact with soil, the pH soil study (Table 11) and EPA Method 1311 (Table 4) testing show the leachability rates are below current 40 CFR 268 standards.

- Temperatures - Temperatures in the mercuric sulfide monofill are expected to be relatively constant below shallow depths that are affected by surface temperature. Unlike municipal landfills, they do not have putrescent waste that generates heat as it degrades. Freeze/thaw cycles are also not anticipated to degrade the LLDPE since the materials will be buried up to 20 feet bgs, on limited amount of precipitation will migrate deep into the monofill, and groundwater is deep (> 300 feet bgs).

10.2 Discussion of Demonstrated Available Technology

Does not propose greater total risk to human health and environment. The encapsulated mercuric sulfide will not create dust or volatilization, and in fact, reduces the potential for these risk pathways by encapsulation and burial within the monofill. Leachability of the material is similarly restricted based on its containment with inert materials, low potential for reactions with soil or groundwater in the monofill, and the arid environment. Future potential risk is also mitigated by encapsulation and burial in the monofill.

Commercially available. The patented vapor distillation process for conversion of elemental mercury into mercuric sulfide has been commercially available for many years. Other vapor phase conversion technologies have become available in the last decade. Encapsulation is also not a new technology and has been used in similar technology/applications since the beginning of RCRA to eliminate leachability of toxins into the environment. LLDPE is commercially available materials that have been used in numerous landfills and building material applications such as landfill liners, water pipes, remediation systems, etc.

Substantial treatment and best technology: The leachability of LLDPE-encapsulated mercuric sulfide has been evaluated using EPA Method 1314 (LEAF), EPA Method

[2] https://pubs.usgs.gov/pp/0713/report.pdf (page 28) for eH-pH diagram.

1315, and EPA 1311 (TCLP) methodology, and the results are below what is currently achievable for other mercury waste streams and below the 0.025 mg/L threshold.

Containment and stabilization: Reaction of distilled, elemental mercury to mercuric sulfide creates a more stable form or mercury, and the reaction is best completed prior to encapsulation (Rodriguez, et al, 2012). Encapsulation of the fully converted mercuric sulfide with LLDPE as a monolith further stabilizes mercury, such that leachability is well below thresholds based on TCLP EPA Method 1311 testing (Tables 1 through 5). Based on these results, converted mercuric sulfide leachate results were below the 0.025 mg/L threshold, with even lower leachate concentrations from the LLDPE encapsulated mercuric sulfide as a monolith that were well below the 0.025 mg/L.

The encapsulation (LLDPE), containment (container or drum), and placement in the monofill (HDPE liner) provides containment redundancy with multiple layers of protection.

Economic factors were not considered in the selection of this technology. Numerous attempts and methodologies were pilot tested to evaluate mercury treatment. The products created by the mercuric sulfide combined with encapsulation have consistently passed leachate tests.

11. LONG-TERM MONITORING

The mercuric sulfide monofill groundwater monitoring requirements will be folded into the existing facility groundwater monitoring that is conducted in accordance with the RCRA Hazardous Waste Management Permit and 40 CFR 264.95 and 264.99 for groundwater detection and compliance monitoring. Groundwater monitoring includes water quality sample collection and water level measurements from the existing groundwater monitoring network, any new groundwater monitoring wells that will be installed surrounding the monofill, and LCRS/LDS sumps. The monofill groundwater monitoring wells and leachate sump collection systems will be included in the existing quarterly data collection and reporting events. Long-term monitoring will also be completed in accordance with the requirements in 40 CFR 294 Subpart N (264.310(b)(4) Closure and Post-Closure Care).

11.1 Mercuric Sulfide Monofill Cap and Closure

Once filled, the monofill will require a final closure system. The details of the closure system will be determined in the RCRA permitting process, administered by the NDEP. Monitoring of the closed monofill will be conducted in accordance with the closure requirements of the RCRA Permit and the requirements in 40 CFR 294 Subpart N.

In conjunction with NDEP, US Ecology Nevada, Inc. prepared an Alternate Final Cover (AFC) design for Trench 12 that relies on the arid climate and high rate of evapotranspiration to limit migration of precipitation through the cover. A low rate of infiltration and high rate of evapotranspiration of the AFC design was demonstrated by using a lysimeter and soil moisture probes placed in an optimized cover soil. With the approval of the NDEP, this AFC design will be used to close the monofill.

12. CONCLUSIONS/RECOMMENDATIONS

The proposed treatment that is the basis of this variance application described herein provides a high level of protection for human health and the environment. Conversion of elemental mercury to mercuric sulfide creates a very stable form of mercury. Stabilization of mercury as mercuric sulfide prior to encapsulation, as described herein, has proven to be a more successful containment strategy. Prior studies conducted by EPA and other entities that attempted to stabilize mercury as mercuric sulfide were less successful when combined with the encapsulation step. However, EPA confirmation testing validated the results of testing described herein (Tables 1 through 5) that indicated LLDPE-encapsulated mercuric sulfide leachate testing results are below the threshold of 0.025 mg/L for leachate using EPA Method 1311.

The stages of treatment/stabilization and containment proposed are:

- Distillation of mercury waste to 99.9999% mercury;
- Reaction of mercury with sulfur for stabilization of elemental mercury to mercuric sulfide;
- Encapsulation of mercuric sulfide with LLDPE;
- LLDPE-encapsulated mercuric sulfide leachate testing;
- Extrusion of LLDPE-encapsulated mercuric sulfide and placement into sealed non-reactive containers or drums; and
- Placement of encapsulated mercuric sulfide into a monofill at the Beatty Nevada facility.

The mercuric sulfide monofill design is ideally suited to limit potential reactions from other materials with the mercury or compete for the sulfide (e.g., nonreactive environment). The arid climate produces very limited precipitation and generation of leachate. There is a very low chance for the introduction of other chemistries from organic material in the soil or rainwater, or another landfill waste. The Beatty Facility is an existing Subtitle C permitted facility. The landfill is lined, has a dedicated monitoring

system of groundwater monitoring wells, and data reporting procedures are already in place.

Initial laboratory testing results of the LLDPE-encapsulated mercuric sulfide are below the 0.025 mg/L threshold following EPA Method 1311. Based on these results, mercuric sulfide and encapsulation with LLDPE shows some small variability but limited overall impact on leachability, and leaching results from the mercuric sulfide monolith compared to the pellets indicated significantly less (order of magnitude less) than the pellets and well below the 0.025 mg/L threshold. Additional EPA Method 1311 testing will be used in the future to test new batches. Groundwater monitoring and comparison of results to GWPS will be used to demonstrate compliance with permit requirements, including federal and state screening levels that are protective of human health and environment.

13. REFERENCES

2019 TSCA Amendment Public Law 116-92, Section 12(D): Environmentally Sound Disposal. December 2019. https://legcounsel.house.gov/Comps/Toxic%20Substances%20Control%20Act.pdf

Chattopadhyay and Condit (Battelle), 2002. Advances in Encapsulation Technologies for the Management of Mercury-Contaminated Hazardous Wastes.

Community Environmental Monitoring Program. (2025). *CEMP: Community Environmental Monitoring Program*. Desert Research Institute & U.S. Department of Energy. Retrieved June 26, 2025, from https://cemp.dri.edu

Concorde East/West Sprl, 2012. The Real Cost of Dental Mercury. March 2012.

Data Collection Program. Community Environmental Monitoring Program (CEMP). Retrieved January 2020 from https://cemp.dri.edu/cemp/. .

Environmental Protection Agency (EPA), 1999. Land Disposal Restrictions: Notice of Intent to Grant a Site-Specific Determination of Equivalent Treatment to Pioneer Chlor-Alkali, Inc., Federal Register Vol. 64, No. 184. September. https://books.google.com/books?id=7AUItzuVSTYC&pg=PA51540&lpg=PA51540&dq=Land+Disposal+Restrictions:+Notice+of+Intent+to+Grant+a+Site-Specific+Determination+of+Equivalent+Treatment+to+Pioneer+Chlor-Alkali,+Inc&source=bl&ots=eUEzi7xTAT&sig=ACfU3U3v9hQOuxU4ZYxiRGTrOiQSL38ZtQ&hl=en&sa=X&ved=2ahUKEwjniLf50dboAhWFJzQIHcQgD_0Q6AEwAnoECAsQKQ#v=onepage&q=Land%20Disposal%20Restrictions%3A%20Notice%20of%20Intent%20to%20Grant%20a%20Site-Specific%20Determination%20of%20Equivalent%20Treatment%20to%20Pioneer%20Chlor-Alkali%2C%20Inc&f=false

Environmental Protection Agency (EPA), 2016. Report to Congress on the Global Supply and Trade of Elemental Mercury

Environmental Protection Agency (EPA), 2020. Inventory of Mercury Supply, Use, and Trade in the United States 2020 Report, Office of Chemical Safety and Pollution Prevention, Reporting Year 2018.

Environmental Protection Agency (EPA), 2023. Inventory of Mercury Supply, Use, and Trade in the United States 2023 Report, Office of Chemical Safety and Pollution Prevention, Reporting Year 2021.

Frank R. Lautenberg Chemical Safety for the 21st Century Act. H.R. 2576, 2016. Public Law 114–182. June 22.

Giannotto M. and Brewer M. 2014. Responsible Mercury Management Post_MEBA.

Huntington, J. L., and R. G. Allen. Evapotranspiration and Net Irrigation Water Requirements for Nevada. Nevada Division of Water Resources, Jan. 2010, http://water.nv.gov/NVET.

Koerner, R.M, Hsuan, Y.G., and Koerner,G.R., 2011. GRI White Paper #6 on Geomembrane Lifetime Prediction: Unexposed and Exposed Conditions Geosynthetic Institute. June 7, 2005, updated February 8, 2011.

Miller, Glenn, 2007 (in USGS 2013), Byproduct mercury production in modern precious metals mines in Nevada: U.S. Environmental Protection Agency, 16 p., accessed August 17, 2012, at *http://www.epa.gov/hg/stocks/Byproduct%20Mercury%20Production%20in%20Modern%20Precious%20Metals%20Mines%20in%20Nevada.pdf*.

Randall and Chattopadhyay 2004. Advances in Encapsulation Technologies for the Management of Mercury-Contaminated Hazardous Wastes

Rodríguez, O., Padilla, I., Tayibi, H., & López-Delgado, A. (2012). Concerns on liquid mercury and mercury-containing wastes: A review of the treatment technologies for the safe storage. US Ecology, 2019a. US Ecology Nevada, Inc., Beatty, Nevada, Permit Number NEVHW0025, EPA ID #NVT 330 010 000. Environmental Monitoring Report Second Half 2018, March 22.

U.S. Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey. Accessed 2025. https://websoilsurvey.nrcs.usda.gov/app/.

U.S. Geological Survey (USGS), 1970. Mercury in the Environment. Geological Survey Professional Paper 713. https://pubs.usgs.gov/pp/0713/report.pdf.

U.S. Geological Survey (USGS), 2013. (Wilburn, D.R.), Changing patterns in the use, recycling, and material substitution of mercury in the United States: U.S. Geological Survey Scientific Investigations Report 2013–5137, *http://pubs.usgs.gov/sir/2013/5137/*.

U.S. Geological Survey (USGS), 2019. Mineral Commodity Summaries 2020 (MERCURY) U.S. Geological Survey, 2020, Mineral commodity summaries 2020: U.S. Geological Survey, 200 p., https://doi.org/10.3133/mcs2020.

United Nations Environment Programme (UNEP), 2019. http://web.unep.org/globalmercurypartnership/global-estimate-global-mercury-cell-chlorine-capacity-global-inventory.

United States Department of Energy (DOE), 2011. Final Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (DOE/EIS-0423; the EIS) (DOE 2011) https://www.energy.gov/nepa/downloads/eis-0423-final-environmental-impact-statement. January 28.

United States Department of Energy (DOE), 2013. Final Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (DOE/EIS-0423-S 1; the SEIS) (DOE 2013). https://www.energv.gov/nepa/downloads/eis-0423-s1-final-supplemental-environmentalimpact- statement. October 4.

United States Department of Energy (DOE), 2019a. Supplement Analysis of the Final Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement, June.

United States Department of Energy (DOE), 2019b. Record of Decision for the Long-Term Management and Storage of Elemental Mercury, Federal Register Vol. 84, No. 235.

United States Department of Energy (DOE), 2024a. Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (DOE/EIS-0423-S2) (Mercury Storage SEIS-II). Federal Register Vol. 89, No. 28 (89 FR 9147).

United States Department of Energy (DOE), 2024b. Record of Decision for the Long-Term Management and Storage of Elemental Mercury, Federal Register Vol. 84, No. 231 (89 FR 95189).

US Ecology, Inc., 2025. RCRA Permit Application 2025 Renewal Beatty, Nevada, USEPA ID# NVT330010000. February 2025.

US Ecology, 2019b. US Ecology Nevada, Inc., Beatty, Nevada, Permit Number NEVHW0025, EPA ID #NVT 330 010 000. Environmental Monitoring Report First Half 2019, September 23, 2019, Revision 1- October 31, 2019.

US Ecology Nevada (USEN), 2016, as reported in US Ecology 21019a. Environmental Monitoring Plan – US Ecology Nevada. Section 13 of USEN's RCRA Permit Application. June 2016.

Wienert, 2009. Trends in mercury use in products: Northeast Waste Management Officials' Association, meeting presentation, Boston, Mass., November 17; in USGS, 2013.

Geosyntec consultants

TABLES

September 2025

Table 1. Summary of Results for Potential Additional Regulated Chemicals
Petition for Site Specific Treatability Variance
Beatty Facility, Nevada

Analyte	R-5473, BLENDER #3, BATCH 36	R-5475, BLENDER #4, BATCH 26	R-5476, BLENDER #2, BATCH 105	SAMPLE DUPLICATE 07/09/2023
Metals by EPA 6010D (mg/L)				
Silver	< 0.0091	< 0.0091	< 0.0091	< 0.0091
Arsenic	< 0.083	< 0.083	< 0.083	< 0.083
Barium	< 0.063	< 0.063	< 0.063	< 0.063
Cadmium	< 0.003	< 0.003	< 0.003	< 0.003
Chromium	< 0.016	< 0.016	< 0.016	< 0.016
Lead	< 0.044	< 0.044	< 0.044	< 0.044
Selenium	< 0.037	< 0.037	< 0.037	< 0.037
Semivolatile Organic Compounds by EPA 8270E (mg/L)				
1,4-Dichlorobenzene	< 0.0045	< 0.0045	< 0.0045	< 0.0045
2,4,5-Trichlorophenol	< 0.0079	< 0.0079	< 0.0079	< 0.0079
2,4,6-Trichlorophenol	< 0.0095	< 0.0095	< 0.0095	< 0.0095
2,4-Dinitrotoluene	< 0.0079	< 0.0079	< 0.0079	< 0.0079
2-Methylphenol	< 0.004	< 0.004	< 0.004	< 0.004
Methylphenol, 3 & 4	< 0.0079	< 0.0079	< 0.0079	< 0.0079
Hexachlorobenzene	< 0.0055	< 0.0055	< 0.0055	< 0.0055
Hexachlorobutadiene	< 0.0084	< 0.0084	< 0.0084	< 0.0084
Hexachloroethane	< 0.004	< 0.004	< 0.004	< 0.004
Nitrobenzene	< 0.012	< 0.012	< 0.012	< 0.012
Pentachlorophenol	< 0.0075	< 0.0075	< 0.0075	< 0.0075
Pyridine	< 0.0082	< 0.0082	< 0.0082	< 0.0082
Mercury by EPA 7470A (mg/L)				
Mercury	**0.029**	**0.018**	**0.045**	**0.024**
Organochlorine Pesticides by EPA 8081B (mg/L)				
Chlordane (technical)	< 0.0029	< 0.0029	< 0.0029	< 0.0029
Endrin	< 0.000091	< 0.000091	< 0.000091	< 0.000091
gamma-BHC (Lindane)	< 0.00012	< 0.00012	< 0.00012	< 0.00012
Heptachlor	< 0.00018	< 0.00018	< 0.00018	< 0.00018
Heptachlor epoxide	< 0.00014	< 0.00014	< 0.00014	< 0.00014
Methoxychlor	< 0.00031	< 0.00031	< 0.00031	< 0.00031
Toxaphene	< 0.02	< 0.02	< 0.02	< 0.02
Chlorinated Herbicides by EPA 8151A (mg/L)				
2,4-D	< 0.02	< 0.02	< 0.02	< 0.02
Silvex (2,4,5-TP)	<0.0064	<0.0064	<0.0064	<0.0064

Table 1. Summary of Results for Potential Additional Regulated Chemicals
Petition for Site Specific Treatability Variance
Beatty Facility, Nevada

Analyte	R-5473, BLENDER #3, BATCH 36	R-5475, BLENDER #4, BATCH 26	R-5476, BLENDER #2, BATCH 105	SAMPLE DUPLICATE 07/09/2023
Volatile Organic Compounds by EPA 8260D (mg/L)				
1,2-Dichloroethane	< 0.011	< 0.011	< 0.011	< 0.011
2-Butanone (MEK)	< 0.051	< 0.051	< 0.051	< 0.051
Benzene	< 0.012	< 0.012	< 0.012	< 0.012
Carbon tetrachloride	< 0.018	< 0.018	< 0.018	< 0.018
Chlorobenzene	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	< 0.012	< 0.012	< 0.012	< 0.012
Tetrachloroethene	< 0.0093	< 0.0093	< 0.0093	< 0.0093
Trichloroethene	< 0.014	< 0.014	< 0.014	< 0.014
Vinyl chloride	< 0.0081	< 0.0081	< 0.0081	< 0.0081
1,1-Dichloroethene	< 0.011	< 0.011	< 0.011	< 0.011

Notes:
Detected concentrations are **bold**.
mg/L = milligrams per liter
"<" = Not detected above the laboratory method detection limit.

Table 2. Summary of Results, Batch Variability
Petition for Site Specific Treatability Variance
Beatty Facility, Nevada

	Sample Results			
Sample Number	**R-5473, BLENDER #3, BATCH 36**	**R-5475, BLENDER #4, BATCH 26**	**R-5476, BLENDER #2, BATCH 105**	**SAMPLE DUPLICATE 07/09/2023**
SW846 EPA 7470A - Mercury (CVAA) - Leach Matrix: Solid, Leach, Results are in ug/L				
T01	**57 B 4 F2**	**0.31 B**	**15 B**	**11 B**
T02	**26 B**	**0.15 J B**	**0.39 B**	**3.3 B**
T03	**14**	< 0.13	**7.8 4 F2**	**2.2**
T04	**23**	**0.13 J**	**4.4**	**1.5 FL FH F2**
T05	**84 B**	**0.28 B**	**8.8 B**	**7.1 B**
T06	**40**	**0.63**	**9.4**	**26**
T07	**39**	**0.69**	**9.8**	**14**
T08	**9.2**	**0.2**	**3.8**	**2.9**
T09	**12**	**1.8**	**4.7**	**1.1**

Notes:

Detected concentrations are **bold**.

ug/L = micrograms per liter

The mercury threshold for this variance is 0.025 mg/L or 25 ug/L.

4 = Matrix spike (MS) and/or matrix spike duplicate (MSD): The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not

B = Analyte was found in the blank.

F2 = MS or MSD Relative Percent Difference (RPD) exceeds control limits

FH = MS and/or MSD recovery above control limits.

FL = MS and/or MSD recovery below control limits.

J = Result is less than the Reporting Limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value.

"<" = Not detected above the laboratory MDL.

CVAA = Cold Vapor Atomic Absorption

Table 3. Summary of Results, Method 1314 Leaching
Petition for Site Specific Treatability Variance
Beatty Facility, Nevada

	B600-1 THRU B600-5	B600-1 THRU B600-5 DUP	B615-1 THRU B615-5	B615-1 THRU B615-5 DUP	B620-1 THRU B620-5	B620-1 THRU B620-5 DUP	B-623-1 THRU B-623-5	B-623-1 THRU B-623-5 DUP	FIELD DUPLICATE	FIELD DUPLICATE DUP
SW846 EPA 7470A - Mercury (CVAA) Matrix: Solid, Leach (ug/L)										
T01	**1.5 B**	**2.8 B**	**1.8 B**	**9.9 B**	**1.7 B**	**1.5 B**	**0.58 B**	**1.6 B**	**2.3 B**	**0.31 B**
T02	**0.60 B**	**0.33 B**	**1.9 B**	**0.98 B**	**0.56 B**	**0.65 B**	**0.39 B**	**1.4 B**	**3.0 B**	**0.26 B**
T03	< 0.13	< 0.13	**1.4**	< 0.13	< 0.13	< 0.13	**0.27**	**0.32**	**0.16 J**	< 0.13
T04	**0.29**	**0.14 J**	**0.2**	< 0.13	< 0.13	< 0.13	**0.83**	**0.18 J**	< 0.13	< 0.13
T05	**0.22 B**	< 0.13	**0.13 J B**	< 0.13	**0.61 B**	**0.29 B**	**1.0 B**	**0.30 B**	< 0.13	**0.18 J B**
T06	**0.36**	< 0.13 FL	**0.48**	< 0.13	< 0.13	**0.33**	**0.91**	< 0.13	< 0.13	**1.1**
T07	**1.3**	< 0.13	< 0.13 FL	< 0.13	< 0.13	**0.88**	**1.3**	< 0.13	**0.71**	**79**
T08	**0.38**	< 0.13	**0.6**	< 0.13	< 0.13	**0.92**	**1.4**	< 0.13	**1**	**0.17 J**
T09	**0.61 J**	**0.16 J**	**0.15 J**	**0.15 J**	< 0.13	**1.1**	**1.3**	< 0.13	**1**	< 0.13

Notes:
Detected concentrations are **bold**.
ug/L = micrograms per liter
The mercury threshold for this variance is 0.025 mg/L or 25 ug/L.
B = Analyte was found in the blank.
J = Result is less than the Reporting Limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value.
"<" = Not detected above the laboratory MDL.
CVAA = Cold Vapor Atomic Absorption

Table 4. Summary of Results, Leach Method 1314 (Anions, TOC, Sulfur)
Petition for Site Specific Treatability Variance
Beatty Facility, Nevada

	Sample Results																											
	B600-1 THRU B600-5			B600-1 THRU B600-5 DUP			B615-1 THRU B615-5			B615-1 THRU B615-5 DUP			B620-1 THRU B620-5			B620-1 THRU B620-5 DUP			B-623-1 THRU B-623-5			B-623-1 THRU B-623-5 DUP			FIELD DUPLICATE			FIELD DUPLICATE DUP		
SW846 EPA 9056A - Anions, Ion Chromatography - Leach Matrix: Solid (mg/L)																												
	Bromide	**Chloride**	**Sulfate**	**Bromide**	**Chloride**	**Sulfate**	**Bromide**	**Chloride**	**Sulfate**	**Bromide**	**Chloride**	**Sulfate**	**Bromide**	**Chloride**	**Sulfate**	**Bromide**	**Chloride**	**Sulfate**	**Bromide**	**Chloride**	**Sulfate**	**Bromide**	**Chloride**	**Sulfate**	**Bromide**	**Chloride**	**Sulfate**	**Bromide**	**Chloride**	**Sulfate**
T01	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	**0.787 J**	< 0.0530	**14.8**	< 0.756	< 0.0530	**3.79**	< 0.756	< 0.0530	**1.69**	< 0.756	< 0.0530	**1.78**	< 0.756	< 0.0530	**2.12**	< 0.756	< 0.0530	**2.12**	< 0.756	< 0.0530	**2.59**	< 0.756
T02	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	**0.974 J**	**0.794 J**	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756
T03	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756
T04	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	**2.78**	< 0.756	< 0.0530	**4.04**	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	**5.51**	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756
T05	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	**1.34**	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756
T06	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	**2.25**	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756
T07	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	**0.870 J**	< 0.756
T08	< 0.0530	**8.2**	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756
T09	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	**1.09**	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756	< 0.0530	< 0.713	< 0.756
SW846 6010D - Metals (ICP) - Total Recoverable Sulfur Matrix: Water (mg/L)																												
	Sulfur			**Sulfur**			**Sulfur**			**Sulfur**			**Sulfur**			**Sulfur**			**Sulfur**			**Sulfur**			**Sulfur**			**Sulfur**		
T01	< 0.083			**0.66**			**0.21 J**			**0.11 J**			**0.46 J**			**0.15 J**			**0.18 J**			**0.13 J**			**0.14 J**			< 0.083		
T02	**0.12 J**			**0.12 J**			**0.17 J**			**0.14 J**			**0.12 J**			**0.12 J**			**0.13 J**			**0.22 J**			**0.12 J**			**0.11 J**		
T03	< 0.083			**0.11 J**			**2.1**			**0.096 J**			**0.12 J**			**0.14 J**			**0.10 J**			**0.10 J**			**0.10 J**			**1.2**		
T04	< 0.083			< 0.083			**0.15 J**			< 0.083			**0.096 J**			< 0.083			**0.13 J**			< 0.083			**0.12 J**			< 0.083		
T05	**0.44 J**			**0.10 J**			**0.10 J**			< 0.083			**0.096 J**			< 0.083			< 0.083			**0.12 J**			**0.21 J**			**0.11 J**		
T06	< 0.083			**0.38 J**			**0.13 J**			**0.74**			< 0.083			< 0.083			< 0.083			**0.5**			**0.21 J**					
T07	**0.21 J**			< 0.083			**0.097 J**			**0.39 J**			**0.17 J**			**0.12 J**			**0.12 J**			< 0.083			**2.5**			**1**		
T08	< 0.083			< 0.083			< 0.083			< 0.083			**0.23 J**			**0.088 J**			**0.088 J**			**0.10 J**			**0.10 J**			**0.083 J**		
T09	**0.095 J**			**0.37 J**			< 0.083			**0.13 J**			**0.23 J**			**0.11 J**			**0.22 J**			**0.16 J**			**0.12 J**			**0.12 J**		
pH (SW846 EPA 9040C) Matrix: Solid (SU)																												
T01	**5**			**5**			**7**			**6**			**5.9**			**5.5**			**6.7**			**6.4**			**6.4**			**6.4**		
T02	**6.9**			**7.1**			**7**			**7**			**6.9**			**6.9**			**6.9**			**7**			**6.9**			**6.9**		
T03	**6.7**			**6.8**			**6.8**			**7**			**7.1**			**7**			**6.8**			**6.9**			**7**			**6.9**		
T04	**6.5**			**6.6**			**6.7**			**6.7**			**6.7**			**6.7**			**6.5**			**6.2**			**6**			**6.5**		
T05	**6.3**			**6.4**			**6.5**			**6.6**			**6.6**			**6.1**			**6.4**			**6.5**			**6.7**			**6.6**		
T06	**6.2**			**6.2**			**6.3**			**6.3**			**6.1**			**6.2**			**6.2**			**6.2**			**6.2**			**6.2**		
T07	**5.9**			**5.8**			**6**			**6**			**5.5**			**5.8**			**5.9**			**5.9**			**5.8**			**5.9**		
T08	**6**			**5.8**			5.90			**5.9**			**5.2**			**5.9**			**5.9**			**5.8**			**5.7**			**5.8**		
T09	**5.9**			**5.7**			5.80			**5.8**			**5.3**			**5.8**			**5.8**			**5.7**			**5.7**			**5.7**		
Total Organic Carbon - Quad (SW846 EPA 9060A) Matrix: Solid (mg/L)																												
T01	**1.3**			**3.9**			**2.6**			**1.1**			**1.6**			**1.4**			**1.3**			**1.6**			**1.4**			**1.3**		
T02	**0.95 J**			**1.3**			**1**			**0.93 J**			**1.4**			**1.6**			**4.4**			**1.1**			**1.2**			**1**		
T03	**0.60 J**			**0.75 J**			**0.73 J**			**0.72 J**			**1.1**			**1.1**			**1.1**			**0.71 J**			**0.71 J**			**0.58 J**		
T04	< 0.51			**0.57 J**			**0.65 J**			**0.65 J**			**0.85 J**			**0.89 J**			**0.88 J**			**0.62 J**			**0.66 J**			**0.55 J**		
T05	< 0.51			**0.51 J**			**0.65 J**			**0.65 J**			**1**			**0.99 J**			**0.86 J**			< 0.51			**0.80 J**			**0.76 J**		
T06	**0.66 J**			**0.65 J**			**0.62 J**			**0.61 J**			**2.2 FL**			**1.2**			**0.72 J**			< 0.51			**1**			**0.92 J**		
T07	< 0.51			< 0.51			< 0.51			**0.54 J**			**1**			**1.3**			**0.68 J**			**0.53 J**			**1.1**			**1**		
T08	<0.51			< 0.51			< 0.51			< 0.51			**0.93 J**			**1**			**0.70 J**			< 0.51			**0.87 J**			**0.86 J**		
T09	**0.64 J**			**0.53 J**			**0.53 J**			**0.59 J**			**1.2**			**1.3**			**0.81 J**			**0.63 J**			**0.76 J**			**0.80 J ^+^ 2**		
Specific Conductance (SM 2510B) Matrix: Solid (umhos/cm)																												
T01	**9.3**			**6.9**			**13**			**2.8**			**2.6**			**6.1**			**6.5**			**5.1**			**5.2**			**3.4**		
T02	**16**			**10**			**14**			**10**			**7.4**			**7.9**			**7.1**			**10**			**8.4**			**6.6**		
T03	**6.0 J**			**5.8**			**7.8**			**6.1**			**5.9**			**5.4**			**3.8**			**4.8**			**5.8**			**4.6**		
T04	**3**			**3.2**			**4.9**			**4.1**			**3.8**			**3.3**			**2.4**			**3.2**			**4.4**			**3**		
T05	**1.9**			**2.1**			**3.5**			**3.1**			**3.2**			**2.7**			**2.2**			**2.2**			**4.5**			**2.7**		
T06	**1.7**			**1.5**			**2.4**			**2.1**			**2.6**			**1.9**			**1.6**			**1.6**			**2.3**			**2.2**		
T07	**1.5**			**1.5**			**1.9**			**1**			**3.1**			**1.8**			**1.7**			**1.5**			**2.2**			**2.1**		
T08	**1.3**			**1.4**			**1.4**			**1.4**			**3.5**			**1.5**			**1.7**			**1.4**			**2.1**			**2**		
T09	**1.6**			**1.6**			**1.7**			**1.6**			**3.9**			**1.8**			**1.7**			**1.7**			**2**			**1.9**		

Table 4. Summary of Results, Leach Method 1314 (Anions, TOC, Sulfur)
Petition for Site Specific Treatability Variance
Beatty Facility, Nevada

	Sample Results									
	B600-1 THRU B600-5	**B600-1 THRU B600-5 DUP**	**B615-1 THRU B615-5**	**B615-1 THRU B615-5 DUP**	**B620-1 THRU B620-5**	**B620-1 THRU B620-5 DUP**	**B-623-1 THRU B-623-5**	**B-623-1 THRU B-623-5 DUP**	**FIELD DUPLICATE**	**FIELD DUPLICATE DUP**
Oxidation Reduction Potential (SM 2580B)	***Matrix: Solid***	***(millivolts)***								
T01	**510**	**480**	**390**	**450**	**450**	**440**	**410**	**430**	**410**	**500**
T02	**420**	**350**	**350**	**350**	**350**	**350**	**350**	**350**	**350**	**470**
T03	**390**	**360**	**370**	**370**	**360**	**370**	**380**	**370**	**370**	**370**
T04	**420**	**340**	**330**	**320**	**360**	**370**	**370**	**360**	**340**	**340**
T05	**340**	**330**	**330**	**320**	**320**	**320**	**330**	**320**	**360**	**360**
T06	**440**	**380**	**370**	**370**	**370**	**370**	**380**	**380**	**380**	**380**
T07	**420**	**420**	**420**	**420**	**430**	**420**	**420**	**420**	**420**	**410**
T08	**400**	**400**	**390**	**390**	**400**	**400**	**390**	**390**	**400**	**380**
T09	**420**	**420**	**380**	**370**	**380**	**360**	**360**	**350**	**350**	**360**

Notes:
Detected concentrations are **bold**.
mg/L = milligrams per liter
SU = Standard units
umhos/cm= millisiemens per centimeter
4 = Matrix spike (MS) and/or matrix spike duplicate (MSD): The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are notapplicable.
B = Analyte was found in the blank.
F2 = MS or MSD Relative Percent Difference (RPD) exceeds control limits
FH = MS and/or MSD recovery above control limits.
FL = MS and/or MSD recovery below control limits.
J = Result is less than the Reporting Limit (RL) but greater than or equal to the method detection limi (MDL) and the concentration is an approximate value.
"<" = Not detected above the laboratory MDL.
^+ =Continuing Calibration Verification (CCV) is outside acceptance limits, high biased
^2 = Calibration Blank (ICB and/or CCB) is outside acceptance limits.

Table 5. Summary of Monolith Testing Results
Petition for Site Specific Treatability Variance
Beatty Facility, Nevada

	R-5877		R-5878		R-5879		R-5880		R-5881		R-5882		MB	
Dissolved Organic Carbon SM 5310C-2014 Matrix: Leach (mg/L)														
T01	< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51	
T02	< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51	
T03	< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51	
T04	< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51	
T05	< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51	
T06	< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51	
T07	< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51	
T08	< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		< 0.51	
T09	< 0.51		< 0.51		< 0.51		< 0.51		< 0.51		**1.20**		< 0.51	
EPA 6020D Matrix: Water (ug/L)														
	Potassium	**Sodium**	**Potassium**	**Sodium**	**Potassium**	**Sodium**	**Potassium**	**Sodium**	**Potassium**	**Sodium**	**Potassium**	**Sodium**	**Potassium**	**Sodium**
T01	< 65	**140 J**	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90
T02	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	**210**	< 65	**140 J**	< 65	< 90
T03	< 65	< 90	< 65	< 90	< 65	< 90	**79 J**	**96 J B**	< 65	< 90	< 65	< 90	< 65	< 90
T04	< 65	< 90 B	< 65	**96 J B**	**76 J**	**150 J B**	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90
T05	< 65	< 90	< 65	< 90 ^+	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90
T06	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90 ^+	< 65	< 90	< 65	< 90 ^+	< 65	< 90
T07	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90
T08	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90
T09	< 65	**140 J**	< 65	< 90	< 65	< 90	< 65	< 90	< 65	< 90	< 65	**590**	< 65	**100 J**
SW846 6010D - Metals (ICP) - Total Recoverable Sulfur Matrix: Water (mg/L)														
	Sulfur		**Sulfur**		**Sulfur**		**Sulfur**		**Sulfur**		**Sulfur**		**Sulfur**	
T01	< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083	
T02	< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083	
T03	< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083	
T04	< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083	
T05	< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083	
T06	< 0.083		**0.092 J**		**0.084 J**		< 0.083		< 0.083		< 0.083		< 0.083	
T07	< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083	
T08	< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083	
T09	< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083		< 0.083	
Mercury by EPA 7470A Matrix: Water (ug/L)														
T01	< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079	
T02	< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079	
T03	< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079	
T04	< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079	
T05	< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079	
T06	< 0.079		< 0.079		**0.14 J**		**0.25**		< 0.079		< 0.079		< 0.079	
T07	< 0.079		< 0.079		**0.11 J H**		**0.084 J H**		< 0.079 H		< 0.079 H		< 0.079	
T08	< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079		< 0.079	
T09	< 0.079		< 0.079		**0.1 J**		< 0.079		< 0.079		< 0.079		< 0.079	
pH (SW846 EPA 9040C) Matrix: Solid (SU)														
T01	**6.2**		**5.8**		**5.9**		**6.1**		**6**		**6.1**		**4.7**	
T02	**6.7**		**6.1**		**6.1**		**5.7**		**6**		**5.9**		**4.5**	
T03	**5.8**		**5.8**		**5.8**		**5.8**		**6**		**5.8**		**5.7**	
T04	**5.7**		**5.6**		**5.8**		**5.7**		**5.8**		**5.8**		**5.9**	
T05	**5.7**		**5.5**		**5.5**		**5.8**		**5.8**		**5.7**		**5.7**	
T06	**5.4**		**5.3**		**5.2**		**5.3**		**5.3**		**5.3**		**6**	
T07	**5.6**		**5.5**		**5.4**		**5.7**		**5.7**		**5.6**		**5.6**	
T08	**5.5**		**5.5**		**5.5**		**5.5**		**5.5**		**5.5**		**5.5**	
T09	**5.6**		**5.4**		**5.4**		**5.5**		**5.5**		**5.4**		**5.6**	
Specific Conductance (SM 2510B) Matrix: Solid (umhos/cm)														
T01	**1.5**		**1.1**		**1.3**		**1.1**		< 1		**1.1**		**9.7**	
T02	**1.1**		**1**		**1.1**		< 1		**1.3**		**1.6**		**19**	
T03	< 1		< 1		< 1		< 1		< 1		< 1		< 1	
T04	**1**		**1.3**		**1.1**		**1.2**		< 1		**1.1**		< 1	
T05	**1.2**		**1.6**		**1.5**		**1.2**		**1.1**		**1.2**		**1.2**	
T06	**1.6**		**2.3**		**5.8**		**1.7**		**1.6**		**1.8**		< 1	
T07	**1.5**		**2**		**2.6**		**4.3**		**1.6**		**1.7**		**1.5**	
T08	**1.3**		**1.3**		**1.3**		**1.4**		**1.2**		**1.3**		< 1	
T09	**1.4**		**1.6**		**1.8**		**1.5**		**1.3**		**1.6**		**1.4**	

Table 5. Summary of Monolith Testing Results
Petition for Site Specific Treatability Variance
Beatty Facility, Nevada

	R-5877	R-5878	R-5879	R-5880	R-5881	R-5882	MB
Oxidation Reduction Potential (SM 2580B) Matrix: Solid (millivolts)							
T01	**270**	**290**	**280**	**260**	**270**	**280**	**330**
T02	**290**	**250**	**260**	**290**	**250**	**300**	**310**
T03	**320**	**280**	**290**	**300**	**270**	**280**	**330**
T04	**310**	**280**	**300**	**310**	**270**	**310**	**300**
T05	**310**	**290**	**310**	**320**	**280**	**310**	**300**
T06	**320**	**420**	**350**	**340**	**330**	**330**	**320**
T07	**300**	**410**	**320**	**300**	**340**	**310**	**300**
T08	**280**	**380**	**310**	**290**	**310**	**270**	**270**
T09	**310**	**310**	**320**	**320**	**330**	**330**	**340**

Notes:
Detected concentrations are **bold**.
mg/L = milligrams per liter
The mercury threshold for this variance is 0.025 mg/L or 25 ug/L.
SU = Standard units
umhos/cm= millisiemens per centimeter
B = Analyte was found in the blank.
H = Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements
H3 = Sample was received and analyzed past holding time. This does not meet regulatory requirements.
J = Result is less than the Reporting Limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value.
"<" = Not detected above the laboratory MDL.
^+ =Continuing Calibration Verification (CCV) is outside acceptance limits, high biased
^2 = Calibration Blank (ICB and/or CCB) is outside acceptance limits.

Table 6
2019 Study:
Summary of Mercury Analytical Results via TCLP 1311 / 7470

Batch Number	Mercury Concentration (mg/L)	Practical Quantitation Limit (mg/L)
167	0.01330	0.00050
168	0.00066	0.00050
171	0.00157	0.00050
172	0.00429	0.00050
174	0.00681	0.00050
175	0.00140	0.00050
179	0.00436	0.00050
180	0.00058	0.00050
181	<0.00050	0.00050
182	<0.00050	0.00050
183	0.00132	0.00050
184	<0.00050	0.00050
185	<0.00050	0.00050
186	0.00209	0.00050
187	0.00121	0.00050
188	0.00644	0.00050
189	0.00742	0.00050
190	0.00491	0.00050
191	0.00469	0.00050
192	0.00292	0.00050

Notes
To pilot test the LLDPE-encapsulated mercuric sulfide, samples were collected from four test batches produced in 2019 and tested at the US Ecology Canton, Ohio Laboratory.

TCLP = Toxicity Characteristic Leaching Procedure

mg/L = milligrams per liter

Table 7
Summary of Technical Documents, Mercury Regulatory

Index Number	File Name	Document Title	Author	Date	Summary
LDR Regulatory and Variance					
001	001_1989 87696	Superfund LDR Guide #4 Complying With the Hammer Restrictions Under Land Disposal Restrictions (LDRs)		1989	Compliance with the LDRs meeting soft or hard hammer restrictions; satisfying min technology of other LDR compliance options (Treatability Variance, Equivalent Treatment Method Petition, No Migration Petition, or Delisting). LDR sof and hard hammer provisions are restrictions on hazardous waste disposal if EPA does not promulgate standards. Hard hammer date: May 8 1990.
002	002_EPA 2 guide_1990 P100L3QU	Superfund LDR Guide #6A (2nd Edition) Obtaining a Soil and Debris Treatability Variance for Remedial Actions		1990	Guide for obtaining and treating soil and debris for hazardous wastes - Treatability variance levels and technologies of specific contaminants - description of FS report, proposed plan, and record of decision documentation
034	034_LDR Variance Guidance	EPA Variance Assistance Document: LDR Treatability Variances & Determinations of Equivalent Treatment	U.S. Environmental Protection Agency	1990	HSWA amendments that require EPA to promulgate regulations restricting land disposal of untreated hazardous wastes - LDR program overview and purpose - QA/QC procedures
003	003_1992 900U0F00	"No Migration" Variances to the Hazardous Waste Land Disposal Prohibitions: A Guidance Manual for Petitioners		1992	Definition of 'No Migration' (allowance of land disposal at certain sites that do not meet specific qualifications only if no migration can be assured - requirements for a no migration petition
004	004_1997 14078	Use of Site-Specific Land Disposal Restriction Treatability Variances Under 40 CFR 268.44(h) During Cleanups		1997	EPA memorandum that clarifies the minimum requirements for alternative treatment standards - treatability variance procedures - LDR applicability
036	036_EPA PhaseIV Rule 1998-12575	Land Disposal Restrictions Phase IV: Final Rule Promulgating Treatment Standards for Metal Wastes and Mineral Processing Wastes; Mineral Processing Secondary Materials and Bevill Exclusion Issues; Treatment		1998	Treatment Standards for Wastewater and Nonwastewater Forms of Mercury Waste. The Agency, in the original Phase IV rule, proposed to change the treatment standard for one subcategory of TC mercury wastewaters (D009—All Others) from the characteristic level of 0.20 mg/L (established in the Third rule (55 FR 22520. June 1, 1990) to the previously promulgated UTS for mercury wastewaters (Mercury—All of 0.15 mg/L. (60 FR 43654, August 22,
005	005_1998 Potential Revisions to LDR Mercury Treatment Standards	Potential Revisions to the Land Disposal Restrictions Mercury Treatment Standards		1999	Advanced notice for the EPA's reevaluation of treatment standards for mercury bearing wastes - request for additional data supporting proposed standards
006	006_1999 EPA letter Granting Pioneer a DET	Memorandum: US EPA granted site-specific determination of equivalent treatment (DET) to Pioneer Chlor-Alkali, Inc.	Elizabeth A. Cotsworth	1999	Requirements for Pioneer Chlor-Alkali's DET as directed by the EPA - must meet 0.20 mg/L Hg TCLP
008	008_1999-24842.pd	Land Disposal Restrictions: Notice of Intent to Grant a Site-Specific Determination of Equivalent Treatment to Pioneer Chlor-Alkali, Inc.	Federal Register	1999	Addresses K106 treatment utilizing Pioneer's Remerc process which has been deemed equivalent to roasting or retorting - overview of this action/grant - how Pioneer meets similar technology requirements
011	011_1999 indxmtsp	Index for Docket F-1999-MTSP-MTSP-FFFFF: Potential Revisions to the Land Disposal Restrictions Mercury Treatment Standards		1999	List of sources (43) for Advanced Notice of Proposed Rulemaking: Potential Revisions to the Land Disposal Restrictions Mercury Treatment Standards
013	013_1999 Mercury Land Disposal Restrictions Wastes US EPA	Potential Revisions to the Land Disposal Restrictions Mercury Treatment Standards		1999	https://archive.epa.gov/epawaste/hazard/web/html/mercury.html. Links to 005-011 documents and additional support materials.
014	014_2000 EPA No-Migration Variance - Exxon - Billings, MT	No-Migration Variance From Land Disposal Restrictions for Exxon Mobil Corporation, Billings, MT South Land Treatment Unit	Federal Register	2000	Approved no-migration variance to Exxon for land disposal of hazardous waste (including mercury).
015	015_BDAT_2001 ldr-bd	Final Best Demonstrated Available Technology (BDAT) Background Documents for Inorganic Chemical Production Wastes - K176, K177, K178		2001	Background document for LDR treatment standards - lists K176 (baghouse filters from antimony oxide production), K177 (slag from antimony oxide production), and K178 (residuals from ferric chloride formed during titanium dioxide production through chloride-ilmenite process) as hazardous wastes. BDAT for Hg in K176 wastewaters: lime addition followed by sedimentation followed by filtration
016	016_2003 NODA Hg LDR EPA research	Land Disposal Restrictions: Treatment Standards for Mercury-Bearing Hazardous Waste; Notice of Data Availability	Federal Register	2003	Notice of available data from 2 studies involving waste residues from high mercury wastes - no changes to prior procedure has been advised/necessary
020	020_2010 EPA-HQ-RCRA-2010-0851-0005	Land Disposal Restrictions: Site-Specific Treatment Variances for Heritage Environmental Services LLC and Chemical Waste Management Inc.	U.S. Environmental Protection Agency	2004	EPA decision grants Heritage Environmental Services LLC to stabilize a selenium-bearing hazardous waste generated by Guardian Industries Corp. (treatment standard of 39.4 mg/L) - CWM is granted 2 site-specific variances (standards to 51 mg/L and 25 mg/L); https://www.federalregister.gov/documents/2004/02/11/04-2821/land-disposal-restrictions-site-specific-treatment-variances-for-heritage-environmental-
022	022_2010 EPA-HQ-RCRA-2010-0851-0008	Waste Analysis Plan - US Ecology - Beatty, NV		2004	Waste Analysis Plan that outlines the necessary sampling, analytical techniques, and procedures for wastes entering the US Ecology - Beatty, NV facility - treatment and disposal activities that are discussed include evaporation, stabilization, crushing, size reduction, and landfilling
017	017_2005 ldr05	Introduction to Land Disposal Restrictions (40 CFR Part 268)	Not Listed	2005	Discusses and introduces the development of LDR and the intended goals and standards for this implementation
018	018_2007 CRPT-110srpt477	Mercury Market Minimization Act of 2007		2007	Report of this Act, which limits the sale, distribution, and transfer of elemental mercury by Federal agencies as well as exportation - introduces the creation of a long-term management program
027	027_2010 EPA-HQ-RCRA-2010-0851-0007	US Ecology Nevada Laboratory QA/QC Plan		2007	Document outlines procedures and laboratory protocol to ensure reliable and concise data acquisition at USEN - establishes QA/QC actions as well as data validation methods
019	019_2008 PLAW-110publ414	Public Law 110-414: Mercury Export Ban Act of 2008		2008	Congressional document that outlines the Mercury Export Ban Act - Definition and Rationale of Act creation
021	021_2010 EPA-HQ-RCRA-2010-0851-0004	US Ecology Nevada DET Application		2008	Application for variance
024	024_2010 EPA-HQ-RCRA-2010-0851-0019	Appendices US Ecology Nevada Environmental Monitoring System.		2008	List the chronology of significant groundwater monitoring system events (US Ecology / Nevada)

Table 7
Summary of Technical Documents, Mercury Regulatory

Index Number	File Name	Document Title	Author	Date	Summary
LDR Regulatory and Variance					
025	025_2010 EPA-HQ-RCRA-2010-0851-0021	EPA Questions for LDR cadmium variance		2009	Questions and Answers involving discussion of LDR cadmium variance - waste to reagent ratio (1:0.45) - claims selenium was treated to 7.1 mg/L, but USEN was only able to treat to 25-38 mg/L - 4x reagent only decreased leachable selenium by hal
026	026_2010 EPA-HQ-RCRA-2010-0851-0023	Email correspondence with EPA and US Ecology Nevada		2009	Selenium variance questions and comments - dialogue among individuals at USEN and EPA
027	038_Longterm management of elemental Hg	Draft EIS for long-term management of elemental Hg: Dep. Energy	U.S. Department of Energy	2010	EIS including background, current and future technologies on the global issue of mercury storage. Lists questions and responses supporting and challenging various strategies and specific issues.
040A	042_Final DOE EIS-0423-FEIS-Summary-2011	Final Long-Term Management and Storage of Elemental Mercury (Environmental impact Statement) Summary	U.S. Department of Energy	2011	This Final Mercury Storage EIS analyzes the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at seven candidate locations. DOE's Preferred Alternative for the long-term management and storage of mercury is the Waste Control Specialists, LLC, site near Andrews, Texas.
040B	040_Final DOE EIS-0423-FEIS-Vol01-2011	Final Long-Term Management and Storage of Elemental Mercury (Environmental impact Statement) Vol.1	U.S. Department of Energy	2011	This final EIS contains revisions and new information based in part on comments received on the draft EIS.
040C	041_Final DOE EIS-0423-FEIS-Vol02-2011	Final Long-Term Management and Storage of Elemental Mercury (Environmental impact Statement) Pt.2	U.S. Department of Energy	2011	Part 2 of final EIS
#VALUE!	039_PAG5.3ReportofActivitiesandfutureplans_upload	UNEP report on global mercury partnership		2013	Discusses the structure of the UNEP's initiative to reduce mercury pollution and the specific goals of the partnership (large and small scale)
028	028_2014 ldr_rules_and_regulations_pre	Chronology of Rules and Regulations Published in the Federal Register Supporting the Land Disposal Restrictions (LDR) Program		2014	Chronology of Rules and Regulations Published in the Federal Register Supporting the Land Disposal Restrictions (LDR) Program
029	037_EPA Strategy.. Hg Products	EPA strategy to address mercury-containing products		2014	EPA strategy to further reduce the creation of mercury containing products
029	029_2016 deq-wmrpd-hws-Part_1_-_Text_with_Appendices_A_and_B_600242_7	Site-Specific Land Disposal Restrictions Treatability Variance Petition - Strebor Inc., Kalamazoo, Michigan		2016	Strebor petition to dispose of spent carbon, PPE, soil containing PCP, dioxins, and furans utilizing alternative treatment standards - Site location and background - Comparison to previously excepted standards - Approval letter for disposal
043	043_LautenbergAct-bills-114hr2576eah	Frank R. Lautenberg Chemical Safety for the 21st Century Act H. R. 2576	One Hundred Fourteenth Congress of the United States of America	2016	To modernize the Toxic Substances Control Act, and for other purposes.
030	030_2018 eCFR — Code of Federal Regulations	Electronic Code of Federal Regulations - LDR Treatment Standards 268.44 Variance from a treatment standard	EPA	2018	LDR treatment standards - list of excluded locations and rationale
031	031_2018 eCFR — Code of Federal Regulations 268.40	Electronic of Federal Regulations 268.40- Subpart D - Treatment Standards		2018	LDR treatment standards: Applicability, standards(concentrations in waste extracts, techniques, waste concentrations) - treatment of hazardous debris and soils
032	032_2018 eCFR — Code of Federal Regulations	Link to standard in 030		2018	https://www.ecfr.gov/cgi-bin/text-idx?SID=9c50a416d3c9b9f52834d5dccd7b518f&mc=true&node=se40.29.268_144&rgn=div8
041	043_DOE EIS Amendment_eis-0423-sa-01-elemental-mercury	Supplement Analysis of the Final Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement	U.S. Department of Energy	2019	"In 2011, DOE issued the EIS to evaluate eight potential facilities across the U.S. for management and storage of elemental mercury. In 2013, DOE issued the SEIS to evaluate three additional potential locations for management and storage of elemental mercury, and to update some analyses from the 2011 EIS To date, no ROD has been issued on the EIS. There has been no change to the proposed action as stated in the 2011 EIS or 2013 SEIS. This SA evaluates changes in environmental conditions at the WCS facility near Andrews, Texas, that may have occurred since EIS and SEIS were published. The WCS facility was the preferred alternative evaluated in the EIS and the SEIS."
042	044_Rod-eis-0423-and-0423-s1-elemental-mercury-2019-12	Federal Register: Department of Energy Record of Decision for the Long-Term Management and Storage of Elemental Mercury	Federal Register	2019	This ROD announces the DOE decision to store up to 6,800 metric tons (7,480 tons) of elemental mercury in existing buildings at Waste Control Specialists near Andrews, Texas.
023	023_2010 EPA-HQ-RCRA-2010-0851-0010	QAPP for Land Disposal Restrictions Program		NA	Lists and describes QA/QC activities that should be enacted in any EPA data collection program (including LDRs) - clarifies how data should be treated within the LDR program and other industry or research organizations
033	033_ldr	Land Disposal Restrictions (EPA AND NDEQ Powerpoint Overview)		NA	Land Disposal Restrictions (EPA AND NDEQ PowerPoint Overview)
010	010_1999 FR Potential Changes to Hg LDRs 1999	DUPLICATE OF 005 - REMOVED	Federal Register		

Notes:
Shaded cells indicate key documents
Numeric order is nonconsecutive where duplicates were removed

Table 8
Summary of Technical Documents, Mercury Technical Background

Index Number	File Name	Document Title	Author	Date	Summary
Background and Technical Information					
001	001_1994_30003WSW	Mercury Usage and Alternatives in the Electrical and Electronics Industries		1994	Outlines specific industries where mercury is found - specific properties of mercury (electromechanical and photoelectric capacities make it viable for electronics - discusses certain/innovative technologies to replace mercury in a few of these disciplines
002	002_1998 incinalt	Analysis of Alternatives to Incineration for Mercury Wastes Containing Organics		1998	Mercury contain waste cloudifications and LDR - LDR assumes incineration of mercury wastes containing organics mostly incinerates the entirety of the organic portion allowing capture of mercury within the residuals - however, suggest it may be more preferred to immobilize mercury rather than recover it
003	003_1998 IWAIR Technical Background	Industrial Waste Air Model Technical Background Document		1998	Background information on the development of the Industrial Waste Air Model program.
004	004_1998_gen-trt2	Analysis of Current Mercury Waste Generation and Treatment		1998	Background information on the current emissions and domestic source of mercury - classifies various wastes contain mercury
005	005_1998_imoblzn2	Technologies for Immobilizing High Mercury Subcategory Wastes		1998	Introductory review of immobilization of mercury wastes rather than using certain processes to recover the hazardous waste - discusses the leachability and benefits of immobilization - lists and defines the specific ways in which mercury is immobilized
006	006_1999 fs_merc	EPA's Comprehensive Review of the Treatment Standards for Mercury-Bearing Hazardous Waste		1999	EPA review of the treatments for mercury bearing wastes - EPA announcement to demonstrate concern for this issue and proposes specific actions the EPA is instituting to combat mercury release into the environment
008	008_2004_GreerNRDC	Mercury Use in Products and Industrial Processes		2004	PPTX of the main sources of industrial related mercury pollution - lists countries, industries, and dangers in mercury pollution
009	009_2008 rmerc2	Waste Specific Evaluation of RMERC Treatment Standard		1998	List of mercury bearing wastes and standards for retorting - lists retorting facilities and quantities among waste types
010	010_2009 mercury-rpt-to-congress-export-ban	Potential Export of Mercury Compounds from the United State for Conversion to Elemental Mercury		2009	Supplemental documentation and report to evaluate the mercury export ban - lists waste types, concerns, standards..etc.., - supplied to congress
011	011_2009_Elementalmercurystorage Interim Guidance (dated 2009-11-13)	US Department of Energy Interim Guidance on Packaging Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury		2009	Discusses procedures and standards for transporting and transferring mercury, designation of mercury storage facility, fees, mercury recycling study, and operating guidance for mercury storage facilities
012	012_2011_EIS-0423-FEIS-Summary-2011	Long-Term Management and Storage of Elemental Mercury		2011	Statement on the long-term management and storage of elemental mercury in response to the mercury export ban - summary and guide for stakeholders - impacts and alternatives. 7 candidate locations in US. DOE's Preferred Alternative for the long-term management and storage of mercury is the Waste Control Specialists, LLC, site near Andrews, Texas.
014	014_2014_2 Mercury MngmtGiannotto Brewer	Responsible Mercury Management Post_MEBA	Michael S. Giannotto and Matthew C. Brewer	2014	Discusses options for companies seeking mercury exportation alternatives and petitions to the EPA because of the Export Ban by companies with accumulating mercury waste Page 25, footnote 1. There is no concentration-based treatment LDR for elemental mercury. See 40 C.F.R. § 268.40. Theoretically, there is a technology-based LDR for high-mercury waste with a concentration of greater than 260 ppm total mercury… While RMERC works for removing mercury from wastes that contain high, but less than 100%, concentrations of mercury, retorting or roasting elemental mercury can only produce more elemental mercury, which, under the regulations, would then have to be retorted or roasted again, ad infinitum. In 2003, EPA published a Notice of Data Availability in which it reported the results of two studies intended to identify an LDR for elemental mercury. See 68 Fed. Reg. 4481 (Jan. 29, 2003). EPA evaluated three treatment processes: (1) sulfur amalgamation followed by thermoplastic encapsulation; (2) formation of mercuric sulfide followed by micro- and macroencapsulation with proprietary binders; and (3) sulfur amalgamation followed by addition of a proprietary precipitation reagent. Id. at 4485. EPA concluded that "[t]he results of the treatability studies outlined in this notice lead us to conclude that, at this time, we cannot establish a new national treatment standard allowing for disposal of high mercury and elemental mercury wastes" because "[n]o technology demonstrated adequate stability across the plausible range of pH conditions found in landfills." Id. at 4488–89.
015	015_2016 mercury_global_supply_and_trade_rtc_and_signed_transmittal_letters	Report to Congress on the Global Supply and Trade of Elemental Mercury	US EPA	2016	Statistical report by the EPA to Congress to assess the global supply of mercury and how it is traded
016	016_2016, EM Technology Plan to Address Mercury	Technology Plan to Address the Em Mercury Challenge		2016	US Department of Energy technology plan to address mercury contamination and remediation efforts - highlights Oak Ridge, Tennessee - approach to remediation techniques
017	017_2018 Treatment Standards for Hazardous Wastes Subject to Land Disposal Restrictions_Hazardous Waste_US EPA	Treatment Standards for Hazardous Wastes Subject to Land Disposal Restrictions		2018	Treatment for specific mercury bearing wastes - LDR alternative treatment standard definitions
020	020_Questions and Answers on the Mercury Export Ban Act (MEBA) of 2008 _ Mercury in Your Environment _ US EPA	Questions and Answers on the Mercury Export Ban Act (MEBA) of 2008		NA	https://www.epa.gov/mercury/questions-and-answers-mercury-export-ban-act-meba-2008#Storage
021	021_2002_Hg Waste Encapsulation Technologies-2002	Advances in Encapsulation Technologies for the Management of Mercury-Contaminated Hazardous Wastes	Chattopadhyay and Condit (Battelle)	2002	Discusses the need for reliable hazardous waste management techniques - highlights encapsulation as being one of the most promising techniques - describes the scale at which encapsulation has been investigated
022	022_2004_Hg Encapsulation WasteTreatment-PaulRandall	Advances in Encapsulation Technologies for the Management of Mercury-Contaminated Hazardous Wastes	Paul Randall, Sandip Chattopadhyay	2004	Update of technical paper from 2002 (document 021)

Table 8
Summary of Technical Documents, Mercury Technical Background

Index Number	File Name	Document Title	Author	Date	Summary
Background and Technical Information					
023	023_2004_Long-term Hg mgt options-Randall-2004	Application of the Analytic Hierarchy Process to Compare Alternatives for the Long-term Management of Surplus Mercury	Paul Randall, Linda Brown, Larry Deschaine, John Dimarzio, Geoffrey Kaiser, John Vierow	2004	Describes the systematic approach for comparing long-term management techniques of mercy bearing wastes and the surplus of mercury within industry - lists and supports three storage options
024	024_2011_DRAFT Disposal of Stabilized Elemental Mercury-DOE	Disposal of Stabilized Elemental Mercury	Bill Hermes, Catherine Mattus, Jim Terry	2011	Draft that calls and proposes a path for the final disposal of mercury bearing wastes - addresses the need for standards for treatment and disposal options for large quantities of commodity grade mercury - discusses potential storage sites
025	025_2012_Hg treatment methods-2012	Concerns of Liquid Mercury and Mercury-Containing Wastes: A Review of the Treatment Technologies for the Safe Storage	Olga Rodríguez*, Isabel Padilla, Hanan Tayibi, Aurora López-Delgado	2012	Review paper that lists and describes treatment techniques for mercury-bearing wastes - claims stabilization and solicitation is the most effective and safest method among the potential techniques
026	026_2012_Review-International Hg Waste Treatment Trends- 2012	A Review of International Trends in Mercury Management and Available Options for Permanent or Long-term Mercury Storage	Keun Jeong Lee, Tai Gyu Lee	2012	Review paper on the trends of mercury management and storage internationally - calls for the construction of more storage facilities in response to the growing surplus of elemental mercury - suggests international collaboration among the various issues involving mercury contamination and storage
027	027_Spanish technology of mercury solidification (1)	-Short questionnaire of metacinnabar process and stabilization	Not Listed	NA	questionnaire that describes the technology and the process of the creation of cinnabar as being a potential stabilization process for elemental mercury
028	028_EPA Roadmap for mercury	EPA Roadmap for Mercury		2006	Background information on the origin of mercury contamination as well as how it affects organisms (specifically fish). The 'roadmap' describes how mercury can move throughout various ecological systems
029	029_Mercury Study Report to Congress Volume VIII	EPA mercury study report to congress		1997	Concentrates on atmospheric mercury pollution and the costs and controls in place to reduce such emissions. Also indicates how regulatory information has affected these issues. Describes the rate/mass of mercury emissions.
030	030_Waste analysis	EPA waste analysis		1994	A guide to the types of facilities that generate, treat, store, and dispose of hazardous. A manual for how mercury is transported through the various stages. Created to assist specific personnel employed by associated companies
031	031_Changing PatternsWilburn	David R. Wilburn, “Changing Patterns in the Use, Recycling, and Material Substitution of Mercury in the United States,” (U.S. Geological Survey (USGS) Scientific Investigations Report 2013–5137) (2013 USGS Report), http://pubs.usgs.gov/sir/2013/5137/	David R. Wilburn	2013	Summarizes current Use, Recycling, and Material Substitution of Mercury ; disposal options; provides some stats/data.
032	032_Global Estimate of Global Mercury Cell Chlorine Capacity - Global Inventory	Global Estimate of Global Mercury Cell Chlorine Capacity - Global Inventory	United Nations Environment Programme	2009	Erco Worldwide facility (69,000 metric tons/year) converted to membrane technology in 2009; PPG Lake Charles, LA facility (249,000 metric tons/year) replaced all mercury cell capacity with membrane technology between 2005-8; the Olin St. Gabriel, LA facility (163,000 metric tons/year) was to convert to membrane technology with completion expected in 2008; Oxy's Muscle Shoals, AL facility(140,000 metric tons/year) closed in 2008, and and Delaware City, De facility (73,000 metric tons/year) closed in 2005 (industry information).
033	033_USGS_mcs-2019-mercu	Mineral Commodity Summaries 2020 (MERCURY)	U.S. Geological Survey, 2020, Mineral commodity summaries 2020: U.S. Geological Survey, 200 p., https://doi.org/10.3133/mcs2020.	2019	Summary of mercury mineral commodity information

Notes:
Shaded cells indicate key documents
Numeric order is nonconsecutive where duplicates were removed

Table 9
Summary of Technical Documents, Mercury Treatability and Stabilization

Index Number	File Name	Document Title	Author	Date	Summary
Treatability/Stabilization Methods and Technologies					
001	001_1989 9101P4ME	Best Demonstrated Available Technology (BDAT) Background Document for Mercury Wastes		1989	Proposed EPA Solid Waste - Characterization of wastewaters and proposed treatment standards (K071,K106,P065,P092,U151,D009) - BDAT for wastewaters, inorganic nonwastewaters, and organic nonwastewaters - summary of treatment standard performances
002	002_1990 9100A3FX	Final BDAT Background Document (updated from 001)		1990	Final EPA Solid Waste - Characterization of wastewaters and proposed treatment standards (K071,K106,P065,P092,U151,D009) - BDAT for wastewaters, inorganic nonwastewaters, and organic nonwastewaters - summary of treatment standard performances - more elaborate performance results for the proposed methods, rationale of BDAT's on pg 5-1
003	003_1994 EPA Approval of Catalytic Extraction Processing Treatment of Metals	Determination of Equivalent Treatment (DET) for 8 of the Waste Codes from Toluene Diiscocyanate (TDI)		1994	Phase III: Recharacterized Wastewaters, Carbamate, and Organobromine Wastes and Spent Pot liners; Proposed Rule - Setting Standards for the newly listed above wastes - previously wastes grouped in Class I nonhazardous waste wells are decharacterized are addressed - anticipated reactions of proposed rule/amendment to prior standard
004	004_1998 BNL Develops Mercury Disposal Process	Brookhaven Lab Develops Process for Safe Disposal of Mercury		1998	Intro to Department of Energy's process for treating mercury-contaminated wastes with no hazardous biproduct - A result of mercury/sulfur chemically bonded polymer cement creation
005	005_2000 Mercury Stabilization in Phosphate Ceramics	Mercury Stabilization in Chemically Bonded Phosphate Ceramics		2000	Due to pH dependency of the sulfidation of Hg, Chemically Bonded Phosphate Ceramic production for mercury stabilization is proposed between pH 4-8 - discussed method for the stabilization process which utilized an acid-base reaction between MgO and KH2PO4 to form a dense ceramic at room temp within hours - elaborates on the chemistry behind this process as well as results of CBPC which proved one order lower than stringent limit formed the chemically bonded phosphate ceramic (CBPC) waste forms of ash and ferric oxide wastes and tested leaching of Hg by using the Environmental Protection Agency's Toxicity Characteristic Leaching Procedure (TCLP) [4]. These initial tests showed that the leaching levels had dropped from 40 and 138 mg/L for untreated ash and ferric oxide, respectively, to 7.7 and 51 mg/L for the treated wastes.
006	006_2001 Stabilization-and-testing-Borden-600r02019	Stabilizing and Testing of Mercury Containing Wastes: Borden Catalyst		2001	Evaluation of chemical stability of spent mercuric chloride catalyst in an aqueous environment before and after treatment with phosphate and sulfide - baseline tests were conducted with untreated waters and the effectiveness of additives on reducing Hg within leachate are determined - little correlation between pH and Hg reduction was concluded, but introduction of more S reduced more Hg
007	007_2002 DOE-Measurements-of-Mercury115769	Measurement of Mercury Released from Solidified/Stabilized Waste Forms-FY 2002		2002	Discusses 2 scenarios of treating elemental mercury (sulfur polymer cement waste process and microencapsulation process), which resulted in a reduction factor of about 10 or 20 - Sulfur polymer cement waste technique reduced Hg more effectively than microencapsulation from NFS
008	008_2002 ucin1059751247	Stabilization of Mercury-containing Wastes Using Sulfide		2002	Ph.D. Thesis involving stabilization of Hg bearing wastes using sodium sulfide - discusses variable of this process (pH, (S/Hg) molar ratios, and stabilization time) - stabilization efficiency reached 99% - mild pH/Hg correlation (high pH leachants have slightly elevated Hg) - excess S can increase Hg mobilization through landfill conditions
009	009_2003 EPA LDR Treatment Mercury-Bearing HazWaste	LDR: Treatment Standards for Mercury-Bearing Hazardous Waste: Notice of Data Availability		2003	Notice of data available of two treatability studies for treating high mercury wastes and elemental mercury.
010	010_2003_25533	Using the Sulfur Polymer Stabilization/Solidification Process to Treat Residual Mercury Wastes from Gold Mining Operations		2003	Evaluation of BNL Mercury Disposal process (see Index Number 004) for treating residual mercury associated with Au mining operations - discussion of future engineering designs to accommodate elevated waste processing - Newmont Mining
011	011_2004 30006P8J	Stabilization of Mercury in Waste Material from the Sulfur Bank Mercury Mine		2004	Discusses effectiveness of Silica Micro encapsulation (Close to 90% reduction goal), inorganic sulfide stabilization technology (minorly effective), and generic phosphate treatment for mercury immobilization -
012	012_2004 71549	In Situ Mercury Stabilization		2004	Notification in situ Sulfur Polymer Cement experimentation conducted by BNL to treat artificially Hg contaminated soils - discussed the need for further studies
013	013_2007-EPA-Mercury Treatment-542r07003	Treatment Technologies for Mercury in Soil, Waste, and Water		2007	Overview of 57 projects which aimed to decontaminate soil, waste, and water of Hg - (23 pilot scale/34 full scale) - previously analyzed standards as well as newly introduced techniques
014	014_2009 grs_252_stabmerc	Technologies for the Stabilization of Elemental Mercury and Mercury-containing wastes		2009	Discussion of 3 approaches (conversion to sulphide / selenide, amalgamation, and stabilization within an insoluble mineral matrix - Selenide seemed to be most promising at stabilization but is not applicable to certain waste forms - doubts exist when utilizing amalgnation due to potential remobilization
015	015_2010 bipro_study20100416_pretreatments	Extended Summary on Pre-treatment Technologies for Metallic Mercury		2010	Overview of Hg stabilization technologies (Sulphur, SPSS, amalgamation, CBPC, encapsulation) - Brief discussion of minimum requirements (environmental, economic, and technical)
016	016_2010 Elsa_Cabrejo_Summer2010_Internship_Report	In Situ Remediation and Stabilization Technologies for Mercury in Clay Soils		2010	Study of mercury contamination within clayey soils on Oak Ridge Reservation (14,260 ha., within Tennessee) - includes four in situ techniques for remediation - electrochemical remediation, in situ mercury stabilization, nanotechnology, and phytoextraction
017	017_2011 Stabilization and Solidification of Elemental Mercury for Safe Disposal and or Long Term Storage	Stabilization and Solidification of Elemental Mercury for Safe Disposal an/or Long-Term Storage	Tai Gyu Lee, Yujin Eom, Chul Hun, and Kyung Su Song	2011	Introduction to a simple and effective stabilization and solidi cation of elemental mercury with the creation of metacinnabar - creation of metacinnabar is confirmed with XRD
018	018_2012 DELA_Stabilisation_Technology_for_Metallic_Mercury_-_Workshop_May_2012	DELA Stabilization Technology for Metallic Mercury		2012	PPTX. of DELA technology - Hg contamination to cinnabar - visuals of the plant and a schematic/flowchart of how mercury is processed at the facility

Table 9
Summary of Technical Documents, Mercury Treatability and Stabilization

Index Number	File Name	Document Title	Author	Date	Summary
Treatability/Stabilization Methods and Technologies					
019	019_2014 7-Mercury-Stabilisation-Technologies	Mercury Stabilization Technologies		2014	PPTX. of EuroChlor (Germany) technology - Hg contamination to cinnabar - visuals of the plant and a schematic/flowchart of how mercury is processed at the facility - leaching values of final products
020	020_2015 Frontiers _ Microbial- and thiosulfate-mediated dissolution of mercury sulfide minerals and transformation to gaseous mercury _ Microbiology	Microbial- and Thiosulfate-mediated Dissolution of Mercury Sulfide Minerals and Transformation to Gaseous Mercury		2015	Use of sulfur oxidizing bacteria to convert Hg to metacinnabar chips - biotic remediation discovery
021	021_Mercury Retirement _ Stabilization to Remove Mercury from Future Use	Mercury Retirement Patented Sulfide Treatment Renders Mercury Suitable for Land Disposal		NA	Bethlehem Apparatus (Pennsylvania) - capacity to retire 300 - 1000 tons of mercury per year through conversion to HgS - product passes TCLP - U.S. Patent No. 7,691,361 and 8,501,107
022	022_14685	Treatment Standards for Mercury-Containing Debris		NA	Memorandum for the clarification of eligible wastes for land disposal - RCRA standards for land disposal
023	023_2006_Hg Diffusion in PCC	Diffusion Tests of Mercury Through Concrete, Bentonite-enhanced Sand and Sand	Margareta Svensson and Bert Allard	2006	Diffusion of Hg(II) and Hg(0) through bentonite enhanced sand or concrete to promote speciation of mercury through purge and trap methods - diffusion coefficients for concrete and sand were observed - Hg(0) diffused at a quicker rate - after 45 months, only 1-10% of total mercury was Hg(0) because of oxidation
024	024_2007_leaching of Hg containing cement monoliths aged for one year	Leaching of Mercury-containing Cement Monoliths Aged for One Year	Margareta Svensson and Bert Allard	2008	Diffusion of mercury from 1-year old mercury bearing PCC or slag cement was observed after 11 months - leaching tests proven 3 distinct dissolution events which caused the diffusion of mercury - aging of 1 year increased the leaching of mercury by 70-400 times than initially contained meta-cinnabar
025	025_2008_Milliing Hg & S-2008-Crete HW Conf	Disposal of Elemental Mercury via Sulphur Reaction by Milling	F.A. LÓPEZ, F.J. ALGUACIL, C.P. ROMAN, H. TAYIBI AND A. LÓPEZDELGADO	2008	Mechanical action of the ball mill allowed the formation of meta cinnabar within a non-stoichiometry mixture of elemental mercury and Sulphur - through utilizing SEM, this process is initiated when micro-spheres of mercury favor adhesion to S particles - kinetics of this reaction require milling times exceeding 60 mins at a speed of 400 rpm
026	026_2009_Hg S-S Haz Waste-zeolite & Portland Cement-J Haz Mat 2009	Stabilization/Solidification (S/S) of Mercury-contaminated Hazardous Wastes Using Thiol-functionalized Zeolite and Portland Cement	Xin-Yan Zhang, Qi-ChaoWang, Shao-Qing Zhang, Xiao-Jing Sun, Zhong-Sheng Zhang	2009	Experimentation proves that stabilizing mercury through thiol-functionalized zeolites is a successful approach - optimum pH is around 5.0 - optimum dosage of TFW is 5% - passes leaching test even with the introduction of Cl and PO4
027	027_2010_HgS formation by Milling-2010	Formation of Metacinnabar by Milling of Liquid Mercury and Elemental Sulfur for Long Term Mercury Storage	F.A. López, A. López-Delgado ⁎, I. Padilla, H. Tayibi, F.J. Alguacil	2010	Meta-cinnabar is created through the incorporation of liquid mercury and elemental sulfur using mechanical/kinetic (ball mill - unreacted Hg was not detected after 60 minutes (reaction 99.99% complete) - meets universal treatment standards
028	028_2012_Hg SPSS-Durability test Lopez-Delgado 2012	A Microencapsulation Process of Liquid Mercury by Sulfur Polymer Stabilization/Solidification Technology. Part II: Durability of Materials	A. López-Delgado*, A. Guerrero**, F. A. López*, C. Pérez* and F. J. Alguacil*	2012	Report of the results of tests to determine the durability of HgS concrete samples that were made with high Hg content - various tests methods were applied to determine the effects of durability (absorption/freeze thaw/permeability..etc..) - proven resistance in even extreme environments
029	029_10.1.1.595.6879	Mercury amalgamation solidification		~2000	Paper from Oak Ridge Lab. discussing how the process of amalgamation/solidification results with a stabilized cement. Discusses the matrix and agents used in their MASS process.
030	030_23537	SPSS treatability of mixed-waste Hg Sludge BHLb		2001	Discusses a project initiated by the EPA to treat radioactive wastes incorporated with mercury. Pilot-scale spss process.
031	031_Pub57179	New required technologies for mixed waste	Michael I. Morris and Greg A. Hulet	2003	Oak Ridge Lab. Four processes demonstrated sufficienct results for stabilization (SPSS, DeHg stabilization, Chemical stabilization, and Vacuum/thermal desorption)
032	032_sulfur-polymer-22164	SPSS treatability of mixed-waste Hg Sludge BHLa		2001	Precursor to 030. BNL project on SPSS. Mixed wastes.

Notes:
Shaded cells indicate key documents
Numeric order is nonconsecutive where duplicates were removed

Table 10
Summary of Leachate Data from
Trenches 12 and 13
Beatty Facility, Nevada

LCRS/LDS Collection Area	Area (acres)	LCRS + LDS Volume (gallons)	LCRS + LDS Flow Rate (gpad)
First Half 2022			
Trench 12 Phase A, B, C	4.5	30,920	19.0
Trench 13 Phase A	9.8	14,325	4.0
Second Half 2022			
Trench 12 Phase A, B, C	4.5	22,715	14.0
Trench 13 Phase A	9.8	16,865	4.7
First Half 2023			
Trench 12 Phase A, B, C	4.5	8,362	5.1
Trench 13 Phase A	9.8	37,930	10.6
Second Half 2023			
Trench 12 Phase A, B, C	4.5	10,860	6.7
Trench 13 Phase A	9.8	57,696	16.1

Notes:

Data from US Ecology Environmental Monitoring Reports 2022 and 2023

LCRS = leachate collection and removal system (LCRS)
LDS = leak detection system (LDS)
gpad = gallons per acre per day
Trench 12 closed in early 2021

Table 11
Soil Study: Summary of pH Results via
SW846 Test Method 9095D (Beatty, Nevada Facility)

Coordinates	Lab Sample ID	pH (SU)
N 10770, E 10750	SAMPLE #1	**8.29**
N 10770, E 10650	SAMPLE #2	**8.79**
N 10770, E 10550	SAMPLE #3	**8.77**
N 10870, E 10550	SAMPLE #4	**9.39**
N 10870, E 10650	SAMPLE #5	**9.37**
N 10870, E 10750	SAMPLE #6	**9.14**
N 10870, E 10750	SAMPLE #6 - DUP	**9.15**
N 10770, E 10750	SAMPLE #7	**8.73**
N 10970, E 10650	SAMPLE #8	**8.97**
N 10970, E 10550	SAMPLE #9	**8.54**

Notes
SU = standard units

FIGURES

Figure 1:
Beatty, Nevada Facility Location

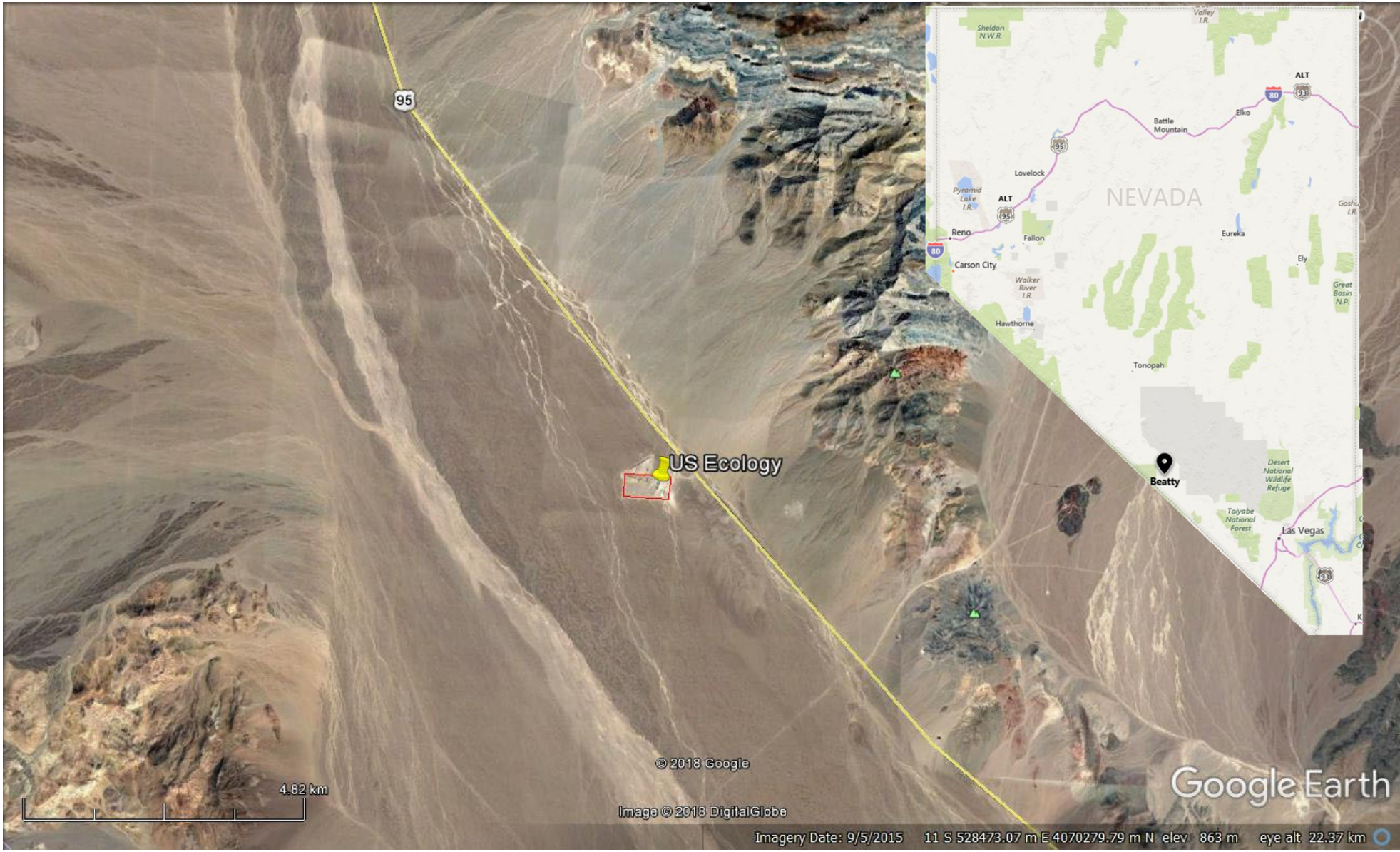
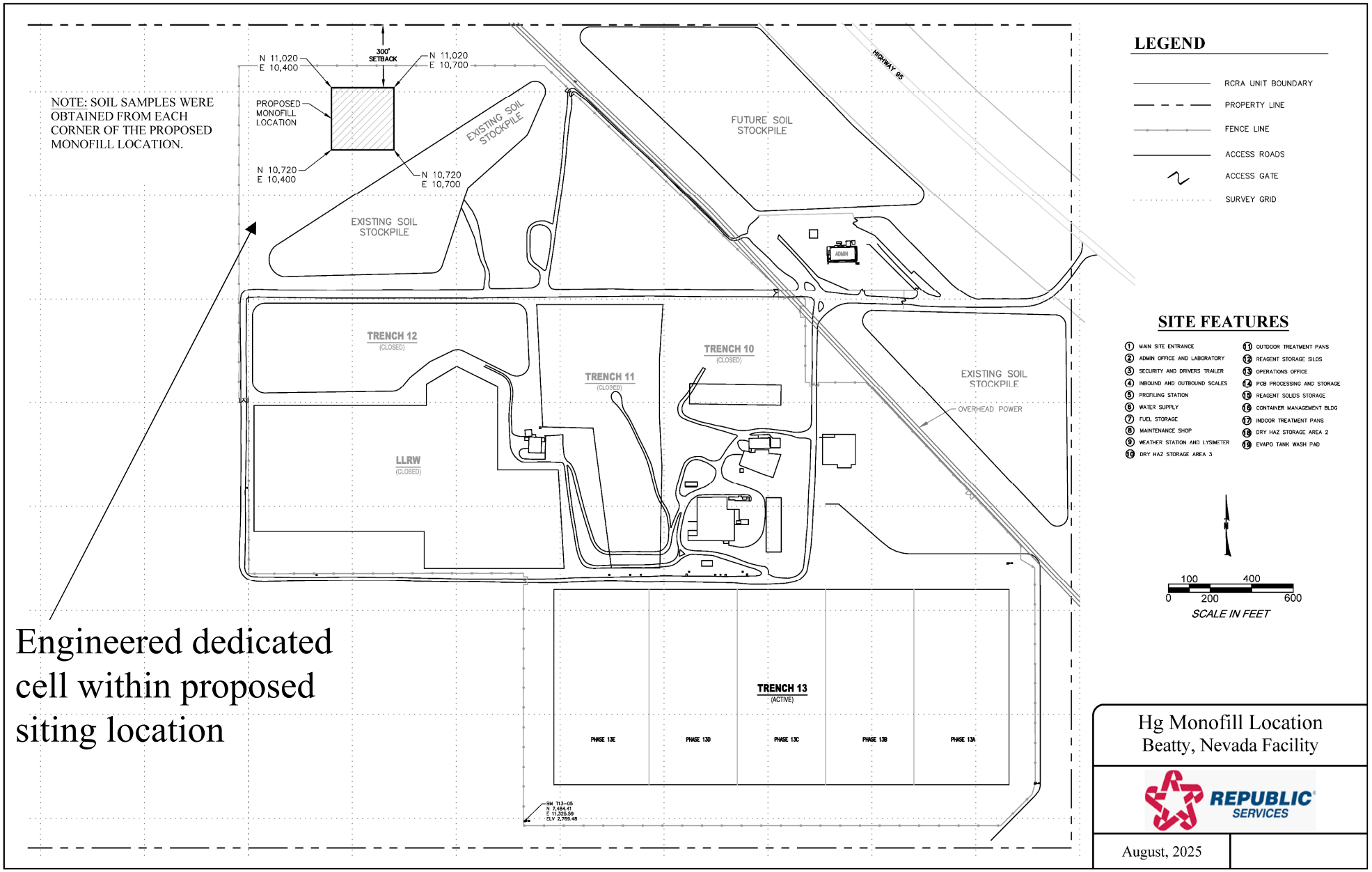


Figure 2:
Proposed Mercury Disposal Process Flow

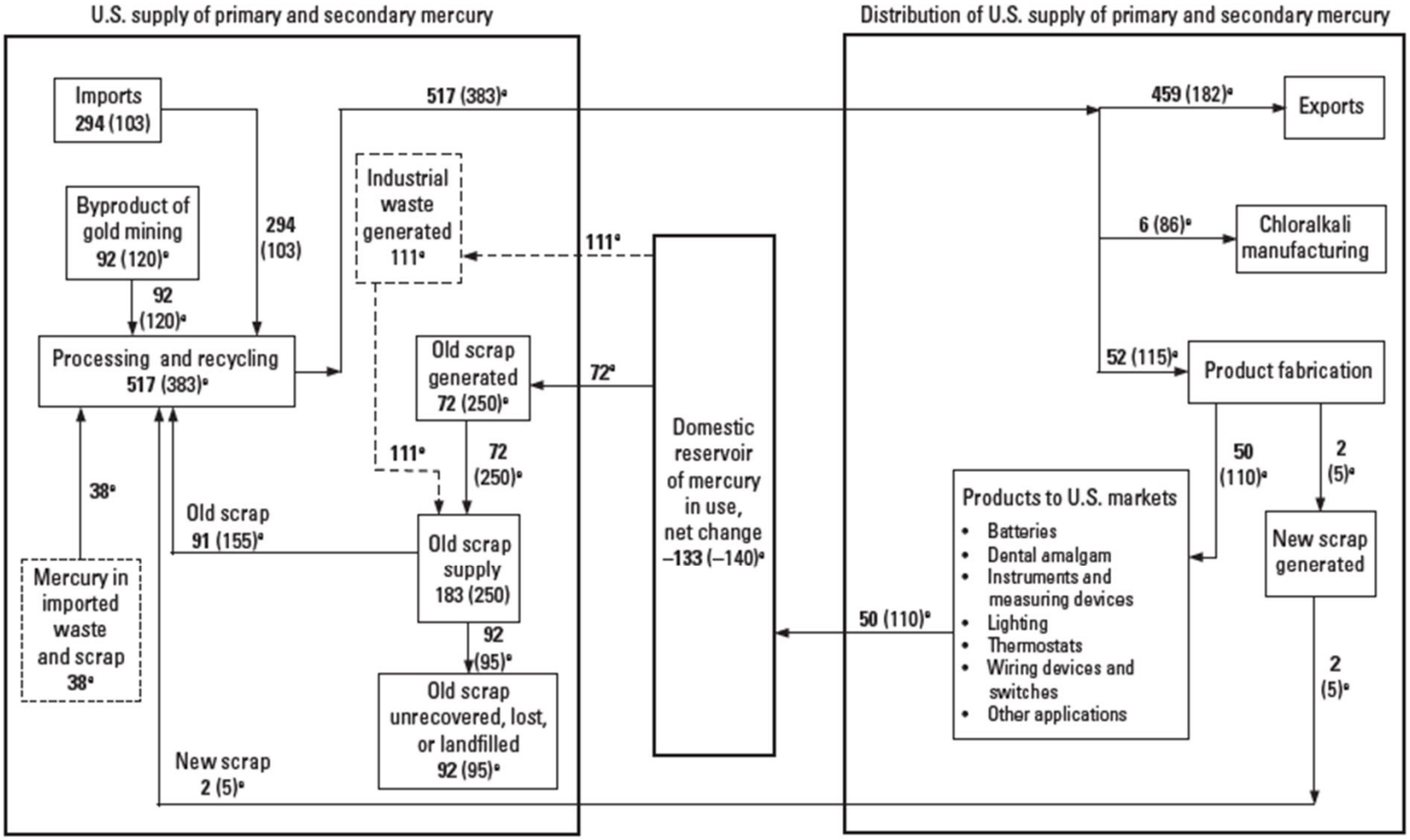


Figure 3:
Proposed Monofill Siting Location – Encapsulated Mercuric Sulfide



Engineered dedicated cell within proposed siting location

Figure 4:
Mercury Generation, Collection, and Treatment in the U.S.



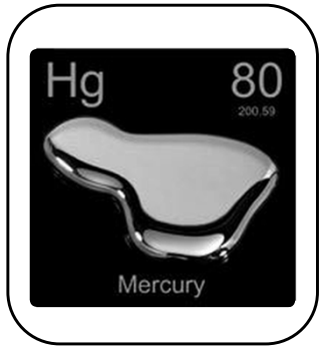
Copied from U.S.G.S 2013: The flow of mercury in the United States in 2000 and 2010. Quantities are in metric tons of contained mercury. Values in bold reflect quantities in 2010; values in parentheses reflect quantities in 2000 as reported by Matos and Brooks (2005). Industrial waste derived from soils from chloralkali plants that have been closed, industrial process waste, and waste imported from Canada were not reported in 2000. Values exclude dissipative losses. e, estimated.

Figure 5:
Current Mercury Waste Generation, Collection, and Treatment/Storage Processes in the U.S.



Figure 6:
Mercuric Sulfide Conversion Process

RETORT/RECYCLING: Collection of mercury containing materials, recycling/reclamation of mercury



DISTILLATION: Distillation of retorted mercury to create high purity mercury (99.99999%)

REACTION: Mercury reacts with sulfur, forming mercury(II) sulfide

$Hg(l) + S(s) + Heat = HgS(s)$

Figure 7a:
Total Annual Precipitation 2008-2024

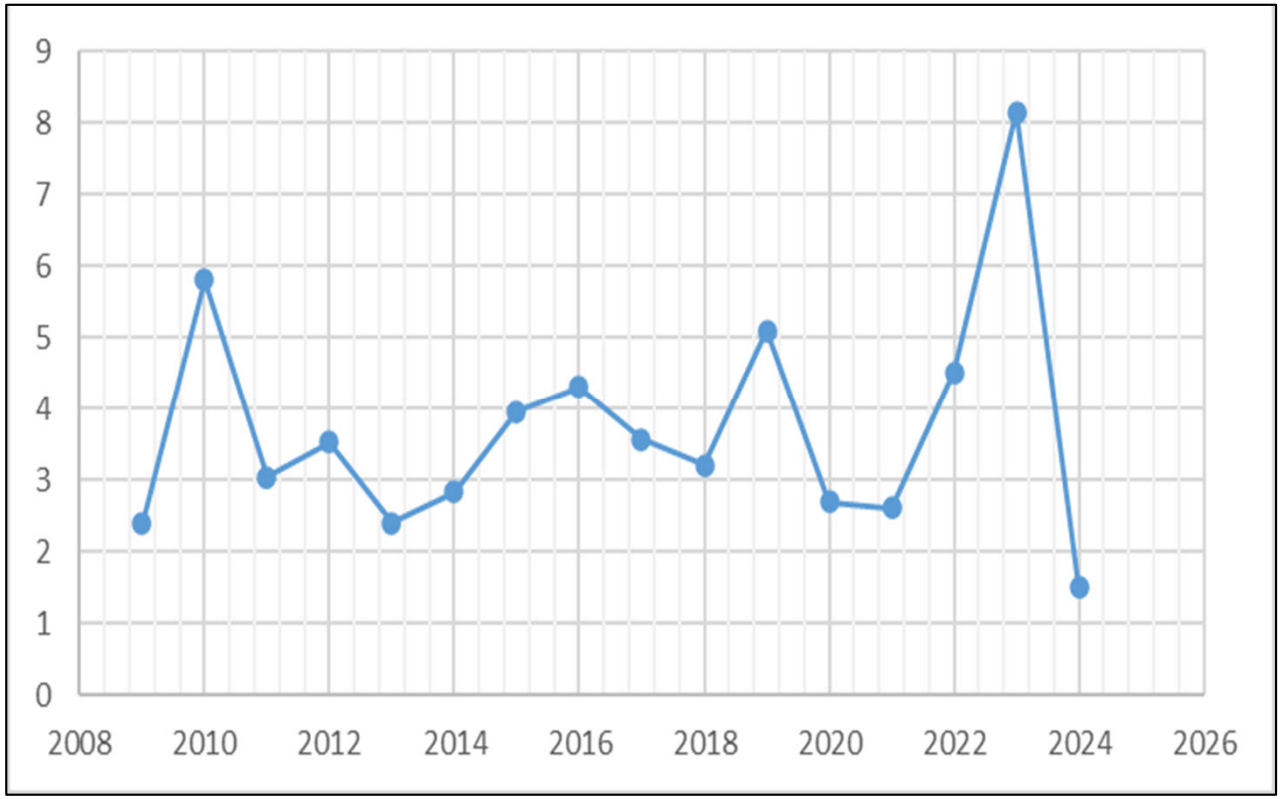
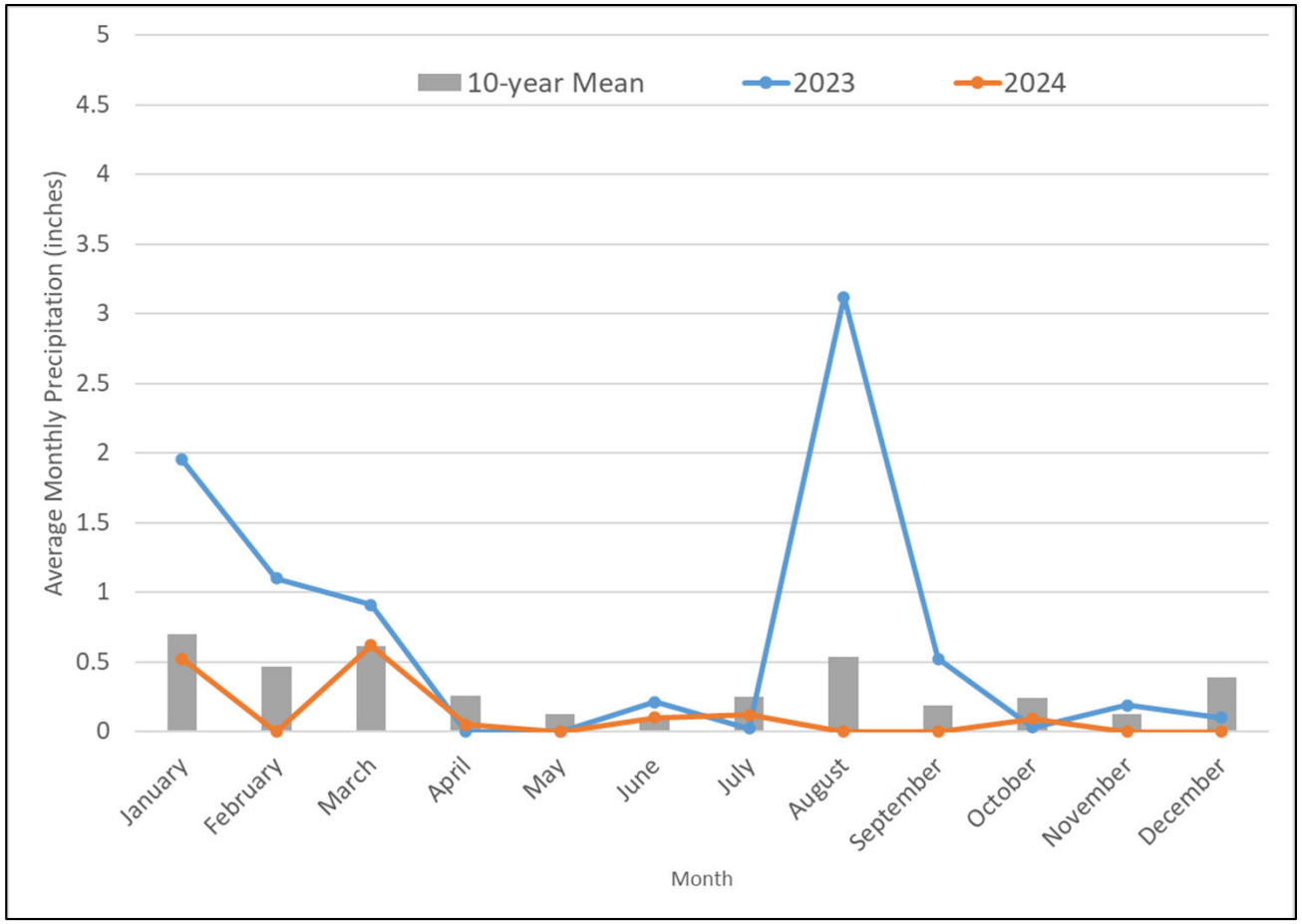


Figure 7b:
Annual Precipitation 2023-2024 and 10-year Monthly Mean Precipitation



Geosyntec consultants

APPENDIX A

Quality Assurance Project Plan (QAPP)

September 2025

QUALITY ASSURANCE PROJECT PLAN

PETITION FOR SITE-SPECIFIC VARIANCE FROM THE TREATMENT STANDARDS FOR ELEMENTAL MERCURY WASTES (D009 AND U151) UNDER THE LAND DISPOSAL RESTRICTIONS

Effective Date: August 2025

PROGRAM MANAGEMENT

Approval Sheet

Concurrence

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Quality Assurance Officer

Name: Amanda Grilli Title: Quality Assurance Officer Organization: Eurofins Pittsburgh	Signature: Amanda L Grilli Date: 09/22/2025

Approval

US EPA

Name: Title: Organization:	Signature: Date:

Revision History

This table shows changes to this controlled document over time. The most recent version is presented on the first row of the table below the header. Previous versions of the document are maintained by Quality Assurance Officer.

Document Control Number	History/ Changes	Effective Date
	Initial Document	
	Rev. 1	August 2025

QAPP Distribution List

QAPP Recipients	Title	Organization	Telephone Number	Email Address

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ACRONYMS AND ABBREVIATIONS

CLP – Superfund Contract Laboratory Program
DOE – Department of Energy
DQO – Data Quality Objective
HDPE – High-density Polyethylene
Hg - Mercury
LCS – Laboratory Control Sample
LDR – Land Disposal Restrictions
LEAF – Leaching Environmental Assessment Framework
LLDPE – Linear Low-density Polyethylene
MEBA – Mercury Export Ban Act
MS – Matrix Spike
MSD – Matrix Spike Duplicate
NDEP – Nevada Division of Environmental Protection
PRRL – Project-required Reporting Limit
PTFE – Polytetrafluoroethylene
QA – Quality Assurance
QAPP – Quality Assurance Project Plan
QC – Quality Control
RCRA – Resource Conservation and Recovery Act
RPD – Relative Percent Difference
SOP – Standard Operating Procedure
TCLP – Toxicity Characteristic Leaching Procedure
UTS – Universal Treatment Standard
US EPA – United States Environmental Protection Agency

1.0 INTRODUCTION

1.1 Project Description and Applicability

This Quality Assurance Project Plan (QAPP) presents the project organization, objectives, procedures, functional activities, and specific quality assurance (QA) and quality control (QC) activities associated with the characterization and assessment tasks to be performed for the US Ecology Nevada, Inc. (US Ecology) Petition for Site-Specific Variance from the Treatment Standards for Elemental Mercury Wastes (D009 and U151) under the Land Disposal Restrictions in accordance with the requirements of the United States Environmental Protection Agency (US EPA) under 40 CFR §268.42(b) to apply for a Variance for elemental mercury (CAS #7439-97-6). This application includes a demonstration that the proposed alternative treatment method can achieve a measure of performance equivalent to that achieved by methods specified in 40 CFR §268.42(a).

The characterization tasks under this Variance will encapsulate mercuric sulfide as a monolith, containerize, and place in a dedicated RCRA Subtitle C landfill cell in an arid location. The dedicated landfill cell will be referred to as a monofill throughout this QAPP. The mercuric sulfide will be managed with a treatment train, and final disposal location that is demonstrated to be in compliance with federal, state, and local requirements, and is as, or more, protective of human health and the environment than current regulatory pathways for this waste today.

Monofill Location:
US Ecology Nevada, Inc.
Highway 95, 11 Miles South of Beatty
Beatty, NV 89003
EPA ID# NVT330010000 (NDEP)
Permit # NEVHW002

Treatment and Encapsulation Location(s):

US Ecology Nevada, Inc.	Bethlehem Apparatus (primary)
Highway 95, 11 Miles South of Beatty	935 Bethlehem Dr.
Beatty, NV 89003	Bethlehem, PA 18017
EPA ID# NVT330010000	EPA ID# PA0000453084

Mercury Disposal History:

Mercury usage in the United States (U.S.) has steadily declined with increased regulation and advances in technology. Primary demand for mercury in the U.S. initially included batteries, thermometric devices, chloralkali manufacturing, and paint. Today, mercury usage in these industries has either been phased out (batteries and paint) or become self-sufficient through recycling and reuse (chloralkali).

When the US EPA declared mercury a toxic substance and began setting regulation standards in the 1970s, mercury demand in the U.S. began to decrease. The passage of the Resource Conservation and Recovery Act (RCRA) in 1978 established more significant regulations in terms of disposal of mercury-bearing waste, leading to further reductions in mercury demand in the U.S. The decreased demand for mercury and addition of new technologies in lighting have shifted primary U.S. mercury usage to switches and dental amalgam.

Anthropogenic disposal of mercury predating US EPA regulations largely resulted in releases of mercury wastes from mining and industrial processes. However, with the addition of RCRA and land disposal restrictions (LDR), mercury wastes are categorized based on total mercury, set at a threshold value of 260 mg/kg total mercury. Low mercury wastes (< 260 mg/kg total mercury), while subject to treatment to prevent leaching of mercury, are allowed disposal to a designated Subtitle C landfill. High mercury wastes (≥ 260 mg/kg total mercury) are subject to removal through retort/roasting, or incineration if organics are present. Excess elemental mercury removed from this process is currently stockpiled/stored at designated facilities across the U.S., until DOE establishes a long-term storage facility.

As no treatment or disposal standards for high-purity mercury have been established by The US EPA, no disposal alternatives have been considered by DOE for high-purity mercury. The stockpiles of high-purity (or elemental) mercury continue to grow and will only increase in the future without a permanent disposal solution.

Mercury Retort and Recycling:

Treatment of high-purity mercury falls to retort/roasting or incineration, dependent on the presence of organics in the mercury waste. Retorting of mercury wastes uses a thermal processing unit to volatilize and condense the mercury from it's contaminant, which results in the generation of elemental mercury. Therefore, the process is most effective for mercury wastes containing elemental mercury carrying the waste codes D009 and U151.

Retorted mercury is either reused/recycled/reclaimed or stockpiled at various facilities across the U.S. chloralkali plants, including facility closures, were once one of the largest consumers of mercury in the U.S.; however, as of late 2012, only two chloralkali plants remained in operation in the U.S. Production of elemental mercury from these facilities decreased with the shift to mercury-free alternatives. Other industries using the mercury from retort process include pharmaceutical, fungicides/bactericides, and gold mining (mercury byproduct).

Mercury that is recovered from closure and cleanup of chloralkali properties was available for export or use in these other industries, such as gold mining, although after 2013 the chloralkali plants have been required to store mercury at a site approved by the US EPA for long-term mercury storage under the Mercury Export Ban Act (MEBA). While the retort process is effective at reclamation of elemental mercury, it is no longer a viable final treatment for mercury, as the product derived from this process no longer has a market. Rather, the retort process is a technology-specific LDR standard that is not a final or permanent treatment method. The reclaimed elemental mercury that is not recycled requires long-term storage under MEBA, and the Lautenberg Act further restricts export of some mercury compounds that had previously been exported for long-term storage. As the domestic market for elemental mercury continues to decline, stockpiles will continue to grow.

Therefore, other options are necessary to facilitate treatment and permanent disposal of mercury. Permanent disposal of treated mercury in a monofill will provide a final solution to the problem of growing mercury stockpiles.

Proposed Action for the Variance:

US Ecology Nevada, Inc. proposes to reduce the growing elemental mercury stockpiles by providing a permanent disposal solution. The proposed action starts with elemental mercury that has been converted to mercuric sulfide. The next step in this process is the encapsulation of

mercuric sulfide with linear low-density polyethylene (LLDPE), packaging the encapsulated monolith within high-density polyethylene (HDPE) closed head drums, and final disposal of the drums in a monofill at the US Ecology Beatty, Nevada, facility.

The facility is in an arid environment, where only small amounts of leachate are intermittently generated in landfill cells at the facility. This proposed action combines a treatment solution for elemental mercury that is permanent and secure, with a disposal solution that is functionally superior to stockpiling, while providing a high level of protection for human health and the environment.

Based on the Variance Project Plan, this QAPP includes the activities associated with organization; laboratory analysis; data management; field activities; and data reporting and archiving. The requirements of this QAPP are applicable to affiliated project personnel, support groups, contractors, and subcontractors. The QAPP is intended to establish an overall program-wide QA plan and to provide the framework for more specific requirements that will be described in the
site-specific standard operating procedures (SOPs). Specific data quality objectives (DQOs) and general requirements associated with various sampling and analysis activities, data generation, data reduction, and reporting are stipulated herein.

1.2 Purpose and Scope

The purpose of this QAPP is to support the processes and procedures necessary to provide a demonstration that the proposed alternative treatment method can achieve a measure of performance equivalent to that achieved by methods specified in 40 CFR §268.42(a).

The scope of this document is to provide the appropriate QA procedures and QC measures to be applied throughout the entire Variance and to describe the following items:

- QA objectives
- Sampling and laboratory procedures
- Sample collection, handling, and preservation
- Field and laboratory custody procedures
- Calibration, maintenance, and field procedures and protocols
- Data reduction, validation, and reporting
- Data assessment procedures, including processing, interpretation, and presentation
- Data validation

1.3 Data Quality Objectives (DQOs)

The DQOs for the project, at their broadest level, are established to demonstrate the safety and reliability of the mercury containment system. Based on the US EPA document “Guidance on Systematic Planning Using the Data Quality Objectives Process,” EPA QA/G-4, EPA/240/B-06/001, February 2006”, the following DQO inputs are offered:

Decision Statement

The proposed alternative treatment technology- conversion, encapsulation, and containment within a monofil can achieve a measure of performance equivalent to that of the treatment

standards specified in 40 CFR 268.40; and compliance with federal, state, and local requirements that are protective of human health and environment.

Inputs to the Decision

The following data will be generated to support the DQOs.

- Evaluate the mercuric sulfide source material for potential TCLP leachate (US EPA Method 1311) constituents of concern other than total mercury.

- Evaluate the kinetics of mercury leaching and variability in leachate concentrations for the mercuric sulfide source material. Leachate samples will be generated by US EPA Method 1314 or 1315 and analyzed for total mercury content, *e.g.,* by SW-846 Method 7470A.

- Evaluate the kinetics of mercury leaching and variability in leachate concentrations for the encapsulated material. Leachate samples will be generated by US EPA Method 1314 and analyzed for total mercury content, *e.g.,* by SW-846 Method 7470A.

- Provide additional data about leachate sample composition that might correlate with increased leaching of mercury from the encapsulated material. A separate set of unpreserved column leachates from Method 1314 will be analyzed to prevent the suggested nitric acid and oxidizer from interfering with anions testing, leading to low bias measurement of organic and inorganic carbon content, and likely conversion of reduced sulfur species to sulfate. The following additional testing will be performed on this leachate:

    - Anion content (including chloride, bromide, sulfate
    - Organic and inorganic carbon content
    - pH
    - Conductivity
    - Oxidation reduction potential (ORP)
    - Reactive/free sulfide
    - Total sulfur content

- Additional information will be generated on the salt/geological material within the proposed monofill/surrounding area to evaluate leaching potential based on anticipated conditions at the site. The following data will be collected:

    - A minimum of three samples from different locations (size: 2 -3 kg/sample) will be collected and analyzed using leaching environmental assessment framework (LEAF) Methods 1313 and 1314 on the salt/geological material to evaluate leaching potential based on anticipated conditions at the site.

Decision Rule

Non-wastewater mercury wastes have two concentration-based universal treatment standards (UTSs) found in 40 CFR 268.48:

- Residues from retort (RMERC) - 0.20 milligrams per liter (mg/L) toxicity characteristic leaching procedure (TCLP)

- All other mercury – 0.025 mg/L TCLP

These non-mercury UTSs are evaluated by analysis of leachate generated by TCLP. Retort residues are required to be treated such that the concentrations of mercury in the waste leachate produced from TCLP is less than 0.20 mg/L, where other low-mercury wastes must be treated to leach less than 0.025 mg/L.

Limits on Decision Error

The following data acquisition parameters will be included as controls on the decision inputs to minimize potential decision error

- Analytical testing of mercuric sulfide source material, encapsulated end-product, and geological material will be performed on a minimum of three separate, individually collected samples to define variability across the test matrix.

- The following additional considerations will be included for the testing of the encapsulated end-product:

    - The material of construction that is best suited to Hg analysis is polytetrafluoroethylene (PTFE; Teflon®); however, borosilicate glass is also acceptable. No fluorinated plastics (*e.g.,* HDPE, LLDPE, nylon, *etc.*) should be used due to the potential for sorption of Hg at low concentrations. Likewise, steel and other metals should be avoided for all wetted surfaces that are likely to contact Hg in solution. Close attention will be paid to lid liners, seals, valves, and fittings.

    - The modified US EPA Method 1314, 1315 and apparats should be a borosilicate glass or PTFE column with a diameter at least 10× the greatest dimension of the test material (*e.g.,* a 2-inch or 50-mm column can accommodate particles up to 5-mm in dimension).

    - Collection bottles should be borosilicate glass of various sizes to minimize headspace of the collected volume to the extent practical (*e.g.,* 250-mL bottles for eluates between 150- and 250-mL) with PTFE lid liners.

    - The tubing that connects the eluate side of the column to the collection bottle should be made of PTFE.

    - All valve seals and valve seats should be made of PTFE.

    - The collection vessel should be fitted with a PTFE tube through the cap that deposits column eluates within 0.5 cm of the bottom of the bottle to minimize exposure of a drop of eluate to open air in the bottle.

    - All collection bottles should have preservation agents (*i.e.,* nitric acid and gold standard) added prior to the start of eluate collection. The amount of preservation

should be calculated to provide 2% nitric acid and 200 µg/L gold(III) based on the final volume of the eluate to be collected.

- To the extent possible, the eluate discharge from the column into the collection vessel should be submerged in the nitric acid solution used for preservation to minimize Hg volatilization during eluate collection (preserved eluates may remain unfiltered).

- The hold time for analysis of Hg should be no more than 28 days after preservation.

- To achieve the DQOs, QA measures will be implemented throughout the Variance Project to ensure that the data meet known and suitable data quality criteria such as accuracy, precision, representativeness, comparability, and completeness. Data quality will be evaluated based on the quality assurance acceptance criteria provided in the published methods used for the leaching and analysis performed for the decision inputs. In instances where no method guidance is provided, the default criteria listed on Table 7.1 will be used.

- Twenty percent (20%) of the produced will be validated against guidance from the "Inorganic National Functional Guidelines for Superfund Inorganic Methods Data Review" (US EPA, November 2020), and Environmental Standards, Inc.'s (Environmental Standards) Data Validation SOPs to provide additional guidance on the acceptability for use.

- Split samples of the leachate generated for the encapsulated end-product will be provide to a third-party reference laboratory for confirmation analyses.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

2.1 Project Organization

This section describes the organizational structure, lines of authority, and responsibilities of key project individuals. Project activities will be performed within the framework of the organization and functions described in this section. Emphasis is placed on the organization and entities responsible for implementation and administration of this QAPP.

2.2 US Ecology Nevada, Inc. Responsibilities

US Ecology personnel hold overall management responsibility for the Variance Project and will serve as the prime interface with US EPA. US Ecology Nevada, Inc. personnel are responsible for oversight of the mercury retort/distillation and mercuric sulfide encapsulation process.

2.3 Environmental Standards, Inc. Responsibilities

Under the direction of US Ecology Nevada, Inc., Environmental Standards, Inc. (Environmental Standards) is primarily responsible for the activities encompassing the quality oversight of sample collection, data processing, interpretation, presentation, and reporting, and the QA procedures and QC measures associated with these activities.

2.4 Contract Laboratory Organization and Responsibilities

The functional roles for the laboratory are described in this subsection of the QAPP. From the project perspective, the structure is designed to facilitate information exchange among the laboratory, US Ecology Nevada, Inc. personnel, and Environmental Standards. This exchange includes planning correspondence, technical requirements, schedules, and QA/QC measures. Project information exchange specifically includes sample identification; preservation procedures; sample container requirements; sample collection procedures; decontamination protocols; and sample labeling, packing, holding times, and shipping.

Although the internal laboratory structure may differ depending on the specific contractor, key functional roles will include division management, technical direction, subcontracting coordination, data review, and data management.

3.0 QUALITY ASSURANCE AND QUALITY CONTROL OBJECTIVES

3.1 General

DQOs are assessed by monitoring QA measures, such as accuracy, precision, representativeness, comparability, and completeness, as discussed in Subsection 1.3 of this QAPP. Specific quantitative DQOs are presented in detail in Section 7 of this QAPP. The objectives related to accuracy and precision of laboratory results are assessed through an evaluation of the results of QC samples.

3.2 Field and Laboratory Quality Control Samples

QA will be verified by maintaining site logs, by documenting field activities, and by collecting and analyzing QC samples. QC samples will be used to assess laboratory performance and gauge the likelihood of cross-contamination associated with both field and laboratory activities. QC samples will be collected and analyzed in conjunction with samples designated for laboratory analysis using US EPA methods.

Standard analytical QC checks that may be instituted by field and laboratory personnel include, but are not limited to, the following:

- Field duplicate samples
- Matrix spike/matrix spike duplicate (MS/MSD) samples
- Laboratory method blanks
- Laboratory control samples/laboratory control sample duplicates(LCS/LCSDs)
- Matrix spike/laboratory duplicate (MS/LD) samples

These types of QC samples are discussed in the following subsections. Field QC samples will be submitted to the laboratory using the same information as the associated investigative samples.

3.2.1 Field Duplicate Samples

Field duplicate samples are used to check for sampling and analytical error and reproducibility. One duplicate sample will be collected for every sample event. Duplicates will be analyzed for the same sample parameters specified for the associated investigative sample.

3.2.2 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

MS/MSD samples are investigative samples to which known amounts of constituents are added in the laboratory before extraction and analysis. MS/MSD samples are prepared, analyzed, and reported in the same manner as the associated samples, inclusive of clean-up procedures. The recoveries for spiked constituents can be used to assess how well the method used for analysis recovers target compounds in the site-specific sample matrices. For each matrix type, at least one set of MS/MSD samples will be analyzed for each batch of every 20 (or less) samples received. For inorganic analyses, a matrix spike and a laboratory duplicate (described below) can be utilized. The Project Manager and Field Team Leader will coordinate the collection of sufficient sample to allow for execution of MS/MSD or matrix spike and a laboratory duplicate on a project sample.

3.2.3 Laboratory Method Blanks

Method blanks consist of analyte-free materials (*e.g.*, reagent water) that are prepared in the same manner as the associated samples (*i.e.*, digested, extracted, distilled, cleanups, *etc.*) and that are analyzed and reported in the same manner as the associated investigative samples.

3.2.4 Laboratory Control Sample (LCS)

The LCS is a sample of laboratory-certified, reagent-grade matrix that is fortified (spiked) with the analytes of interest or a certified reference material that is prepared and analyzed. LCS samples are prepared, analyzed, and reported in the same manner as the associated samples, inclusive of cleanup procedures. LCS data are used to monitor analytical accuracy and laboratory performance.

3.2.5 Laboratory Duplicate Samples

Laboratory duplicate samples are obtained by splitting a field sample into two separate aliquots and performing separate preparation and analysis on the respective aliquots. The analysis of laboratory duplicate samples monitors precision; however, precision may be affected by sample heterogeneity, particularly in the case of non-aqueous samples. Laboratory duplicates will be analyzed and reported for inorganic analyses only. A laboratory duplicate will be analyzed with every batch of 20 (or less) field samples. The Project Manager and Field Team Leader will coordinate the collection of sufficient sample volume to allow for execution of a laboratory duplicate on a project sample.

4.0 SAMPLE IDENTIFICATION, DOCUMENTATION, AND CUSTODY

Field sampling personnel are responsible for the collection, description, documentation, labeling, packaging, storage, handling, and shipping of samples obtained in the field. These practices are necessary to ensure sample integrity from the time of collection through laboratory analysis and data reporting.

4.1 Sample Container and Preservation Requirements

Program samples submitted for analysis will be collected by US Ecology Nevada, Inc. personnel. The specific sample containers, preservatives, and analytical holding times associated with the various chemical analyses are presented in the Eurofins Environment Testing Northeast, LLC, Pittsburgh, Pennsylvania (Eurofins Pittsburgh) SOPs included in Attachment A of this document.

4.2 Documentation and Chain-of-Custody

Documentation and Chain-of-Custody procedures used to document sample shipment to the Laboratory are presented in the Eurofins Pittsburgh SOPs included in Attachment A of this document.

5.0 ANALYTICAL PROCEDURES

Routine analytical services are performed using standard US EPA-approved methodology. Analytical methods cited in this QAPP reference *The Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* (US EPA SW-846). Individual sample reporting limits may vary from the laboratory's routinely reported limits; this variance may be a result of dilution requirements, sample weight or volume used to perform the analysis, dry-weight adjustment for solid samples, the presence of analytical background contaminants, or other sample-related or analysis-related conditions.

5.1 Laboratory Analysis

5.1.1 Analytical Methods

As part of the characterization and assessment programs, various media, including solid source material and leachates, will be analyzed for the constituents of concern. Samples collected as part of these studies may be analyzed for the following parameters as identified on Table 5-1.

The specific SOPs to be used for the analysis of samples are referenced in Appendix A of this document. Note that Total Sulfur will be performed by Eurofins Lancaster Laboratories Environmental.

Table 5.1: List of Analytical Methods

Analyte	Matrices	Method
TCLP Extraction	solid	SW-846 Method 1311
LEAF Extraction	solid	SW-846 Method 1314, 1315
Mercury	solid, leachate	SW-846 Methods 7470A/7471
Metals	solid, leachate	SW-846 Methods 6010/6020
Anions	leachate	SW-846 Method 9056A
Total Organic Carbon	leachate	SW-846 Method 9060A
Total Inorganic Carbon	leachate	SW-846 Method 9060A
pH	leachate	SW-846 Method 9040
Conductivity	leachate	SW-846 Method 9050A
ORP	leachate	Standard Methods 2580B
Reactive/Free Sulfide	leachate	SW-846 Chapter 7
Total Sulfur	leachate	SW-846 Methods 6010

6.0 DATA REDUCTION, VALIDATION, AND REPORTING

Criteria for analytical data review/verification include checks for internal consistency, transmittal errors, laboratory protocol, and laboratory QC. QC sample results and information documented in field notes will be used to interpret and evaluate laboratory data. The laboratory QA Department will independently conduct a complete review of selected reports to determine analytical results.

The laboratory will complete standard validation procedures, including:

- Proofing analyses requested with analyses performed
- Preliminary data proofing for anomalies - investigation and corrections, where possible
- Proofing of laboratory data sheets for detection limits, holding times, surrogate recovery performance, and spike recovery performance
- Double-checking computerized data entry, if applicable

The Laboratory Project Manager will review data for consistency and reasonableness with other generated data and determine whether program requirements have been satisfied. Selected hardcopy output of data will be reviewed to ensure that results are interpreted correctly. Unusual or unexpected results will be reviewed, and a resolution will be made as to whether the analyses should be repeated. In addition, the Laboratory Project Manager may recalculate selected results to verify the calculation procedure.

Prior to final review/signoff by the Laboratory Project Manager, the Data Reporting Department will verify that the report deliverable is complete and in proper format, screen the report for compliance to laboratory and client QA/QC requirements, and ensure that the Case Narrative addresses noted deficiencies. The Laboratory Project Manager will perform the final laboratory review prior to reporting the results to the Environmental Standards Project Manager.

The QA Department or Laboratory QA Coordinator will independently conduct a complete review of selected projects to determine whether laboratory and client QA/QC requirements have been met. Discrepancies will be reported to the Laboratory Project Manager for resolution.

In addition, analytical results will be reported in full “CLP-like” (as applicable to the SW-846 QC criteria) documentation data packages sufficient to support independent data validation. The following items will be included in the CLP-like data package report:

- Cover page/laboratory chronicle
- Completed Chain-of-Custody sample request form
- Sample data (including QC sample) results
- Case Narrative describing laboratory data qualifiers, sample collection, sample preparation and analysis dates, and technical problems encountered with the analysis
- CLP report forms or equivalent information, including QC result forms
- Associated raw data for standards and samples

QC results include method blank, MS/MSD samples, and the results of the field QC samples, in addition to LCS results. Sample data results (including QC sample results) will also be entered into the program data management system. Laboratories are responsible for reviewing the electronic data to ensure that these data are consistent with the CLP-like reports.

6.1 Data Review and Validation

The purpose of analytical data validation is to identify and eliminate unacceptable data and to qualify data for data quality limitations identified during validation. In addition to the laboratory QA review, the CLP-like reports will be evaluated by the Data Administrator for the following:

- Compliance with requested testing
- Completeness
- Confirmation of receipt of requested items

The following parameters will be independently evaluated, as discussed in Subsection 8.2 of this QAPP:

- Holding times
- Method blank results
- Field blank results
- Media blank results
- MS/MSD results
- Laboratory duplicate results
- LCS results
- Field duplicate results
- Percent solids

Based on the electronic analytical data evaluation, data that does not meet the DQOs will be properly qualified (flagged) in the database and included in the data validation report; otherwise, data will be used as supplied by the laboratory. In addition, 25 % of the data will be independently validated by the Environmental Standards Data Validator, or equivalent, who will validate the data with guidance from the “Inorganic National Functional Guidelines for Superfund Inorganic Methods Data Review” (US EPA, November 2020), and the Environmental Standards Data Validation SOPs.

7.0 DATA ASSESSMENT PROCEDURES AND CRITERIA

The overall QA objective for field activities, data analyses, and laboratory analyses is to produce data of sufficient and known quality to support the investigation. Specifically, data will be gathered or developed using procedures appropriate for the intended use.

Standard procedures are used so that known and acceptable levels of accuracy, precision, representativeness, completeness, and comparability are maintained for each data set. Descriptions of these criteria are presented in the following subsections.

Laboratories must develop internal precision and accuracy limits for the methods that they perform and must be applied to work performed under this QAPP unless otherwise specified. In the absence of QA/QC objectives defined by a site-specific SAP or the laboratory, the limits summarized on Tables 7-1 shall be used.

7.1 Precision

The degree of agreement between the numerical values of a set of duplicate samples performed in an identical fashion constitutes the precision of the measurement.

During the collection of data using field methods and/or instruments, precision is checked by reporting measurements at one location and comparing results. For example, water-level measurements are taken three times at a well and the values compared. The measurements are considered sufficiently precise only if the values are within a specified percentage of each other.

Analytical precision is calculated by expressing, as a percentage, the relative difference between results of analyses of laboratory duplicate samples for a given analyte. Precision is expressed by the following formula:

$$\text{RPD} = \left| \frac{(C_1 - C_2)}{(C_1 + C_2)/2} \right| \times 100\%$$

Where: C_1 = Value of original sample
C_2 = Value of duplicate sample

Typical precision objectives for laboratory duplicate samples, including MSDs, are presented on Table 7-1.

For solid field duplicate samples, the acceptance criterion is 40% relative percent difference (RPD) if both results are ≥ 5× the project-required reporting limit (PRRL). The acceptance criterion is that the difference must be < 2× the PRRL if at least one of the results is < 5× the PRRL.

For aqueous and air, field duplicate samples, the acceptance criterion is 20% RPD if both results are ≥ 5× the PRRL. The acceptance criterion is that the difference must be less than the PRRL if at least one result is < 5× the PRRL.

Table 7-1: Typical Precision and Accuracy Objectives for Laboratory QC Samples

Parameter	Method	Matrix	Matrix Spike Accuracy (% Recovery)	Duplicate Precision (RPD)[1]	Laboratory Control Standard Accuracy (% Recovery)
Metals	SW-846 – Method 6010/6020	solid	75-125	35[2]	80-120
TCLP Metals	SW-846 – Method 1311 Prep/6010/6020	leachate	75-125	20	80-120
LEAF Metals	SW-846 – Method 1314 Prep/6010/6020	leachate	75-125	20	80-120
Mercury	SW-846 – Method 7471A	solid	80-120	35[2]	80-120
TCLP Mercury	SW-846 – Method 1311 Prep/7470A	water	75-125	20	80-120
LEAF Mercury	SW-846 – Method 1314, 1315-Prep/7470A	leachate	75-125	20	80-120

Notes:

[1] Duplicate precision is anticipated for MS/MSD analyses and for sample/laboratory duplicate analyses.

[2] If at least one result is < 5× the sample-specific PRRL, the acceptance limit is that the difference between the results must be < 2× the PRRL.

7.2 Accuracy

Accuracy is the degree of agreement of a measurement, X, with an accepted reference or true value, T. Accuracy is usually expressed as the difference between the two values, X-T, or the difference as a percentage of the reference or true value, 100(X-T)/T; accuracy is sometimes expressed as a ratio, X/T. Accuracy, which is a measure of the bias in a system, is assessed by means of reference samples and percent recoveries. Error may arise from personal, instrumental, or methods factors.

The accuracy of data collected using field instruments is difficult to quantify; however, accuracy can be qualitatively maximized by strict adherence to standard protocols and, where applicable, to manufacturer operating and calibration procedures. Strict adherence to protocols will ensure that the data are accurate and within manufacturer reported accuracy limits.

The two types of analytical check samples used are LCSs and MS samples. Analytical accuracy is expressed as the percent recovery of an analyte that has been added to the control sample or a standard matrix (*e.g.*, blank soil, analyte-free water, *etc.*) at a known concentration prior to analysis.

The formula used to calculate accuracy for the LCS is:

$$\text{Accuracy} = \% \text{ Recovery} = (A^T / A^F) \times 100$$

Where: A^T = The total concentration of the analyte measured or recovered
A^F = The concentration of the analyte spiked

When calculating accuracy in the MS analysis, a correction for background concentration found in the unspiked sample must be made. The formula is:

$$\text{Accuracy} = \%\ \text{Recovery} = \frac{A^T - A^O}{A^F} \times 100$$

Where: A^T = The total concentration of the analyte measured or recovered
A^O = The unspiked concentration of the analyte
A^F = The concentration of the analyte spiked

In general, the accuracy objectives (provided on Table 7-1) are based on those specified in the analytical method. Limits developed by the laboratory or those detailed in site-specific Sampling and Analysis Plans supersede those listed on Table 7-1.

Accuracy objectives for field measurements will equal equipment manufacturer's specifications.

7.3 Completeness

Completeness is a measure of the degree to which the amount of sample data collected meets the needs of the sampling program and is quantified as the relative number of analytical data points that meet the acceptance criteria (including accuracy, precision, and other criteria required by the specific analytical method used). Completeness is defined as a comparison of actual numbers of usable data points and expected numbers of points expressed as a percentage.

The QA objectives for completeness will be based upon laboratory QA protocols. The ability to meet or exceed this completeness objective is dependent on the nature of samples submitted for analysis. If data cannot be reported without qualifications, project completion goals may still be met if the qualified data (*i.e.*, data of known quality, even if not perfect) are suitable for specified project goals.

Difficulties encountered while handling samples in the laboratory, as well as unforeseen complications regarding analytical methods, may affect completeness during sample analysis. For example, the proposed analytical methods are intended to analyze "environmental samples" (low-level and medium-level concentrations). Using these methods to analyze unknown or hazardous-level samples may result in poor performance, which would adversely impact the data completeness goal.

Access to various areas and/or media and unanticipated difficulties with sample collection affect field data completeness. For example, poor sample recovery in a split-spoon sampler reduces the number of soil samples that can be collected, and therefore, affects the completeness. The minimum goal for completeness is 90%, and the ability to exceed this goal is dependent on the applicability of the analytical methods to the sample matrices analyzed.

7.4 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter associated with the proper design of the sampling program. The representativeness criterion can be met by the proper selection of sampling locations and the collection of a sufficient number of samples.

Representativeness is addressed by describing sampling techniques and the rationale used to select sampling locations. US EPA and ASTM-approved and standardized sampling procedures will be used to ensure the representativeness of sample data.

7.5 Comparability

Comparability is a qualitative parameter used to express the confidence with which one data set can be compared with another. The comparability of the data, a relative measure, is influenced by sampling and analytical procedures. By providing specific protocols to use for obtaining and analyzing samples, data sets should be comparable regardless of who collects the sample or who performs the sample analysis.

The analytical laboratory will be responsible for enhancing comparability using the following controls:

- Adherence to current, standard US EPA-approved methodology, except where specified in the QAPP for sample preservation and analysis and holding time determination
- Consistent reporting units for each parameter of similar matrices
- NIST-traceable standards, when available
- Participation in inter-laboratory performance evaluation studies

8.0 FEEDBACK AND CORRECTIVE ACTION

8.1 Feedback Mechanism

There are mechanisms within the project structure that allow for the identification, feedback, and control of non-conformances or deficiencies. In general, the technical personnel involved with the project are responsible for reporting suspected technical non-conformances through standard communication channels established by the organizational structure. In the same manner, project personnel are responsible for reporting suspected QA non-conformances.

8.2 Corrective Action

8.2.1 Field Activities

Field personnel have the initial responsibility to monitor the quality of field measurements and observations. The Field Team Leader is responsible for verifying that QC procedures are followed. This responsibility requires the Field Team Leader to assess the correctness of field methods and the ability to meet QA objectives. If a problem occurs that might jeopardize the integrity of the project or that might cause a specific QA objective to not be met, the Field Team Leader will notify the Environmental Standards Project Manager and the appropriate technical QA Officer. An appropriate corrective action will then be determined and implemented. The Field Team Leader will document the problem, the corrective action, and the results.

8.2.2 Laboratory Corrective Action

The individual contract laboratory has the responsibility to monitor the quality of the analytical system. The laboratory will verify that QC procedures are followed and that the results of QC analyses samples are within the acceptance criteria. This verification requires that the laboratory assess the correctness of the following items, as appropriate:

- Sample preparation procedure
- Initial calibration
- Calibration verification
- Method blank result
- Laboratory control sample
- Laboratory duplicate analysis
- Fortified sample result
- Internal standard performance

If the assessment reveals that the QC acceptance criteria are not met, the laboratory must immediately evaluate the analytical system and correct the problem. The Analyst will notify the Laboratory Section Manager and QA Coordinator of the problem and, if possible, will identify potential causes and suggest corrective action.

The nature of the corrective action obviously depends on the nature of the problem. For example, if a continuing calibration verification is determined to be out-of-control, the corrective action may require recalibration of the analytical system and reanalysis of samples analyzed since the last acceptable continuing calibration standard.

When the appropriate corrective action measures have been defined and the analytical system is determined to be “in control,” the Analyst will document the problem, the corrective action, and the data demonstrating that the analytical system is in control. Copies of the documentation will be provided to the Laboratory Section Manager and QA Coordinator.

Data generated concurrently with an out-of-control system will be evaluated for usability relative to the nature of the deficiency. If the deficiency does not impair the usability of the results, data will be reported and the deficiency will be addressed in the Case Narrative. If sample results are impaired, the Laboratory Project Manager will be notified and appropriate corrective action (*e.g.*, reanalysis) will be taken.

The specific approach to corrective action procedures for laboratory instruments will be those contained in the participating laboratory’s SOPs and QAPPs.

9.0 QUALITY ASSURANCE REPORTS

9.1 Data Validation Reports

The Environmental Standards Project Manager will provide data validation reports to the US Ecology Nevada, Inc. Project Manager, for samples that undergo data validation. These reports will summarize reporting and data usability issues relative to the analytical parameters evaluated. The Project Manager will be immediately notified about reporting and data usability issues that require corrective action.

APPENDIX A
STANDARD OPERATING PROCEDURES (SOPS)

eurofins	Always check on-line for validity. **Toxicity Characteristic Leaching Procedure and Synthetic Precipitation Leaching Procedure**	Level: **Standard Operating Procedure**
Document number: **PIT-ORG-TCLP-SOP45839**		
Old Reference: **PT-OP-004**		
Version: **10**		Organisation level: **4-Business Unit**
Approved by: **LU4M** Effective Date: **27-APR-2022**	Document users: **6_EUUS79_PIT_Organic Prep_TCLP-SPLP_ASTM Leaching**	Responsible:

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19) Appendix

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1) Scope and Application

1.1)
This SOP describes the application of the Toxicity Characteristic Leaching Procedure (TCLP), SW846 Method 1311. The Toxicity Characteristic (TC) of a waste material is established by determining the levels of 8 metals and 31 organic chemicals in the aqueous leachate of a waste. The TC is one of four criteria in 40 CFR Part 261 to determine whether a solid waste is classified as a hazardous waste. The TC Rule utilizes the TCLP method to generate the leachate under controlled conditions that are designed to simulate leaching through a landfill. EPA's "worst case" waste disposal model assumes mismanaged wastes will be exposed to leaching by the acidic fluids generated in municipal landfills. The EPA's model also assumes the acid/base characteristics of the waste will be dominated by the landfill fluids. The TCLP procedure directs the testing laboratory to use a more acidic leaching fluid if the sample is an alkaline waste, again in keeping with the model's assumption that the acid fluids will dominate leaching chemistry over time.

1.2)
A specific list of TC analytes and regulatory limits may be found in Appendix A, Table 3

1.2.1)
Note: The list in Appendix A does not include the December 1994 EPA rule for Universal Treatment Standards for Land Disposal Restrictions. Those requirements include 216 specific metallic and organic compounds and, in some cases, lower detection limit requirements (see 40 CFR 268.40). TCLP leachates are part of the new Universal Treatment Standards, but the conventional analytical methods will not necessarily meet the new regulatory limits. Consult with the client and with TestAmerica Technical Specialists before establishing the instrumental methods for these regulations.

1.3)
This SOP also describes the application of the Synthetic Precipitation Leaching Procedure (SPLP) that was designed to simulate the leaching that would occur if a waste was disposed in a landfill and exposed only to percolating rain water. The procedure is based on SW846 Method 1312. The list of analytes for SPLP may extend beyond the toxicity characteristic compounds shown in Appendix A. With the exception of the use of a modified extraction fluid, the SPLP and TCLP protocols are essentially equivalent. Where slight differences may exist between the SPLP and TCLP they are distinguished within this SOP.

1.4)
The procedure is applicable to liquid, solid, wastes and multiphasic wastes.

1.5)
The results obtained are highly dependent on the pH of the extracting solution, the length of time that the sample is exposed to the extracting solution, the temperature during extraction, and the particle size/surface area of the sample. These parameters must be carefully controlled. Any deviations from the method affecting these parameters must be documented as a nonconformance, with a cause and corrective action described.

1.6)
The reporting limits are based on the individual samples as well as the individual analysis techniques. However, the sample is determined to be hazardous if it contains any analyte at levels greater than or equal to the regulatory limits.

1.7)
If a total analysis of the waste demonstrates that individual analytes are not present in the waste, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, the TCLP procedure need not be run. If the total analysis results indicate that TCLP is not required, the decision to cease TCLP analysis should be remanded to the client.

1.8)
If an analysis of any one of the liquid fractions of the procedure leachate indicates that a regulated compound is present at such a high concentration that, even after accounting for dilution from the other fractions of the leachate, the concentration would be equal to or above the regulatory level for that compound, then the waste is hazardous and it may not be necessary to analyze the remaining fractions of the leachate. However, the remaining analyses should not be terminated without the approval of the client.

1.9)
Volatile organic analysis of the leachate obtained using a bottle extraction, normally used for extractable organics and metals, can be used to demonstrate that a waste is hazardous, but only the ZHE option can be used to demonstrate that the concentration of volatile organic compounds is below regulatory limits.

1.10)
On occasion clients may request modifications to this SOP. These modifications are handled as indicated in PT-QA-M-001, Quality Assurance Manual.

1.11)
One-time procedural variations are allowed only if deemed necessary in the professional judgment of management to accommodate variation in sample matrix, radioactivity, chemistry, sample size, or other parameters. Any variation in procedure shall be completely documented on a Nonconformance Memo kept in the project file and described in the final report. The variation must be approved by the Project Manager and Technical Director or QA Manager. Any unauthorized deviations from this procedure must also be documented as a nonconformance, with a cause and corrective action described.
NOTE: TCLP is a "method defined parameter" as such any changes from the method may invalidate the analytical results. Careful consideration by the technical staff and discussion with the QA department is required before any procedural changes occur.

1.12)
For subsampling procedures refer to SOP PT-QA-024.

2) Summary of Method

2.1)
For liquid wastes that contain less than 0.5% dry solid material, the waste, after filtration through 0.6 to 0.8 μ m glass fiber filter, is defined as the TCLP or SPLP leachate.

2.2)
For wastes containing greater than or equal to 0.5% solids, the liquid, if any, is separated from the solids and stored for later analysis. The particle size of the remaining solid phase is reduced, if necessary. The solid phase is extracted with an amount of extraction fluid equal to 20 times the weight of the solid phase. For TCLP, the extraction fluid employed for extraction of non-volatile analytes is a function of the alkalinity of the solid phase of the waste. For SPLP, the extraction fluid employed is a function of the region of the country where the sample site is located if the sample is a soil. Two leachates may be generated: a) one for analysis of non-volatile constituents (semi-volatile organics, pesticides, herbicides and metals and/or b) one from a

Zero Headspace Extractor (ZHE) for analysis of volatile organic constituents. Following extraction, the liquid leachate is separated from the solid phase by filtration through a 0.6 to 0.8 μm fiber filter.

2.3)
If compatible (i.e., multiple phases will not form on combination), the initial liquid phase of the waste is added to the liquid leachate and these are prepared and analyzed together. If incompatible, the liquids are analyzed separately and the results are mathematically combined to yield a volume-weighted average concentration.

3) Definitions

3.1)
Leachate - the TCLP or SPLP extract (aqueous solution) generated from this procedure.

3.2)
Percent Wet Solids - that fraction of a waste sample (as a percentage of the total sample) from which no liquid may be forced out by an applied pressure.

3.3)
TALS – TestAmerica Laboratory Information Management System.

3 .4)
NCM - Non-Conformance Memo – a system within TALS for the lab to communicate to project management and others when there is an anomaly seen with the samples or batch, or a QC failure.

3.5)
Refer to the glossary in the Quality Assurance Manual PT-QA-M-001 for additional definitions.

4) Interferences

4.1)
Oily wastes may present unusual filtration and drying problems. As recommended by EPA (see Figure 3), oily wastes will be evaluated on an individual basis. This applies specifically to samples containing viscous non-aqueous liquids that would be difficult to filter.

4.2)
Wastes containing free organic liquids (i.e., those with separable non-aqueous liquid phases) will be assumed to be 100% liquid and totals analysis will be performed to determine if the oil exceeds TCLP limits.

4.3)
Solvents, reagents, glassware and other sample processing hardware may yield artifacts and/or interferences to sample analysis. All these materials must be demonstrated to be free from interferences under the conditions of the analysis by analyzing method blanks as described in the Section 9.0 and the individual determinative SOPs.

4.4)
Glassware and equipment contamination may result in analyte degradation. Soap residue on glassware and equipment may contribute to this. All glassware and equipment should be rinsed very carefully to avoid contamination.

4.5)
Phthalates may be eliminated by proper glassware cleanup and by avoiding plastics. Only glass, Teflon, or Type 316 stainless steel tumblers may be used for leachates to be analyzed for organics. Plastic tumblers may be used for leachates to be analyzed for metals only.

4.6)
Overexposure of the sample to the environment will result in the loss of volatile components.

4.7)
Potential interferences that may be encountered during analysis are discussed in the individual analytical methods.

5) Safety

5.1)
Employees must abide by the policies and procedures in the Corporate Environmental Health and Safety Manual (CW-E-M-001), the Pittsburgh Facility Addendum EH&S Manual (PT-HS-001) and this document. This procedure may involve hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum.

5.2)
The following is a list of the materials used in this method, which have a serious or significant hazard rating. This list does not include all materials used in the method. The table contains a summary of the primary hazards listed in the SDS for each of the materials listed in the table. A complete list of materials used in the method can be found in the reagents and materials section. Employees must review the information in the SDS for each material before using it for the first time or when there are major changes to the SDS.

Material (1)	Hazards	Exposure Limit (2)	Signs and Symptoms of Exposure
Acetic Acid	Corrosive Poison Flammable	10 ppm- TWA	Contact with concentrated solution may cause serious damage to the skin and eyes. Inhalation of concentrated vapors may cause serious damage to the lining of the nose, throat, and lungs. Breathing difficulties may occur.
Hydrochloric Acid	Corrosive Poison	5 ppm- Ceiling	Inhalation of vapors can cause coughing, chocking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary

			edema, circulatory failure and death. Can cause redness, pain and severe skin burns. Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
Nitric Acid	Corrosive Oxidizer Poison	2ppm-TWA 4ppm-STEL	Nitric acid is extremely hazardous; it is a corrosive reactive, an oxidizer and a poison. Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract. Can cause redness, pain and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow brown color. Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
Sodium Hydroxide	Corrosive	2Mg/M3- Ceiling	Severe irritant. Effects from inhalation of dust or mist vary from mild irritation to serious damage of the upper respiratory tract, depending on severity of exposure. Symptoms may include sneezing, sore throat or running nose. Contact with skin can cause irritation or severe burns and scarring with greater exposures. Causes of irritation of eyes, and with greater exposures it can cause burns that may result in permanent impairment of vision, even blindness.

1- Always add acid to water to prevent violent reactions.
2- Exposure limit refers to the OSHA regulatory exposure limit.

5.3)
Eye protection that protects against splash, laboratory coat, and appropriate gloves must be worn while samples, standards, solvents, and reagents are being handled. Cut resistant gloves must be worn doing any

other task that presents a strong possibility of getting cut. Disposable gloves that have become contaminated will be removed and discarded, other gloves will be cleaned immediately.

5.4)
Gas pressurized equipment is employed in this procedure. Be sure all valves and gauges are operating properly and that none of the equipment, especially tubing, is over-pressurized. **CAUTION:** Do not open equipment that has been pressurized until it has returned to ambient pressure.

5.5)
A rotary agitation apparatus is used in this procedure. Certain samples may break the glass jars used in the procedure. For these samples, extra caution, including plastic or polyethylene overwraps of the glass jar, may be necessary.

5.6)
Secure the tumbler and extraction apparatus before starting rotary agitation apparatus. Once the tumbler apparatus is started the area around the apparatus is roped off to prevent injury.

5.7)
During sample rotation, pressure may build up inside the bottle. Periodic venting of the bottle will relieve pressure.

5.8)
Exposure to chemicals must be maintained as low as reasonably achievable, therefore, unless they are known to be non-hazardous, all samples must be opened, transferred and prepared in a fume hood, or under other means of mechanical ventilation. Solvent and waste containers will be kept closed unless transfers are being made.

5.9)
The preparation of standards and reagents and glassware cleaning procedures that involve solvents such as methylene chloride will be conducted in a fume hood, outside of the TCLP room, with the sash closed as far as the operation will permit.

5.10)
All work must be stopped in the event of a known or potential compromise to the health and safety of a TestAmerica associate. The situation must be reported **immediately** to a laboratory supervisor or EH&S coordinator.

5.11)
Due to the potential for ignition and/or flammability, do not attempt to dry non-aqueous liquid samples in an oven.

6) Equipment and Supplies

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met.

6.1) Extraction vessels

6.1.1)
For volatile analytes - zero-headspace extraction (ZHE) vessel, gas-pressure actuated, Millipore YT3009OHW or equivalent (see Figure 2 in Appendix B).

6.1.2)
For metals - either borosilicate glass jars (2.5 L plastic-coated, with Teflon lid inserts) or 2 L HDPE (Nalgene or equivalent) bottles may be used.

6.1.3)
For non-volatile organics - only borosilicate glass may be used.

6.2)
Vacuum filtration apparatus, capable of 0 - 50 psi and stainless steel pressure filtration apparatus (142 mm diameter), capable of 0 - 50 psi.

6.3) Borosilicate glass fiber filters, 0.6 - 0.8 μm (Whatman GF/F 14.2 cm, 0.7 μm or equivalent). When analyzing for metals, wash the filters with 1 N nitric acid and deionized water prior to use. As an alternative, certified pre-washed filters may be used. Glass fiber filters are fragile and should be handled with care.

6.4)
Rotary agitation apparatus, multiple-vessel - Associated Design and Manufacturing Company 3740-6 or equivalent (see Figure 1). The apparatus must be capable of rotating the extraction vessel in an end-over-end fashion at 30 ± 2 rpm.

6.5)
ZHE Extract Collection Devices are used to collect the initial liquid phase and the final extract of the waste from the ZHE device, either of the following may be used:

6.5.1)
Gas-tight syringes, 100 mL capacity, Hamilton 0158330 or equivalent,

6.5.2)
or dispense leachate directly into a VOA vial.

6.6)
Top loading balance, capable of 0 - 4000 ± 0.01g (all measurements are to be within ± 0.1 grams).

6.7)
pH meter and probe capable of reading to the nearest 0.01 unit, and with automatic temperature compensation. (Accumet XL150 pH meter or equivalent).

6.8)
Magnetic stirrer/hotplate and stirring bars.

6.9)
VOA vials, 40 mL, with caps and septa.

6.10)
Glass jars, 1/2 - 1 gallon, with Teflon lid-liners.

6.11)
Nalgene plastic bottles, 1 liter.

6.12)
Peristaltic pump, Cole Parmer or equivalent

6.13)
Miscellaneous laboratory glassware and equipment.

7) Reagents and Standards

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirement in this SOP can be met. Please refer to the SDS prior to the use of any reagent or standard.
Reagent grade, or better, chemicals must be used unless otherwise indicated. Follow manufacturer's instructions for storage and expiration.

7.1)
Reagent water for non-volatile constituents must be produced by a Millipore DI system or equivalent. For volatile constituents, water must be passed through an activated carbon filter bed (Milli-Q or tap water passed through activated carbon). Reagent water must be free of the analytes of interest as demonstrated through the analysis of method blanks.

7.2)
Hydrochloric acid, 1 N: Carefully add 83.3 mL concentrated HCl to 800 mL reagent water, cool and dilute to 1 liter with reagent water. Cap and shake to mix well. Store at room temperature. This solution expires 1 year after preparation.

CAUTION: Always add acid to water to avoid splattering.

7.3)
Nitric acid, concentrated, (HNO_3)

7.4)
Sodium hydroxide, 1 N, purchased or prepared: Carefully add 40 g reagent grade NaOH pellets to 800 mL reagent water, stir until the pellets are completely dissolved, cool and dilute to 1 liter with reagent water. Store at room temperature. If prepared in the laboratory, this solution expires 1 year after preparation.

CAUTION: Significant heat is generated in the preparation of this reagent.

7.5)
Acetic acid, glacial: concentrated, reagent grade liquid (HOAc).

7.6)
pH calibration solutions: pH Buffers of 2, 4, 7, 10 and 13 - Purchased with certificate of analysis. A fresh portion of buffer solution must be used each day of analysis.

7.7) TCLP Leaching Fluids

7.7.1)
The pH of both solutions listed below must be checked and recorded daily with use. The pH meter/probe must be calibrated prior to daily use.

7.7.2)
TCLP Leaching Fluid 1 is purchased from Ricca Chemical Company, TCLP Leaching Fluid 2 is purchased from Lab Chem. Fluids may be prepared following the procedure outlined in sections 7.7.5 and 7.7.6. If prepared in the laboratory, the solution expires 1 year after preparation, or if the pH falls outside the required range.

7.7.3)
The leaching fluids MUST be prepared correctly. If the desired pH range is not achieved and maintained, the TCLP may yield erroneous results due to improper leaching. If the pH is not within the specifications, the fluid must be discarded and fresh extraction fluid prepared. The pH of purchased and prepared TCLP fluids must be checked prior to each day's use, and the actual pH is recorded in the TALS batch.

7.7.4)
Additional volumes of extraction fluids listed above may be prepared by multiplying the amounts of acetic acid and NaOH by the number of liters of extraction fluid required.

7.7.5)
TCLP Fluid #1: Carefully add 5.7 mL glacial acetic acid and 64.3 mL of 1 N NaOH to 500 mL reagent water in a 1 liter volumetric flask. Dilute to a final volume of 1 L with reagent water, cap and shake to mix well. When correctly prepared, the pH of this solution is 4.93 ± 0.05.

7.7.6)
TCLP Fluid #2: Carefully add 5.7 mL glacial acetic acid to 500 mL reagent water in a 1 liter volumetric flask. Dilute to a final volume of 1 L with reagent water, cap and shake to mix well. When correctly prepared, the pH of this solution is 2.88 ± 0.05.

7.8)
Nitric acid, 20% solution: Slowly and carefully add 200 mL concentrated HNO_3 to 800 mL reagent water. Cap and shake to mix well. Store at room temperature. This solution expires 1 year after preparation.

7.9)
Sulfuric acid / nitric acid - 60/40 weight percent mixture. Cautiously mix 60 g of concentrated sulfuric acid with 40 g of concentrated nitric acid. Store at room temperature. This solution expires 1 year after preparation.

7.10) SPLP Leaching fluids

7.10.1)
SPLP Leaching Fluids are purchased from Lab Chem Inc. or prepared following the procedures outlined below. The pH of SPLP fluids must be checked prior to each day's use. If not within specifications, the fluid is discarded and fresh fluid prepared.

7.10.2)
SPLP fluid #1: Add 60/40 weight percent mixture of sulfuric and nitric acids (7.9) to reagent water until the pH is 4.20 ± 0.05. This fluid is used for soils from a site that is east of the Mississippi River and for wastes and wastewaters.

7.10.3)
SPLP fluid #2: Fluid #1 is diluted with laboratory reagent water until the pH is 5.00 ± 0.05. This fluid is used for soils from a site that is west of the Mississippi River.

7.10.4)
DI Water for SPLP Volatiles leaching - This is laboratory reagent water. SPLP leaching for Volatiles and always performed with DI water only. Additionally, any cyanide-containing waste or soil is leached with DI water because leaching of cyanide containing samples under acidic conditions may result in the formation of hydrogen cyanide gas.

7.11)
Methanol - used to aid in cleaning oil-contaminated equipment

7.12)
Metals Spiking Standards – See Table 4 at the end of this document for details

7.13)
Nitric Acid, concentrated – used for preserving leachates' MS/MSD volume for metals analysis. Sample aliquots for metals are filtered directly into pre-preserved bottles containing nitric acid.

8) Sample Collection, Preservation, Shipment and Storage

8.1)
Samples being analyzed for non-volatile organic compounds should be collected and stored in glass containers with Teflon lid liners.

8.2)
Samples being analyzed for metals only can be collected in either glass or polyethylene containers.

8.3)
When the waste is to be evaluated for volatile analytes, care should be taken to minimize the loss of volatiles. Samples shall be collected and stored in a manner intended to prevent the loss of volatile analytes (e.g., samples should be collected in Teflon lined septum capped vials with minimal headspace and stored at >0.0 °C but ≤6.0°C).

8.3.1)
Samples should not be cooled for shipment or storage <u>if doing so will change the composition of the sample.</u>

8.3.2)
Samples should be opened only immediately prior to extraction.

8.4)
Samples must not have any chemical preservation prior to leaching. Chemical preservatives are never added to leachates generated for organic analysis. Chemical preservation is added only to inorganic parameters after leaching and filtration.

8.5)

Samples should be refrigerated to >0.0 ^{o} C but ≤6.0°C, unless refrigeration results in irreversible physical changes to the waste. If precipitation occurs, the entire sample (including precipitate) should be extracted.

8.6)
The minimum TCLP or SPLP sample collection size is determined by the physical state or states of the waste and the analytes of concern. The amount of waste required varies with the percent solids. The lower the percent solids, the more waste will be required for preliminary and final testing. For aqueous samples containing between 0.5 and 10% solids, several kilograms of sample are required to complete the analyses. The general minimal requirements when the samples are 100% solids include: 1 - 32 oz jar for semi-volatile organic analysis and metals, and 1 - 4 oz jar for volatile organic analysis. Low-density sample materials, such as rags or vegetation, will require larger volumes of sample. For liquid samples (less than 50% solids), minimum requirements are 2 - 32 oz jars for semi-volatile organic analysis and metals, and 2 - 8 oz jars for volatile organic analysis. If volatile organic analysis is the only requested parameter, 2 separate jars are required. If matrix spike or duplicate control samples are requested, additional sample volume is required. If sufficient sample volumes were not received, analyses cannot be started and the client should be notified as soon as possible. Reduced volume will only be done if there is insufficient sample received from the client.

8.7)
TCLP or SPLP leachates should be prepared for analysis and analyzed as soon as possible following extraction. Leachates or portions of leachates for metallic analyte determinations must be acidified with nitric acid to a pH less than 2, unless precipitation occurs. If precipitation occurs upon addition of nitric acid to a small aliquot of the leachate, then the remaining portion of the leachate shall not be acidified and the leachate shall be analyzed as soon as possible. All other leachates should be stored under refrigeration (>0.0 ^{o} C but ≤6.0°C) until analyzed. ZHE leachates must be stored in VOA vials filled to eliminate all headspace.

8.8)
Samples are subject to appropriate treatment within the following time periods:

Table 1 – Holding Times

Parameter	Collection to Start of TCLP/SPLP Leach	End of TCLP/SPLP Tumble to Semi-Volatile Extraction	End of TCLP/SPLP Leach or Semi-volatile Extraction to Analysis
Volatiles	14	N/A	14
Semivolatiles	14	7	40
Mercury	28	N/A	28
Other Metals	180	N/A	180

NOTE: The initial holding time is measured from date of collection to date TCLP/SPLP extraction started. (This should be the TCLP/SPLP extraction date in TALS LIMS.) Semi-volatile method prep holding time is measured from the day tumbling is complete to the start of method extraction. Subsequent analysis holding times are measured from the date extraction (TCLP/SPLP or method prep) starts**.** If sample holding times are exceeded, the values obtained will be considered minimal concentrations. Exceeding holding times is not acceptable in establishing that a waste does not exceed the regulatory level. Exceeding the holding time will not invalidate characterization if the waste exceeds the regulatory limit. The Total Elapsed Time is to be used as guidance. If preps are initiated at the last possible moment of a holding time, the elapsed times may be exceeded.

9) Quality Control

9.1)
A Quality Control Batch (QC Batch) is a set of up to 20 field samples of similar matrix that behave similarly and are processed using the same procedures, reagents and standards within the same time period. The same lot of reagents must be used within a batch. A minimum of one TCLP/SPLP extraction blank (Method Blank), and enough leachate to prepare one Matrix Spike (MS), and one Matrix Spike Duplicate (MSD) are required with each TCLP/SPLP leachate batch.

9.2) TCLP/SPLP Extraction Blanks - A minimum of one blank (using the same extraction fluid as used for the samples) must be prepared and analyzed for every batch of samples extracted in a particular vessel type. The blanks are generated in the same way as the samples (i.e., blanks will be tumbled and filtered with the samples). Consult the individual analytical Method SOPs for blank acceptance criteria.

Note: ZHE vessels are uniquely numbered. Each time a new batch is set up the blank should be rotated sequentially to the next vessel to ensure all vessels are periodically checked. A blank is required to be performed at least every 20th time a vessel is used (see Appendix C for Example Blank Vessel Rotation Forms).

9.3) Matrix Spike (MS/MSD) - Matrix spikes are used to monitor the performance of the analytical methods on the matrix and to assess the presence of interferences. MS/MSD generation will be done when client requested with each batch of 20 samples.

9.3.1) Matrix spikes are added after filtration of the TCLP/SPLP leachate. Spikes are not added prior to the TCLP/SPLP leaching. For metals, matrix spikes are to be added before preservation with nitric acid.

- MS/MSD for Mercury are spiked with 0.25 mL of the 1000 ug/L TCLP Hg spiking solution to 50 mL sample.
- MS/MSD for Metals are spike with 0.50 mL of the solutions listed in Table 4 at the end of this document, according to the elements that are requested, to 50 mL of sample.

9.3.2) The use of internal calibration or alternate methods may be needed when the recovery of the matrix spike is below the expected performance (see Section 9.4.2).

9.3.3) Consult the individual analysis SOPs for additional guidance on spike compounds and levels.

9.4) Corrective Actions

9.4.1) Consult the Laboratory QC Program SOP (PT-QA-021) and individual analysis SOPs for corrective action for QC failures.

9.4.2)

Method of Standard Additions (MSA) shall be used for metals if all of the following conditions are met:

- Recovery of the analyte in matrix spike is not at least 50%,
- The concentration of the analyte does not exceed the regulatory level, and
- The concentration of the analyte measured in the sample is within 20% of the appropriate regulatory level.

If the matrix spike recovery is 5% or less due to dilution or matrix interference, contact the project manager and client for guidance. The client should also be contacted prior to initiation of any MSA steps. Refer to the individual analysis SOPs for details on how to perform MSA analysis.

9.4.3) If the temperature during the tumbling procedure is not maintained at 23 ± 2°C then the samples are required to be re-tumbled. If insufficient sample remains to repeat the tumbling process, the Project Manager will be notified and will call the client for direction on how to proceed.

10) Procedure

10.1) PRELIMINARY SAMPLE EVALUATIONS (Refer to Flow Chart #1, Appendix D)

10.1.1) Preliminary TCLP evaluations (percent solids, particle size, selection of extraction fluid, and fluid/leachate compatibility) are required to be done using a minimum of a 100 gram aliquot of waste. This aliquot may also undergo the actual TCLP or SPLP extraction for Non-volatiles ONLY IF it has NOT been oven dried. If the solid portion is oven dried, a separate aliquot must be used for the actual leaching procedure.

10.1.2) Consult the holding times for the appropriate tests (Section 8.8) and prioritize extractions such that holding times are not exceeded.

10.1.3)

All non-aqueous samples must be leached with a minimum100g to 2L for TCLP and SPLP. The following sample volumes are given to the laboratory for further preparation and analysis after leaching and/or filtration.

Table 2 - Minimum Required Leachate Volume

Analysis	Required Volume (mL)
Volatiles	2 x 40
Semi-volatiles	200
Pesticides	100
Herbicides	100
Metals	150

10.1.3.1) For TCLP and SPLP samples designated or chosen for matrix spike and matrix spike duplicate analysis, three times the listed volumes are required. Spiking is performed after leaching and/or filtration.

10.1.4) SAMPLE DESCRIPTION

10.1.4.1) Observe the number of phases present in the sample according to apparent density. (Note: It may be impossible to distinguish apparent density if only one liquid phase is observed and there is no indication on the COC form. If this is the case, record it as aqueous material and let the subsequent analytical record show

if the liquid is organic.) It is common that when more than one container of multi-phasic materials is received from the field, each container will show different amounts of each phase.

10.1.4.2) If the sample has multiple phases and is received in more than 1 bottle then the contents of each bottle should be combined in a single larger container prior to processing the sample further. If this is not possible, then the alternate procedure described in the following section should be used. This procedure is not appropriate if testing will be done for volatile organic compounds.

10.1.4.3) Properly record the relative amounts of each phase by measuring the depth of the layers in each container after the contents have been allowed to settle. Determine the combined volume of each phase for all containers. These values are needed to determine the correct volume/mass adjustments on the final result.

10.1.5) PERCENT SOLID PHASE

10.1.5.1) Percent Solids and ZHE Extractions - The ZHE filtration apparatus cannot accurately determine percent solids less than 5%. If an extraction is to be performed solely for volatile organic compounds and the percent solids concentration is apparently greater than 5%, proceed to Section 10.3 (Procedure: ZHE Extraction Procedure, Volatile Constituents). Otherwise, continue with the steps in this section. The aliquot of sample used here cannot be used again for the ZHE extraction.

10.1.5.2) Determine Type of Filtration Apparatus Needed

- If the waste will obviously yield no free liquid when subjected to pressure filtration (i.e., it is 100% solid), then proceed to Section 10.1.6 (Particle-size Reduction).
- If the sample is mostly a non-viscous liquid (water or non-viscous organic liquid) of low solids content (<10%) or a highly granular, liquid containing waste vacuum filtration may be used.
- If the sample is viscous (sludge or has high solids content), use pressure filtration.

10.1.5.3) Weight of filter - Measure and record this value before loading the filter into the filter holder.

10.1.5.4)

Weight of subsample and filtrate for percent solids measurement.

- Assemble the filtration apparatus (use blunt forceps to handle the 0.6 to 0.8 mm filter membrane).
- Homogenize the waste in the sample container. Measure and record the gross weight.
- Measure and record the tare weight of the filtration vessel, screen and filter paper.
- Transfer the sample to the filtration device attempting to spread the waste sample evenly over the surface of the filter. Measure and record the tare weight of the empty sample container and any residual sample.
- Calculate and record the net weight of sample used for testing.

10.1.5.5) Filtration for percent solids

- Slowly apply gentle pressure or vacuum of 10 psi to the filtration apparatus. Allow the sample to filter until no SIGNIFICANT additional liquid has passed through the filter during a 2 minute period.
- Repeat previous step by increasing the pressure in 10 psi increments until a maximum of 50 psi is reached. Stop the filtration when no additional filtrate is generated within a 2 minute period.

Note: Some samples will contain liquid material that does not filter (e.g., oil). Do not attempt to filter the sample again by exchanging filters. Viscous oils or any wastes which do not pass through the filter are classified as a solid.

- Remove the filtrate collection vessel, weigh and record the gross weight.
- Calculate and record the net weight of filtrate. This result will be used in the percent solids calculation.

- Pour the filtrate into a graduated cylinder. Measure and record the volume of the aqueous phase. Measure and record the volume of any organic phase. If more than one organic phase is observed, provide a description. These results will be used in the final sample calculations.
- Retain the filtrate for use in Section 10.1.8 (Determination of Filtrate/Extraction Fluid Compatibility), and for possible recombination with the filtrate obtained in Section 10.2.13.

10.1.5.6)

Percent of Wet Solids

- Subtract the net weight of the filtrate from the net weight of the subsample to calculate the total weight of wet solids.
- Calculate the weight percent of wet solids using the Equation in Section 11.1.1.
- If the percent wet solids result is ³ 0.5% and < 5.0%, and it is noticed that a small amount of the aqueous filtrate is entrained in the wetting of the filter, proceed to Section 10.1.5.7 to complete the percent solids measurement on a dry-weight basis. **Note:** If obviously oily (non-aqueous) material is entrained on the filter, do not dry the filter; proceed to Section 10.1.7 (Determination of Appropriate Extraction Fluid).
- If the percent wet solids result is greater than 5.0%, proceed to Section 10.1.6 (Particle-Size Reduction).
- If the percent wet solids result is less than 0.5%, the sample is treated as a TCLP/SPLP liquid. Discard the solid phase. No leaching will be necessary; the filtrate is the final TCLP/SPLP leachate.

10.1.5.7)

Weight percent of dry solids (skip this step and refer to Appendix B for oily samples). Note: These steps are required only if it is noticed that a small amount of the filtrate is entrained in wetting of the filter and the percent wet solids content is ≥ 0.5% and < 5.0 %

- Remove the filter with the wet solids from the filtration apparatus.
- Dry the filter and solid phase at 100 ± 20 ° C.
- Remove the filter from the oven and allow it to cool in a desiccator.
- Weigh and record the gross dry weight.
- Repeat the drying step. Weigh and record the second gross dry weight. If the two weighings do not agree within 1%, perform additional drying and weighing until successive weighings agree within 1%.
- Calculate the weight percent of dry solids.
- If the dry solids result is ≥ 0.5% and the sample will be extracted for non-volatile constituents, proceed to Section 10.1.6 (Particle Size Reduction) using a fresh wet portion of waste.
- If the percent solids result is less than 0.5%, discard the solid phase. No leaching will be necessary; the filtrate is the TCLP leachate. Proceed to Section 10.1.8 (Determination of Filtrate/Leachate Compatibility) to determine whether or not the material is a non-aqueous, immiscible liquid.

10.1.6) PARTICLE-SIZE REDUCTION FOR FLUID SELECTION

10.1.6.1) This procedure is not applicable to oily or organic liquid samples that are to be treated as a TCLP/SPLP solid.

10.1.6.2) The subsample used for fluid selection must consist of particles less than 1 mm in diameter (versus the less than 1 cm requirement for the material used for the actual extraction). Inappropriate use of coarser materials could result in the selection of the wrong fluid type.

10.1.6.3) Surface area exclusion - size reduction is not required if the sample surface area is greater than or equal to 3.1 cm^2 per gram.

10.1.6.4) If the sample contains particles greater than 1 mm in diameter, crush, cut, or grind the solids to the required size.

10.1.6.5) Consult your supervisor or manager when dealing with unusual sample matrices (e.g., wood, cloth, metal, brick).

10.1.6.6) Equipment blank will be generated when samples undergo particle size reduction. This blank is used to evaluate sieve cleanliness. The blank is generated after the sample goes through the sieve and the sieve is washed and methanol rinsed.

10.1.7) DETERMINATION OF APPROPRIATE EXTRACTION FLUID

10.1.7.1) If the solid content is greater than or equal to 0.5%, and if the sample is being analyzed for metals or nonvolatile organic compounds, the type of leaching solution must be determined.

10.1.7.2) Follow times, temperature, and particle size specified in this section as closely as possible. If reaction time between the acid solution and solid waste is too short or too long, the procedure may produce false pH readings.

10.1.7.3) For SPLP, refer to Section 7.10 for fluid selection. Matrix type must be specified by the client. Check special instructions or see the project manager, then record the fluid type selected on the SPLP worksheet.

10.1.7.4) The TCLP leaching fluid for all volatiles is Fluid #1.

10.1.7.5) For TCLP leach fluid determination for non-volatile analytes, continue with the following steps.

10.1.7.6) Calibrate the pH meter with fresh buffer solutions, using buffers that bracket the anticipated range of samples. (Instructions are for the Accumet XL150 pH meter. If another meter type is used, follow the manufacturer’s instructions for calibration.) The meter is calibrated daily with use.

a. Touch **Standardize** on the pH measure screen to access the standardization screen. Touch “**Clear**” to clear the last calibration.

b. Rinse the electrode with reagent water and place in the pH 2.0 buffer. Enter the value (2.0) of the standard into the pH meter using the touch screen, and touch **Enter**. When the reading stabilizes, **STABLE** will appear on the screen. Touch **Confirm** to accept that buffer standardization.

c. Rinse the probe and place it into the 4.0 buffer. Touch **Standardize** to access the standardization screen again, and repeat the steps in b.

d. Repeat b. and c. for 7.0, 10.0 and 13.0 buffers.

e. The Slope of the calibration curve is displayed on the pH Measure screen. The slope must meet the of >95% (or other manufacturer’s recommended limit) for the calibration to be acceptable.

f. If the slope requirement is not met, clean the probe and repeat calibration with fresh buffers. If the second calibration does not meet the acceptance limit, change the KCl solution in the electrode, and repeat calibration.

g. Each buffer reading must be within 0.05 pH units of the true buffer value. If readings do not meet this requirement, repeat with a second fresh portion of buffer, or repeat the calibration.

h. After the calibration the ICV/LCS, a second source pH 7 buffer, is analyzed before sample analysis. The pH readings must be within 0.05 pH units.

i. Document the calibration and verification in the meter calibration log daily.

10.1.7.7) Weigh out a 5.0 ± 0.1 g subsample (less than 1 mm particle size) of the solid phase into a 250-mL beaker and enter the actual weight on the TCLP worksheet.

10.1.7.8)

Add 96.5 ± 1.0 mL of reagent water, cover with a watchglass, and stir for 5 minutes on a stirrer and enter the actual volume on the TCLP worksheet.

10.1.7.9) Measure and record the sample pH. **Note**: To avoid damaging the pH probe when organic liquid (i.e., Oily samples) is present, use narrow range pH indicator paper to determine the pH of this type of sample.

10.1.7.10) If the pH is less than or equal to 5.00, use Fluid #1 and proceed to Section 10.1.8 (Fluid Compatibility).

10.1.7.11) If the fluid pH is greater than 5.0, add 3.5 mL 1 N HCl, cover with a watchglass. Slurry the sample briefly then heat at 50^{o}C ± 5°C for 10 minutes. Record the temperature of the hotplate on the TCLP worksheet. **Note**: The heating cycle is a critical step. If the solid waste does not remain in contact with the acidic solution under specified time and temperature conditions, an erroneous pH may be measured.

10.1.7.12) Cool to room temperature.

10.1.7.13)

Measure and record the pH immediately after the sample has reached room temperature.

- **If the pH is less than or equal to 5.00, use Fluid #1.**
- **If the pH is greater than 5.00, use Fluid #2.**

10.1.8) DETERMINATION OF FILTRATE/EXTRACTION FLUID COMPATIBILITY
(skip this step for SPLP extractions)

10.1.8.1) Place 5 mL of the appropriate leaching fluid (determined in the previous step) into a 20-25 mL vial. **Note**: Use fluid type # 1 if simply testing the filtrate for a sample with less than 0.5% solids.

10.1.8.2) Add 5 mL of the initial filtrate, cap and shake.

10.1.8.3) If the phases are miscible, the initial filtrate and solid phase leachate will be physically recombined upon completion of the leachate generation.

10.1.8.4) If the phases are NOT miscible, the initial filtrate and the solid phase leachate will be prepared and

analyzed separately and the results mathematically combined (see Section 11.1.4).

10.1.9) For samples requiring analysis for semi-volatile organics, pesticides, herbicides or metals proceed to Section 10.2.

10.1.10) For samples requiring analysis for volatile organics (ZHE), proceed to Section 10.3.

10.2) **BOTTLE EXTRACTION PROCEDURE: NON-VOLATILE CONSTITUENTS: SEMI-VOLATILES, PESTICIDES, HERBICIDES, METALS** (Refer to Flow Chart #2, Appendix D).

10.2.1) Record all masses to the nearest 0.1 g.

10.2.2) The aliquot used in the Preliminary Evaluation may be used for this procedure only if it was not oven dried. If the sample is 100% solid or if the preliminary aliquot was not oven dried proceed directly to Section 10.2.7 (Particle Size Reduction). If the Preliminary Evaluation aliquot was oven dried then, using a fresh aliquot of sample, continue as described in Sections 10.2.3 through 10.2.6.

10.2.3) Examine the sample and determine the type of filtration to employ per Section 10.1.5.2.

10.2.4) Determine and record the volume (mass) of the initial filtrate. Cover with aluminum foil and retain for use as defined in Section 10.2.13.

10.2.5) Determine and record the “solid” phase mass by subtracting the mass of the liquid filtrate from the mass of the subsample.

10.2.6) Evaluate the solid portion of the waste for particle size. If it contains particles greater than 1 cm in size, prepare the solid portion of the waste for leaching by crushing, cutting, or grinding such that all particles are less than 1 cm in size (i.e., capable of passing through a 9.5 mm, 0.375 inch, standard sieve). Size reduction is not required if the sample surface area is greater than or equal to 3.1 cm^2 per gram.

10.2.6.1) Consult your supervisor or manager when dealing with unusual sample matrices (e.g., wood, cloth, metal, brick). Scissors or shears may be used to cut cloth, plastic or sheet metal. Saws may be used for wood or solid metal. Bricks, rocks, or other solids amenable to grinding should be subcontracted out for particle size reduction. (Contact the assigned Project Manager.) Note that size reduction to fine powder is not appropriate, and could invalidate results. If necessary, consult client for guidance.

10.2.7) Weigh out 100g of solid sample, or the weight required to provide 100g of solid if adjusted for the percent moisture present in the sample.

10.2.8) NOTE: If the solid sample contains 10% moisture that is not filterable liquid, the weight of sample required for 100g of solids is 110g. The corresponding leaching fluid to be added is then reduced for the 10% moisture content of the sample, or 10mL, to 1990mL.

10.2.9) Weigh the required mass of solid phase into an appropriate bottle (plastic for metals only, glass for all others) and slowly add 2000mL, or the volume adjusted for the percent moisture present in the solid sample, of appropriate leaching fluid as determined under Section 10.1.7 (e.g., 100 g of sample would require 2000 g of leaching fluid). Record the weight of the sample aliquoted for the extraction on and the amount of extraction fluid added on the TCLP worksheet.

10.2.9.1) Record the vessel number used for ZHE leaching for each sample on the TCLP worksheet. Note that the same vessel should not be used repeatedly for the method blank, if practical.

10.2.9.2) Vessels are labeled and tracked in a logbook. The date that the vessel is first used and the date it is disposed of are included in this logbook.

10.2.10) Ensure any effervescence has stopped before capping the bottle tightly. Secure in a rotary agitator and rotate end-over-end at 28-32 rpm for 16-20 hours. The temperature of the room must be maintained at 23 ± 2°C throughout the tumbling period. Start and end times for tumbling are recorded in the TALS batch. The room temperature is monitored using the min/max thermometer that has been set at the beginning of the tumbling period. Both the minimum and maximum temperature of the room during the tumbling period are recorded on the TALS worksheet. The actual tumbler speed (RPM's) will be monitored at the start of each batch and is recorded in the TALS batch information. As agitation continues, pressure may build up within the bottle for some types of wastes. To relieve excessive pressure, the bottle may be removed and opened periodically in a properly vented hood to relieve any built-up pressure.

10.2.11) Remove the bottle and filter the sample using vacuum or pressure filtration by filtering through a new glass fiber filter as discussed in Sections 10.1.5.2. For final filtration of the TCLP/SPLP leachate, the glass fiber filter may be changed, if necessary, to facilitate filtration. Filters must be acid washed if metals are to be determined (see Section 6.3). The entire sample need not be filtered; however, sufficient volume should be generated to support the required analyses. Record the date and time the filtration is started on the TCLP/SPLP worksheet.

10.2.12) If the waste contained no initial filtrate, this solution from 10.2.11 is defined as the TCLP/SPLP leachate.

10.2.13) If the waste did yield an initial filtrate, consult the worksheet for initial filtrate/leachate compatibility. If they are compatible, they are to be combined in the correct proportions (see Section 11.1.4) and mixed well. This combined solution is defined as the TCLP/SPLP leachate.

10.2.14) If the individual phases are NOT compatible, they are to be prepared and analyzed separately and the results combined mathematically. (See Section 11.1.5.).

10.2.15) Measure the pH of the TCLP leachate after filtration and record on the TCLP/SPLP worksheet in TALS. (Do not attempt to measure the pH of oily samples as the probe may be rendered inoperable. Measure the pH of oily samples with pH strips.).

10.2.16) Prepare subsamples for metals for MS/MSD quality control testing using the appropriate TCLP/SPLP spiking solution (do not spike for organics). Record the lot number of the spiking solution on the TCLP/SPLP worksheet. Refer to the appropriate determinative SOPs for further guidance on the spike components, levels and action criteria.

10.2.17)

Immediately preserve the leachate as follows:

- Metals: pH < 2 w/50% HNO3 for non-oils (do not acidify oils or non-aqueous miscible liquids.
- Do an NCM along with the batch to let the lab and PM know the sample was not preserved.)
  - All metals aliquots other then the MS and MSD volumes shall be filtered into a pre-preserved 125mL bottle containing nitric acid.
  - The preservation pH shall be checked by dripping a few drops of the preserved sample onto acid-range pH paper. The pH of the preserved leachate must be $\leq$2.

- MS and MSD volumes are spiked according to section 9.3, and then preserved with nitric acid to pH $\leq$2. Start by adding 0.5mL concentrated nitric acid to the spiked sample, add an additional 0.5mL if the pH is not $\leq$2.
- Document the preserved pH in the comment column of the TALS batch.

- All other parameters: Refrigerate to >0.0°C but ≤6.0°C

Note: Refer to Section 8.7 if precipitation occurs upon preservation.

10.2.18) Label each sample with the appropriate information and submit to the appropriate analytical groups for leachate extraction/digestion and analysis with copies of the TCLP preparation worksheets.

10.3) ZHE EXTRACTION PROCEDURE: VOLATILE CONSTITUENTS
(Refer to Flow Chart #3, Appendix D)

10.3.1) Use the ZHE device to obtain a TCLP/SPLP leachate for analysis of volatile compounds only. Leachate resulting from the use of the ZHE shall NOT be used to evaluate the mobility of non-volatile analytes (e.g., metals, pesticides, etc.).

10.3.2) Due to some shortcomings of the method, losses of volatile compounds may occur. Extra care should be observed during the ZHE procedure to ensure that such losses are minimized. Charge the ZHE with sample only once and do not open the device until the final extract has been collected. Do not allow the waste, the initial liquid phase or the extract to be exposed to the atmosphere any longer than necessary.

10.3.3) If the TCLP/SPLP extraction is for volatile components only, refer to Section 10.1.5.1 before proceeding.

10.3.4) All masses should be recorded to the nearest 0.1 g.

10.3.5) Assemble the ZHE apparatus. Test for leakage by closing all valves except the gas inlet/outlet valve and pressurizing to 50 psi. Allow to stand for 15 minutes and check the pressure on the built-in gauge to make sure it is not leaking. If the pressure is NOT 50 psi, consult your supervisor.

10.3.6) Adjust the ZHE piston in the ZHE body to the appropriate height (slightly moisten the O-rings with leaching fluid if necessary).

10.3.7) Consult the backlog for matrix designation and examine the sample. If the sample appears to be different from the preliminary information found on the backlog, consult your supervisor.

10.3.8) If the preliminary evaluations indicated the need for particle size reduction, homogenize the waste, weigh out a sufficient size subsample and prepare for leaching by crushing, cutting, or grinding such that all particles are less than 1 cm in size as measured with a ruler (Do NOT sieve the sample). Size reduction is not required if the sample surface area is greater than or equal to 3.1 cm^2 per gram. **Note:** To minimize loss of volatiles, samples for volatiles that require particle size reduction should be kept in sample storage (>0.0 ºC but ≤6.0°C) until immediately before size reduction. Aggressive reduction, which would generate heat, should be avoided and exposure of the waste to the atmosphere should be avoided to the extent possible. Size reduction to a fine powder is not appropriate.

10.3.8.1) Consult your supervisor or manager when dealing with unusual sample matrices (e.g., wood, cloth, metal, brick). Scissors or shears may be used to cut cloth, plastic or sheet metal. Saws may be used for wood or

solid metal. Bricks, rocks, or other solids amenable to grinding should be subcontracted out for particle size reduction.

10.3.9) Place the ZHE apparatus on the balance and tare the balance.

10.3.10) Determine the appropriate size subsample to weigh using the percent solids information from Section 10.1.5, based on 25 g of solid.

10.3.10.1) For wastes that are 100% solids, a 25 g sample is used.

10.3.10.2) For wastes containing < 0.5% solids the liquid portion of the waste, after filtration, is defined as the TCLP/SPLP leachate. Filter enough of the sample to support all of the volatile analyses required.

10.3.10.3) For wastes containing ≥ 0.5% and < 5.0% solids, a 500 g subsample of waste is recommended.

10.3.10.4) If the sample has ≥ 5.0% solids, the appropriate sample size should be determined using the equation in Section 11.2. **Note:** For wastes containing greater than 0.5% wet or dry solids (Section 10.1.5), the “solids” value from the ZHE filtration process may be used to determine the volume of fluid to load into the ZHE. This approach is recommended since the solids value from Section 10.1.5 may differ from the filtration solids due to sample variability or differences in the filtration apparatus.

10.3.11) Homogenize and transfer an appropriate size subsample of the waste into the ZHE and record the mass.

10.3.12) Carefully place the glass fiber filter between the support screens and secure to the ZHE. Tighten all the fittings.

10.3.13) Place the ZHE in a vertical position; open both the gas AND liquid inlet/outlet valves. Attach a gas line to the gas inlet/outlet valve.

10.3.14) If the waste is 100% solid, slowly increase the pressure to a maximum of 50 psi to force out as much headspace as possible and proceed to Section 10.3.19.

10.3.15) If the waste is < 100% solids, carefully apply gentle pressure of 10 PSI (or more, if necessary) to force all headspace slowly out of the ZHE. At the FIRST appearance of liquid from the liquid inlet/outlet valve, quickly close the valve and discontinue gas pressure.

10.3.16) Assemble a syringe and place the plunger in all the way. Adjust the tension on the plunger to provide slight drag. Attach the pre-weighed syringe or Tedlar bag to the liquid inlet/outlet valve and open the valve. Record the tare weight of the collection device.

10.3.17) Carefully apply gas pressure of no more than 10 PSI to force out the liquid phase. Allow the sample to filter until no SIGNIFICANT additional filtrate has passed in a 2 minute period. **Note**: If the capacity of the syringe is reached, close the liquid inlet/outlet valve, discontinue gas pressure, remove the syringe and return to Section 10.3.15.

10.3.18) Repeat previous step increasing the pressure in 10 PSI increments until 50 PSI is reached and no significant liquid has passed in a 2 minute period. Remove the collection device and record the total weight of the collection device with filtrate. Close the valve and discontinue gas pressure. Transfer the filtrate to VOA vials and label appropriately. Calculate the weight of filtrate collected. **Notes:** If the original waste contained less than 0.5% solids (Section 11.2.5), this filtrate is defined as the TCLP/SPLP leachate and you may proceed to Section 10.3.28. Otherwise, save the vials by storing at 4 C under minimal headspace conditions, for recombination as in Section 10.4.27. The material remaining in the ZHE is defined to be the “solid” phase. Calculate the weight of the solid phase.

10.3.19) Based on the information from Sections 10.1.5 and 10.3.10 and using the formula in 11.1.3, determine the weight of fluid to load into the ZHE on the "solid" phase. The ZHE device has approximately a 500-mL capacity. Based on the need to add an amount of extraction fluid equal to 20 times the mass of the "solid" phase, the ZHE can therefore accommodate a maximum of 25 grams of "solid". **Note:** The TCLP ZHE prep uses only TCLP fluid #1; the SPLP ZHE prep uses only DI Water.

10.3.20) Load the fluid transfer reservoir with an excess of Fluid #1 for TCLP or DI Water for SPLP and preflush the transfer line to eliminate air pockets. Be sure the required volume remains.

10.3.21) Using a stainless steel syringe transfer the required volume into the ZHE and close the valve.

10.3.22) Check the ZHE to make sure all the valves are closed and manually rotate the ZHE (end-over-end) 2 or 3 times. Reposition the ZHE in the vertical position.

10.3.23) Pressurize the ZHE to 5-10 PSI. Allow to stand for 10 minutes, and then recheck the pressure. If the ZHE appears to be leaking, follow the corrective action protocols recommended by the manufacturer and repeat the test.

10.3.24) Slowly open the liquid inlet/outlet valve to bleed out any headspace that may have been introduced during the introduction of the Fluid. Upon the first sign of liquid from the valve, close the valve.

10.3.25) Repressurize the ZHE to 5-10 PSI and place in the rotary agitator. Rotate at 28-32 rpm for 16-20 hours. Room temperature should be 23 ± 2 °C. The room temperature and time should be checked at both the start and end of the extraction and recorded on the ZHE worksheet.

10.3.26) Confirm that the pressure of 5-10 PSI was maintained throughout the leaching. If it was not maintained, return to Section 10.3.1 and repeat the leachate with a new aliquot of sample. Contact the PM if there is insufficient sample to repeat the leaching procedure.

10.3.27) Attach a syringe or Tedlar bag and open the liquid inlet/outlet valve to collect the aqueous leachate and proceed as outlined in 10.3.19 - 10.3.20. Record the volume/mass of the leachate and any oil phase. Record the date and time the filtration is completed on the ZHE worksheet. **Note:** If the waste contained an initial liquid phase, the liquid may be filtered directly into the same collection device holding the initial liquid phase of the waste. A separate filtrate collection container must be used if combination would create multiple phases or there is not enough volume left within the filtrate collection container.

10.3.28) If the waste contained an initial filtrate (Section 10.3.18) that is miscible with the solid phase leachate (as determined in Section 10.1.8), the solid phase leachate and the initial filtrate are directly recombined in the correct proportions (see Section 11.1.4). If the individual phases are NOT compatible, they are to be collected, prepped and analyzed separately. **Note:** Chill the filtrate and receiving vessels before recombining.

10.3.29) Following collection, store the TCLP/SPLP leachate in 2 40-mL VOA vials with minimal headspace at 4 ± 2 ^{o}C and prepare for analysis as soon as possible using the appropriate organic extraction procedure. Due to space limitations, the rest of the leachate is disposed of.

10.3.30) If the individual phases are analyzed separately, combine the results mathematically by using the recombination calculation in Section 11.1.5.

11) Calculations/Data Reduction

11.1)

Calculation of Percent Wet Solids:

$$Percent\ \ Wet\ Solids = 100\left(\frac{Mass,"solid"\ phase}{Mass,initial\ subsample}\right)$$

11.2)

Calculation of weight of waste to charge to ZHE:

$$Weight\ of\ waste\ to\ charge\ to\ ZHE = 100\left(\frac{25}{\%wet\ solids}\right)$$

11.3) Calculation of weight of extraction fluid to use:

$$Weight\ of\ Extraction\ fluid = \frac{20\,x\,\%\ wet\ solids\,x\ weight\ of\ waste\ to\ be\ extracted}{100}$$

11.4) Calculation of volume of initial filtrate phase to recombine with solid phase leachate:

$$\text{Volume of filtrate for recombination} = \left(\frac{Weight\ of\ solids\ leached}{Total\ weight\ of\ solids}\right)\left(\frac{Leachate\ recovered}{Fluid\ added}\right)\left(Volume\ of\ initial\ aqueous\ filtrate\right)$$

11.5) Mathematical recombination of analytical results:

$$Final\ Analyte\ Concentration = \frac{(V_1 \times C_1) + (V_2 \times C_2)}{V_1 + V_2}$$

V_1 = total volume of the initial filtrate phase (L).
C_1 = analyte concentration in initial filtrate phase (mg/L).
V_2 = volume of the theoretical solid phase leachate (L).
C_2 = analyte concentration in solid phase leachate (mg/L).

11.6) REPORTING REQUIREMENTS

11.6.1) Samples generated with method deviations, such as temperature exceedances, insufficient sample for TCLP/SPLP complaint tumble, etc…, must be reported as **NOT** TCLP/SPLP compliant through an NCM and narrated in the Case Narrative of the final report.

11.6.2) Follow these reporting conventions for multi-phase samples:

11.6.2.1) If both phases have positive results, use the values from each phase to calculate the recombined result. Use the reporting limit for each phase to calculate the recombined reporting limit.

11.6.2.2) If both phases are “ND,” not detected, the recombined result is “ND,” and the reporting limit is calculated from the reporting limit for each phase.

11.6.2.3) If one phase is “ND” and the other phase has a positive result, use the reporting limit for the “ND” phase and the positive value for the other phase to calculate the combined result. The combined reporting limit is based on the reporting limit for both phases. If the combined result is less than the combined reporting limit, then supply a footnote to indicate that “a positive result was detected below the calculated detection limit.”

11.6.3) Units - regardless of the nature of the sample, all TCLP and SPLP results are reported in units of mg/L.

11.6.4) For limits and significant figures, consult the appropriate analytical methods.

11.6.5) Anomalies - all anomalies observed during the leach procedure must be noted on the worksheet or an anomaly form. Some examples of such anomalies are:

11.6.5.1) Sample was monolithic - subsample was obtained by crushing, cutting, grinding, sawing, etc.

11.6.5.2) Insufficient sample - less than the required 100 g minimum was available.

11.6.5.3) If less than the required minimum sample is available, the client will be contacted to determine whether or not to proceed with the extraction. If the client chooses to proceed, an explanation will be included in the Case Narrative.

11.6.5.4) Multiple phases - “X” phases were present.

11.6.5.5) Sample was oil - single phase.

11.6.5.6) Sample contained liquid that did not filter under test conditions.

11.7) REVIEW REQUIREMENTS

11.7.1) Review all applicable holding times. If a holding time was exceeded, confirm that a holding time violation form was properly documented and routed.

11.7.2) If Total analysis results are available, those results may be compared with the TCLP/SPLP analysis results according to the following:

Total > TCLP/ SPLP

NOTE: Assumes the sample is 100% Solids

11.7.3) Total constituent analysis results can be used to demonstrate the TCLP/SPLP protocol is unnecessary. In performing a TCLP/SPLP analysis, there is a 20x dilution of the original sample with the leaching solution. Thus, if the “total constituent” result is less than 20 times the TCLP/SPLP action level, it is impossible for the leachate to “fail” and the TCLP/SPLP does not need to be performed. For example, the TC level for lead is 5.0 mg/L (ppm). Therefore, if a sample of lead-contaminated soil contains less than 100 ppm total lead, a TCLP/SPLP test need not be run for lead.

12) Method Performance

12.1) The supervisor has responsibility to ensure that an analyst who performs this procedure is properly trained in its use and has the required experience. Performance is monitored through internal QC and outside performance evaluation samples. Please refer to the QA Manual (PT-QA-M-001) for additional information concerning Precision and Accuracy.

12.2) Demonstration of Capability – Prior to the independent analysis of client samples, A Demonstration of Capability (DOC), as described in the QA Manual, must be performed. DOCs are repeated annually and any time a significant change is made to the analytical system.

12.3) TCLP/SPLP leaching is not included in MDL studies.

13) Pollution Control

13.1) It is TestAmerica’s policy to evaluate each method and look for opportunities to minimize waste generated (i.e., examine recycling options, ordering chemicals based on quantity needed, preparation of reagents based on anticipated usage and reagent stability). Employees must abide by the policies in Section 13 of the Corporate Environmental Health and Safety Manual (CW-E-M-001) for “Waste Management and Pollution Prevention” and the Pittsburgh Facility Addendum EH&S Manual (PT-HS-001).

13.2) This method does not contain any specific modifications that serve to minimize or prevent pollution.

14) Waste Management

14.1) Waste management practices are conducted consistent with all applicable rules and regulations. Excess reagents, samples and method process wastes are disposed of in an accepted manner. Waste description rules and land disposal restrictions are followed. Waste disposal procedures are incorporated by reference to PT-HS-001. The following waste streams are produced when this method is carried out.

14.1.1) Remaining TCLP/SPLP extracts: Fluid is collected in a Hazardous Water Drum, Waste #24.

14.1.2) Solids: This waste includes soils, filter paper, paper towels, etc. This waste is collected in containers

identified as “Lab Trash”, Waste #12.

15) References/Cross-References

15.1) Method 1311, Toxicity Characteristic Leaching Procedure, Revision 0, July 1992, SW-846 Final Update IV.

15.2) Method 1312, Synthetic Precipitation Leaching Procedure, Revision 0, September 1994, SW-846 Final Update IV.

15.3) Toxicity Characteristic: Corrections to Final Rule. Method 1311, Federal Register, Vol. 55, No. 126, Friday, June 29, 1990.

15.4) Toxicity Characteristic: Final Rule. Method 1311, Federal Register, Vol. 55, No. 61, Thursday, March 29, 1990.

15.5) Technical Background Document and Response To Comments, Method 1311, Toxicity Characteristic Leaching Procedure, USEPA/OSW, April, 1989

15.6) PT-QA-021, TestAmerica Pittsburgh QC Program

15.7) PT-QA-024, Subsampling

15.8) PT-QA-031, Internal Chain of Custody

15.9) PT-QA-M-001, Quality Assurance Manual

15.10) PT-HS-001, Pittsburgh Facility Addendum EH&S Manual

16) Method Modifications

16.1) Section 10.1.1: Preliminary Evaluations. Section 7.1 of source method SW846 1311 states that the sample aliquot used for the preliminary evaluation “...may not actually undergo TCLP extraction.” Section 7.1.5 of the source method indicates that the portion used for the preliminary evaluation may be used for either the ZHE or non-volatile extraction if the sample was 100% solid. Section 7.1.5 further indicates that if the sample was subjected to filtration (i.e., < 100% solid) that this aliquot may be used for the non-volatile extraction procedure only as long as sufficient sample is available (minimum 100 g). Samples which have been subjected to the ovendrying step may not be used for TCLP extraction because solid phase degradation may result upon heating.

16.2) Section 10.1.5.6: Percent Solids Determination. Section 7.1.2 of source method SW846 1311 indicates that “if the percent wet solids is ≥ 0.5% and it is noticed that a small amount of the filtrate is entrained in wetting of the filter” that the filter should be oven dried to determine percent dry solids “. Drying of oil or organic matrices can both be hazardous and inappropriate. Additionally, it may be impossible to achieve a constant weight when performing this step. Due to safety concerns, if obviously oily or heavy organic matrices are entrained on the filter, the filter is not oven dried.

16.3) Section 10.1.8: Preliminary Determination of Filtrate/Extraction Fluid Compatibility. Section 7.2.13 of the source method SW846 1311 provides no guidance as to how to make this determination. As a result, the procedure herein was developed and incorporated into the Preliminary Determinations section.

16.4) Section 9.2: TCLP/SPLP Extraction Blanks. Section 8.1 of the source methods state that a minimum of one blank for every 20 extractions "...that have been conducted in an extraction vessel." TestAmerica has interpreted this to mean one blank per twenty samples leached per TYPE of leaching vessel (i.e., Bottle or ZHE) per leach fluid used. Only ZHEs are tracked, as bottles used for other tumbling are not re-used.

16.5) Section 10.1.7.10: Determination of Appropriate Extraction Fluid. SW846 Method 1311 does not address the appropriate approach to take if the pH equals 5.0. This SOP requires that Fluid #1 must be used if the pH is less than or equal to 5.0.

16.6) Section 9.3: QA/QC - Matrix Spikes. Section 8.2 of the source method SW846 1311 states "A matrix spike shall be performed for each waste type..." and "A minimum of one matrix spike must be analyzed for each analytical batch." Further, Section 8.2.3 of the source method also states "The purpose of the matrix spike is to monitor the performance of the analytical methods used, and to determine whether matrix interferences exist." The standard TestAmerica QAPP is designed to address the performance monitoring of analytical methodology through the LCS program. A minimum of one MS and MSD will be prepared for each TCLP/SPLP leachate batch. The MS/MSD results are used to determine the effect of a matrix on the precision and accuracy of the analytical process. Due to the potential variability of the matrix of each sample, the MS/MSD results have immediate bearing only on the specific sample spiked and not all samples in the batch.

16.6.1) Section 8.2.2 of the source method states that "In most cases, matrix spikes should be added at a concentration equivalent to the corresponding regulatory level." The method also states "If the analyte concentration is less than one half the regulatory level, the spike concentration may be as low as one half of the analyte concentration but may not be less than five times the method detection limit". For several analytes, spiking at the regulatory level is inappropriate to the range of analysis afforded by the determinative methods. Due to the wide range in these levels, TestAmerica spikes at the levels specified in the determinative SOPs.

17) Attachments

17.1) APPENDIX A – Tables

17.2) APPENDIX B – Figures

17.3) APPENDIX C – Example Worksheets/Logbooks

17.4) APPENDIX D - Flowcharts

18) Revision History

18.1) Revision 4, 1/31/2009

18.2) Revision 5, 5/8/2012

18.3) Revision 6, 6/09/2013

18.4) Revision 7, 6/30/2015

18.5) Revision 8, 9/27/2017

18.6) Revision 9, 10/29/2018

18.7) Revision 9.1, 4/29/2019

18.8.1)

SOP section	Change from	Change to	Reason
7.10.4, 10.3.19 and 10.3.20	SPLP Fluid #3	DI Water	Clarification
7.12		Added metals spiking solutions	Clarification
7.13		Added conc. Nitric acid for preservation	Clarification
9.3.1		Added details for spiking metals MS/MSD	Clarification
10.2.12		Added details for metals preservation	Clarification
Table 4		Added for metals spike concentrations	Clarification

APPENDIX A

TABLES

Table 3 - Toxicity Characteristic Analytes and Regulatory Levels (Final Rule)

-

Contaminant	mg/L
Arsenic	5.0
Barium	100.0
Benzene	0.5
Cadmium	1.0
Carbon tetrachloride	0.5
Chlordane	0.03
Chlorobenzene	100.0
Chloroform	6.0
Chromium	5.0
o-Cresols	200.0
m-Cresols	200.0
p-Cresols	200.0
Total Cresols (used if isomers not resolved)	200.0
2,4-D	10.0
1,4-Dichlorobenzene	7.5
1,2-Dichloroethane	0.5
2,4-Dinitrotoluene	0.13
1,1-Dichloroethylene	0.7
Endrin	0.02
Heptachlor (& epoxide)	0.008
Hexachlorobenzene	0.13
Hexachlorobutadiene	0.5
Hexachloroethane	3.0
Lead	5.0
Lindane	0.4
Mercury	0.2
Methoxychlor	10.0
Methyl ethyl ketone	200.0
Nitrobenzene	2.0
Pentachlorophenol	100.0
Pyridine	5.0
Selenium	1.0
Silver	5.0
Tetrachloroethylene	0.7
Toxaphene	0.5
Trichloroethylene	0.5
2,4,5-Trichlorophenol	400.0
2,4,6-Trichlorophenol	2.0
2,4,5-TP (Silvex)	1.0
Vinyl chloride	0.2

Table 4 – Metals Spikes concentrations (mg/L)

Element	LPTCLP Spike	TA-Spike 1	TA-Spike 2	TA-Spike 3 INT
Al	--	--	1000	--
Ag	100	--	--	50
As	500	200	--	--
B	--	--	--	250
Ba	500	200	--	--
Be	--	100	--	--
Ca	--	--	5000	--
Cd	100	100	--	--
Co	--	100	--	--
Cr	500	100	--	--
Cu	--	100	--	--
Fe	--	--	1000	--

K	--	--	5000	--
Li	--	100	--	--
Mg	--	--	5000	--
Mn	--	100	--	--
Mo	--	100	--	--
Na	--	--	5000	--
Ni	--	100	--	--
Pb	500	100	--	--
Sb	--	--	--	50
Se	100	200	--	--
Si	--	200	--	--
Sn	--	200	--	--
Sr	--	100	--	--
Ti	--	100	--	--
Tl	--	200	--	--
V	--	100	--	--
Zn	--	--	--	50

18.8.2)

APPENDIX B

FIGURES

Figures 1 & 2 - Rotary Agitation Apparatus and Zero Headspace Extraction Vessel (ZHE)

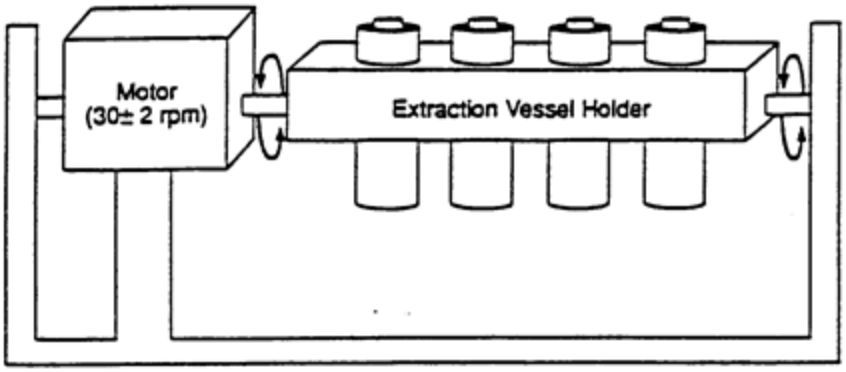


Figure 1. Rotary Agitation Apparatus

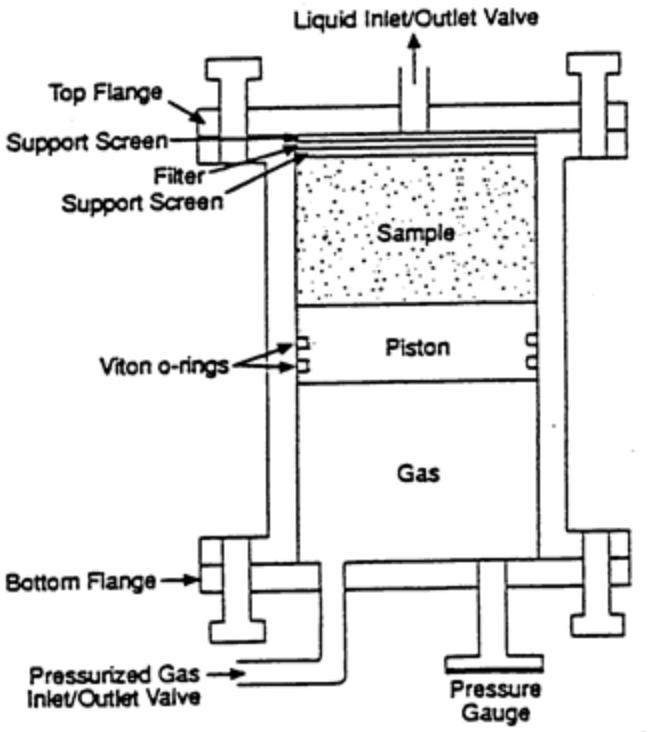


Figure 2. ZHE Vessel

Figure 3 - US Environmental Protection Agency Memorandum #35, Page 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM # 35

DATE: June 12, 1992

SUBJECT: Notes on RCRA Methods and QA Activities

From: Gail Hansen, Chief
Methods Section (OS-331)

This memo addresses the following topics:

- o 1992 Symposium on Waste Testing and Quality Assurance
- o SW-846 Update
  - Final Rule for January 23, 1989 Proposed Rule
  - Notice, Proposed Rulemaking for the Second Update to the Third Edition
- o Chlorofluorocarbon 113 (CFC-113) Solvent Replacement Update
- o Environmental Monitoring Methods Index (EMMI)
- o Sampling Work Group Formation
- o MICE Update
- o Oily Waste Analysis
- o Electronic SW-846 Availability.

1

Figure 3 - US Environmental Protection Agency Memorandum #35, Page 10

Oily Waste Analysis

One of the most frequently asked questions on the MICE Service concerns the application of the TCLP, Method 1311, to oily wastes. Many callers request technical guidance on the extraction of oily wastes due to the difficulty in the filtration on these types of waste. In many cases, an oily waste does not filter completely due to premature clogging of the glass fiber filter. This can result in the retention of standing liquid on the glass fiber filter. Material that do not pass through the glass fiber filter at the conclusion of the filtration step is defined by the method as the solid phase of the waste. The solid phase is then subjected to the leaching procedure of the TCLP. For oily wastes, clogging of the glass fiber filter can result in an overestimation of the amount of solid material available for leaching.

To solve this problem, the Agency recommends a conservative approach, one that probably will overestimate the amount of leaching. Rather than performing the TCLP extraction on the unfiltered portion of the oily waste, assume the waste is 100% liquid (e.g., will pass through the glass fiber filter) and perform a totals analysis on the oily waste to determine if the oil exceeds the appropriate regulatory level.

Filterable waste oil generated during the TCLP must be analyzed for a variety of organic and inorganic analytes. The OSW recognizes the difficulty in achieving acceptable performance for the analysis of waste oil using methods currently provided in SW-846. As a result, the Agency will provide several new methods for the preparation and analysis of oil samples to the Organic Methods Workgroup in July. In addition, a microwave assisted digestion procedure should improve the analysis of metals and will be proposed as part of the Second Update of the Third Edition of SW-846. Brief descriptions of these techniques are provided below, for additional information on the organic procedures contact Barry Lesnik at (202) 260-7459. For additional information on microwave digestion contact Ollie Fordham (202) 260-4778.

The use of purge-and-trap (Method 5030) for volatiles in oil generally results in severe contamination of analytical instrumentation. Traps, transfer lines and chromatography columns may become contaminated with oil. This leads to elevated baselines, hydrocarbon background in subsequent analyses, and cross-contamination. Headspace (Method 3810) is currently allowed only as a screening procedure in SW-846. The Agency is evaluating the use of headspace in conjunction with isotope dilution mass spectrometry for the quantitative analysis of volatiles in oil. Headspace reduces interference problems encountered with purge-and-trap. However, headspace quantitation can be questionable because the distribution of analytes is not

10

18.8.3)

APPENDIX C

EXAMPLE WORKSHEETS/LOGBOOKS

Example – ZHE Blank Vessel Tracking Logbook

TestAmerica Pittsburgh **Year: _____**

Work Instruction #: PT-LP-W-002 R1

TCLP: Zero Headspace (ZHE) Extraction Blank Vessel Tracking Logbook

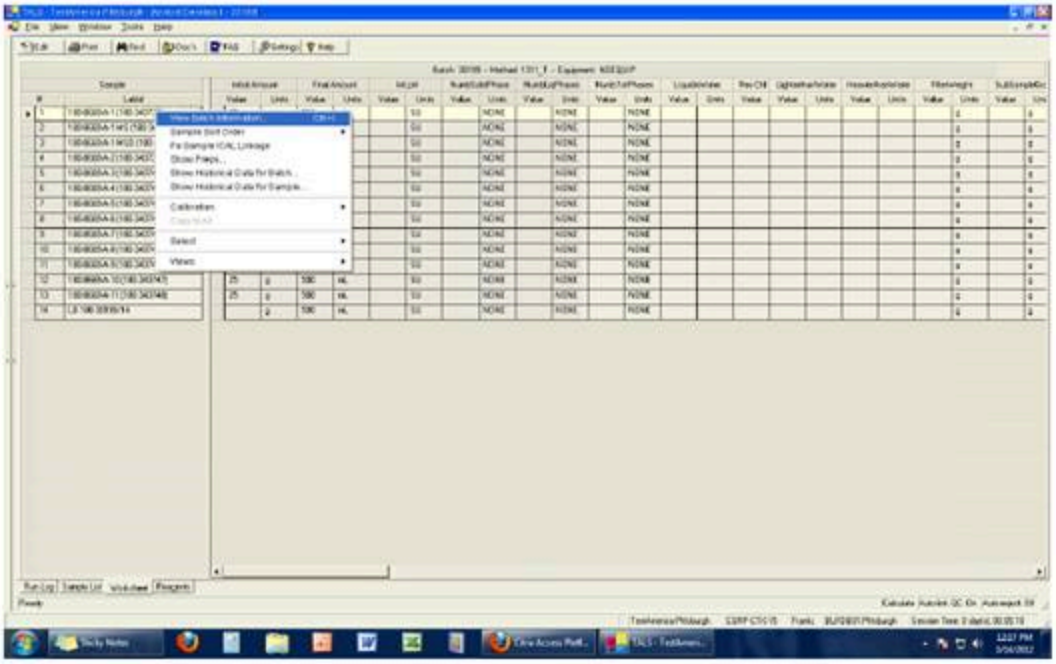
Circled extraction date number indicates that the vessel was used for a blank

ZHE No.	No. of Extractions																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Prep Analyst																				
A2																				
A7																				
B2																				
B7																				
B10																				
B101																				
BC																				
BE																				
BI																				
BV																				
C2																				
CF																				
D34																				
DG																				

Page 1 of 2 PT-LP-W-002 R1

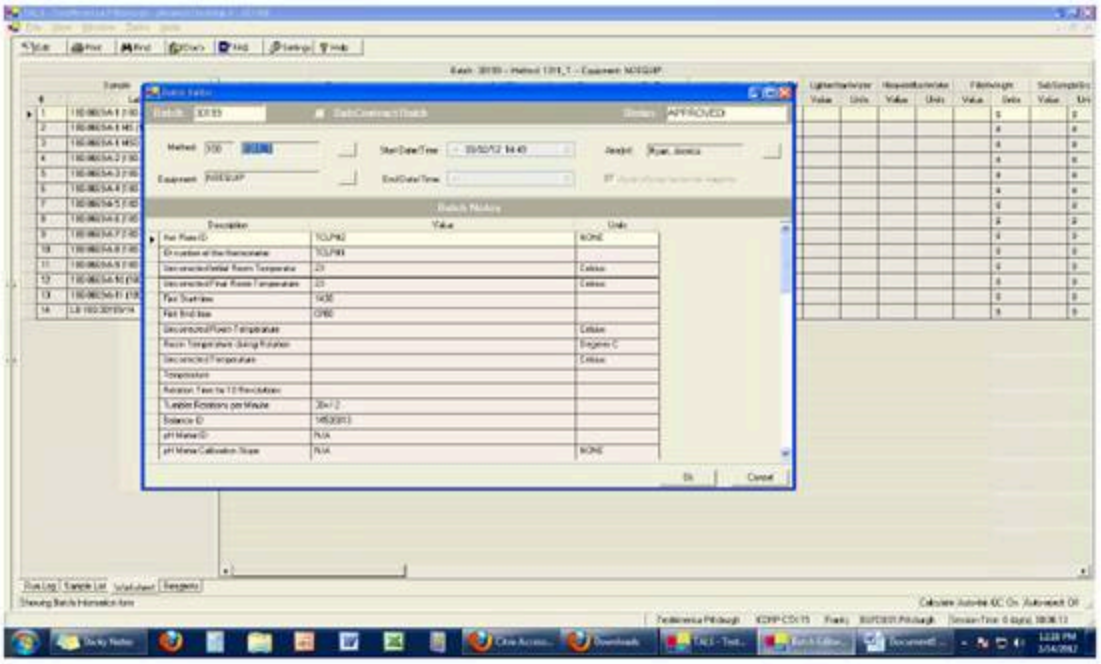
TALS LIMS Screenshots - TCLP

TCLP Method 1311: Batch Info and Worksheet



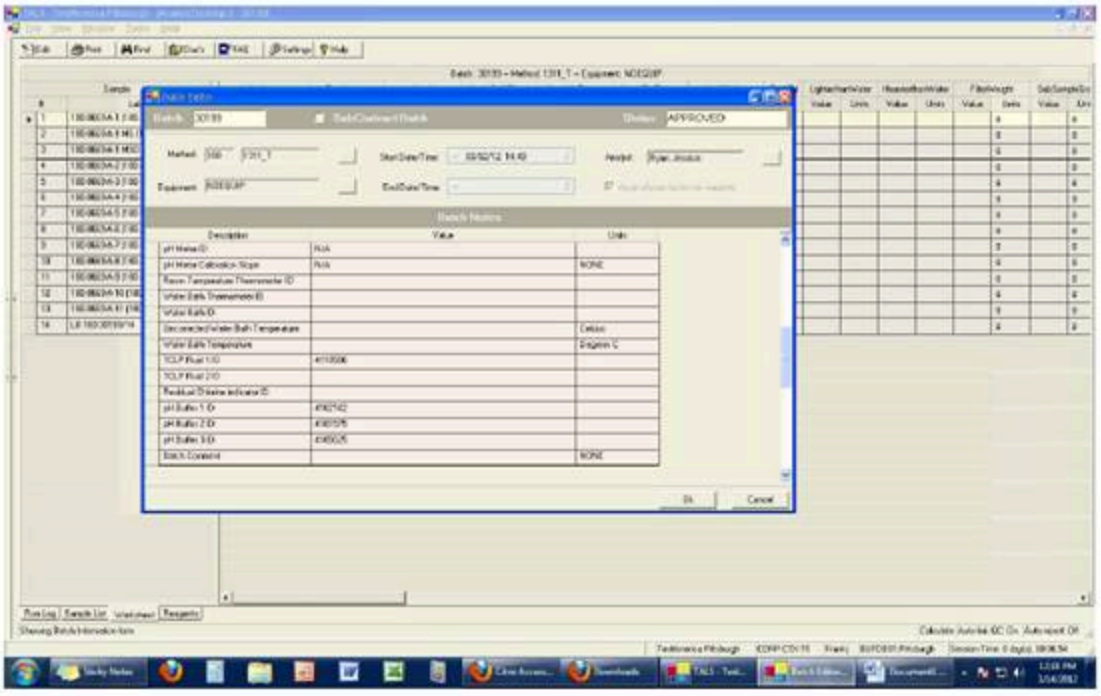
To View/Edit Batch info once in a batch, right-click and select View Batch Info.

TCLP Method 1311: Batch Info and Worksheet



This is the Batch Info window. (Only ½ of the Batch Info in this screenshot)

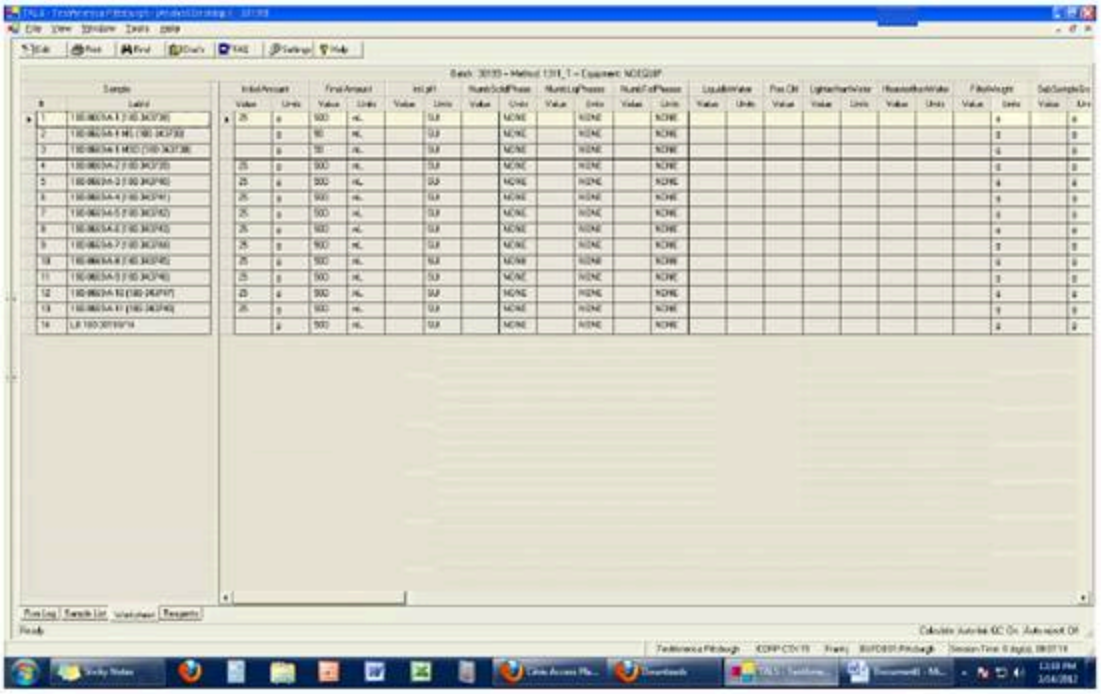
TCLP Method 1311: Batch Info and Worksheet



This is the rest of the Batch Info screen

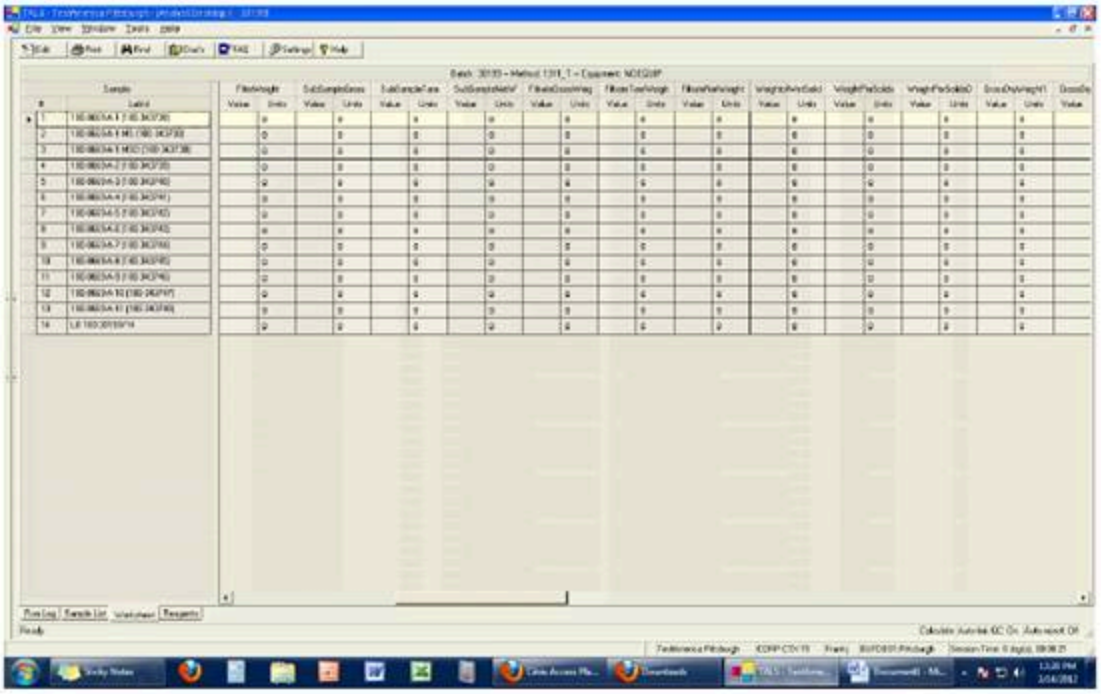
TALS LIMS Screenshots – TCLP (cont.)

TCLP Method 1311: Batch Info and Worksheet



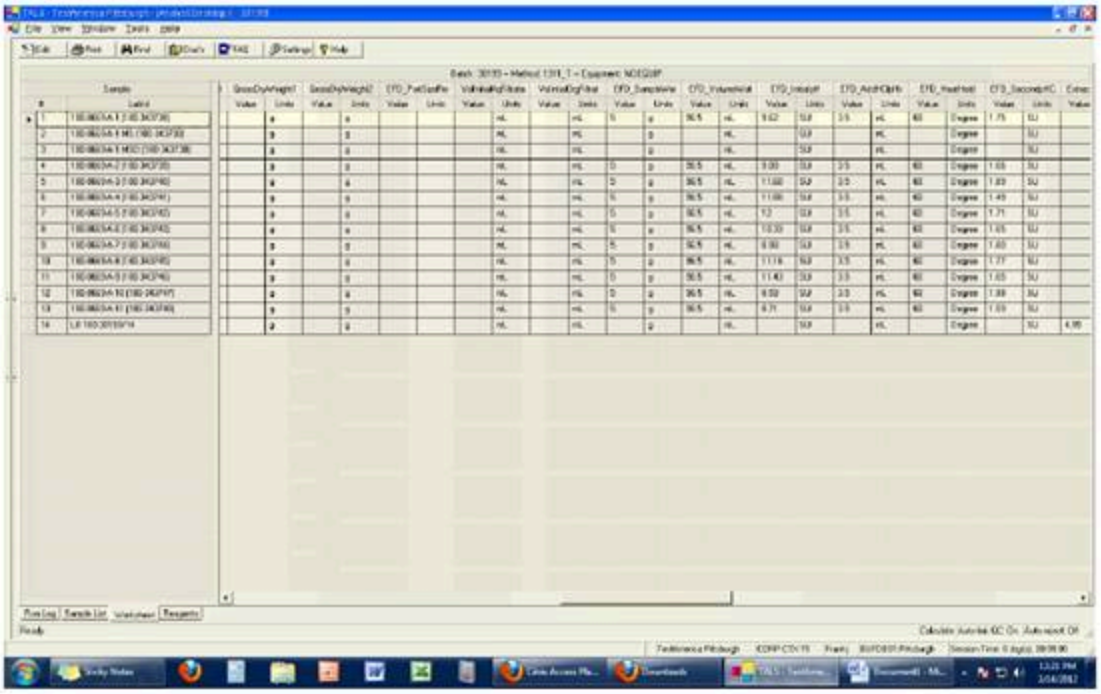
This is screenshot 1 of 5 of the Worksheet for Method 1311.

TCLP Method 1311: Batch Info and Worksheet



Screenshot 2 of 5

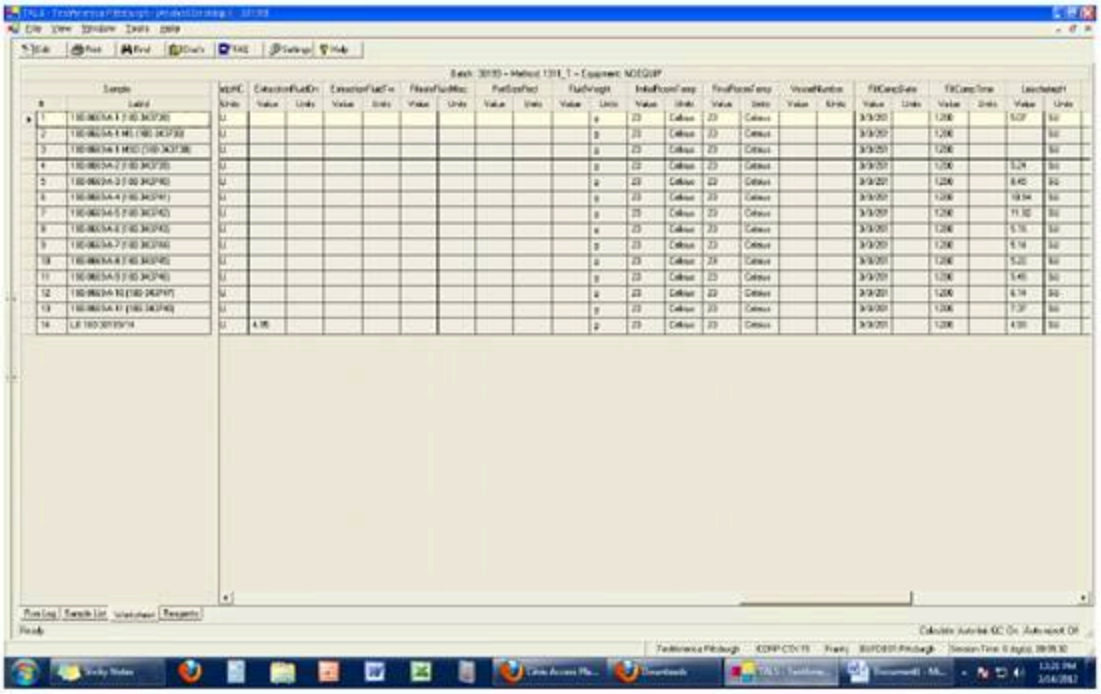
TCLP Method 1311: Batch Info and Worksheet



Screenshot 3 of 5

TALS LIMS Screenshots – TCLP (cont.)

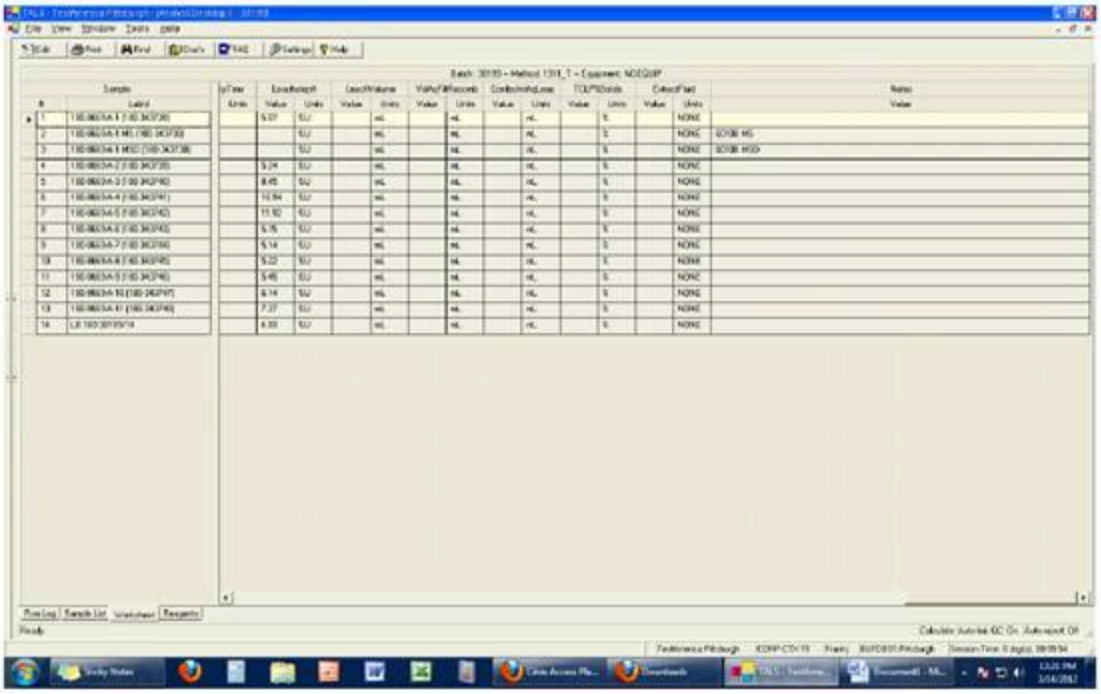
TCLP Method 1311: Batch Info and Worksheet



Screenshot 4 of 5

TALS LIMS Screenshots – TCLP (cont.)

TCLP Method 1311: Batch Info and Worksheet

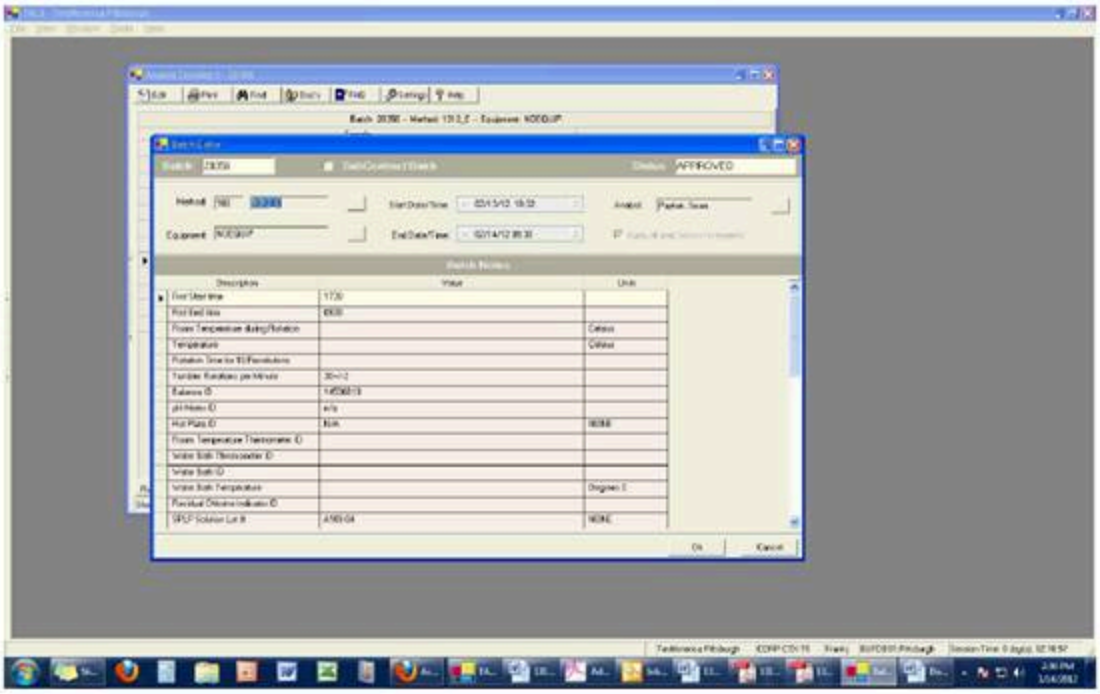


Screenshot 5 of 5

18.8.4)

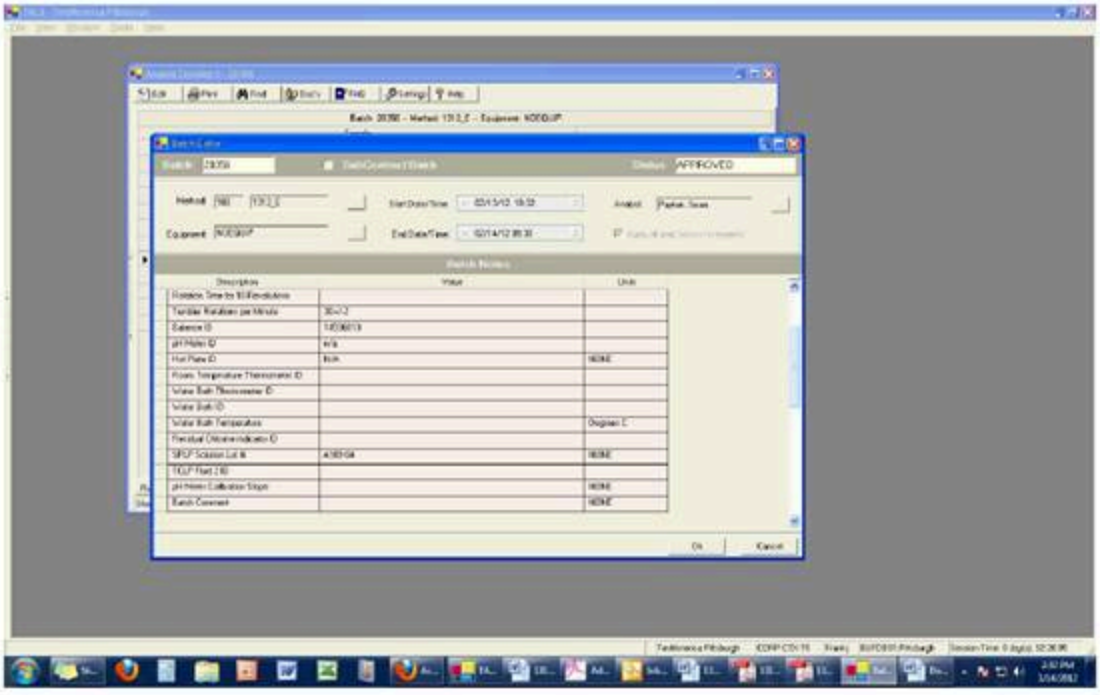
TALS LIMS Screenshots – SPLP

Method 1312 SPLP: Batch Info and Worksheet



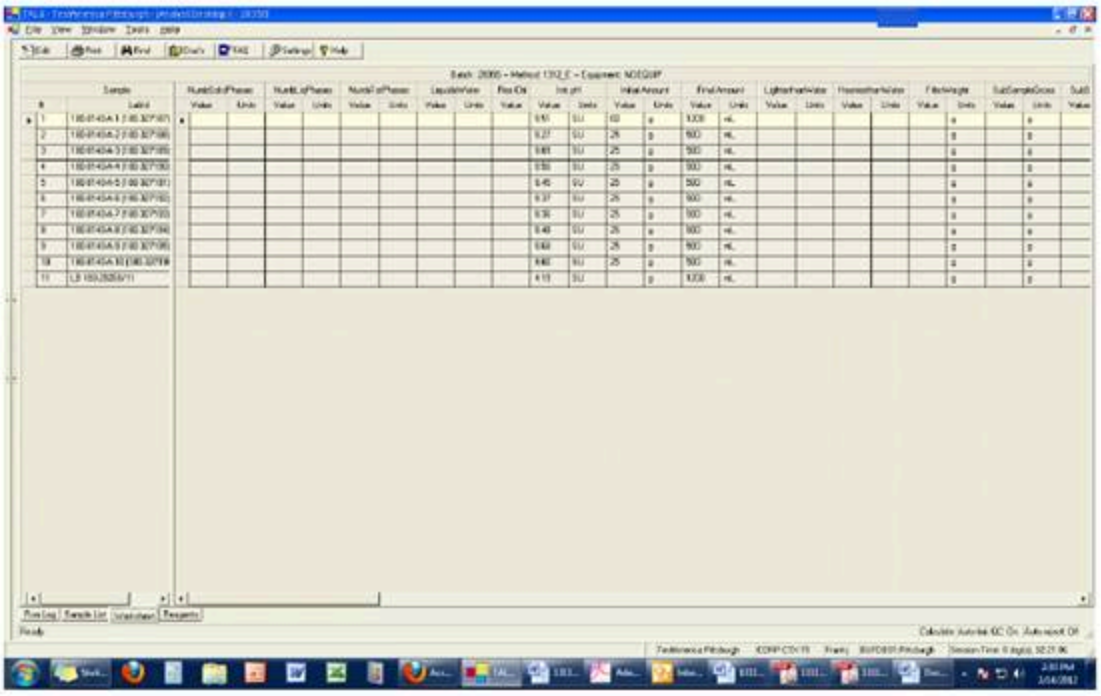
1312 Method: SPLP Batch Info (Screenshot 1 of 2)

Method 1312 SPLP: Batch Info and Worksheet



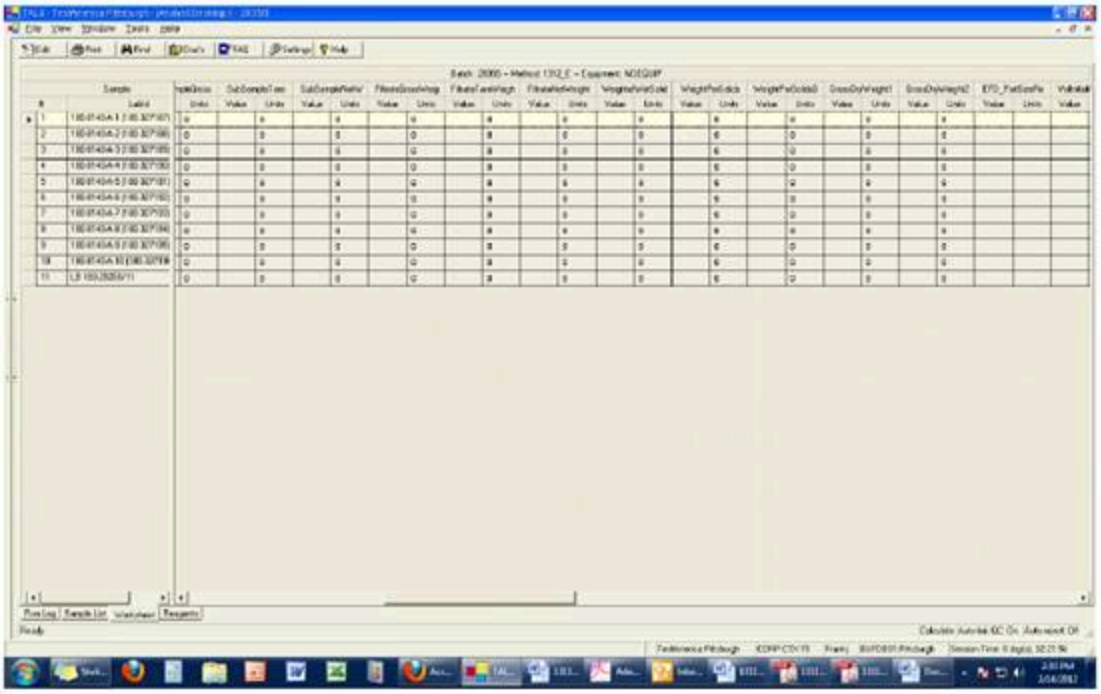
1312 Method: SPLP Batch Info (Screenshot 2 of 2)

Method 1312 SPLP: Batch Info and Worksheet



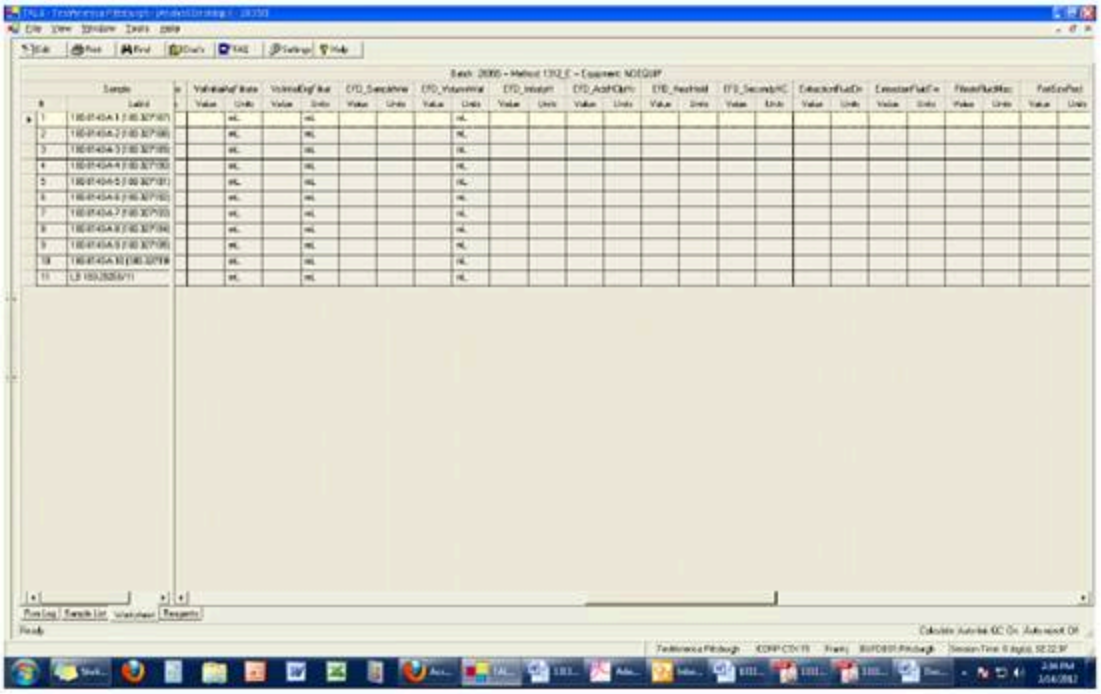
SPLP Worksheet Screenshot 1 of 5

Method 1312 SPLP: Batch Info and Worksheet



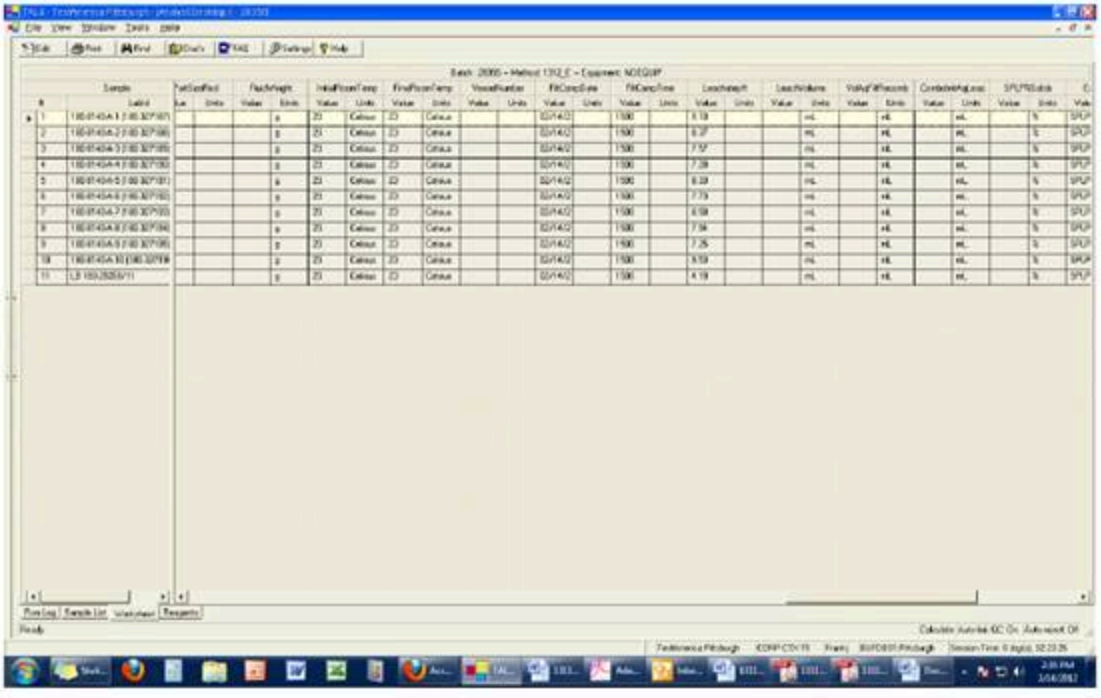
SPLP Worksheet Screenshot 2 of 5

Method 1312 SPLP: Batch Info and Worksheet



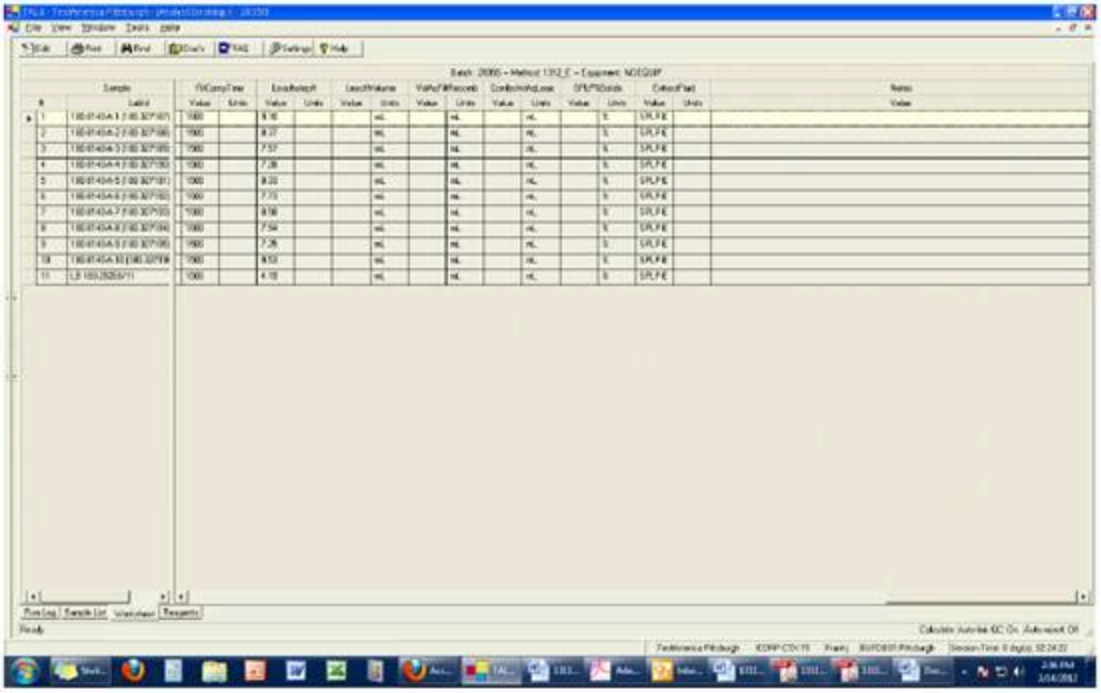
SPLP Worksheet Screenshot 3 of 5

Method 1312 SPLP: Batch Info and Worksheet



SPLP Worksheet Screenshot 4 of 5

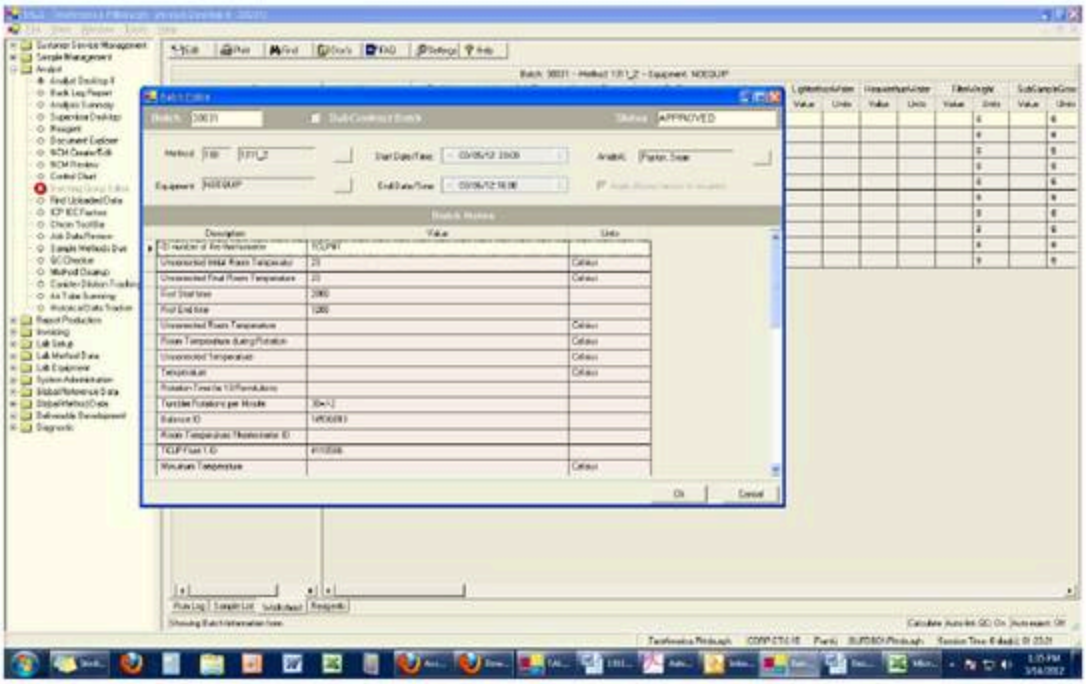
Method 1312 SPLP: Batch Info and Worksheet



SPLP Worksheet Screenshot 5 of 5

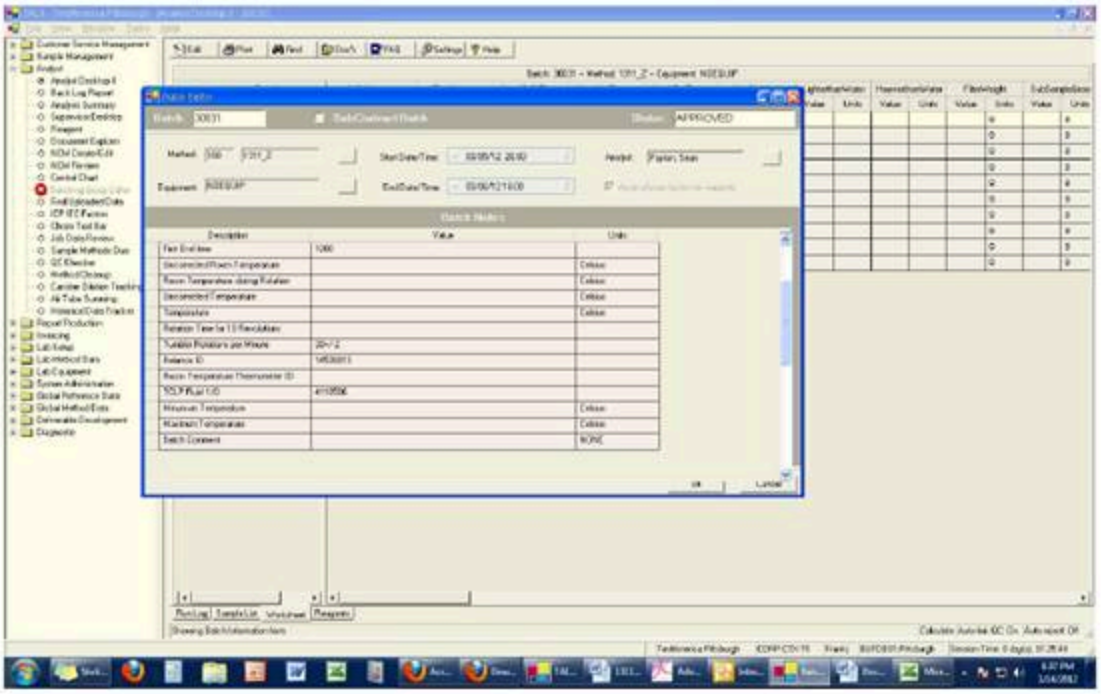
TALS LIMS Screenshots – ZHE

TCLP Method 1311 ZHE: Batch Info and Worksheet



1311 Method: ZHE Batch Info (Screenshot 1 of 2)

TCLP Method 1311 ZHE: Batch Info and Worksheet

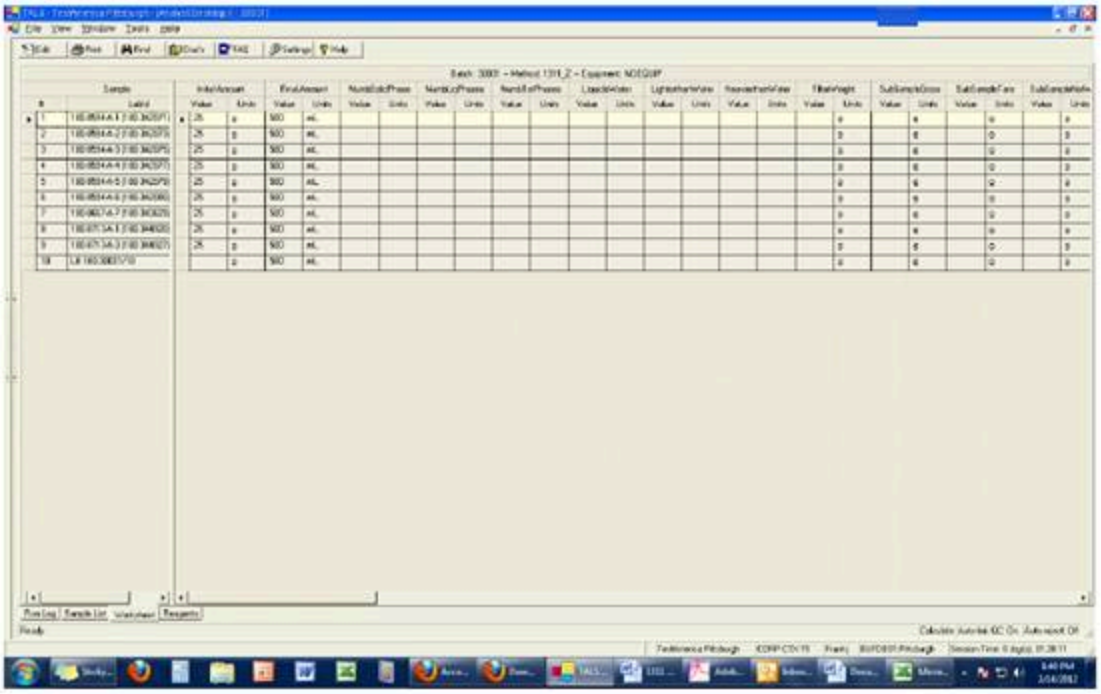


1311 Method: ZHE Batch Info (Screenshot 2 of 2)

18.8.5)

TALS LIMS Screenshots – ZHE

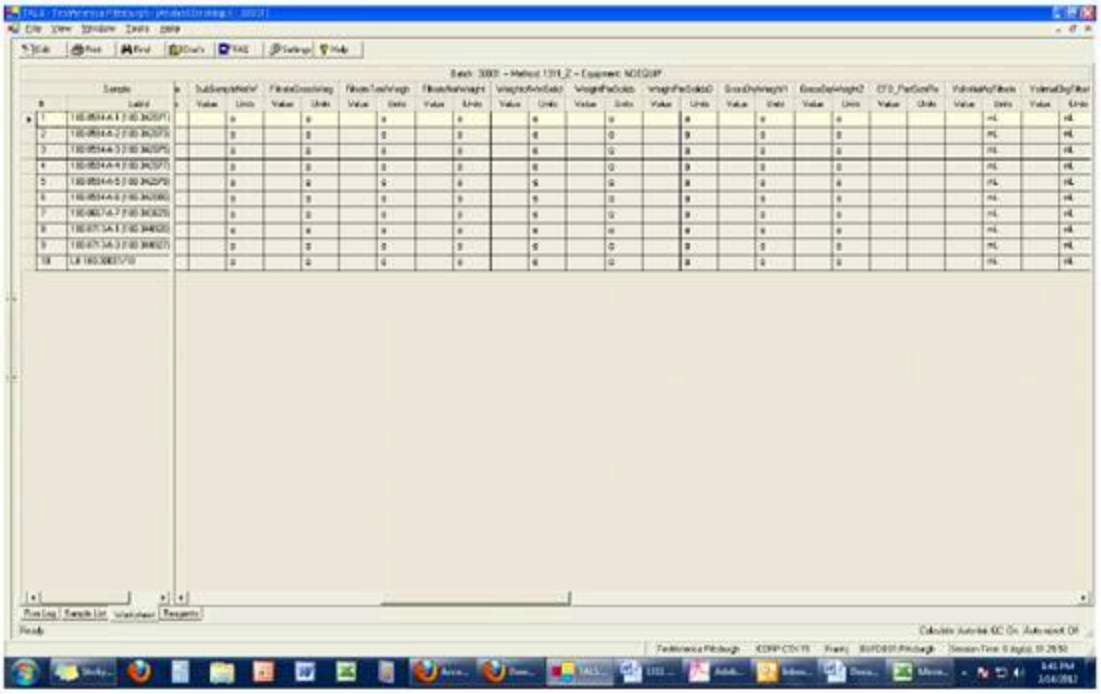
TCLP Method 1311 ZHE: Batch Info and Worksheet



ZHE Worksheet Screenshot 1 of 5

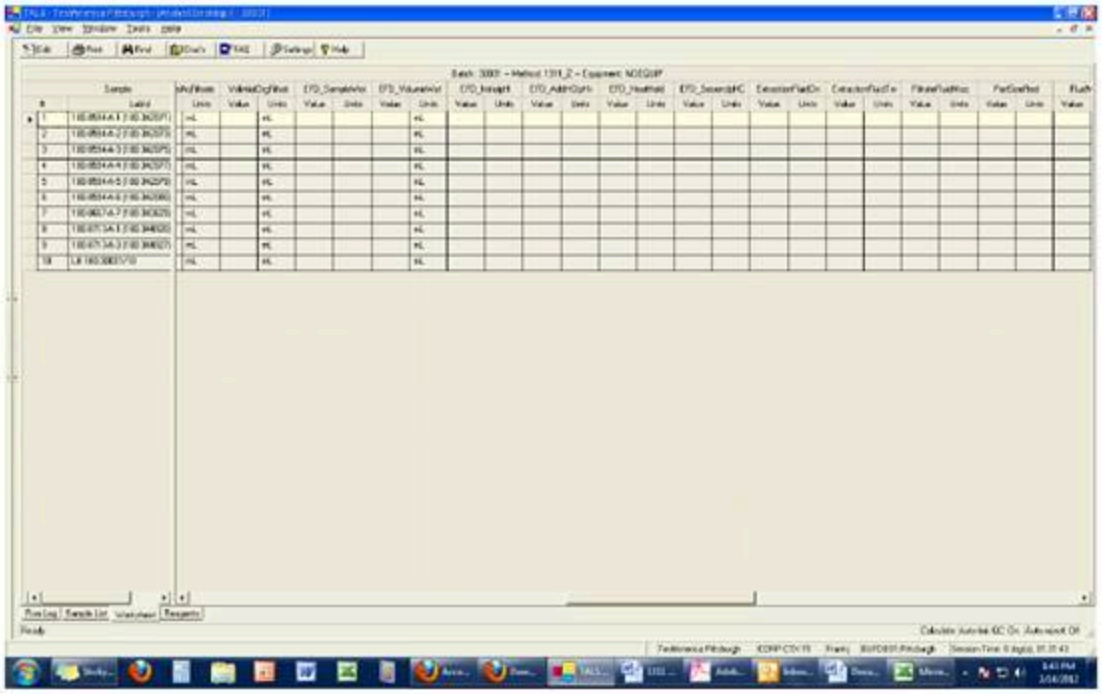
TALS LIMS Screenshots – ZHE

TCLP Method 1311 ZHE: Batch Info and Worksheet



ZHE Worksheet Screenshot 2 of 5

TCLP Method 1311 ZHE: Batch Info and Worksheet



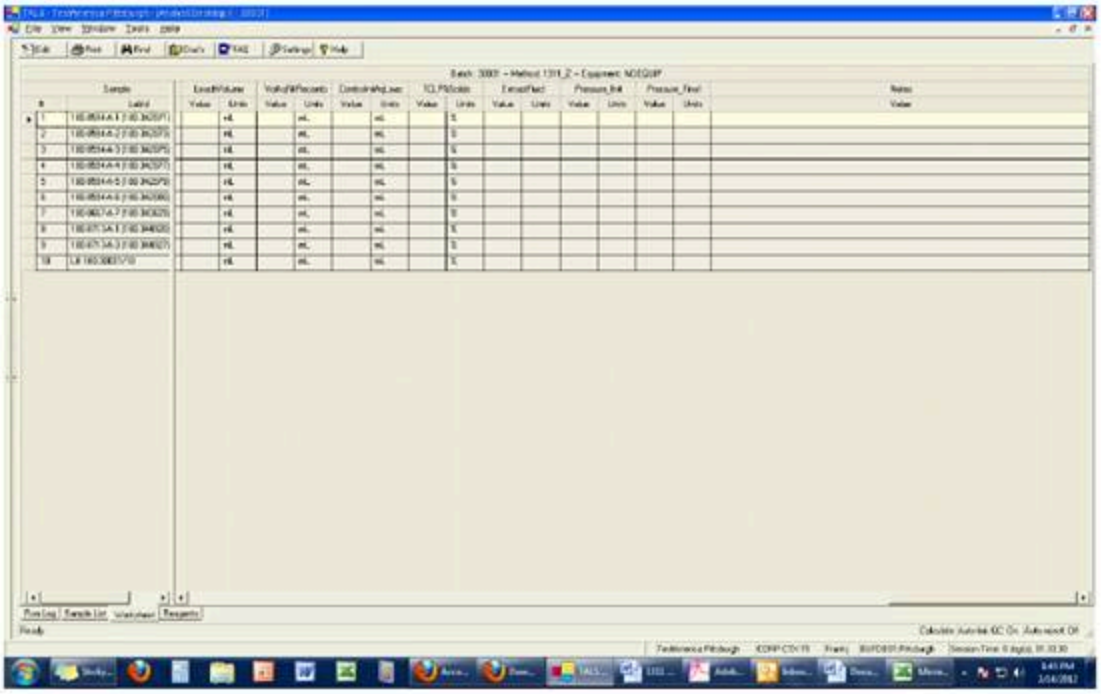
ZHE Worksheet Screenshot 3 of 5

TCLP Method 1311 ZHE: Batch Info and Worksheet



ZHE Worksheet Screenshot 4 of 5

TCLP Method 1311 ZHE: Batch Info and Worksheet



ZHE Worksheet Screenshot 5 of 5

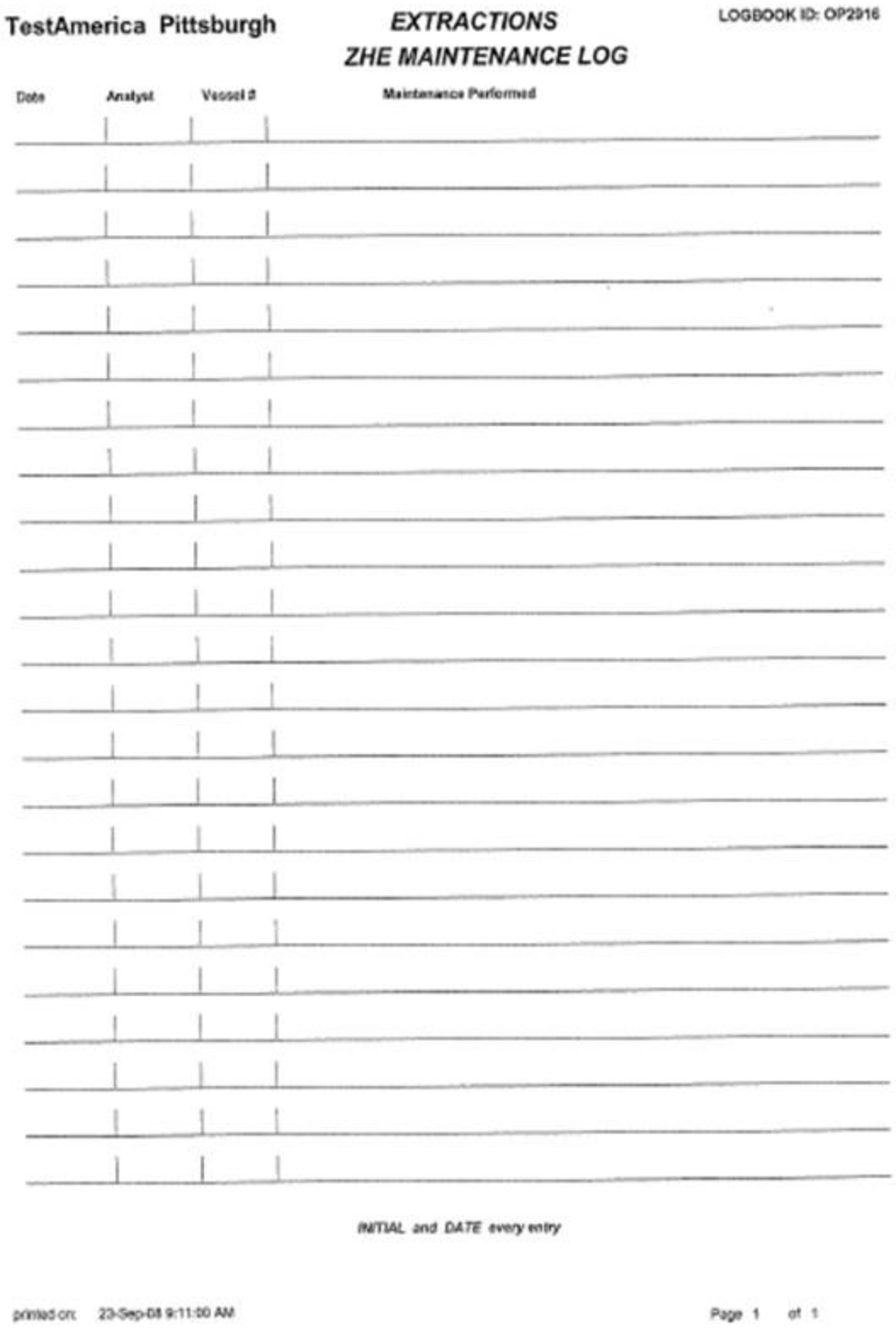
TestAmerica Pittsburgh ***EXTRACTIONS*** LOGBOOK ID: OP2914

TCLP VESSEL MAINTENANCE LOG

Date	Analyst	Vessel #	Maintenance Performed

INITIAL and DATE every entry

printed on: 23-Sep-08 9:09:26 AM



TestAmerica Pittsburgh

EXTRACTIONS
ZHE MAINTENANCE LOG

LOGBOOK ID: OP2916

Date	Analyst	Vessel #	Maintenance Performed

INITIAL and DATE every entry

printed on: 23-Sep-08 9:11:00 AM

Page 1 of 1

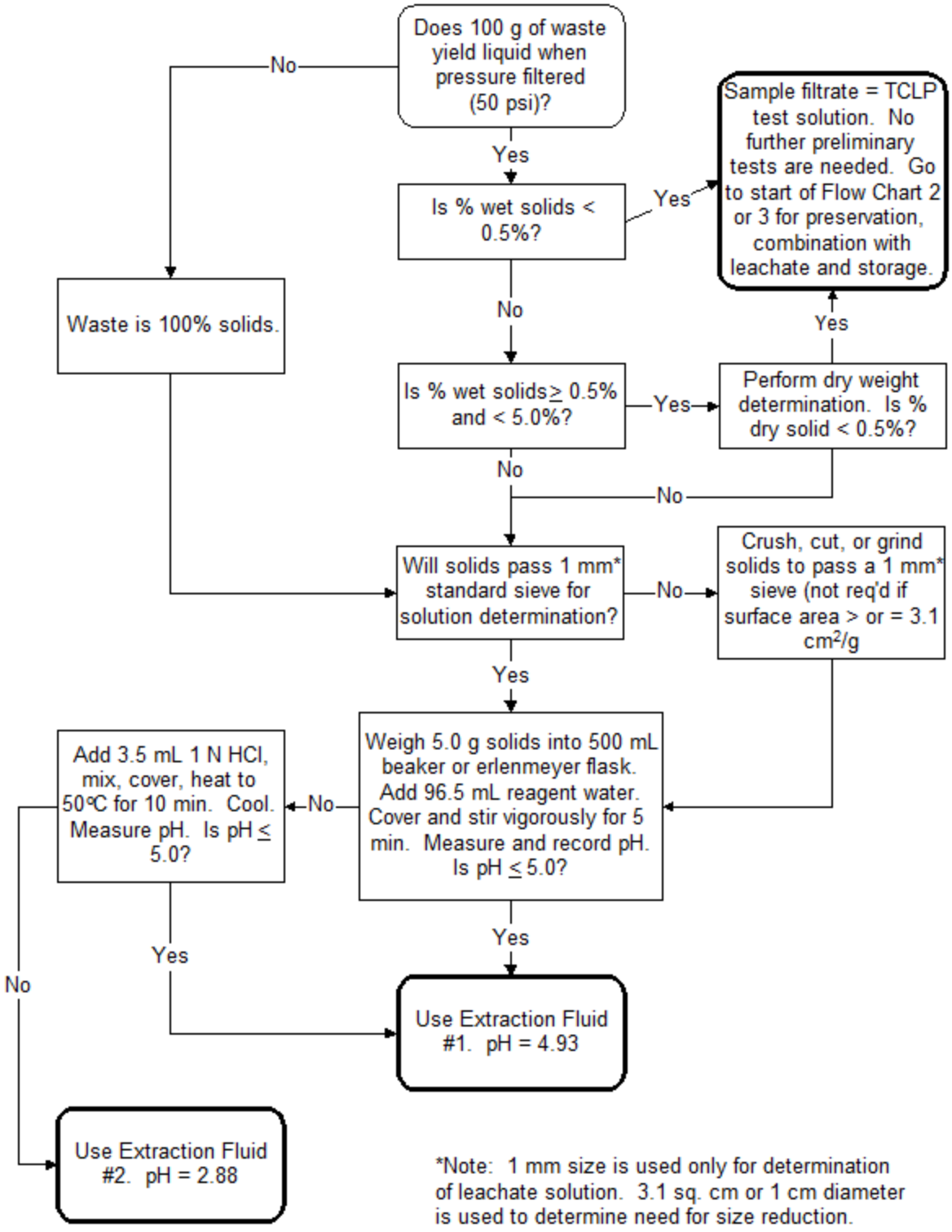
19) Appendix

19.8.6)

APPENDIX D

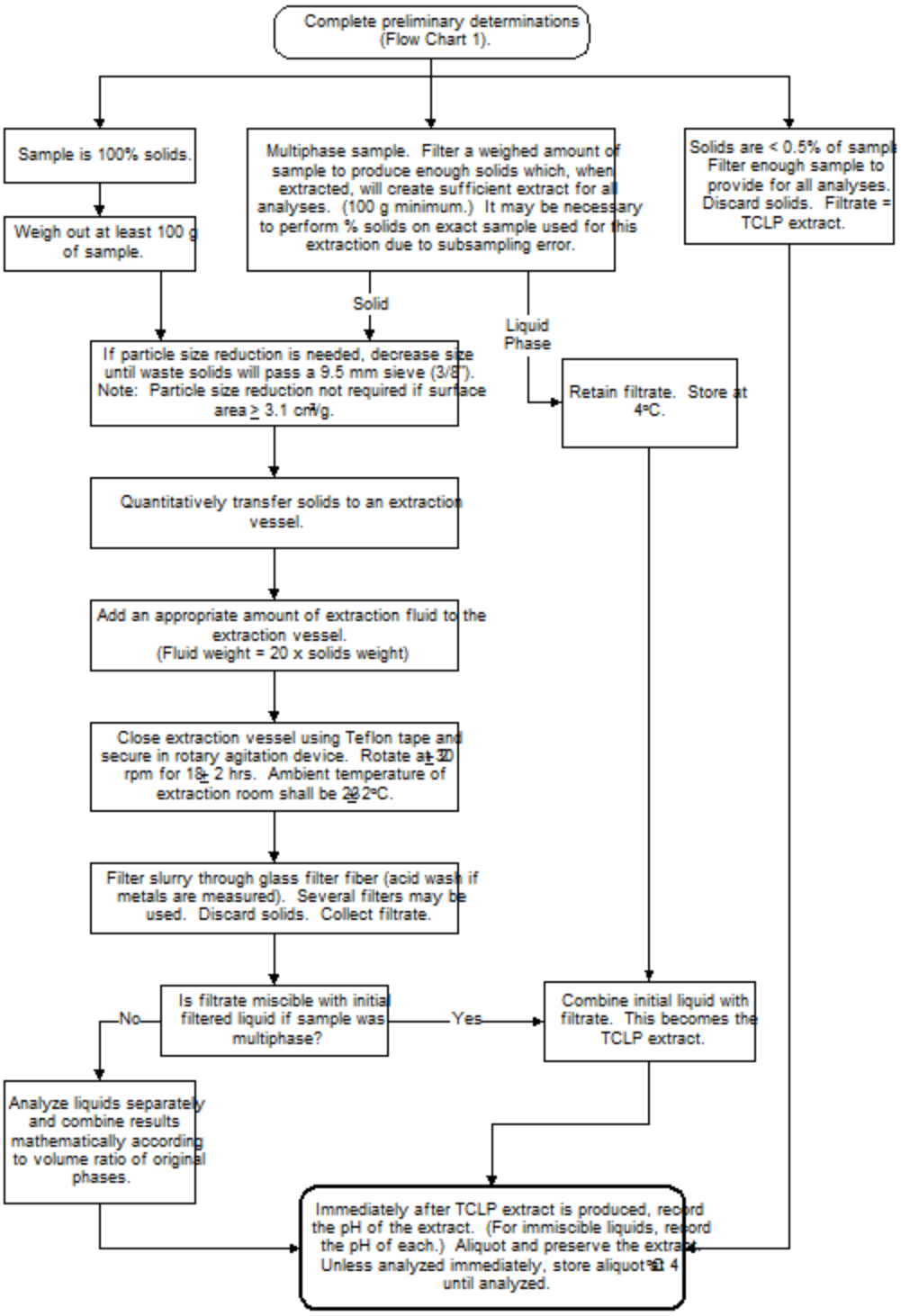
FLOW CHARTS

Flow Chart 1 - Preliminary Sample Evaluation (Section 10.2)

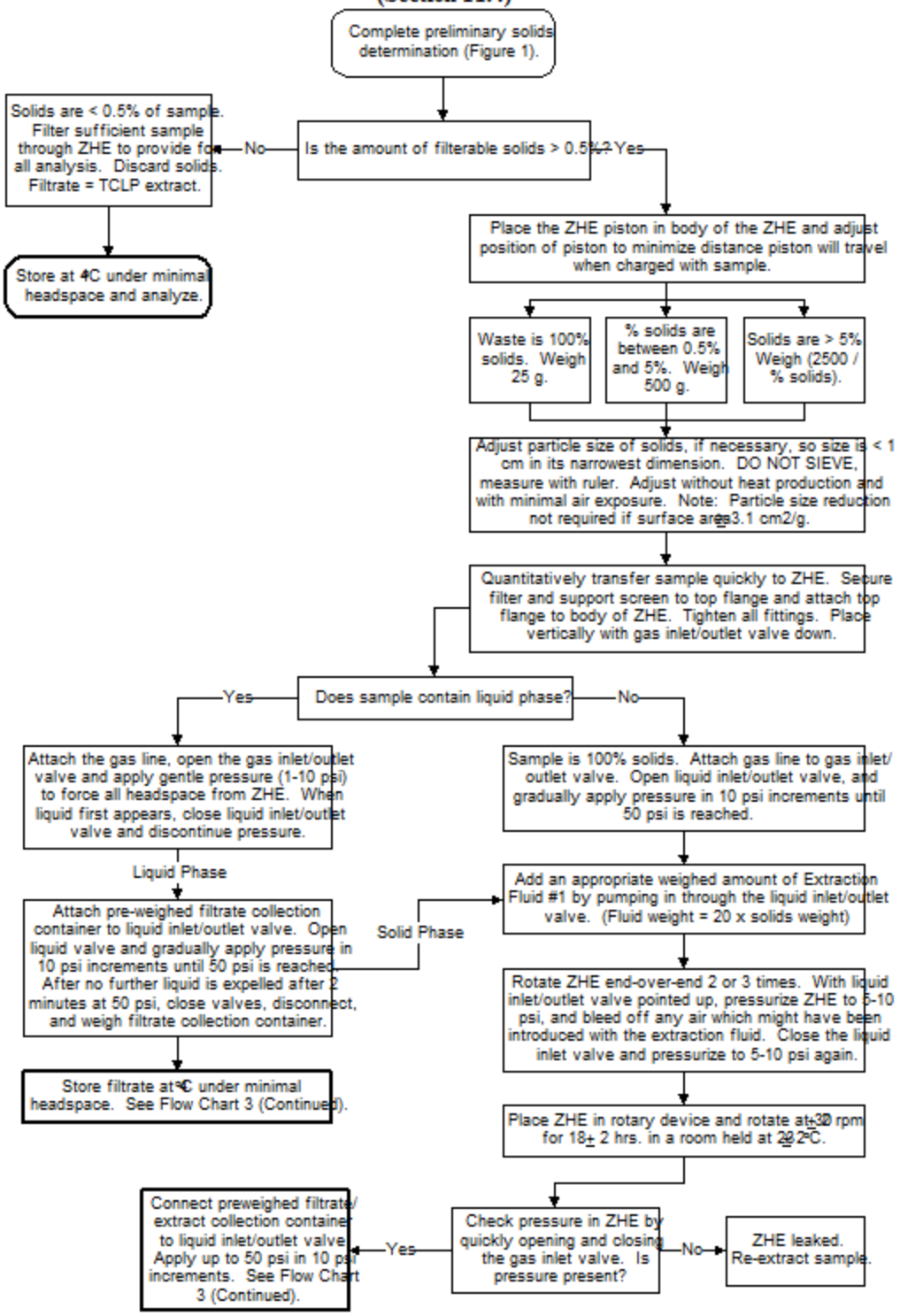


*Note: 1 mm size is used only for determination of leachate solution. 3.1 sq. cm or 1 cm diameter is used to determine need for size reduction.

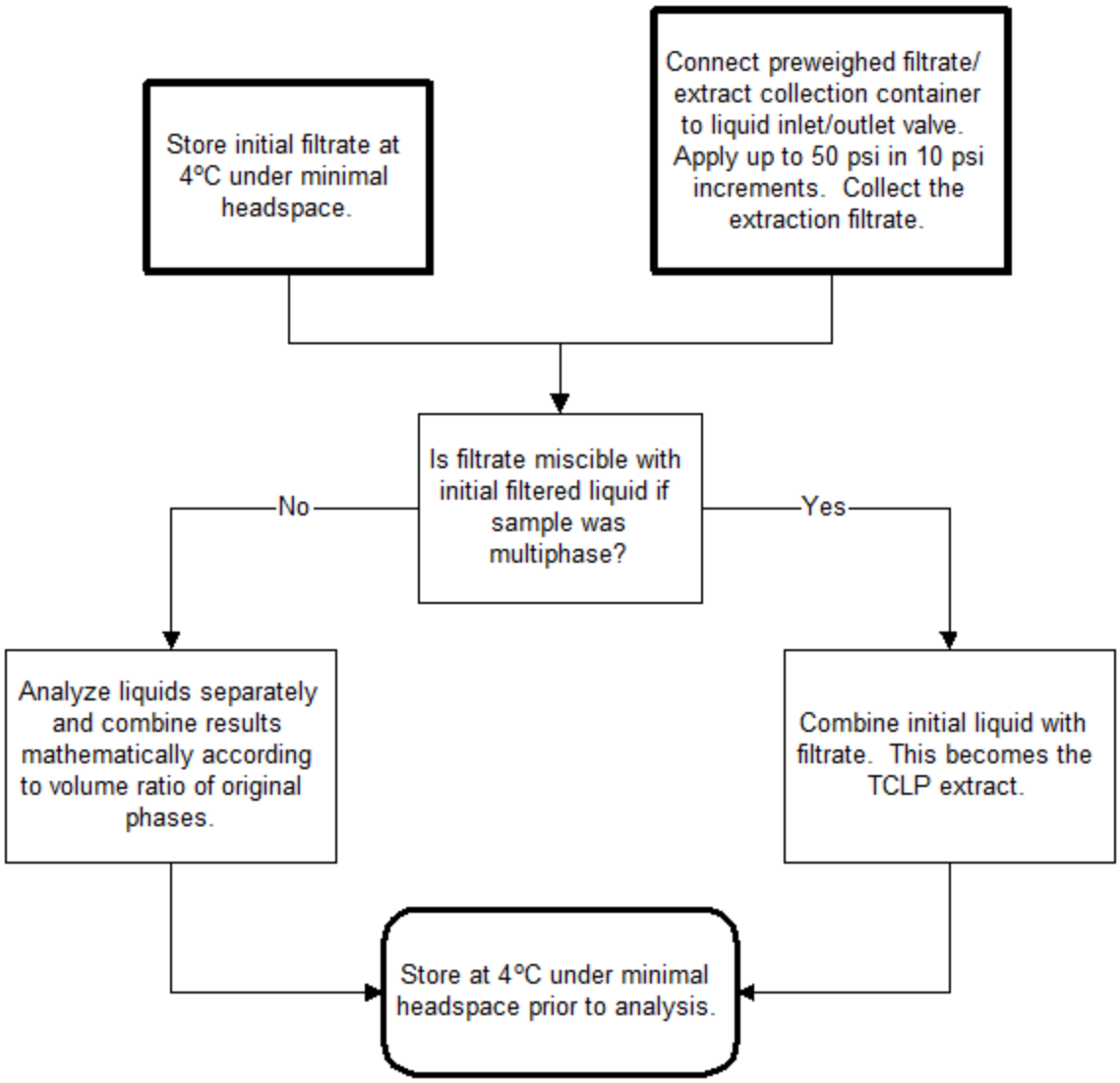
Flow Chart 2. Bottle Extraction, Non-Volatile Constituents (Section 11.3)



Flow Chart 3. ZHE Extraction, Volatile Constituents (Section 11.4)



Flow Chart 3. ZHE Extraction
(Continued)



Attachment:
1, Toxicity Characteristic Leaching Procedure and Synthetic Precipitation Leaching Procedure (.pdf)

End of document

Version history

Version	Approval	Revision information	
10	27.APR.2022	D4 Template for Analytical SOPs -	

eurofins	Always check on-line for validity **Liquid-Solid Partitioning as a Function of Liquid-Solid Ratio for Constituents in Solid Materials using an Up-Flow Percolation Procedure SW-846 Method 1314**	Level: **Standard Operating Procedure**
Document number: **PIT-ORG-SEDP-SOP45834**		
Old Reference: **PT-OP-021**		
Version: **4**		Organisation level: **4-Business Unit**
Approved by: **OA3Z, SBB9, TE9H** Effective Date: **06-JUN-2023**	Document users: **6_EUUS79_PIT_Sediment Prep**	Responsible: **5_EUUS79_PIT_QA All**

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....
1) Scope and Application
2) Summary of Method
3) Definitions
4) Interferences
5) Safety
6) Equipment and Supplies
7) Reagents and Standards
8) Sample Collection, Preservation, Shipment and Storage
9) Quality Control
10) Procedure
11) Calculations/Data Reduction
12) Method Performance
13) Pollution Control
14) Waste Management
15) References/Cross-References
16) Method Modifications
17) Attachments
18) Revision History
19) Appendix

....

1) Scope and Application

1.1 This method is designed to provide the liquid-solid partitioning (LSP) of inorganic constituents (e.g., metals, radionuclides) and non-volatile organic constituents (e.g., polycyclic aromatic hydrocarbons (PAHs), dissolved organic carbon) in a granular solid material as a function of liquid-to-solid (LS) ratio under percolation conditions. The first eluates of the column test provide insight into pore solution composition either in a granular bed (e.g., soil column) or in the pore space of low-permeability material(e.g., solidified monolithic or compacted granular fill). Analyses of eluates for dissolved organic carbon and of the solid phase for total organic carbon afford evaluation of the impact of organic carbon release and the influence of dissolved organic carbon on the LSP of inorganic constituents.

1.2 This method is intended to be used as part of environmental leaching assessment for the evaluation of disposal, beneficial use, treatment effectiveness and site remediation.

1.3 This method is suitable to a wide range of granular solid materials. Example materials include industrial wastes, soils, sludges, combustion residues, sediments, construction materials, and mining wastes. This method is not suitable to monolithic materials (e.g., cement based and stabilized materials) without particle-size reduction prior to testing.

1.4 This test method is intended as a means for obtaining a series of extracts (i.e., the eluates) of a granular solid material which may be used to show eluate concentrations and/or cumulative release as a function of LS ratio which can be related to a time scale when data on mean infiltration rate, density and height of application are available.

1.5 This method provides options for the preparation of analytical samples that provide flexibility based on the level of detail required. For example, when the purpose of characterization is for comparison to previous testing, compositing of eluates may be possible to create a reduced set of analytical samples. Table 1 outlines the eluate fractions and collection options, based on whether concentration or cumulative release is to be reported. The collection schemes are described below.

1.5.1 Complete characterization

- For complete characterization of eluate concentration and cumulative release as a function of LS ratio, nine discrete eluate collections and analyses are required (see Table 1, Option A). No compositing of eluate fractions is performed for complete characterization, and all eluate fractions are analyzed.

- Eluate concentrations from complete characterization may be used in conjunction with information regarding environmental management scenarios to estimate anticipated leaching concentrations, release rates, and extents of release for individual material constituents in the management scenarios evaluated. Eluate concentrations may also be used along with geochemical speciation modeling to infer the mineral phases that control the LSP in the pore structure of the solid material.

1.5.2 Limited analysis

Under a limited analysis approach, nine eluate collections and analysis of six analytical samples are required. If evaluation is based on eluate concentrations, six discrete eluate fractions are chemically analyzed (see Table 1, Option B). If evaluation is based on cumulative release, some eluate fractions are composited by volume-weighted averaging to create a set of six analytical samples (see Table 1, Option C). The concentrations of composite analytical samples cannot be interpreted along with eluate fractions on the basis of concentration.

1.5.3 Index testing

For the determination of consistency between the subject material and previously characterized materials, nine eluate collections and analysis of three analytical samples are required. If consistency is to be determined by eluate concentrations, three discrete eluate fractions are chemically analyzed (see Table 1, Option D). If consistency is to be determined by cumulative release, some eluate fractions are composited by volume-weighted averaging to create a set of three analytical samples (see Table 1, Option E). The concentrations of composited analytical samples cannot be interpreted along with eluate fractions on the basis of concentration.

1.6 This method is not applicable to characterize the release of volatile organic analytes.

1.7 This method provides eluate solutions considered indicative of leachate under field conditions only where the field leaching pH is controlled by the alkalinity or acidity of the solid material and the field leachate is not subject to dilution or other attenuation mechanisms. The cumulative mass of constituent released over a LS ratio range may be considered an estimate of the maximum mass of that constituent to be leached under field leaching over intermediate time frames (e.g., up to 100 years) and the domain of laboratory test pH.

1.8 Prior to employing this method, analysts are advised to take reasonable measures to ensure that the granular sample is homogenized to the extent practical. Particle size reduction may provide additional assurance of sample homogenization.

1.9 In preparation of solid materials for use in this method, particle-size reduction or exclusion of samples with large grain size is used to enhance the approach towards liquid-solid equilibrium over the residence time of eluent in the column.

1.10 The structure and use of this method is similar to that of NEN 7343 (see Ref. 1) and CEN TS 14405 (see Ref. 2).

1.11 If for any reason a part of this method cannot be followed, seek the guidance of the Department Supervisor or the Laboratory Technical Director. All abnormalities must be noted using an NCM in the TALS batch.

1.12 On occasion clients may request slight modifications to this SOP. Any modifications to this procedure must be approved by the QA department of the Laboratory or Technical Director and be fully documented in an NCM that accompanies the preparation batch.

2) Summary of Method

2.1 Eluent is introduced into a column of moderately-packed granular material in an up-flow pumping mode, with eluate collection performed as a function of the cumulative LS ratio. Upflow pumping is used to minimize air entrainment and flow channeling.

2.2 The default eluent for most materials is reagent water; however, a solution of 1.0 mM calcium chloride in reagent water is used when testing materials with either a high clay content (i.e., to prevent deflocculation of clay layers) or high organic matter (i.e., to moderate mobilization of dissolved organic carbon).

2.3 The flow rate is maintained between 0.5-1.0 LS/day to increase the likelihood of local equilibrium between the solid and liquid phases, due to residence times longer than 1 day.

2.4 Eluate volumes are chemically analyzed for a combination of inorganic and non-volatile organic analytes depending on the constituents of potential concern (COPC). For the purposes of chemical speciation modeling, the entire eluate volume up to 10 mL/g dry sample (g-dry) is collected in nine specific aliquots of varying volume. A limited subset of eluate volumes within the same LS ratio range may be collected and analyzed for regulatory and compliance purposes.

2.5 A flowchart for performing this method is shown in Figure 1.

3) Definitions

3.1 COPC - A chemical species of interest, which may or may not be regulated, but may be characteristic of release-controlling properties of the sample geochemistry.

3.2 Release - The dissolution or partitioning of a COPC from the solid phase to the aqueous phase during laboratory testing (or under field conditions). In this method, mass release is expressed in units of mg COPC/kg dry solid material.

3.3 LSP - The distribution of COPCs between the solid and liquid phases at the conclusion of the extraction.

3.4 LS ratio - the fraction of the total liquid volume (including the moisture contained in the "as used" solid sample) to the dry mass equivalent of the solid material. LS ratio is typically expressed in volume units of liquid per dry mass of solid material (mL/g-dry).

3.5 "As-tested" sample - The solid sample at the conditions (e.g., moisture content and particle-size distribution) present at the time of the start of the test procedure. The "as tested" conditions will differ from the "as-received" sample conditions if particle-size reduction and drying were necessarily performed.

3.6 Dry-mass equivalent - The mass of "as-tested" (i.e., "wet") sample that equates to the mass of dry solids plus associated moisture, based on the moisture content of the "as-tested" material. The dry-mass equivalent is typically expressed in mass units of the "as-tested" sample (g).

3.7 Eluent – The solution used to contact the solid material in a leaching test.

3.8 Eluate – The solution collected as an extract from a leaching test that contains the eluent plus constituents leached from the solid phase.

3.9 TALS - Eurofins Laboratory Information Management System (LIMS)

3.10 NCM - Non-Conformance Memo – a system within TALS for the lab to communicate to project management and others when there is an anomaly seen with the samples or batch, or a QC failure.

3.11 Please refer to the glossary in the Laboratory Quality Assurance Manual (*PIT-QA-QM45117*) for additional definitions.

4) Interferences

4.1 Reagents, glassware and other sample processing hardware may yield artifacts and/or interferences to sample analysis. All of these materials must be demonstrated to be free from interferences under the conditions of the analysis by analyzing method blanks. Specific selection of reagents and purification of solvents by distillation in all glass systems may be necessary. Refer to each method to be used for specific guidance on quality control procedures and to Chapters Three and Four for general guidance on the cleaning of laboratory apparatus prior to use.

4.2 When the test method is applied to solid materials with clay content greater than 10% or organic matter content greater than 1%, a solution of 1.0 mM calcium chloride in reagent water is recommended to minimize deflocculation of clay minerals. However, the use of calcium chloride solution will interfere with the determination of actual calcium and chloride release.

NOTE: The critical values of clay and organic matter content are verified during ruggedness testing.

4.3 When this method is applied to fine-grained, granular materials, tamping during column preparation may result in flow problems due to a low-permeability sample bed. This problem can be resolved by incorporating 20-50% inert material (e.g., 20–30-mesh normal sand or 2-mm borosilicate glass beads) into the solid sample. Alternatively, mass release from low permeability materials may be measured using Method 1315.

5) Safety

5.1 Employees must abide by the policies and procedures in the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*), the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*) and this document. This procedure may involve hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum.

5.2 Eye protection that protects against splash, laboratory coat, and appropriate gloves must be worn while samples, standards, solvents, and reagents are being handled. Cut resistant gloves must be worn doing any other task that presents a strong possibility of getting cut. Disposable gloves that have become contaminated will be removed and discarded; other gloves will be cleaned immediately.

5.3 All work must be stopped in the event of a known or potential compromise to the health and safety of a Eurofins associate. The situation must be reported immediately to a laboratory supervisor or EH&S coordinator.

5.4 The following is a list of the materials used in this method, which have a serious or significant hazard rating. This list does not include all materials used in the method. The table contains a summary of the primary hazards listed in the SDS for each of the materials listed in the table. A complete list of materials used in the method can be found in the reagents and materials section. Employees must review the information in the SDS for each material before using it for the first time or when there are major changes to the SDS.

Material (1)	Hazards	Exposure Limit (2)	Signs and symptoms of exposure
Hydrochloric Acid	Corrosive Poison	5 ppm-Ceiling	Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death. Can cause redness, pain, and severe skin burns. Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
1 – Always add acid to water to prevent violent reactions.			
2 – Exposure limit refers to the OSHA regulatory exposure limit.			

6) Equipment and Supplies

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met.

6.1 Column apparatus

This method recommends the use of a specific column apparatus (see Figure 2). Equipment with equivalent specifications may be substituted. The apparatus should have valves and quick connectors (e.g., Luer lock fittings) such that the column with end caps can be removed for packing with test material and mass measurements.

6.1.1 A 30-cm, straight cylindrical column with an inner diameter (ID) of 5-cm and constructed of inert material, resistant to high- and low-pH conditions and interaction with constituents of interest.

6.1.2 For the evaluation of inorganic COPC mobility, equipment composed of borosilicate glass (e.g., Kimble-Kontes CHROMAFLEX #420830-3020 or equivalent), polytetra-fluoroethylene (PTFE), high density polyethylene (HDPE), polypropylene (PP), or polyvinyl chloride (PVC) is recommended. For the evaluation of non-volatile organics, equipment composed of glass or Type 316 stainless steel is recommended due sorption of species with high hydrophobicity (e.g., PAHs). Borosilicate glass is recommended over other types of glass.

6.1.3 The column must be of sufficient volume to accommodate a minimum of a 300–g-dry material plus a 1-cm layer of silica sand (20-30 mesh) used at the bottom of the column to distribute eluent flow and at the top of the column to form a coarse filter for eluate particulates.

6.1.4 The column must have end cap materials that form a leak-proof seal and that can withstand pressures, such as encountered when pumping eluent through the column.

6.2 Eluent feed stock container — Resealable bottle or other container, constructed of inert material, capable of withstanding extreme pH conditions and interaction with any constituents of interest (see guidance in Sec. 6.1.2.).

6.3 Eluent feed tubing — 2-mm or similarly small ID tubing composed of chemically-inert material such as polyvinyl chloride or equivalent.

NOTE: Larger ID tubing may be required if a single eluent stock container is used to feed multiple column set-ups.

6.4 Eluate collection bottles — capable of assembly with column apparatus using simple water locks in order to prevent the intrusion of air (see Figure 3).

6.5 20–30-mesh normal washed quartz sand

6.6 Balance — Capable of 0.01-g resolution for masses less than 500 g.

6.7 Filtration apparatus — Pressure or vacuum filtration apparatus composed of appropriate materials so as to maximize the collection of extracts and minimize loss of the COPCs (e.g., Nalgene #300-4000 or equivalent) (see Sec. 6.1).

6.8 Filtration membranes — Composed of hydrophilic polyproylene or equivalent material with an effective pore size of 0.45-µm (e.g., Gelman Sciences GH Polypro #66548 from Fisher Scientific or equivalent).

6.9 pH Meter — Laboratory model with the capability for temperature compensation (e.g., Accumet AR20 or equivalent) and a minimum resolution of 0.1 pH units.

6.10 pH combination electrode — Composed of chemically-resistant materials.

6.11 Conductivity meter — Laboratory model (e.g., Mylon L Company Ultrameter or equivalent), with a minimum resolution of 5% of the measured value.

6.12 Conductivity electrode — Composed of chemically-resistant material

7) Reagents and Standards

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met. Please refer to the SDS prior to the use of any reagent or standard.

7.1 Reagent-grade chemical must be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specification are available. Other grade may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination. Inorganic reagents and extracts should be stored in plastic to prevent interaction of constituents from glass containers.

7.2 Reagent water must be interference free. All references to water in this method refer to reagent water unless otherwise specified.

7.3 Calcium chloride (1.0 mM), $CaCl_2$ — Prepared by dissolving 0.11 g of ACS grade or better solid calcium chloride in 1 L of reagent water.

8) Sample Collection, Preservation, Shipment and Storage

Sample Maximum Holding Times (Days): Holding times must be continuous with no gap during the 1314 leaching process.				
	From Field collection	From 1314 Leaching	From Preparative extraction	Total Elapsed Time
	To 1314 Leaching	To Preparative extraction	To Determinative analysis	
Semivolatiles	30	7	40	77
Mercury	30	NA	28	58
Metals, except mercury	30	NA	180	210
Non-Metal Inorganics	30	NA	28	58
NA = Not Applicable				
If sample holding times are exceeded, the values obtained are considered minimal concentrations. Exceeding the holding time is not acceptable in establishing that a waste does not exceed the regulatory level. Exceeding the holding time does not invalidate characterization if the waste exceeds the regulatory level.				

8.1 All samples should be collected using an appropriate sampling plan, in glass or plastic containers.

8.2 All analytical sample containers should be composed of materials that minimize interaction with solution COPCs.

8.3 Chemical preservatives should not be added to samples before extraction.

8.4 Samples should be kept at >0 and $\leq$6.0^{o}C during transport and storage.

8.5 Extracts should be preserved according to the guidance given in the individual determinative methods for the COPCs.

8.6 Extract holding times should be consistent with the aqueous sample holding times specified in the determinative methods for the COPCs.

8.7 Unless the "as-received" samples are part of a time-dependent (e.g, aging) study, solid materials should be processed and tested within one month of their receipt.

9) Quality Control

9.1 Method Blank - One method blank (using the same extraction fluid as used for the samples) must be prepared and analyzed for every batch of 20 or fewer samples of similar matrix, extracted in a particular vessel type. The blanks are generated in the same way as the samples (i.e., blanks will be percolated and filtered with the samples).

9.1.1 Extraction vessels will be uniquely numbered. Each time a new batch is set up the blank should be rotated sequentially to the next vessel to ensure all vessels are periodically checked.

9.1.2 If the MB is contaminated above the RL of the analytical method, leaching of the batch must be repeated, or an NCM must be created for the contamination to be included in the report case narrative.

9.2 Laboratory Control Sample (LCS) / Matrix Spike (MS/MSD) are spiked after a batch of Method 1314 leachates have been generated (i.e., at the time of the preparative digestion or extraction). QC limits of the determinative method apply.

10) Procedure

10.1 One-time procedural variations are allowed only if deemed necessary in the professional judgment of supervision to accommodate variation in sample matrix, radioactivity, chemistry, sample size, or other parameters. Any variation in procedure shall be completely documented on a Nonconformance Memo kept in the project file and described in the final report. The variation must be approved by a project manager, Technical Specialist and QA Manager. Any unauthorized deviations from this procedure must also be documented as a nonconformance, with a cause and corrective action described.

10.2 Refer to SOP *PIT-SM-SUB-SOP45639* for subsampling procedures.

10.3 Calibration and Standardization

10.3.1 The balance must be calibrated and certified at a minimum annually, and the calibration verified over the range of use on each day of use.

10.3.2 Prior to measurement of eluate pH, the pH meter should be calibrated using pH buffers 2, 4, 7, 10, and 13 or buffers that bracket the range of pH measurements. Refer to the current version of SOP *PIT-WC-ISE/P-SOP45358* for details of pH calibration and analysis.

10.3.3 Prior to measurement of eluate conductivity, the meter should be calibrated using at least one standard at a value greater than the range of conductivity measurements. Refer to the current version of SOP *PIT-WC-ISE/P-SOP45359* for details of conductivity calibration and analysis.

10.4 Particle-size reduction (if required)

10.4.1 In this method, particle-size reduction is used to prepare large grained samples for the column test so that the approach toward liquid-solid equilibrium is enhanced and fluid channeling along column walls is minimized. The maximum particle size of the solid should ~ 1/20 of the column diameter. For the column recommended in this method, a maximum particle size of 2.5 mm is acceptable. Therefore, 85% of the test material should pass through a 2.38-mm (US No. 8) sieve. If less than 15% of the solid material is larger than the maximum acceptable particle size, this fraction of the solid may be excluded from the material tested, rather than particle size-reduced. The mass and nature of the discarded fraction should be documented.

10.4.2 Particle-size reduction of "as received" sample may be achieved through crushing, milling or grinding with equipment made from chemically inert materials. During the reduction process, care should be taken to minimize the loss of sample and potentially volatile constituents in the sample.

NOTE: If the solid material is susceptible to interaction with the atmosphere (e.g., carbonation, oxidation), drying should be conducted in an inert environment.

10.4.3 When the material seems to be of a somewhat uniform particle size, calculate the percentage less than the sieve size as follows:

$$\% \text{ Passing} = (M_{sieved}/M_{total})*100\%$$

Where: M_{sieved} = mass of sample passing the sieve (g)
M_{total} = mass of total sample (g) (e.g., M_{sieved} + mass not passing sieve)

10.4.4 The fraction retained by the sieve should be recycled for further particle-size reduction until at least 85% of the initial mass has been reduced below the designated maximum particle size. Calculate and record the final percentage passing the sieve and the designated maximum particle size. For the uncrushable fraction of the "as received" material, record the fraction mass and nature (e.g., rock, metal or glass shards, etc).

10.4.5 Store the size-reduced material in an airtight container in order to prevent contamination via gas exchange with the atmosphere. Store the container in a cool, dark and dry place prior to use.

10.5 Determination of solids and moisture content

10.5.1 If the moisture content of the "as received" material is greater than 15% (wet basis), air-drying or desiccation may be necessary. Oven drying is not recommended for the preparation of test samples due to the potential for mineral alteration an volatility loss. In all cases, the moisture content of the "as received" material should be recorded.

10.5.2 In order to calculate eluate collection as a function of the dry-mass equivalent of "as tested" sample material, the solids content of the solid sample material should be determined and recorded. In this method, the moisture content is

determined and recorded on the basis of the "wet" or "as-tested" sample. The drying oven should be contained in a hood or otherwise properly ventilated. Significant laboratory contamination or inhalation hazards may result when drying heavily contaminated samples. Consult the laboratory safety officer for proper handling procedures prior to drying samples that may contain volatile, hazardous, flammable or explosive materials.

10.5.3 Place a 5–10g sample of solid material into a clean, pre-tared dish or crucible. Dry the sample to a constant mass at 105 ± 2 °C. Periodically check the sample mass after allowing the sample to cool to room temperature (20 ± 2 °C) in a desiccator. Refer to SOP *PIT-WC-SGRAV-SOP45403* for details of this analysis.

The oven-dried sample is not used for the extraction and should be properly disposed of once the dry mass is determined.

10.5.4 Calculate and report the solids content as follows:

$$SC = M_{dry}/M_{test}$$

Where: SC = solids content (g-dry/g)
M_{dry} = mass of oven-dried sample (g-dry)
M_{test} = mass of "as-tested" sample (g)

10.5.5 Calculate and report the moisture content (wet basis) as follows:

$$MC_{wet}=(M_{test}-M_{dry})/M_{test}$$

Where: MC_{wet} = moisture content on a wet basis (gH_2O/g)
M_{dry} = mass of oven-dried sample (g-dry)
M_{test} = mass of "as-tested" sample (g)

10.6 Column preparation

10.6.1 Prepare the column test apparatus as depicted in Figure 3. Eluent feed should be directed through the lower end cap and upwards into the column, in order to minimize air retention in the packed bed and fluid channeling along the column walls.

NOTE: When solid samples may be affected by dissolved oxygen in the feed stock, an inert gas (e.g., nitrogen or argon) may be bubbled through the feed solution to displace oxygen or used to purge the headspace above the feed solution.

NOTE: When alkaline or other air-sensitive eluates are expected, the vapor space of empty collections bottles may be purged with an inert gas (e.g., nitrogen or argon) prior to eluate collection.

10.6.2 Record the mass of the empty column with end caps and any tubing leads that are needed to separate the column from the entire apparatus.

10.6.3 Place an approximately 1-cm thick layer of quartz sand (Sec. 6.5) on the bottom of the column using a small scoop or spoon. Record the mass of the column and sand layer. Level the sand layer by tapping the sides of the column.

10.6.4 Pack the main body of the column with a minimum 300-g dry-mass equivalent of "as tested" sample in approximately five layers with light tamping with a glass rod to level the material between layers. The top of the packed sample should be approximately 1 cm from the level of the column interface with the top end cap. Record the mass of the column, lower sand layer, and "as tested" sample.

10.6.5 Place a layer of sand to fill the approximate 1-cm gap between the top of the sample packing and the interface between the column and top-end cap. Record the total mass of the completely-packed column.

10.6.6 Determine the "as tested" mass of the sample packing by subtracting the mass of the column and lower sand layer (Sec. 10.6.4) from the mass of the column, sand layer and packing (Sec. 10.6.3).

10.6.7 Calculate the dry-mass equivalent packed of "as tested" sample into the column using the solids content as follows:

$$M_{dry} = SC \times M_{test}$$

Where: M_{dry} = dry-mass equivalent of sample in column (g-dry)
SC = solids content (g-dry/g)
M_{test} = mass of "as tested" sample in column (g)

10.7 Pump setup

10.7.1 Prior to the start of the test, set the flow rate of the pump to a value that will provide an eluate production rate of 0.75 ± 0.25 LS/day. For example, given a dry-mass equivalent of 350 g-dry, an LS ratio of 0.5 would translate to 175 mL/g-dry, in which case the pump should be set to a flow rate of 175 mL/day.

10.7.2 Prime the tubing with eluent

10.7.2.1 Detach the inlet tubing from the bottom of the column and place the open end into a waste container.

10.7.2.2 Turn on the pump and allow the inlet tubing to fill with eluent. Remove any air bubbles trapped in the inlet tubing.

10.7.2.3 When the inlet tubing is full with eluent, stop the pump and reconnect the tubing to the bottom of the column.

10.8 Eluate collection schedule

10.8.1 Table 2 provides a schedule of fraction end-point LS ratios, interval LS ratios, and eluate fraction volumes for collection, assuming a dry-mass equivalent of 300 g-dry. The minimum volume of each collection bottle should be sized so as to capture the entire eluate fraction.

10.8.2 Using the assumed pump rate and the dry-mass equivalent of the sample, calculate the durations of column testing required to reach the target eluate collection LS ratios shown in Table 2 as follows:

$$Ti = [M_{dry} - \Sigma L/Si] / Ri$$

Where: Ti = target time from start for collection of eluent fraction i (day)
M_{dry} = dry-mass equivalent of sample in column (g-dry)
ΣLSi = target cumulative LS ratio for interval i from Table 1 (mL/g-dry)
Ri = pump rate assumed for interval i (mL/day)

Alternatively, use the provided Microsoft® Excel spreadsheet template to develop the schedule of target collection times.

NOTE: The schedule of predicted collection times is for reference purposes only. Typically, the eluate collection rate is slower that predicted initially, due in part to pump inefficiencies, back pressure and dead-volume lag times. The decision to switch collection bottles should be made based on the volume of eluate collected with time. The schedule may be revised with each eluate fraction collected, so that the prediction of future collections may be more accurate. Pump flow-rate adjustment may be necessary.

10.9 Column Test Procedure

10.9.1 Column/Eluent Equilibration

10.9.1.1 Turn on the pump and allow the column to fill with eluent, thus wetting the column packing.

10.9.1.2 When the column packing is completely wetted and the eluent level is even with the top of the column (or just beginning to be seen through the effluent tubing at the top of the column apparatus), stop the pump and allow the column to equilibrate for 21 $\pm$ 3 hours.

10.9.2 Column test

10.9.2.1 Following equilibration, begin the column test by starting the pump and recording the date and time.

NOTE: The eluate production rate should be monitored frequently during the column test and the pump rate adjusted, such that the eluate production rate is maintained at approximately 0.75 ± 0.25 LS/day.

10.9.2.2 When the eluate fraction has reached the target volume according to the predicted collection schedule, release the Luer lock connecting the active collection bottle and attach the eluent tubing to a new collection bottle.

10.9.3 Eluate processing

10.9.3.1 Decant a minimum volume (~ 5 mL) of the eluate fraction from the collection vessel in order to measure the solution characteristics.

10.9.3.2 Measure and record the pH, specific conductivity, and oxidation-reduction potential (ORP) (ORP is optional, but strongly recommended) of the eluate (see SOPs *PIT-WC-ISE/P-SOP45358*, *PIT-WC-ISE/P-SOP45359* and *PIT-WC-ISE/P-SOP45360* for analysis details).

10.9.3.3 Separate any suspended particulates from the remaining liquid in the collection bottle by pressure or vacuum filtration through a 0.45-µm filtration membrane (Sec.6.8).

NOTE: If either low-volatility organic species or mercury is a COPC, pressure filtration is recommended over vacuum filtration in order to minimize volatility losses.

10.9.3.4 Immediately preserve and store the volume(s) of eluate required for chemical analysis. Preserve all analytical samples in a manner that is consistent with the determinative chemical analyses to be performed.

10.9.4 Reiterate Sections 10.9.2.2 through 10.9.3.4 until nine eluate fractions are collected up to an LS ratio of 10 ± 0.2 mL/g-dry.

NOTE: In order to complete this method, all nine eluate fractions must be collected from the column. However, for purposes of limited analysis or index testing with interpretation based on cumulative release, fractions may be composited by volume-weighted averaging to create a single analytical sample from multiple eluate fractions.

10.9.5 Analytical sample preparation options

This method allows for options in the preparation of analytical samples based on the detail of characterization required (e.g., complete, limited or index) and the basis for data reporting (e.g., concentration or cumulative release). However, the complete set of nine eluate fractions must be collected in all cases.

10.9.5.1 Table 1 shows the analytical preparation scheme for Options A-E described in the following sections. Each composite sample may be created either by combining the total eluate volumes and preserving the total sample for analysis; or combining aliquots of two eluate fractions using volume-weighted averages. However, it is recommended that composite analytical samples be prepared using aliquots of eluate fractions whenever possible, rather than whole eluate fractions as this approach allows for potential analysis of discrete eluate fractions if desired at a later date.

10.9.5.1.1 Option A — This sample preparation option is used for complete characterization and includes analysis of all eluate fractions. Since the entire cumulative release curve is captured in nine discrete fractions, reported data may be based on either eluate concentrations or cumulative release.

10.9.5.1.2 Option B — This sample preparation option is used only for limited analyses based on eluate concentration. Six discrete eluate fractions are analyzed. Data obtained using this option cannot be used for cumulative release since there are sections of the cumulative release curve not analyzed.

10.9.5.1.3 Option C — This sample preparation option is used only for limited analysis based on cumulative release. Six analytical samples are created from three discrete eluate fractions and three composite samples. In the scheme shown in Table 1, the following fractions are composited:

- T04 and T05
- T06 and T07
- T08 and T09

10.9.5.1.4 Option D — This sample preparation option is used only for index testing based on eluate concentration. Three discrete eluate fractions are analyzed. Data obtained using this option cannot be used for cumulative release since there are sections of the cumulative release curve not analyzed.

10.9.5.1.5 Option E — This sample preparation option is used only for index testing based on cumulative release. Three analytical samples are created from one discrete eluate fraction and two composite samples. In the scheme shown in Table 1, the following fractions are composited:

- T02, T03, T04, and T05
- T06, T07, T08, and T09

10.9.6 Volume-weighted composites

10.9.6.1 The volume of aliquots of eluate fractions for composite analytical samples may be calculated using the Excel template provided or the following formula:

$$Vi = \frac{Fi}{\sum_{i}^{n} Fi} * V_{sample}$$

Where: Vi = the volume of an aliquot from eluate fraction i (mL)
Fi = the collected volume of eluate fraction i (mL)
V_{sample} = the total volume of the analytical sample (mL)
n = total number of eluate fractions to be composited

As an illustration of volume-weighted averaging, eluate fraction aliquots are calculated as required to create an analytical sample by compositing eluate fractions T06 through T09 for index testing based on cumulative release. The calculation follows the example volumes shown in Table 2 and assumes that an analytical sample volume of 100 mL is required.

$$\sum_{i}^{n} Fi = F_{T06}+F_{T07}+F_{T08}+F_{T09} = 450mL+150mL+1350mL+150mL=2100mL$$

$V_{T06}=(F_{T06}/\Sigma_{i}^{n}Fi)*V_{sample}=450mL/2100mL*100mL=21.5mL$

$V_{T07}=(F_{T07}/\Sigma_{i}^{n}Fi)*V_{sample}=150mL/2100mL*100mL=7.1mL$

$V_{T08}=(F_{T08}/\Sigma_{i}^{n}Fi)*V_{sample}=1350mL/2100mL*100mL=64.3mL$

$V_{T09}=(F_{T09}/\Sigma_{i}^{n}Fi)*V_{sample}=450mL/2100mL*100mL=21.5mL$

$V_{sample}=V_{T06}+V_{T07}+V_{T08}+V_{T09}=21.5ml+7.1mL+64.3mL+7.1mL=100mL$

NOTE: The above illustration uses example eluate fraction volumes based on interval LS ratios and an assumed test material mass. When calculating the aliquots of collected eluates fractions for composite samples, the actual collected fraction volumes should be used.

11) Calculations/Data Reduction

11.1 Data reporting

Figure 1 presents an example of a data sheet that may be used to report the concentration results of this method. This example is included in the Excel template. At a minimum, the basic test report should include the following:

a) Name of the laboratory
b) Laboratory contact information
c) Date and time at the start of eluate flow (start of test)
d) Name or code of the solid material tested
e) Particle size (85 wt% less than)
f) Packed bed dimensions (column ID and bed depth (cm))
g) Mass of solid material in column packing
h) Moisture content of solid material packed in column (gH2O/g)
i) Eluate specific information (see below)

The minimum set of data that should be reported for each eluate includes:

a) Eluate sample ID
b) Eluate collection date and time
c) Amount of eluate collected (mass or volume)
d) Measured eluate pH
e) Measured eluate conductivity (mS/cm)
f) Measured ORP (mV) (optional)
g) Concentration of all COPCs
h) Analytical QC qualifiers as appropriate

11.2 Data Interpretation (optional)

11.2.1 Concentration as a function of LS ratio

11.2.1.1 A curve of the eluate concentration as a function of LS ratio can be generated for each COPC after chemical analysis of all extracts by plotting the constituent concentration in the liquid phase as a function of the cumulative collected LS ratio. The curve indicates the nominal equilibrium concentration of the constituent of interest as a function of LS ratio from 0 to 10 mL/g-dry at natural pH. An example such curve is provided in Figure 4.

11.2.1.2 The lower limit of quantitation (LLOQ) of the determinative method for each COPC may be shown as a horizontal line. COPC concentrations below this line indicate negligible or non-quantitative concentrations.

NOTE: The lower limit of quantitation is highly matrix dependent and should be determined as part of a QA/QC plan.

11.2.2 Cumulative release as a function of LS ratio

11.2.2.1 The cumulative mass release of a COPC per unit solid material may be calculated as follows:

$$\Sigma M_i = \sum_{i=1} [C_i (\Sigma LS_i - \Sigma L/S_i - \Sigma L/S_{i-1})]$$

Where: ΣM_i = the cumulative mass release through interval i (mg/kg-dry])
C_i = the concentration of the COPC in the eluent collected during interval i (mg/L)
ΣLS_i = the cumulative LS ratio of eluate collected through interval i (L/kg-dry)
ΣLS_{i-1} = the cumulative LS ratio of eluate collected through interval i-1 (L/kg-dry)

11.2.2.2 Prepare a curve of the cumulative mass release generated for each COPC by plotting the cumulative mass release calculated in Sec. 11.2.2.1 as a function of the cumulative collected LS ratio. This curve provides an interpretation of the cumulative mass expected to be leached from a column of material as a function of LS ratio percolating through the column.

11.2.2.3 A comparison of the slope of the mass release curve to a unity slope, which is indicative of solubility-controlled release, may be made by plotting the cumulative mass release calculated in Sec. 11.2.2.1 versus the logarithm of the cumulative collected LS ratio. An example is provided in Figure 4.

12) Method Performance

12.1 Training Qualification: The supervisor has the responsibility to ensure that this procedure is performed by an associate who has been properly trained in its use and has the required experience.

12.2 Prior to performing this procedure on client samples, a Demonstration of Capability, as described in the QA Manual, must be documented.

12.3 Method Detection Limits are specific to the subsequent preparation and analytical methods, and are not performed for this leaching procedure.

13) Pollution Control

13.1 It is Eurofins' policy to evaluate each method and look for opportunities to minimize waste generated (i.e., examine recycling options, ordering chemicals based on quantity needed, preparation of reagents based on anticipated usage and reagent stability). Employees must abide by the policies in Section 13 of the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*) for "Waste Management and Pollution Prevention" and the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*).

13.2 This method does not contain any specific modifications that serve to minimize or prevent pollution.

14) Waste Management

14.1 Waste management practices are conducted consistent with all applicable rules and regulations. Excess reagents, samples and method process wastes are disposed of in an accepted manner. Waste description rules and land disposal restrictions are followed. Waste disposal procedures are incorporated by reference to *PIT-EHS-HS-SOP45640*. The following waste streams are produced when this method is carried out.

14.1.1 The remaining eluate waste is neutralized to a pH of 6 to 9 and discharged down a lab sink.

14.1.2 Acid waste is collected in containers identified as "Waste Acid", Waste #33. The waste is neutralized to a pH of 6 to 9 and discharged down a lab sink.

14.1.3 Solid waste including soils, filter paper, paper towels, etc. is collected in containers identified as "Lab Trash", Waste #12.

15) References/Cross-References

15.1 Method 1314, Liquid-Solid Partitioning as a Function of Liquid-Solid Ratio for Constituents in Solid Materials using an Up-Flow Percolation Column Procedure, Revision 1, July 2017

15.2 *PIT-QA-QM45117*, Pittsburgh Laboratory Quality Assurance Manual

15.3 SOP *PIT-QA-DR-SOP45623*, formerly, PT-QA-012, Selection and Calibration of Balances and Weights

15.4 SOP *PIT-QA-QAS-SOP45629*, formerly, PT-QA-016, Nonconformance & Corrective Action System

15.5 SOP *PIT-WC-SGRAV-SOP45403*, Percent Moisture, Solids, Ash, Organic Matter

15.6 SOP *PIT-QA-QAS-SOP45631*, formerly, PT-QA-021, Eurofins Pittsburgh QC Program

15.7 SOP *PIT-SM-SUB-SOP45639*, formerly, PT-QA-024, Subsampling

15.8 SOP *PIT-SM-RCT-SOP45637*, formerly, PT-QA-031, Internal Chain of Custody

15.9 SOP *PIT-WC-ISE/P-SOP45359*, Specific Conductance by methods EPA 120.1, SW-846 9050A, SM 2510B

15.10 SOP *PIT-WC-ISE/P-SOP45358*, Electrometric pH by methods SW-846 9040B/C, 9045C/D. SM4500-H+B

15.11 SOP *PIT-WC-ISE/P-SOP45360*, Oxidation-Reduction Potential (ORP) by method SM2580B

16) Method Modifications

16.1 None

17) Attachments

17.1 Table 1 – Schedule of Fraction Collections and Analytical Samples

17.2 Table 2 – Schedule of Eluate Fractions for Collection with Example Volumes

17.3 Figure 1 – Example Data Report Format

17.4 Figure 2 – Schematic of Column Test Apparatus

17.5 Figure 3 – Example Eluate Concentration Curves for Complete Characterization of a Coal Combustion Fly Ash

17.6 Figure 4 – Example Cumulative Release Curves for Complete Characterization of a Coal Combustion Fly Ash

18) Revision History

18.1 Revision 0, 1/13/13
18.2 Revision 1, 5/29/2015
18.3 Revision 2, 7/6/2017
18.4 Revision 2.1, 4/29/2019
18.5 Revision 3, 10/31/2019
18.6 Changes to current revision

SOP section	Change from	Change to	Reason
3.9, 5.3, 13.1, 15.6	TestAmerica	Eurofins	Name change
3.9		added: LIMS	Clarification
3.11, 15.2	PT-QA-M-001	*PIT-QA-QM45117*	Name change
5.1, 13.1	Corporate	NBLSC	Name change
5.1, 13.1	CW-E-M-001	*NDSC-US EHS-QP46060*	Name change
5.1, 13.1, 14.1	PT-HS-001	*PIT-EHS-HS-SOP45640*	Name change
10.2, 15.7	PT-QA-024	*PIT-SM-SUB-SOP45639*	Name change
10.3.2, 10.9.3.2, 15.10	PT-WC-026	*PIT-WC-ISE/P-SOP45358*	Name change
10.3.3, 10.9.3.2, 15.9	PT-WC-013	*PIT-WC-ISE/P-SOP45359*	Name change
10.5.3, 15.5	PT-WC-020	*PIT-WC-SGRAV-SOP45403*	Name change
10.9.3.2, 15.11	PT-WC-037	*PIT-WC-ISE/P-SOP45360*	Name change
15.3	PT-QA-012	*PIT-QA-DR-SOP45623*	Name change

15.4	PT-QA-016	*PIT-QA-QAS-SOP45629*	Name change
15.6	PT-QA-021	*PIT-QA-QAS-SOP45631*	Name change
15.8	PT-QA-031	*PIT-SM-RCT-SOP45637*	Name change

19) Appendix

TABLE 1
SCHEDULE OF FRACTION COLLECTIONS AND ANALYTICAL SAMPLES

Option		A		B	C	D	E
Fraction Label	ΣLS Ratio (mL/g-dry)	Characterization		Limited	Analysis	Index	Testing
		Conc.	ΣRel	Conc.	ΣRel	Conc.	ΣRel
T01	0.2 ± 0.1	9	9	9	9	9	9
T02	0.5 ± 0.1	9	9	9	9		p
T03	1.0 ± 0.1	9	9	9	9		p
T04	1.5 ± 0.2	9	9		p		p
T05	2.0 ± 0.2	9	9	9	9T05c	9	9T05c
T06	4.5 ± 0.2	9	9		p		p
T07	5.0 ± 0.2	9	9	9	9T07c		p
T08	9.5 ± 0.2	9	9		p		p
T09	10.0 ± 0.2	9	9	9	9T09c	9	9T09c

NOTE: ΣRel = Cumulative release.
9 = Collect eluate fraction (or pool of fractions) as analytical sample.
p = composite eluate fraction with next fraction to create analytical sample.

TABLE 2
SCHEDULE OF ELUATE FRACTIONS FOR COLLECTION WITH EXAMPLE VOLUMES

Interval Label	End Point ΣLS Ratio (mL/g-dry)	Fraction ΣLS Ratio (mL/g-dry)	Example Fraction Volume (mL)
T01	0.2 ± 0.1	0.2	60
T02	0.5 ± 0.1	0.3	90
T03	1.0 ± 0.1	0.5	150
T04	1.5 ± 0.2	0.5	150
T05	2.0 ± 0.2	0.5	150
T06	4.5 ± 0.2	1.5	450
T07	5.0 ± 0.2	0.5	150
T08	9.5 ± 0.2	4.5	1350
T09	10.0 ± 0.2	0.5	150
B01	Eluent		100

NOTE: Example fraction volumes based on assumed packing mass of 300 g-dry.

FIGURE 1 EXAMPLE DATA REPORT FORMAT

EPA METHOD 1314
Report of Analysis

ABC Laboratories
123 Main Street
Anytown, USA
Contact: John Smith
(555) 111-1111

Client Contact: Susan Jones
(555) 222-2222

Material Code: **XYZ**
Material Type: Coal Combustion Fly Ash
Date Received: 10/1/20xx
Test Date: 11/1/20xx
Report Date: 12/1/20xx

Particle Size: 88% passing 2-mm sieve
Mass used in Column: 360 g
Moisture Content: 0.002 g_{H_2O}/g
Column ID: 4.8 cm
Packing Bed Depth: 28 cm
Eluent: ASTM Type II Water
Lab Temperature: 21 ± 2 °C

Test Position	Replicate	Value	Units	Method	Note
T01	A				
	Eluate Sample ID	**XYZ-1314-T01-A**			
	Collection Date	11/1/20xx			
	Collection Time	12:35	PM		
	Eluate Mass	70.4	g		
	Eluate pH	8.82	-	EPA 9040	
	Eluate Conductivity	5.4	mS/c	EPA 9050	
	Eluate ORP	NA	mv		

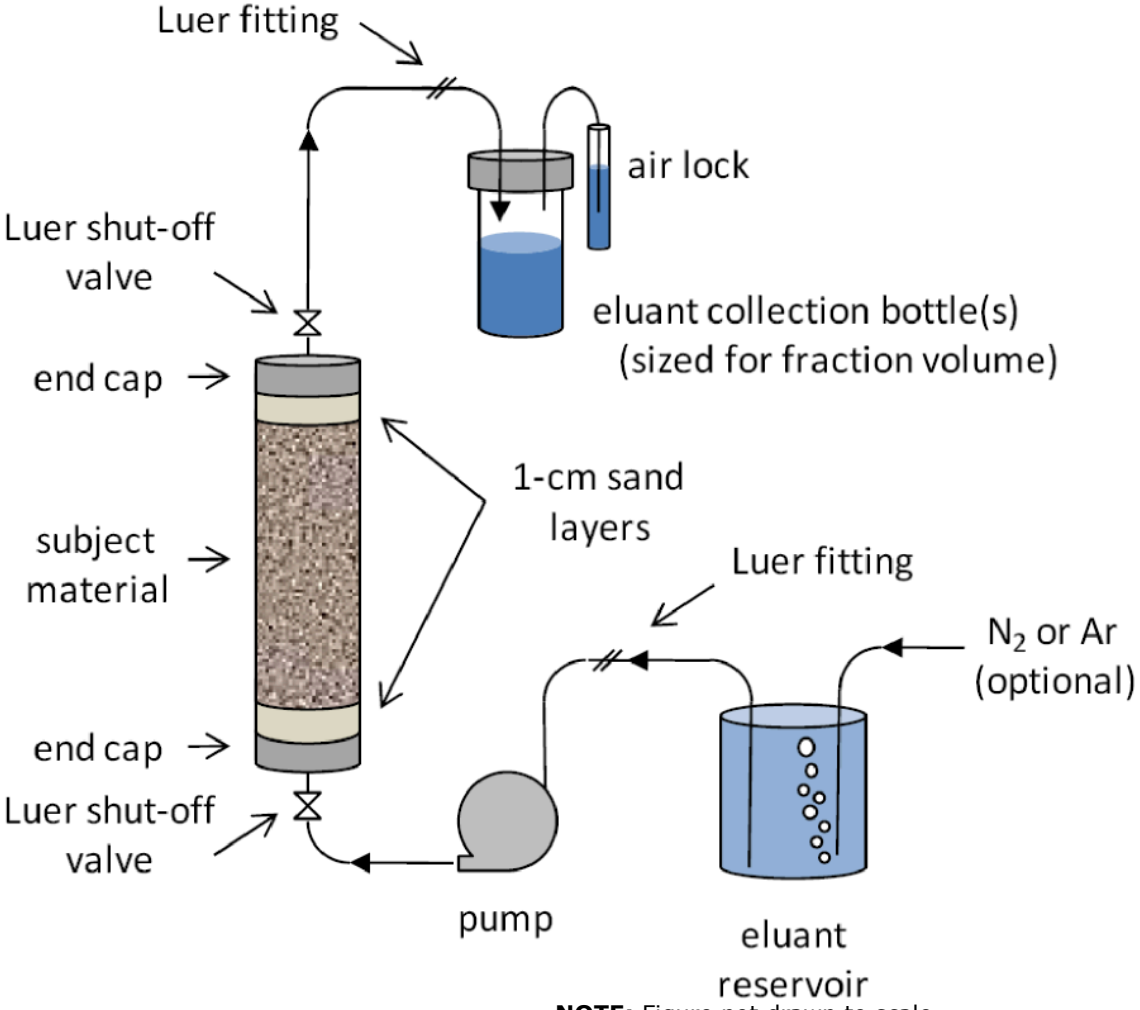
Chemical Analysis	Value	Units	QC Flag	Method	Date	Dilution Factor
Al	4.72	mg/L		EPA 6020	11/7/20xx	1000
As	0.12	mg/L		EPA 6020	11/7/20xx	10
Cl	5.42	mg/L		EPA 9056	11/9/20xx	1

Test Position	Replicate	Value	Units	Method	Note
T02	A				
	Eluate Sample ID	**XYZ-1314-T02-A**			
	Collection Date	11/1/20xx			
	Collection Time	9:15	AM		
	Eluate Mass	105.1	g		
	Eluate pH	9.15	-		
	Eluate Conductivity	2.3	mS/c		
	Eluate ORP	NA	mv		

Chemical Analysis	Value	Units	QC Flag	Method	Date	Dilution Factor
Al	2.99	mg/L		EPA 6020	11/7/20xx	1000
As	0.21	mg/L		EPA 6020	11/7/20xx	10
Cl	4.20	mg/L	U	EPA 9056	11/7/20xx	1

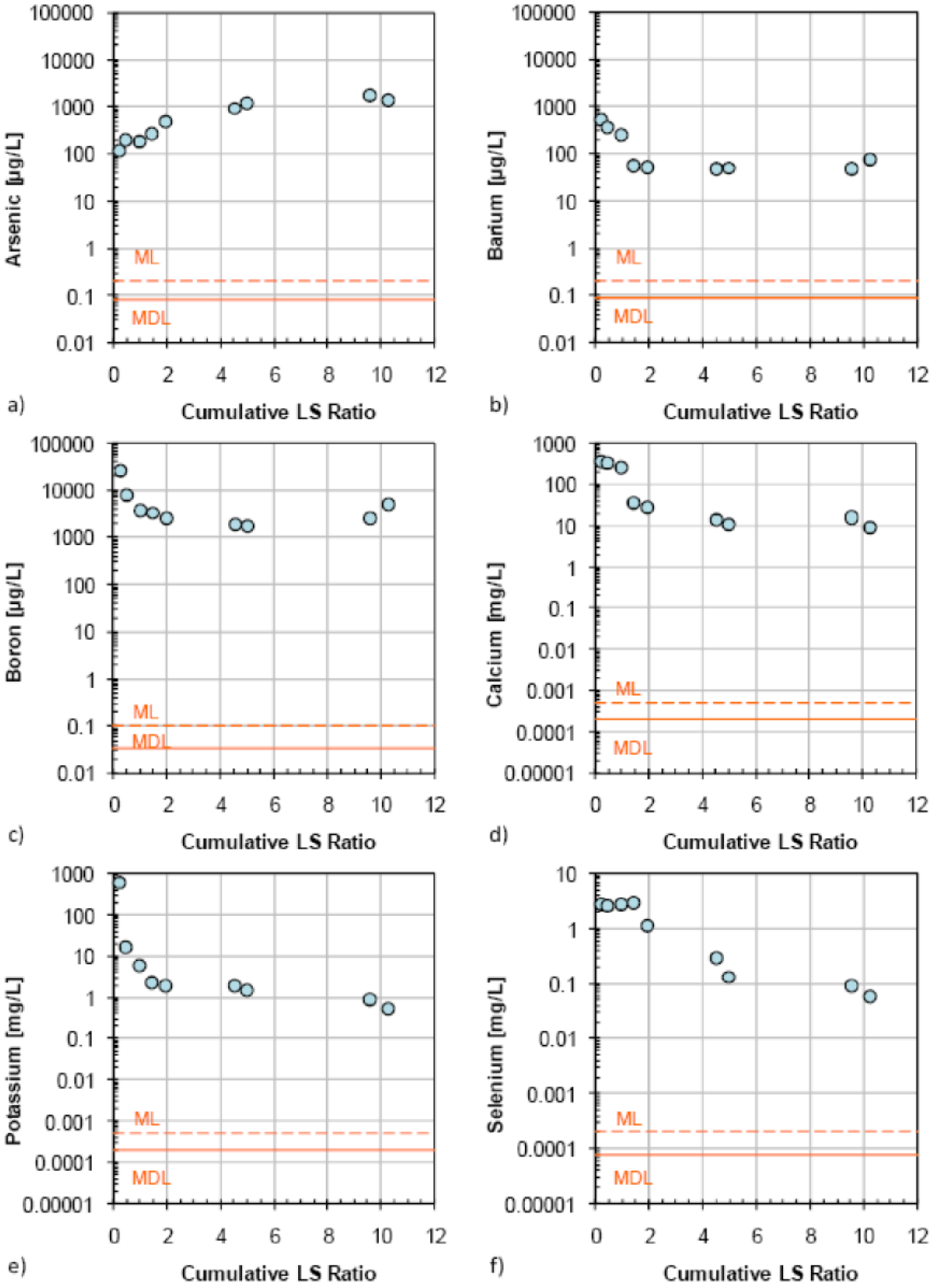
QC Flag Key: U Value below lower limit of quantitation as reported (< "LLOQ")

FIGURE 2
SCHEMATIC OF COLUMN TEST APPARATUS



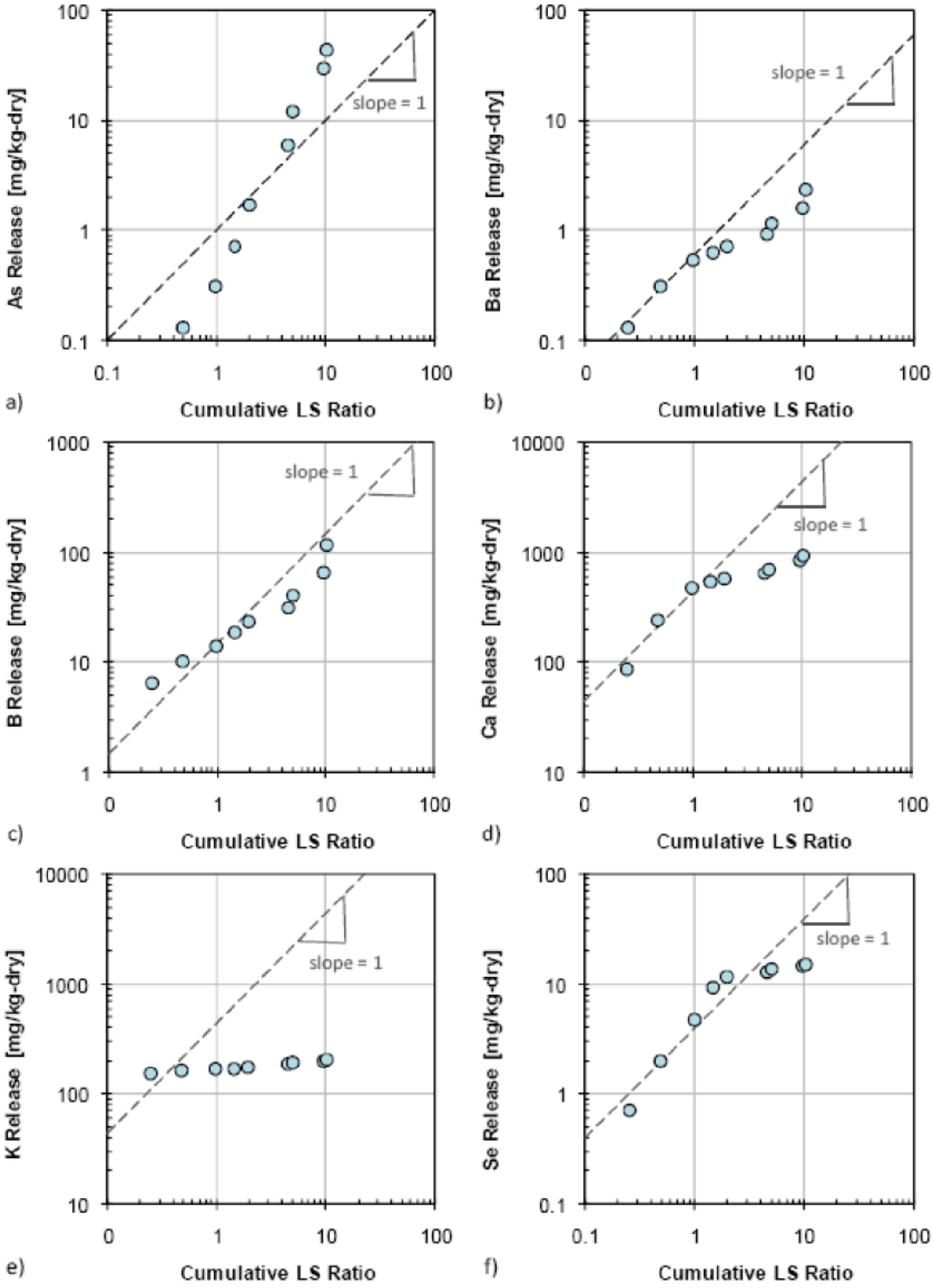
NOTE: Figure not drawn to scale

FIGURE 3 – EXAMPLE ELUATE CONCENTRATION CURVES FOR COMPLETE CHARACTERIZATION OF A COAL COMBUSTION FLY ASH



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FIGURE 4 – EXAMPLE CUMULATIVE RELEASECURVES FOR COMPLETE CHARACTERIZATION OF A COAL COMBUSTION FLY ASH



NOTE: Dashed line represents solubility control (slope = 1).

NDSC-US-EHS-QP46060 Environmental Health and Safety (HSE) Manual
PIT-EHS-HS-SOP45640 Environmental Health and Safety Manual Pittsburgh Facility Addendum
PIT-QA-DR-SOP45623 Selection and Calibration of Balances and Weights
PIT-QA-QAS-SOP45629 Nonconformance & Corrective Action System
PIT-QA-QAS-SOP45631 Laboratory Quality Control Program
PIT-QA-QM45117 Pittsburgh QA Manual

PIT-SM-RCT-SOP45637 Internal Chain of Custody
PIT-SM-SUB-SOP45639 Subsampling
PIT-WC-ISE/P-SOP45358 Electrometric pH, Methods 9040C and 9045D and SM4500-H+B
PIT-WC-ISE/P-SOP45359 Specific Conductance (Hand Held Meter), Methods 120.1, 9050A, SM 2510B
PIT-WC-ISE/P-SOP45360 Oxidation Reduction Potential (ORP), Method SM 2580B
PIT-WC-SGRAV-SOP45403 Percent Moisture, Solids, Ash, Organic Matter in Soil Samples, Methods SM 2540G and ASTM D297-84

End of document

Version history

Version	Approval	Revision information	
4	06.JUN.2023	D4 Template for Analytical SOPs -	

eurofins	Always check on-line for validity **Mass Transfer Rates of Constituents in Monolithic or Compacted Granular Materials using a Semi-Dynamic Tank Leaching Procedure SW-846 Method 1315**	Level: **Standard Operating Procedure**
Document number: **PIT-ORG-SEDP-SOP45833**		
Old Reference: **PT-OP-019**		
Version: **5**		Organisation level: **4-Business Unit**
Approved by: **SBB9** Effective Date: **21-JUN-2023**	Document users: **6_EUUS79_PIT_Sediment Prep**	Responsible: **5_EUUS79_PIT_QA** **All**

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1) Scope and Application

1.1 This method is designed to provide the mass transfer rates (release rates) of inorganic analytes contained in a monolithic or compacted granular material, under diffusion-controlled release conditions, as a function of leaching time. Observed diffusivity and tortuosity may be estimated through analysis of the resulting leaching test data.

1.2 This method is suitable to a wide range of solid materials which may be in monolithic form (e.g., cements, solidified wastes) or may be compacted granular materials (e.g., soils, sediments, stacked granular wastes) which behave as a monolith in that the predominant water flow is around the material and release is controlled by diffusion to the boundary.

1.3 This leaching characterization method provides intrinsic material parameters for release of inorganic species under mass transfer-controlled leaching conditions. This test method is intended as a means for obtaining a series of eluants which may be used to estimate the diffusivity of constituents and physical retention parameter of the solid material under specified laboratory conditions.

1.4 This method is a characterization method and does not provide a solution considered to be representative of eluate under field conditions. This method is similar in structure and use to predecessor methods such as MT001.1 (see Ref. 1), NEN 7345 (see Ref. 2), ANSI/ANS 16.1 (see Ref. 3), and ASTM C1308 (see Ref. 4). However, this method differs from previous methods in that: a) leaching intervals are modified to improve quality control, b) sample preparation accounts for mass transfer from compacted granular samples, and c) mass transfer may be interpreted by more complex release models that account for physical retention of the porous medium and chemical retention at the pore wall through geochemical speciation modeling.

1.5 The geometry of monolithic samples may be rectangular (e.g., bricks, tiles), cubes, wafers, cylinders. Samples may also have a variety of faces exposed to eluant forming anything from 1-dimensional (1-D) through 3-dimensional (3-D) mass transfer cases. In all cases, a minimum sample size of 5 cm in the direction of mass transfer must be employed and the liquid-surface-area (LSa) ratio must be maintained at 9 ± 1 mL/cm^2.

1.6 Monolithic samples should be suspended or held in the leaching fluid such that at least 98% of the entire sample surface area is exposed to eluant and the bulk of the eluant (e.g., a minimum of 2 cm between any exposed surface and the vessel wall) is in contact with the exposed sample surface. Figure 1 provides examples of appropriate sample holders and leaching configurations for 3-D and 1-D cases.

1.7 Compacted granular materials are granular solids, screened to pass a 2-mm sieve, compacted following a modified Proctor compaction effort (see Ref. 5). The sample geometry must be open-faced cylinders due to limitations of mechanical packing. However, the diameter and height of the sample holder may be altered to correspond appropriately with the diameter and volume of the leaching vessel. In all cases, the sample size of at least 5 cm in the direction of mass transfer must be employed and the LSa ratio must be maintained at 9 ± 1 mL/cm^2.

The sample should be positioned at the bottom of the leaching vessel with a minimum of 5 cm of distance between the solid-liquid interface and the top of the vessel. The distance between the non-leaching faces (i.e., outside of the mold surfaces) and the leaching vessel wall should be minimized to < 0.5 cm, such that the majority of the eluant volume is on top of the sample. Figure 2 shows an example of a holder and leaching configuration for a compacted granular sample.

1.8 The solvent system used in this characterization method is reagent water. Other systems (e.g., groundwater, seawater, and simulated liquids) may be used to infer material performance under specific environmental conditions. However, interaction between the eluant and the solid matrix may result in precipitation and pore blocking, which may interfere with characterization or complicate data interpretation.

1.9 If for any reason a part of this method cannot be followed, seek the guidance of the Department Supervisor or the Laboratory Technical Director. All abnormalities must be noted using an NCM in the TALS batch.

1.10 On occasion clients may request slight modifications to this SOP. Any modifications to this procedure must be approved by the QA department of the Laboratory or Technical Director and be fully documented in an NCM that accompanies the preparation batch.

2) Summary of Method

2.1 This method comprises leaching of continuously water-saturated monolithic or compacted granular material in an eluent-filled tank with periodic renewal of the leaching solution. The vessel and sample dimensions are chosen such that the sample is fully immersed in the leaching solution. Monolithic samples may be cylinders or parallelepipeds, while granular materials are compacted into cylindrical molds at optimum moisture content using modified Proctor compaction methods (see Ref. 5). In either case, the exposure of a regular geometric area to the eluant is recommended.

2.2 Samples are contacted with reagent water at a specified LSa ratio. The leaching solution is exchanged with fresh reagent water at nine pre-determined intervals.

2.3 The sample is freely drained and the mass is recorded to monitor the amount of eluant absorbed into the solid matrix at the end of each leaching interval. The eluate pH, ORP, and specific conductance is measured for each time interval and analytical samples are collected and preserved accordingly based on the determinative methods to be performed.

2.4 Eluate concentrations are plotted as a function of time, as a mean interval flux and as cumulative release as a function of time. These data are used to estimate mass transfer parameters (i.e., observed diffusivity) for each constituent of potential concern (COPC). A flowchart for performing this method is shown in Figure 3.

NOTE: The leaching schedule may be extended for additional exchanges with individual intervals of 14 days to provide more information about longer-term release.

3) Definitions

3.1 COPC - A chemical species of interest, which may or may not be regulated, but may be characteristic of release-controlling properties of the sample geochemistry.

3.2 Release - The dissolution or partitioning of a COPC from the solid phase to the aqueous phase during laboratory testing (or under field conditions). In this method, mass release is expressed in units of mg COPC/kg dry solid material.

3.3 LSa ratio - The ratio representing the total liquid volume used in the leaching interval to the external geometric surface area of the solid material. LSa ratio is typically expressed in units of mL of eluent/cm^2 of exposed surface area.

3.4 Observed mass diffusivity - the apparent, macroscopic rate of release due to mass transfer from a solid into a liquid as measured using a leaching test under conditions where mass transfer controls release. The observed diffusivity accounts for all physical and chemical retention factors influencing mass transfer and is typically expressed in units of cm^2/s.

3.5 Effective mass diffusivity - The intrinsic rate of mass transfer in a porous medium accounting for physical retention. The effective mass diffusivity is typically expressed in units of cm^2/s.

3.6 Physical retention factor - A mass transfer rate term that describes the retardation of diffusion due to intrinsic physical properties of a porous medium (e.g., effective porosity, tortuosity).

3.7 Chemical retention factor - A mass transfer rate term that describes the chemical processes (e.g., dissolution/precipitation, adsorption/desorption, complexation) occurring at the pore water interface with the solid mineral phases within the porous structure of the solid material.

3.8 TALS - Eurofins Laboratory Information Management System (LIMS)

3.9 NCM - Non-Conformance Memo – a system within TALS for the lab to communicate to project management and others when there is an anomaly seen with the samples or batch, or a QC failure.

3.10 Please refer to the glossary in the Laboratory Quality Assurance Manual (*PIT-QA-QM45117*) for additional definitions.

4) Interferences

4.1 Glassware and other sample processing hardware may yield artifacts and/or interferences to sample analysis. These materials must be demonstrated to be free from interferences under the conditions of the analysis by analyzing method blanks. Specific selection of reagents and purification of solvents by distillation in all glass systems may be necessary. Refer to each method to be used for specific guidance on QC procedures and to Chapters Three and Four for general guidance on the cleaning of laboratory apparatus prior to use.

4.2 The reaction of atmospheric gases can influence the measured concentrations of constituents in eluates. For example, reaction of carbon dioxide with eluants from highly alkaline or strongly-reducing materials will result in neutralization of eluate pH and precipitation of carbonates. Leaching vessels, especially those used when testing highly alkaline materials, should be designed to be air-tight in order to minimize the reaction of samples with atmospheric gases.

4.3 Use of certain solvent systems may lead to precipitation at the material surface boundary which may reduce mass transport rates. For example, exposure of cement-based materials to seawater leads to sealing of the porous block (see Ref. 6).

5) Safety

5.1 Employees must abide by the policies and procedures in the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*), the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*) and this document. This procedure may involve hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum.

5.2 All work must be stopped in the event of a known or potential compromise to the health and safety of a Eurofins associate. The situation must be reported immediately to a laboratory supervisor or EH&S coordinator.

6) Equipment and Supplies

The mention of trade names or commercial products in this manual is for illustrative purposes only, and does not constitute an EPA endorsement or exclusive recommendation for use. The products and instrument settings cited in SW-846 methods represent those products and setting used during the method development or subsequently evaluated by the Agency. Glassware, reagents, supplies, equipment, and setting other than those listed in this manual may be employed provided that method performance appropriate for the intended application has been demonstrated and documented.

Common laboratory glassware (e.g., beakers and flasks) may be used with this procedure. Any volumetric glassware must be class A.

6.1 Sample holder

6.1.1 Monolithic samples

6.1.1.1 A mesh or structured holder constructed of an inert material such as high-density polyethylene (HDPE) or other material resistant to high and low pHs is recommended.

6.1.1.2 The holder should be designed such that at least 98% of the sample external surface area may be exposed to eluant.

6.1.1.3 The holder should be designed to match the geometry of the mass transfer such that the bulk of the eluant may be in contact with the sample and the exposed surfaces of the sample centered within the leaching fluid.

NOTE: In the case of 1-D mass transfer from the axial face of a cylindrical sample, the outer diameter (OD) of the holder should be matched as closely as possible to the inner diameter (ID) of the leaching vessel so that the majority of the eluant is above the sample (e.g., in contact with the exposed material surface), while allowing for easy placement and removal of the holder in the leaching vessel (see Figure 1).

6.1.2 Compacted granular samples

6.1.2.1 A cylindrical mold constructed of an inert material such as HDPE or other material resistant to high and low pH is recommended.

6.1.2.2 The holder should be capable of withstanding the compaction force required to prepare the sample (see Section 10.7) without breaking or distorting.

NOTE: The outer diameter of the holder for a compacted granular sample should be matched as closely as possible to the inner diameter of the leaching vessel so that the majority of the eluant is above the sample (e.g., in contact with the exposed material surface) while allowing for easy placement and removal of the holder in the leaching vessel.

6.2 Leaching vessel

6.2.1 A straight-sided container constructed of a material resistant to high and low pH is recommended. Jars or buckets composed of HDPE, polycarbonate (PC), polypropylene (PP), or polyvinyl chloride (PVC) are recommended when evaluating the mobility of inorganic species.

6.2.2 The leaching vessel should have an air-tight seal that can sustain long periods of standing without gas exchange with the atmosphere.

6.2.3 The container must be of sufficient volume to accommodate both the solid sample and an eluant volume based on an LSa ratio of 9 ± 1 mL eluant/cm^2 sample surface area. Ideally, the vessel should be sized such that the headspace is minimized within the tolerance of the LSa ratio.

6.2.4 For organic parameters, a 2-Liter glass container with a Teflon lined lid will be used as the leaching vessel. The 2- Liter size ensures that no headspace will be in the container during the leaching duration. For leachates that require volatile analysis, the same size jar will be used but a luer lock fitting is attached to the lid. A 50-mL syringe is attached to the lid. Once the leaching is completed, the syringe will draw 50 mL of sample which will be placed in a preserved VOA vial.

6.3 Leaching setup

Example photos of three possible leaching equipment arrangements for monolithic and compacted granular samples are shown in Figures 1 and 2, respectively. The equipment used in the each of these cases is described below.

6.3.1 Figure 1a shows a monolithic sample 3-D configuration with the following accessories:

- Sample holder — PP sink washers, 43-mm OD, 37-mm ID, 6-mm high, with four holes drilled at the quadrants to accept 2-mm OD nylon string knotted at top.
- Sample stand — PVC pipe, 47-mm OD, 51-mm high, cut to have four legs approximately 8-mm wide and 30-mm high.
- Leaching Vessel — PP bucket, 140-mm ID at top, 120-mm ID at bottom, 200-mm high (Berry Plastics #T51386CP3, VWR Scientific, or equivalent).

6.3.2 Figure 1 b shows a monolithic sample 1-D configuration with the following accessories:

- Sample holder — Polyethylene (PE) mold, 54-mm OD, 100-mm high (MA Industries, Peach Tree City, GA, or equivalent), with the test sample cured in mold and cut to 51-mm high.
- Leaching vessel — 250-mL PC jar, (60-mm ID, 100-mm high, (Nalgene #2116-0250, Fisher Scientific, or equivalent).

6.3.3 Figure 2 shows a compacted granular sample 1-D Configuration with the following accessories:

- Sample holder — PE mold, 100-mm OD, 200-mm high, (MA Industries, Peach Tree City, GA, or equivalent) cut to 63-mm high with three tabs drilled for 0.7-mm fishing line knotted at the top.
- Leaching vessel — 1000-mL PC jar, 110-mm ID at top, 130-mm high (Nalgene #2116-1000, Fisher Scientific, or equivalent).
- Glass beads, borosilicate — 2-mm diameter

6.4 Filtration apparatus — Pressure- or vacuum-filtering apparatus made of appropriate materials to maximize the collection of extracts and minimize the loss of COPCs (Nalgene #300-4000 or equivalent).

6.5 Filtration membranes — Composed of hydrophilic PP or similar material with an effective pore size of 0.45-µm (e.g., Andwin Scientific GH Polypro 28143-288 or equivalent).

6.6 pH Meter — Laboratory model with the capability for temperature compensation (e.g., Accumet 20, Fisher Scientific or equivalent) and a minimum resolution of 0.1 pH units.

6.7 pH combination electrode — Composed of chemically-resistant materials.

6.8 Conductivity meter — Laboratory model (e.g., Accumet 20, Fisher Scientific or equivalent), with a minimum resolution of 5% of the measured value.

6.9 Conductivity electrodes — Composed of chemically-resistant materials.

6.10 Proctor compactor (for compacted granular samples only) — Equipped with a slide hammer capable of dropping a 4.5-kg weight over a 0.46-m interval (see Ref. 5 for further details).

7) Reagents and Standards

Reagent-grade chemicals must be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specification are available. Other grade may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

7.1 Reagent water must be interference free. All references to water in this method refer to reagent water unless otherwise specified.

7.2 Other reagents may be used in place of reagent water on a case-specific basis.

8) Sample Collection, Preservation, Shipment and Storage

8.1 Samples may be taken in glass or plastic containers and must be kept at >0 and <6.0^{o}C during shipment and storage.

8.2 Extract holding time is equal to the aqueous holding time for the determinative method, with the holding time starting when the liquid sample is filtered.

8.3 Solid materials should be tested within one month of receipt unless the project requires that the "as-received" samples are tested sooner (e.g., the material is part of a time-dependent study or the material may change during storage due to oxidation or carbonation).

9) Quality Control

9.1 Batching Samples - Groups of samples with visibly different bulk matrices (e.g., petroleum sludge and soil samples) must be batched separately for QC testing purposes. Batches may consist of up to 20 samples of similar matrix.

9.2 Method Blanks – A method blanks (using the same extraction fluid as used for the samples) must be prepared and analyzed for each leaching interval, for each batch.

9.2.1 If the MB is contaminated above the RL of the analytical method, leaching of the batch must be repeated, or an NCM must be created for the contamination to be included in the report case narrative.

9.3 Laboratory Control Sample (LCS) / Matrix Spike (MS/MSD) are spiked after a batch of Method 1315 leachates have been generated (i.e., at the time of the preparative digestion or extraction). QC limits of the determinative method apply.

10) Procedure

10.1 Calibration

10.1.1 The balance must be calibrated and certified at a minimum annually, and the calibration verified over the range of use on each day of use.

10.1.2 Prior to measurement of eluate pH, the pH meter should be calibrated using a minimum of three standards that bracket the range of pH measurements. Refer to the current version of SOP *PIT-WC-ISE/P-SOP45358* for additional guidance on pH meter calibration and verification.

10.1.3 Prior to measurement of eluate conductivity, the meter should be calibrated using at least one standard at a value greater than the range of conductivity measurements. Refer to the current version of SOP *PIT-WC-ISE/P-SOP45359* for additional guidance on conductivity meter calibration and verification.

10.2 PREPARATORY PROCEDURES

A flowchart of this method, including preparatory and leaching procedures, is shown in Figure 3.

10.2.3 Determination of solids and moisture content - The moisture and solids content of the sample material are used to relate leaching results to dry-material masses. When preparing compacted granular samples for testing, the moisture content or solid content is used to determine the optimum moisture content following the modified Proctor test. This method calculates moisture content on the basis of the "wet" or "as tested" sample.

- The drying oven should be contained in a hood or otherwise properly ventilated. Significant laboratory contamination or inhalation hazards may result when drying heavily contaminated samples. Consult the laboratory safety officer for proper handling procedures prior to drying samples that may contain volatile, hazardous, flammable or explosive materials.

10.2.4 Place a 5–10 g sample of solid material into a clean, pre-weighed dish or crucible. Dry the sample to a constant mass at 105 ± 2 °C. Periodically check the sample mass after allowing the sample to cool to room temperature (20 ± 2 °C) in a desiccator.

The oven-dried sample is not used for the extraction and should be properly disposed of once the dry mass is determined.

10.2.5 Calculate and report the solids content as follows:

$$SC = M_{dry} / M_{test}$$

Where: SC = solids content (g-dry/g)
M_{dry} = mass of oven-dried sample (g-dry)
M_{test} = mass of "as-tested" sample (g)

10.2.6 Calculate and report the moisture content as follows:

$$MC_{wet} = (M_{test} - M_{dry})/M_{test}$$

Where: MC_{wet} = moisture content on a wet basis (g H_2O/g)
M_{dry} = mass of oven-dried sample (g-dry)
M_{test} = mass of "as-tested" sample (g)

10.3 Preparation of monolithic samples

10.3.3 If the material to be tested is granular, disregard this section and proceed to Section 10.4.

10.3.4 A representative sample of monolithic material should be obtained by molding material components in place (e.g., cementitious media) or by coring or cutting a sample from a larger existing specimen.

10.3.5 The geometry of monolithic samples may be rectangular (e.g., bricks, tiles), cubes, wafers, cylinders. Samples may also have a variety of faces exposed to eluant forming 1-, 2-, or 3-D mass-transfer cases. Example monolithic sample leaching setups are shown in Figure 1.

10.3.6 A minimum sample size of 5 cm in the direction of mass transfer must be employed and the LSa ratio must be maintained at 9 ± 1 mL/cm^2.

Because the sample holder and leaching vessel must correspond to the specifications in Sec 6.1, it is often easier to modify the sample size and geometry rather than the holder and vessel dimensions.

10.3.7 Proceed to Section 10.5.

10.4 Preparation of compacted granular samples

10.4.1 Compacted granular materials, for most cases, must be open-faced cylinders due to the limitations of mechanical packing. However, the diameter and height of the sample holder may be altered to work appropriately with the diameter and volume of the leaching vessel. In all cases, a minimum sample size of 5 cm in the direction of mass transfer must be employed and the LSa ratio must be maintained at 9 ± 1 mL/cm^2.

10.4.2 Granular samples are compacted into the sample holder using a variation on the modified Proctor compaction (see Ref. 5) to include the use of 6-cm high test molds compacted in three layers (rather than the five layers specified in Ref. 5) to maintain the total compaction effort. The granular sample should be compacted at optimum moisture content in order to obtain packing densities that approximate field conditions. Optimum moisture content refers to the amount of moisture or fractional mass of water (g H_2O/g material) in the granular sample that is present at the optimum packing density (g-dry material/cm^3). Optimum packing density is defined in Ref. 5. The optimum moisture content of the test material is determined from a pretest measuring the packing density of granular materials compacted at different levels of moisture content.

10.4.3 Pre-test to determine optimum moisture content

The pre-test is conducted as a series of five batch-wise packing trials with consecutive increases in moisture content until the maximum packing density has been surpassed. The optimum moisture content is determined as the maximum of a third order polynomial fit through the graph of dry-packing density as a function of moisture content (wet basis).

10.4.3.1 Place 1500 g of "as received" material into a pail or bowl and mix well by hand to homogenize. As an alternate to hand mixing, a mechanical paddle mixer may used.

The pretest may be conducted from a bulk supply of solid material (e.g., 10 kg total for five batches) as long as the starting mass for each trial is recorded and incremental water additions are used.

10.4.3.2 Mix a known amount of laboratory water with the bulk material in the pail or bowl until homogenized based on visual inspection. For the first point in the pre-test, no water needs to be added.

The amount of water added should be enough increase the moisture content in approximately 3-5% increments. Smaller additions may be needed in order to provide finer resolution of the packing density as a function of moisture content curve.

10.4.3.3 Calculate the new moisture content for the trial as follows:

$$MCi_{wet} = (M_{test} \times MC_{wet} + W_{added})/(M_{test} + W_{added})$$

Where: MCi_{wet}= moisture content (wet basis) of the pre-test trial (g H_2O/g)
M_{test} = mass of "as-tested" material used in the trial (g)
MC_{wet} = moisture content (wet basis) of the "as-tested" material (g H_2O/g)
W_{added} = mass of water added to the "as-tested" material (g H_2O/g)

10.4.3.4 Compact approximately 1000 g of material into a pre-tared 10-cm diameter mold into three consecutive layers of material. The compacted mass should have a level flat surface as a top face.

10.4.3.5 Measure and record the height, diameter, and mass of the resulting compacted material.

10.4.3.6 Calculate and record the packing density (dry basis) as follows:

$$P_{pack} = (m \times sc)/(\pi \times h) \times (2/d)^2$$

Where: P_{pack}= packing density (dry basis) (g-dry/cm^3)
m = mass of the compacted sample (g)
SC = solids content of the "as -received" granular material (g-dry/g)
d = measured diameter of the compacted sample (cm)
h = measured height of the compacted sample (cm)

10.4.3.7 Repeat Sections 10.4.3.1 through 10.4.3.6 for four subsequent trials until the value of the calculated packing density decreases.

10.4.3.8 Plot the packing density as a function of moisture content. Figure 4 shows an example of a packing density curve.

10.4.3.9 Determine the optimum moisture content at the maximum of the packing density curve. This value may be read directly from the graph or determined by the maximum of a third-order polynomial fit through the five pre-test data points. A controlled Excel Worksheet may be used to produce this plot.

10.4.4 Compacted granular test sample preparation

10.4.4.1 Using the optimum moisture content determined in Sec. 10.4.3.9, calculate the amount of "as-received" material that is required to pack the sample holder to within 3 mm of the rim of the holder.

$$M_{test} = ((P_{opt} \times \pi \times (h - 0.03))/SC \times (d/2)^2$$

Where: M_{test} = mass of "as tested" sample (g)
P_{opt} = optimal packing density (dry basis) (g-dry/cm^3) determined in Section 10.7.1.9.
SC = solids content of the "as received" granular material (g-dry/g)
d = measured diameter of the sample mold (cm)
h = measured height of the sample mold (cm)

10.4.4.2 Adjust the moisture content of the "as-received" material to the optimum moisture content using reagent water and mix until homogenized.

10.4.4.3 Pack the sample material into the sample holder using the modified Proctor compaction as described in Ref. 5.

10.4.4.4 Place a mono-layer of borosilicate glass beads (Sec. 6.3.3) on the exposed sample surface to minimize scouring and mass loss during testing.

10.4.4.5 Begin the leach test procedure promptly or cover the sample with plastic wrap to minimize moisture loss to the atmosphere.

10.5 LEACHING PROCEDURE

This protocol is a semi-dynamic, tank-leaching procedure (see schematic in Figure 5) where the sample is exposed to eluate for a series of leaching intervals interspersed with eluant exchanges. The chemical composition of each eluate is determined and mass transfer from the bulk solid is determined as a function of cumulative leaching time. The schedule of leaching intervals for this method is shown in Table 1.

10.5.1 Pre-test measurements

10.5.1.1 For the surface area calculation, measure and record the dimensions of the test specimen (i.e., diameter and height for a cylinder; length, width and depth for a parallelepiped; or diameter of exposed surface for a compacted granular sample).

10.5.1.2 Measure and record the mass of the specimen. This value should be monitored for each eluant exchange.

10.5.1.3 If a holder is used, place the specimen in the monolith holder.

10.5.1.4 Measure and record the mass of the specimen and holder, if applicable.

10.5.1.5 The recommended temperature for conducting this method is room temperature (20 ± 2 °C). When conducted at temperatures readings or variations other than those recommended, record the ambient temperature at each eluant renewal.

10.5.2 Eluant exchange

10.5.2.1 Fill a clean leaching vessel with the required volume of reagent water based on an LSa ratio of 9 ± 1 mL/cm^2. Record the amount of eluant used.

10.5.2.2 Carefully place the specimen or the specimen and holder in the leaching vessel (Figure 6a) so that the sample is centered in the eluant (see Figure 6b). Submersion should be gentle enough so that the physical integrity of the monolith is maintained and scouring of the solid is minimized.

10.5.2.3 Cover the leaching vessel with the air-tight lid and place in a safe location until the end of the leaching interval. Table 1 shows the schedule of leaching intervals and cumulative release times for this method.

10.5.2.4 Prior to the end of the leaching interval, repeat Section 10.5.2.1 in order to prepare a vessel for the next leaching interval.

10.5.2.5 At the end of the leaching interval (see Table 1), carefully remove the specimen or the specimen and holder from the vessel (Figure 6c). Drain the liquid from the surface of the specimen into the eluate for approximately 20 sec.

10.5.2.6 Measure and record the mass of the specimen or the mass of the specimen and holder (Figure 6d).

NOTE: The change in sample mass between intervals is an indication of the potential absorption of eluant by the matrix (mass gain) or erosion of the matrix (mass loss). In the case where a holder is used, moisture may condense on the holder during the leaching intervals and sample absorption may not be evident.

CAUTION: Mass gain may also be indicative of carbonate precipitation if the vessel is not tightly sealed and carbon dioxide is absorbed from the atmosphere.

10.5.2.7 Place the specimen or the specimen and holder into the clean leaching vessel filled with new eluant as prepared in section 10.5.2.1.

10.5.2.8 Cover the new leaching vessel with the air-tight lid and place in a safe location until the end of the leaching interval.

10.5.3 Eluate processing

10.5.3.1 Measure and record the pH, specific conductivity, and oxidation-reduction potential (ORP) (ORP is optional, but strongly recommended) of the eluate of the decanted eluate from the previous leaching interval (see SOPs *PIT-WC-ISE/P-SOP45358*, *PIT-WC-ISE/P-SOP45359* and *PIT-WC-ISE/P-SOP45360* for pH, conductivity and ORP analysis details).

10.5.3.2 Filter the remaining eluate through a 0.45-µm membrane (Sec. 6.5). Eluates requiring analysis of organic constituents will not be filtered.

10.5.3.3 Immediately, preserve and store the volume(s) of eluate required for chemical analysis. Preserve all analytical samples in a manner that is consistent with the determinative chemical analyses to be performed.

10.5.3.4 Collect all subsequent eluate by repeating the eluant exchange and eluate processing procedures in sections 10.5.2 and 10.5.3.

11) Calculations/Data Reduction

11.1 Data reporting

Figure 7 shows an example of a data sheet, which may be used to report the concentrations results of this method. This example is included in the Excel template. At a minimum, the basic test report should include the following:

a) Name of the laboratory
b) Laboratory contact information
c) Date and time at the start of the test
d) Name or code of the solid material
e) Material Description (including monolithic or compacted granular)
f) Moisture content of material used (g H_2O/g)
g) Dimensions (cm) and geometry of sample used
h) Mass of solid material used (g)
i) Mass of sample and holder at start of test (g)
j) Eluate type (e.g., reagent water)
k) Eluate specific information (see below)

The minimum set of data that should be reported for each eluate includes:

a) Eluate sample ID
b) Target eluant exchange date and time
c) Actual eluant exchange date and time
d) Volume of eluant used (mL)
e) Mass of sample and holder (g)
f) Measured eluate Ph
g) Measured eluate conductivity (mS/cm)
g) Measured ORP (mV) (optional)
h) Concentration of all COPCs
i) Analytical QC qualifiers as appropriate

11.2 Data presentation

11.2.1 Interval concentrations

11.2.1.1 At the conclusion of the schedule of leaching intervals (see Table 1), the concentration of COPCs in each eluate may be plotted as a function of cumulative leaching time. An example of this is shown in Figure 8 for mass transport from a monolithic field sample of fixated scrubber sludge and lime.

11.2.1.2 If data is available from Method 1313, interval concentrations and Method 1313 data may be plotted on the same graph as a function of eluate pH. This QC step is conducted in order to determine if the concentration of COPCs approached equilibrium in any leaching interval (i.e., the driving force for mass transport from the matrix may not be constant which is a common assumption of dynamic-tank √leach testing). Figure 9 shows this type of graph for the release from a field sample of fixated scrubber sludge and lime.

11.2.2 Interval mass release

At the conclusion of the schedule of leaching intervals (see Table 1), the interval mass released can be calculated for each leaching interval as follows:

$$M_{ti} = (C_i \times V_i) / A$$

Where: M_{ti} = Mass released during the current leaching interval i (mg/m^2)
C_i = constituent concentration in the eluate for interval i (mg/L) V_i
V_i = eluate volume in interval i (L)
A = specimen external geometric surface area exposed to the eluant (m^2)

11.2.3 Mean interval flux

The flux of a COPC in an interval may be plotted as a function of the generalized mean of the square root of cumulative leaching time. An example of a flux graph is shown in Figure 10 for the release from a field sample of fixated scrubber sludge with lime. This graph may be used to interpret the mechanism of release (see REF. 7 for further details.)

11.2.3.1 The flux across the exposed surface of the sample can be calculated by dividing the interval mass release by the interval duration as follows:

$$F_i = M_i / (t_i - t_{i-1})$$

Where: F_i = flux for interval, i ($mg/m^2 \cdot s$)
M_i= mass released during the current leaching interval i (mg/m^2)
t_i = cumulative time at the end of the current leaching interval i (s)
t_{i-1} = cumulative time at the end of the previous leaching interval i-1 (s)

11.2.3.2 The time used to plot each interval mass is the generalized mean of the square root of the cumulative leaching time using the cumulative time at the end of the ith interval, ti, and the cumulative time at the end of the previous interval, ti-1.

$$T_i = ((\sqrt{t_i} + \sqrt{t_{i-1}}) / 2)^2$$

Where: T_i = generalized mean leaching time for the current interval, i (s)
t_i = cumulative time at the end of the current leaching interval, i (s)
t_{i-1} = cumulative time at the end of the previous leaching interval, i-1 (s)

NOTE: If the concentrations of a COPC in the eluates approach that shown in Method 1313 for liquid-solid equilibrium, the flux curve will show the pattern in Figure 10 with intervals of the same duration having the same flux value. When the eluate concentration approaches saturation, the driving force for mass transfer approaches zero, interval flux is limited, and intervals with like durations will display similar flux limitations.

11.2.4 Cumulative release

11.2.4.1 The interval release calculated in 11.2.2 can be summed to provide the cumulative mass release as a function of leaching time. Figure 11 shows the cumulative release curves for a field sample of fixated scrubber sludge with lime.

11.2.4.2 Interpretation of the cumulative release of constituents is illustrated using the analytical solution for simple radial diffusion from a cylinder into an infinite bath presented by Crank (see Ref. 6).

$$M_t = 2pC_o (D_{obs}t / \pi)^{1/2}$$

Where: M_t = cumulative mass released during leaching interval, i (mg/m^2)
p = density of the "as-tested" sample (kg/m^3)
C_o = concentration of available COPC in the solid matrix (mg/kg)
D_{obs} = observed diffusivity (m^2/s)
t = leaching time (s)

When transformed to a log-log scale, the analytical solution presented by Crank becomes becomes linear with the square root of time.

$$Log[M_t] = log[2pC_o (D_{obs}/\pi)^{1/2}] + 1/2t$$

Thus, under the assumptions of the analytical solution presented by Crank, the mass release should be proportional to the square root of time. A line showing the square root of time is plotted in Figure 11 along with the data. Since flux is the derivative of release, a similar treatment of flux as a function of leaching time using the simple diffusion model would be proportional to the negative square root of time as shown in Figure 10.

Other models than the simple diffusion model presented by Crank may also be used to interpret mass release. For example, the Shrinking Unreacted Core Model (see Ref. 8) and the Coupled Dissolution-Diffusion Model (see Ref. 9) incorporate chemical release parameters (e.g., as derived from Method 1313 data) into the model to better estimate release mechanisms and predictions (see Ref. 7 for further details).

11.2.5 Observed diffusivity

An observed diffusivity for each COPC can be determined using the logarithm of the cumulative release plotted versus the logarithm of time. In the case of a diffusion¬controlled mechanism, this plot is expected to be a straight line with a slope of 0.5. An observed diffusivity can then be determined for each leaching interval where the slope is 0.5 ± 0.15 (see Refs. 10 and 11) by the following:

$$D_{iobs} = \pi[M_{ti} / (2pC_o(\sqrt{t_i} - \sqrt{t_{i-1}})]^2$$

Where: D_{iobs} = observed diffusivity of a COPC for leaching interval, i (m^2/s)
M_{ti} = mass released during leaching interval, i (mg/m^2)
t_i = cumulative contact time after leaching interval, i (s)
t_{i-1} = cumulative contact time after leaching interval, i - 1 (s)
C_o = initial leachable content (i.e., available release potential) (mg/kg)
p = sample density ($kg\text{-}dry/m^3$)

The mean observed diffusivity for each COPC is then determined by taking the average of the interval observed diffusivities. It should be reported with the computed uncertainty (i.e., standard deviation).

NOTE: Since the analysis presented above assumes a diffusion process, only those interval mass transfer coefficients corresponding to leaching intervals with slopes of 0.50 ± 0.15 are included in the overall average mass-transfer coefficient.

11.3 Data representation by constituent

A concise representation of all relevant data for a single constituent may be presented as shown in Figure 12 for arsenic from a field core of FSSL material. The data shows eluate pH generation as a function of leaching time (Figure 12a), comparison between eluate concentrations and Method 1313 data as a function of eluate pH (Figure 12b), constituent flux as a function of generalized mean cumulative leaching time (Figure 12c), and constituent release as a function of cumulative leaching time (Figure 12d).

12) Method Performance

The supervisor has the responsibility to ensure that the analyst who performs this procedure is properly trained in its use and has the required experience. On-going performance is monitored by observation for compliance to this document.

12.2 Prior to performing this procedure on client samples, a Demonstration of Capability, as described in the QA Manual, must be documented.

12.3 Method Detection Limits are specific to the subsequent preparation and analytical methods, and are not performed for this leaching procedure.

13) Pollution Control

13.1 It is Eurofins' policy to evaluate each method and look for opportunities to minimize waste generated (i.e., examine recycling options, ordering chemicals based on quantity needed, preparation of reagents based on anticipated usage and reagent stability). Employees must abide by the policies in Section 13 of the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*) for "Waste Management and Pollution Prevention" and the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*).

13.2 This method does not contain any specific modifications that serve to minimize or prevent pollution.

14) Waste Management

14.1 Waste management practices are conducted consistent with all applicable rules and regulations. Excess reagents, samples and method process wastes are disposed of in an accepted manner. Waste description rules and land disposal restrictions are followed. Waste disposal procedures are incorporated by reference to *PIT-EHS-HS-SOP45640*. The following waste streams are produced when this method is carried out.

14.2 The remaining eluate waste is neutralized to a pH of between 6 and 9 and discharged down a lab sink.

14.3 Acid Waste is collected in containers identified as "Waste Acid", Waste #33. The waste is neutralized to a pH of 6 to 9 and discharged down a lab sink.

14.4 Solids including soils, filter paper, paper towels are collected in containers identified as "Lab Trash", Waste #12.

15) References/Cross-References

15.1 D.S. Kosson, H.A. van der Sloot, F. Sanchez and A.C. Garrabrants (2002) "An Integrated Framework for Evaluating Leaching in Waste Management and Utilization of Secondary Materials," Environmental Engineering Science, 19(3) 159-204

15.2 NEN 7345 (1995) "Leaching Characteristics of Solid Earth and Stony Materials – Leaching Tests – Determination of the Leaching of Inorganic Constituents from Molded and Monolithic Materials with the Diffusion Test," Dutch Standardization Institute, Delft, The Netherlands

15.3 ANSI/ANS 16.1 (1986) "American National Standard Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-term Test Procedure," American Nuclear Society, La Grange Park, IL

15.4 ASTM D1308-95 (2001) "Standard Method for Accelerated Leach Test for Diffusive Releases from Solidified Waste and a Computer Program to Model Diffusive, Fractional Leaching from Cylindrical Waste Forms," ASTM International, West Conshohocken, PA

15.5 ASTM D1557-07 "Standard Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))," ASTM International, West Conshohocken, PA

15.6 D.E. Hockley and H.A. van der Sloot (1991) "Long-term Processes in a Stabilized Coal-Waste Block Exposed to Seawater," Environmental Science and Technology, 25(8), 1408-1414

15.7 D.S.Kosson, A.C. Garrabrants, H.A. van der Sloot (2009) "Background Information for the Development of Leaching Test," Draft Methods 1313 through 1316, (in preparation)

15.8 Crank (1986) Mathematics of Diffusion, Oxford University Press, London

15.9 Hinsenveld, and P.L. Bishop (1996) "Use of the shrinking core/exposure model to describe the leachability from cement stabilized wastes," in Stabilization and Solidification of Hazardous, Radioactive, and Mixed Wastes, 3rd Volume, ASTM STP 1240, T. M. Gilliam and C. C. Wiles (eds), American Society for Testing and Materials, Philadelphia, PA

15.10 Sanchez (1996) "Étude de la lixiviation de milieux poreux contenant des espèces solubles: Application au cas des déchets solidifiés par liants hydrauliques," doctoral thesis, Institut National des Sciences Appliquées de Lyon, Lyon, France

15.11 IAWG (1997) Municipal Solid Waste Incinerator Residues, International Ash Working Group, Elsevier Science Publishers, Amsterdam, the Netherlands

15.12 J. de Groot, and H. A. van der Sloot (1992) "Determination of Leaching Characteristics of Waste Materials Leading to Environmental Product Certification," in Solidification and Stabilization of Hazardous, Radioactive, and Mixed Wastes, 2nd Volume, ASTM STP 1123, T. M. Gilliam and C. C. Wiles (eds), American Society for Testing and Materials, Philadelphia, PA

15.13 A.C. Garrabrants and D.S. Kosson (2005) "Leaching Processes and Evaluation Tests for Inorganic Constituents Release from Cement-Based Matrices," in Solidification/Stabilization of Hazardous, Radioactive and Mixed Wastes, R Spence and C. Shi (eds.), CRC Press

15.14 Method 1313, "Liquid-Solid Partitioning as a Function of Extract pH in Solid Materials using a Parallel Batch Procedure", Revision 1, July 2017

15.15 Method 1315, "Mass Transfer Rates of Constituents in Monolithic of Compacted Granular Materials using a Semi-Dynamic Tank Leaching Procedure", Revision 1, July 2017

15.16 *PIT-QA-QM45117*, Pittsburgh Laboratory Quality Assurance Manual

15.17 SOP *PIT-QA-DR-SOP45623*, formerly, PT-QA-012 Selection and Calibration of Balances and Weights

15.18 SOP *PIT-QA-QAS-SOP45629*, formerly, PT-QA-016, Nonconformance and Corrective Action System

15.19 SOP *PIT-QA-QAS-SOP45631*, formerly, PT-QA-021, Quality Assurance Program

15.20 SOP *PIT-SM-SUB-SOP45639*, formerly, PT-QA-024, Subsampling

15.21 SOP *PIT-SM-RCT-SOP45637*, Internal Chain of Custody

15.22 SOP *PIT-WC-ISE/P-SOP45359*, Specific Conductance by 120.1, 2510B, and 9050A

15.23 SOP *PIT-WC-ISE/P-SOP45358*, pH Electrometric by SM 4500-H+ B and SW 846 Methods 9045C/D and 9040B/C

15.24 SOP *PIT-WC-ISE/P-SOP45360*, Oxidation-Reduction Potential (ORP) by Method SM2580B

16) Method Modifications

16.1 None

17) Attachments

17.1 Table 1 – Schedule of Eluate Renewals
17.2 Figure 1 - Examples of Monolithic Sample Holders
17.3 Figure 2 – Examples of Compacted Granular Sample Holder and Setup
17.4 Figure 3 – Method 1315 Flowchart
17.5 Figure 4 - Example Curve of Packing Density as a Function of Moisture Content
17.6 Figure 5 – Schematic of Semi-Dynamic Mass Transfer Test Process
17.7 Figure 6 – Example of Leaching Procedure Steps
17.8 Figure 7 – Example of Data Reporting Sheet
17.9 Figure 8 – Example of Interval Concentration Graphs
17.10 Figure 9 – Example of Saturation Check Between Interval Concentrations and Method 1313 Data
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17.12 Figure 11 – Interval Flux at Eluate Saturation
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17.14 Figure 13 – Data Representation by Constituent (Quad Format)

18) Revision History

18.1 Revision 0, New SOP
18.2 Revision 1, 5/29/2015
18.3 Revision 2, 7/13/2017
18.4 Revision 2.1, 4/29/2019
18.5 Revision 3, 10/31/2019
18.6 Revision 4, 6/6/2023
18.7 Changes to current revision

SOP section	Change from	Change to	Reason
6.2.4		Added section to discuss containers used for organic parameters	Clarification
10.5.3.2		Added: Eluates requiring analysis of organic constituents will not be filtered	Clarification
Appendix 1	removed	Info added to Sections 6.2.4 & 10.5.3.2	Clarification

19) Appendix

TABLE 1
SCHEDULE OF ELUATE RENEWALS

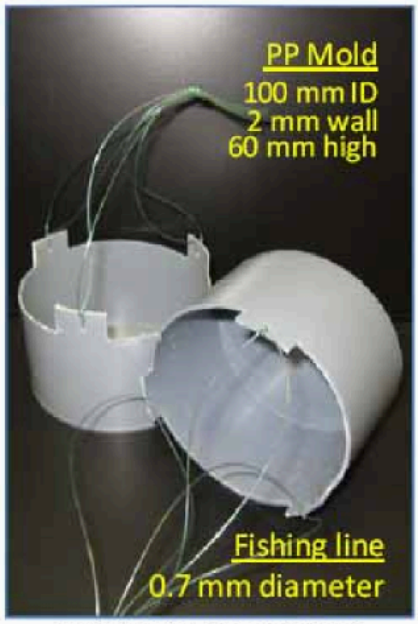
Interval Label	Interval Duration (h)	Interval Duration (d)	Cumulative Leaching Time (d)
T01	2.0 ± 0.25	–	0.08
T02	23.0 ± 0.5	–	1.0
T03	23.0 ± 0.5	–	2.0
T04	–	5.0 ± 0.1	7.0
T05	–	7.0 ± 0.1	14.0
T06	–	14.0 ± 0.1	28.0
T07	–	14.0 ± 0.1	42.0
T08	–	7.0 ± 0.1	49.0
T09	–	14.0 ± 0.1	63.0

NOTE: This schedule may be extended for additional 14-day contact intervals to provide more information regarding longer-term release.

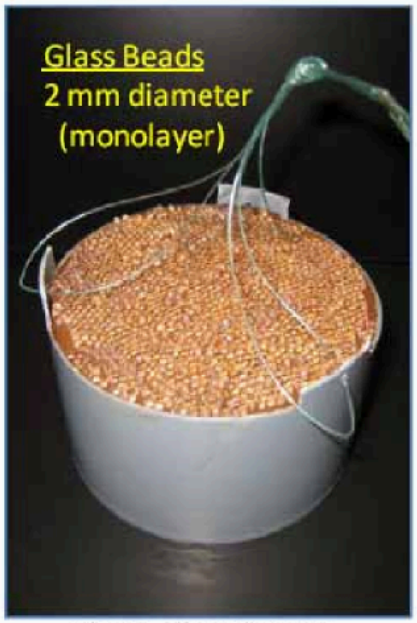
FIGURE 1 - EXAMPLES OF MONOLITHIC SAMPLE HOLDERS



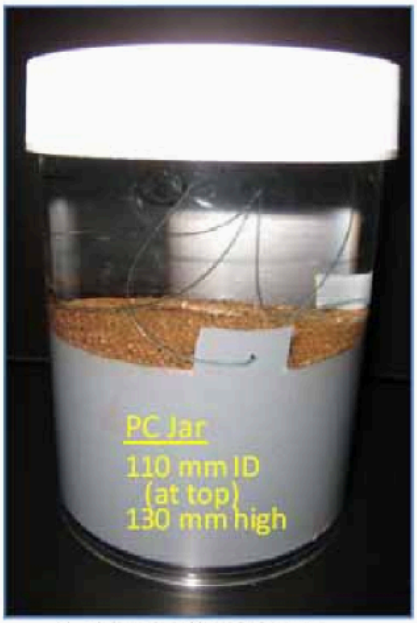
FIGURE 2 - EXAMPLE OF COMPACTED GRANULAR SAMPLE HOLDER AND SETUP



Empty Sample Holder



Compacted Sample



1-D Leaching Setup

FIGURE 3

METHOD 1315 FLOWCHART

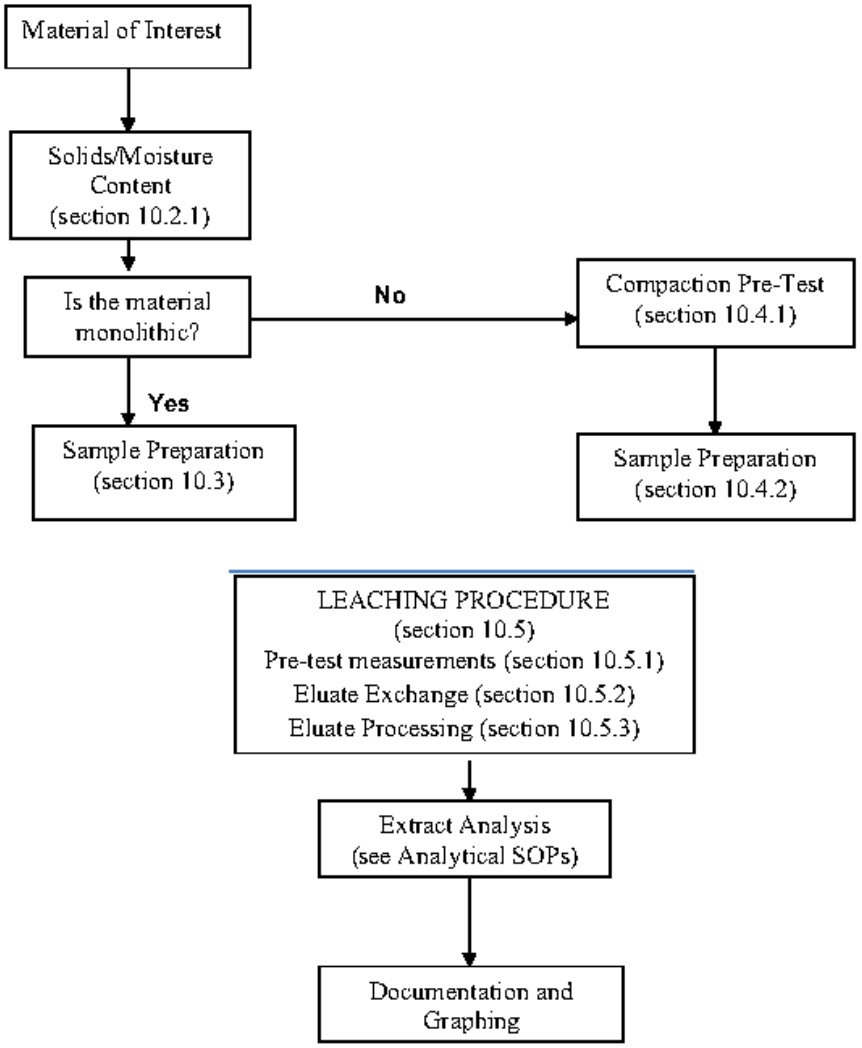
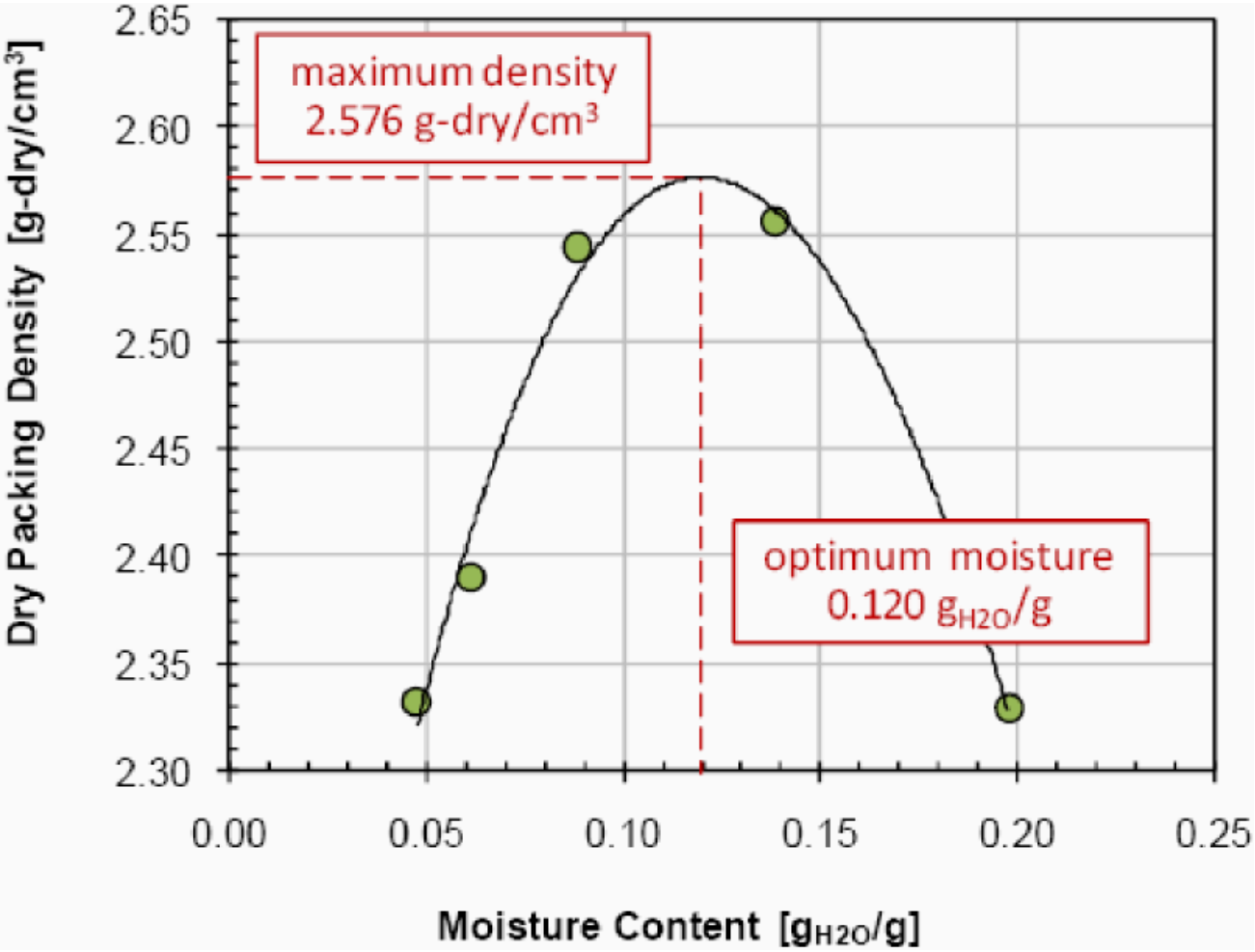


FIGURE 4
EXAMPLE CURVE OF PACKING DENSITY AS A FUNCTION OF MOISTURE CONTENT



$y = 55.975x3 - 65.036x2 + 1.8352$
$r^2 = 0.983$

FIGURE 5
SCHEMATIC OF SEMI-DYNAMIC MASS TRANSFER TEST PROCESS

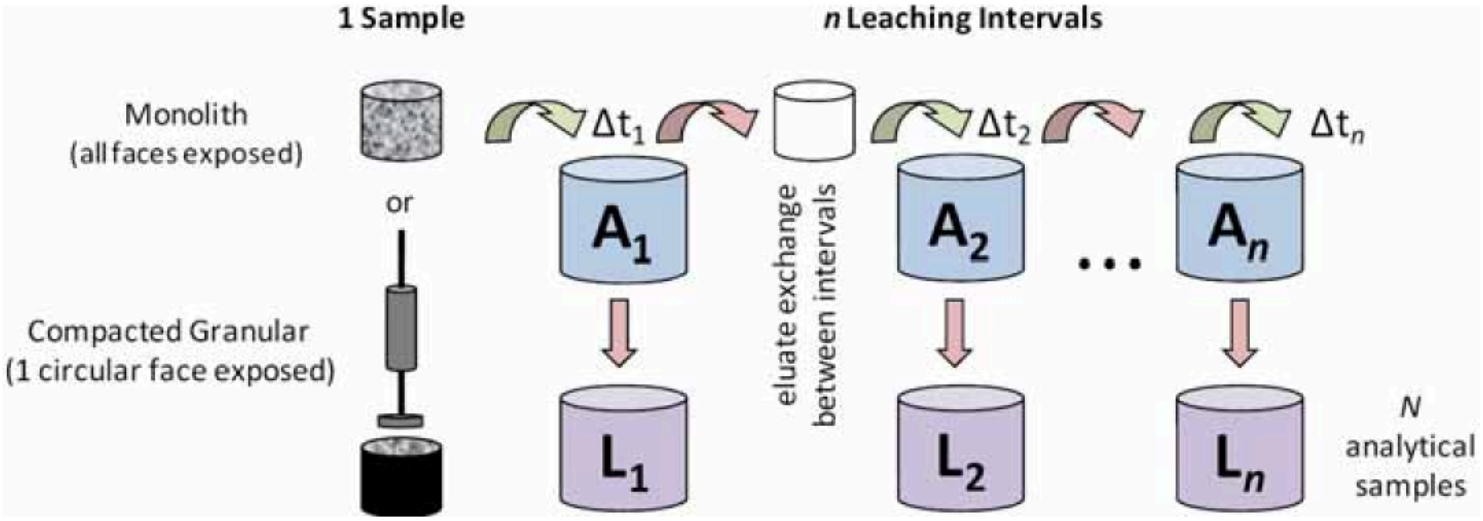


Figure obtained and modified from Ref. 11.

FIGURE 6
EXAMPLE OF LEACHING PROCEDURE STEPS



Start of Leaching Interval



Sample Centered in Eluant (top view)



Removing Sample for Exchange



Mass of Sample and Holder

FIGURE 7- EXAMPLE DATA REPORTING SHEET

EPA METHOD 1315

ABC Laboratories
123 Main Street
Anytown, USA
Contact: John Smith
(555) 111-1111

Report

Client Contact: Susan
(555) 222-2222

Material Code: XYZ
Material Type: Coal Combustion Fly Ash
Date Received: 10/1/20xx
Test Start Date: 11/1/20xx
Report Date: 12/1/20xx
Test Type: Compacted Granular
Eluant: ASTM Type II Water

Particle Size: 88% passing 2-mm sieve
Mass used in Column: 860 g
Moisture Content: 0.002 gH_2O/g
Sample Geometry: Cylinder
Sample Diameter 10.0 cm
Sample Depth: 60.3 cm
Mass of Sample & Holder 1020 g
Lab Temperature: 21 ± 2 °C

Test Position	Replicate	Value	Units	Method	Note
T01	A				
	Eluate Sample	XYZ-1315-			
	Exchange Date	11 /1 /20xx			
	Target	12:00	PM		
	Actual	12:15	PM		
	Mass of	1026	g		
	Eluate Mass	730.4	g		
	Eluate pH	8.82	-	EPA	
	Eluate	5.4	mS/c	EPA	
	Conductivity	NA	mv	9050	
	Eluate ORP				

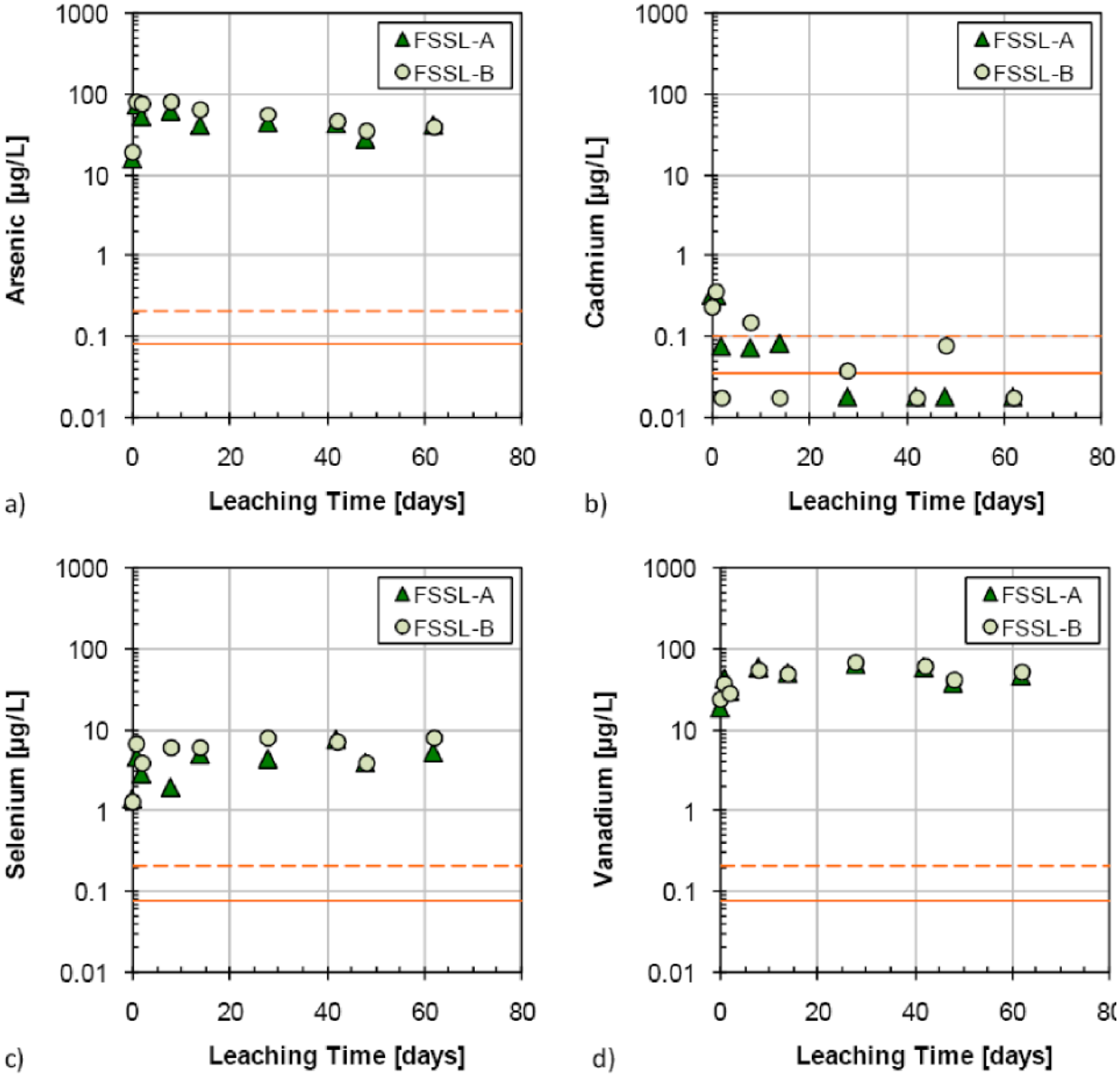
	Value	Units	QC Flag		Date	Dilution Factor
Al	4.72	mg/L		EPA	11/7/20xx	1000
As	0.12	mg/L		EPA	11/7/20xx	10
Cl	5.42	mg/L		EPA	11 /9/20xx	1

Test Position	Replicate	Value	Units	Met hod	Note
T02	A				
	Eluate Sample ID	XYZ-1315-T02-			
	Exchange Date	11 /1 /20xx			
	Target Exchange	12:00			
	Actual Exchange	12:18			
	Mass of Sample &	1027	g		
	Eluate Mass	725.0	g		
	Eluate pH	9.15	-	EPA	
	Eluate	2.8		EPA	
	Conductivity	m		9050	
	Eluate ORP	S/c			
		NA			

Chemical	Value	QC F	Metho	Date	Dilution Factor
Al	2.99		EPA	11/7/20xx	1000
As	0.21		EPA	11/7/20xx	10
Cl	4.20	U	EPA	11/7/20xx	1

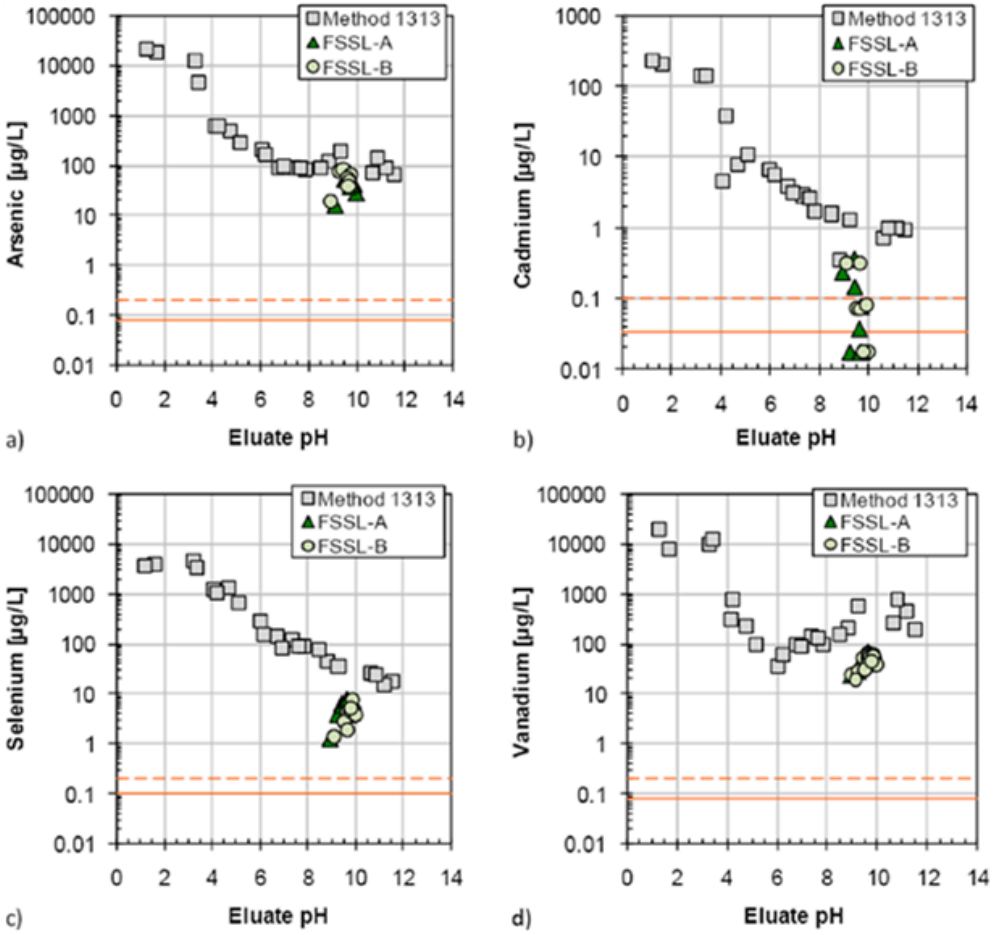
QC Flag Key: U Value below lower limit of quantitation as reported (< "LLOQ")

FIGURE 8 – EXAMPLE OF INTERVAL CONCENTRATION GRAPHS



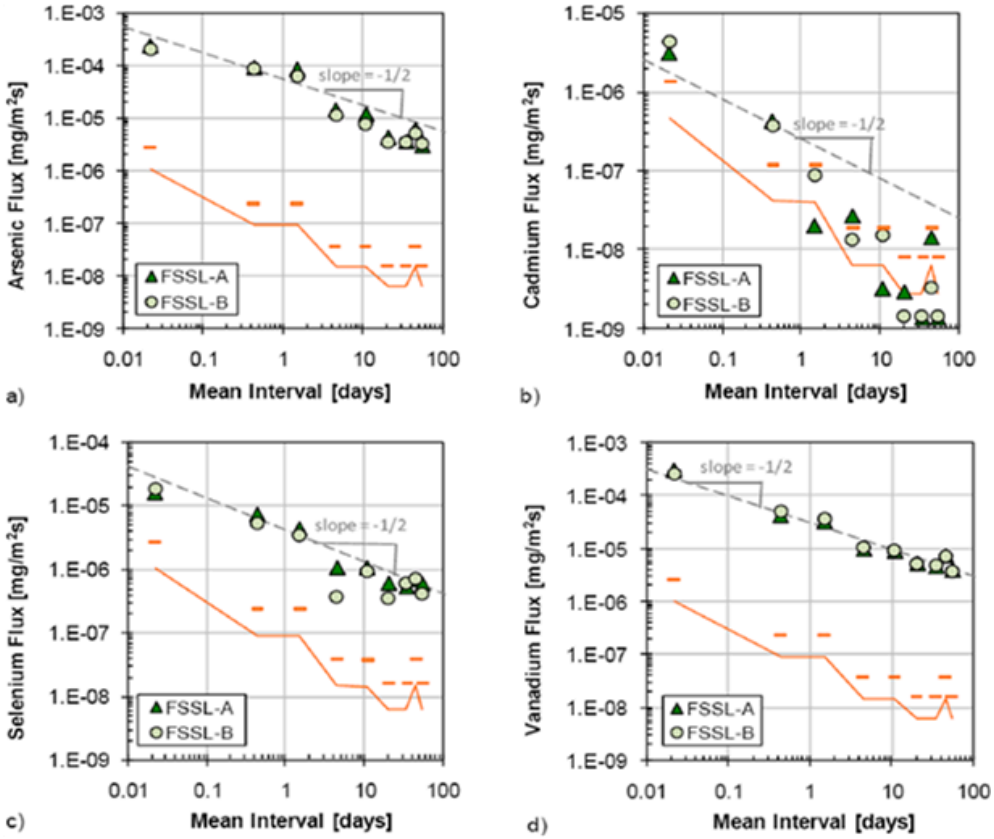
NOTE: Orange lines represent cumulative release if all eluate extracts were at the quantitation limit (dashed) and detection limit (solid). Chemical analyses below the detection limit are shown at ½ the detection limit value.

FIGURE 9 - EXAMPLE OF SATURATION CHECK BETWEEN INTERVAL CONCENTRATIONS AND METHOD 1313 DATA



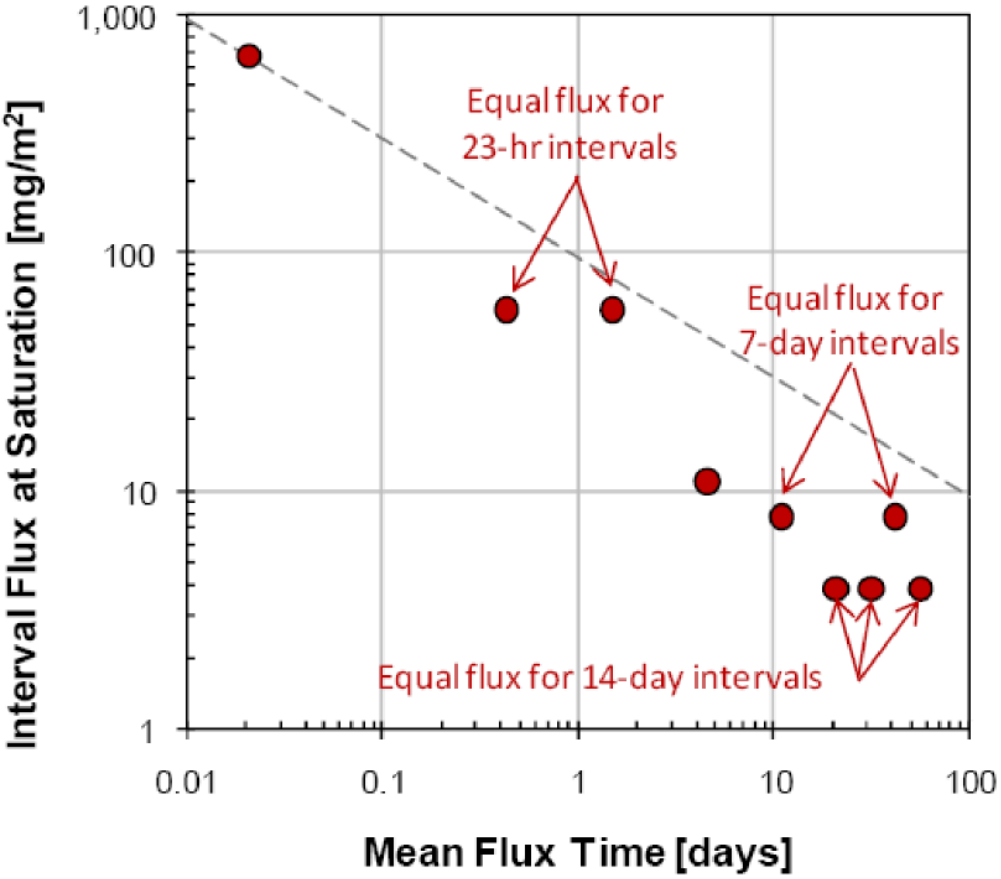
NOTE: Orange lines represent cumulative release if all eluate extracts were at the quantitation limit (dashed) and detection limit (solid). Chemical analyses below the detection limit are shown at ½ the detection limit value.

FIGURE 10 – EXAMPLE OF INTERVAL FLUX GRAPHS



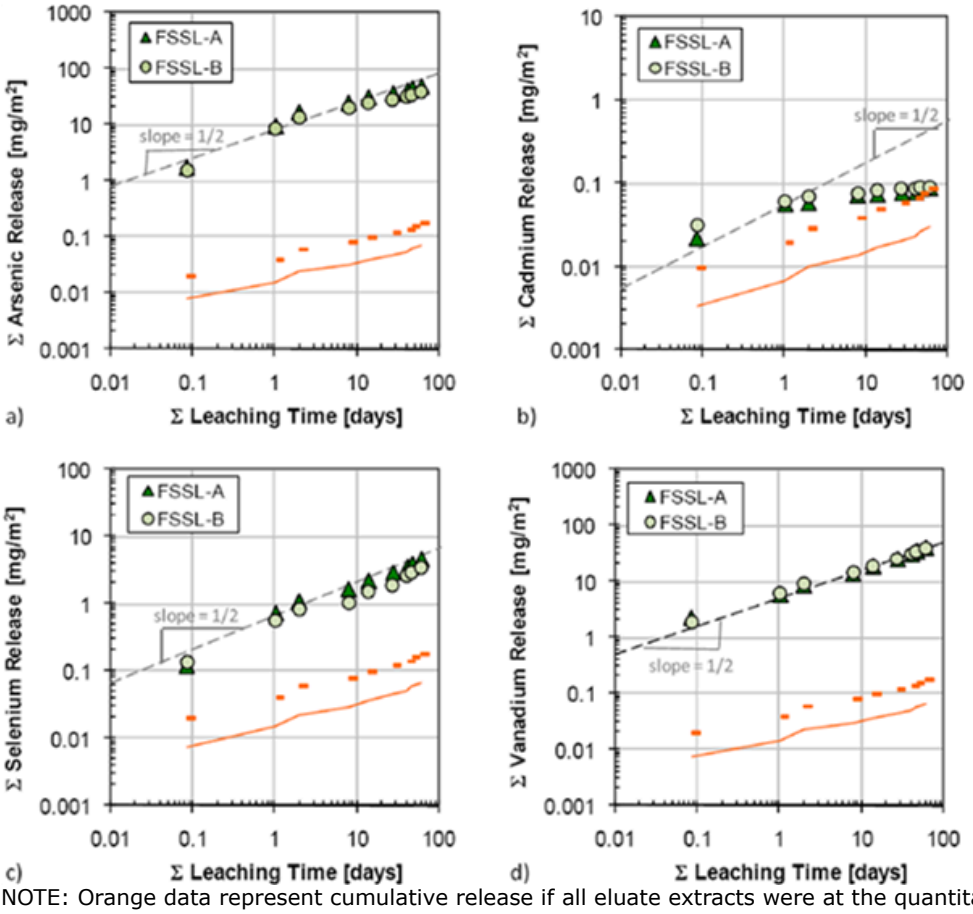
NOTE: Orange data represent cumulative release if all eluate extracts were at the quantitation limit (dashes) and detection limit (solid line).

FIGURE 11
INTERVAL FLUX AT ELUATE SATURATION



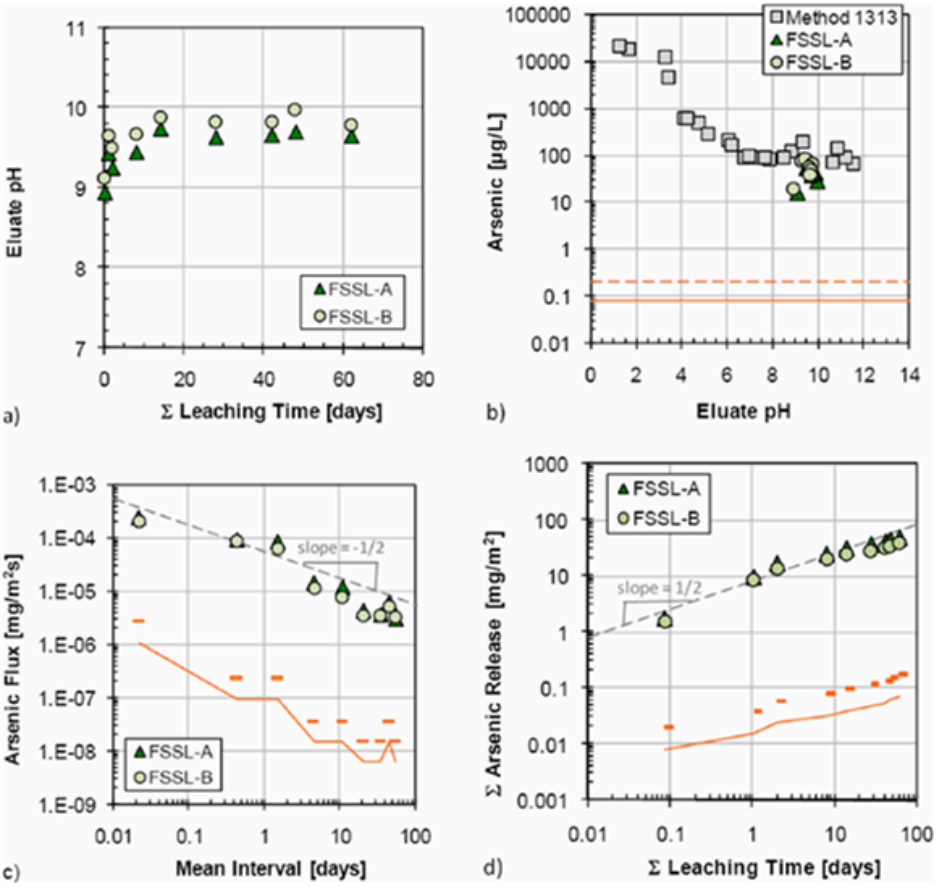
NOTE: This figure assumes that the concentration in the eluate approaches saturation during the leaching interval (i.e., the driving force for diffusion approaches zero). When the leaching solution is saturated, the resulting mass release and interval flux is constant for intervals of the same duration.

FIGURE 12 - EXAMPLE OF CUMULATIVE RELEASE GRAPHS



NOTE: Orange data represent cumulative release if all eluate extracts were at the quantitation limit (dashes) and detection limit (solid line).

FIGURE 13 - DATA REPRESENTATION BY CONSTITUENT (QUAD FORMAT)



NOTE: Orange data represent cumulative release if all eluate extracts were at the quantitation limit (dashes) and detection limit (solid line).

NDSC-US-EHS-QP46060 Environmental Health and Safety (HSE) Manual
PIT-EHS-HS-SOP45640 Environmental Health and Safety Manual Pittsburgh Facility Addendum
PIT-QA-DR-SOP45623 Selection and Calibration of Balances and Weights
PIT-QA-QAS-SOP45629 Nonconformance & Corrective Action System
PIT-QA-QAS-SOP45631 Laboratory Quality Control Program
PIT-QA-QM45117 Pittsburgh QA Manual
PIT-SM-RCT-SOP45637 Internal Chain of Custody
PIT-SM-SUB-SOP45639 Subsampling
PIT-WC-ISE/P-SOP45358 Electrometric pH, Methods 9040C and 9045D and SM4500-H+B
PIT-WC-ISE/P-SOP45359 Specific Conductance (Hand Held Meter), Methods 120.1, 9050A, SM 2510B
PIT-WC-ISE/P-SOP45360 Oxidation Reduction Potential (ORP), Method SM 2580B

End of document

Version history

Version	Approval	Revision information	
4	06.JUN.2023	D4 Template for Analytical SOPs -	
5	21.JUN.2023		

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Revision Log
Reference
Cross Reference
Scope
Basic Principles
Definitions
Interferences
Safety Precautions and Waste Handling
Personnel Training and Qualifications
Sample Collection, Preservation, and Handling
Apparatus and Equipment
Reagents and Standards
Calibration
Procedure
Sample Analysis
Calculations
Statistical Information/Method Performance
Quality Assurance/Quality Control
Data Review
Instrument Maintenance and Repair

Revision Log

Revision	24	**Effective Date**: This Version
Section	**Justification**	**Changes**
Revision Log	Formatting requirement	Removed revision logs up to the previous version
Procedure	Addition	Addition of New Instrument setup details
Sample Analysis	Clarification/Addition	Clarification on which instrument export for which instrument is used. Addition of RA7000 export/raw data instructions.
Procedure	Throught	Updated to include new insrtumentation RA7000

Revision	23	**Effective Date**: February 06.2025
Section	**Justification**	**Changes**
Revision Log	Formatting requirement	Removed revision logs up to the previous version
Reference	Addition	Added USEPA Drinking Water Manual
Definitions	Addition	Added MRL
Personnel Training and Qualifications	Addition	Added Arizona Drinking Water requirement for MDLs
Procedure C.	Addition	Added MRL
Quality Assurance/Quality Control	Addition	Added Arizona MRL requirement

Reference

1. Test Methods for Evaluating Solid Wastes, SW-846 Method 7470A, September 1994

2. Test Methods for Evaluating Solid Wastes, SW-846 Method 7471B, February 2007.

3. Test Methods for Evaluating Solid Wastes, SW-846 Method 7471A, September 1994

4. Method 245.1 (rev. 3), Determination of Mercury in Water by Cold Vapor Atomic Absorption Spectroscopy, USEPA 600/R-94/111 May 1994.

5. USEPA Manual for the Certification of Laboratories Analyzing Drinking Water, Criteria and Procedures, Quality Assurance, Fifth Edition

6. *Chemical Hygiene Plan*, current version.

Cross Reference

Document	Document Title
T-MET-WI11948	Preparation of Solids by EPA 7471A or B for Mercury Analysis
T-MET-WI11924	Digestion of Aqueous Samples by SW-846 Method 7470A
T-MET-WI26740	Digestion of Aqueous Samples for Mercury by EPA 245.1
T-MET-WI9084	Preparation of Mercury Solutions and Standards
QA-SOP11178	Demonstrations of Capability
QA-SOP11901	Instrument Maintenance and Calibration
QA-SOP11892	Determining Method Detection Limits and Limits of Quantitation
QA-SOP11896	Establishing Control Limits
QA-SOP11886	Processing Regulatory Compliance (i.e. SDWA, NPDES) Samples
QA-FRM6871	Do Not Use - Environmental
T-MET-WI35797	Metals Data Verification Process
T-MET-FRM8776	HV/GA Maintenance Log

Scope
This method is used for determination of mercury in aqueous and solid samples. The optimum concentration range for this method is 0.2 to 5.0 ppb.

Matrices - EPA 7470A and EPA 245.1 are applicable to water analysis. EPA 7471A and EPA 7471B are applicable to soil and tissue analysis. EPA 245.1 is applicable to drinking water analysis.

Method Detection Limits (MDLs) are based on annual statistical evaluation of laboratory data and are subject to change. The current MDLs and RLs are maintained in the LIMS, and are subject to change without notification.

Basic Principles

The RA7000A mercury analyzer measures the mercury quantities contained in liquid samples with high sensitivity and precision.Samples to be measured are ones in which mercury compounds have been made to be bivalent mercury ions (Hg^{2+}) in advance using a wet pretreatment. When stannous chloride is added to the sample after this wet pretreatment, bivalent mercury ions (Hg^{2+}) are reduced to zero valent mercury (Hg^{0}) and changed to mercury gas by bubbling, transitioning from the liquid phase to the gaseous phase.After acid mist and steam generated by the bubbling are removed by the dehumidifier and the membrane filter, mercury gas is led to the detection unit (light absorption cell), and the absorbance is measured at 253.7 nm, which is the first absorption wavelength band of mercury.

Teledyne M7600 measures the mercury by using a solid state detector with a wide dynamic range and a mercury source that delivers a stable source of emission at 254 nm. The signal is referenced to the simultaneous absorbance of air through direct view of the lamp. The system adds Stannous chloride to the samples via a "Y" connection in the pump tubing. The peristaltic pump then carries the sample/stannous mix to the liquid gas separator. Argon gas is bubbled through the liquid and used to transport the volatile mercury into the detector. The mercury is reduced with stannous chloride to liberate mercury metal and Tin (IV) chloride.

Definitions

1. CRA - Low Level Check Standard
2. MSA – Method of Standard Additions
3. SPLP - Synthetic Precipitation Leaching Procedure
4. TCLP – Toxicity Characteristic Leaching Procedure
5. QC Type Designators:
    a. BKG – unspiked background sample
    b. DUP – Sample Duplicate
    c. MS – sample spike
    d. MSD – Sample spike duplicate
    e. MB –Preparation Blank (Water/ Solid). Equivalent to a Method Blank (MB)
    f. LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate
    g. MRL - Method Reporting Limit

Interferences
Potassium permanganate is added to samples to eliminate possible interference from sulfide. Concentrations as high as 20 mg/L of sulfide as sodium sulfide do not interfere with the recovery of added inorganic mercury from reagent water.

Samples high in chlorides require additional permanganate (as much as 25 mL) because, during the oxidation step, chlorides are converted to free chlorine, which also absorbs radiation of 253.7 nm. Take care to ensure that free chlorine is absent before the mercury is reduced and swept into the cell by using an excess of hydroxylamine sulfate (or chloride) reagent.

Copper has been reported to interfere; however, copper concentrations as high as 10 mg/kg had no effect on recovery of mercury from spiked samples.

Safety Precautions and Waste Handling
All laboratory waste is accumulated, managed, and disposed of in accordance with all federal, state, and local laws and regulations.

See *Chemical Hygiene Plan* for general information regarding employee safety, waste management, and pollution prevention.

Preparing samples for inorganic analysis involves working with concentrated acids and other chemicals which are dangerous if not handled carefully:

Nitric acid (HNO3) – This acid can cause skin burns. Add nitric acid to samples in a hood to avoid exposure to toxic fumes.

Sulfuric acid (H2SO4) – This acid is a strong oxidizing agent and can cause severe burns. Sulfuric acid spills are extremely slippery, adding to the danger. Always use in a fume hood. Never mix with concentrated HCl or concentrated KMNO4 to avoid a violent reaction (explosive splattering and extreme heat).

Hydrochloric acid (HCl) – This acid can cause skin burns. Never mix HCl with concentrated H2SO4 to avoid a violent reaction. Always use in a fume hood.

When diluting strong acids, never add water to acid; always add acid to water.

Store concentrated acids in the prep room acid lockers. Only acids are to be stored in these lockers. (Store solvents in the flammable liquid storage cabinet.) Some concentrated acids are kept in the acid reagent bottles on prep room counters. Fill reagent bottles in an operating fume hood using caution to avoid spills.

Perform acid digestions in hoods that are turned on and have active alarms. Notify a supervisor immediately if the hood is malfunctioning or the alarm sounds. Samples that contain dust may be hazardous. Open in a fume hood.

Samples that may contain cyanide require special precautions to avoid exposure to hydrogen cyanide gas. Contact your supervisor prior to adding acid. Always open these samples and add the acid in a hood.

Use spill pillows to absorb large acid spills (small spills are cleaned with wet paper towels.) Use SPILL-X-A powder or equivalent to neutralize any remaining acid and then rinse the area thoroughly with water.

Dispose of acid waste properly. Collect all acid digestions, waste solutions, and expired reagent solutions in waste containers. When the acid waste containers are full, a designated acid waste handler transfers the waste to the acid neutralization tank.

Personnel Training and Qualifications

All personnel performing this procedure must have documentation of reading, understanding, and agreeing to follow the current version of this SOP and an annual documented Demonstration of Capability (DOC) which is maintained in the analyst's training records.

Initially, each analyst performing the instrumental analysis must work with an experienced analyst for a period of time until they can independently calibrate the instrument, use the sequence editor to set up the run, perform calculations, interpret raw data, and enter data into the LIMS. Proficiency is measured through documented audits of the tasks listed and over checking of data as well as an IDOC (Initial Demonstration of Capability).

The IDOC consists of aliquots spiked at 1-4X the RL that are carried through all steps of the prep and analysis and meet the defined acceptance criteria. The criteria include the calculation of mean accuracy of 50 - 150% and standard deviation of </= 20%.

Arizona Drinking Water requires that each analyst perform an MDL study that consist of 7 spikes over 3 days.

Various options are available for a DOC and can include four laboratory control samples (LCS) or one blind sample. The mean recovery of four LCSs must meet the accuracy criteria of an LCS, and the standard deviation must be </= 20%.

Sample Collection, Preservation, and Handling

Aqueous samples are collected in plastic or glass containers, preserved to a pH of <2 with nitric acid. Samples must be analyzed within 28 days of collection.
NOTE: Regulatory Drinking Water samples (EW) are collected in 1-L plastic or glass containers and must be analyzed by EPA 245.1. Drinking water samples are not analyzed for dissolved mercury.

Solid samples are collected in glass containers and stored at 0° to 6°C not frozen. Samples must be analyzed within 28 days of collection.

Dissolved Mercury: Samples to be analyzed for soluble mercury requiring filtration at the lab must be submitted unpreserved. The sample is run through a 0.45 micron filter within 5 days of receipt and are collected in plastic containers and preserved to a pH of <2 with HNO3.

Samples must be held for 16 hours following preservation and checked again prior to processing.

Store sample digestates in plastic bottles at room temperature. Store standards and digestates separately.

Apparatus and Equipment

1. Nippon RA7000A or Teledyne Quick Trace M7600 CVAA
2. RA7000AWIN software or Quicktrace (M7600)
3. 15-mL graduated polypropylene screw cap tubes (certified ± 1%)
4. 10-mL sterile disposable syringes
5. 25-mm syringe filters, PTFE, 0.45-µm
6. 40-mL clear glass VOA vials and lids
7. 50-mL polypropylene containers and covers (digestion vessels for block digestion) - certified clean and Class A equivalent
8. 6X3 mm stir bars
9. Disposable glass digestion tubes
10. Pump Tubing

Reagents and Standards

A. Store all standards and reagents in polyethylene or glass containers at room temperature. Label the container with the solution name, lot number, date prepared, the expiration date, the initials of the person preparing the solution, and the storage conditions.

NOTE: Standard/ spiking concentration and reagent vendors are subject to change without notification.

B. Reagents use the following or equivalent:

1. Nitric acid, 70.0% to 71.0% HNO3, Fisher Trace Metal Grade reagent, 1.428 g/mL; Store in glass container at room temperature. Follow manufacturer's expiration date.

2. Sodium chloride, NaCl, J.T. Baker, Certified ACS. Store in plastic container at room temperature. Follow manufacturer's expiration date.

3. Hydroxylamine hydrochloride, NH2OH·HCl, J.T. Baker, Certified ACS. Store in plastic container at room temperature. Follow manufacturer's expiration date.

4. Reagent Water.

5. Stannous chloride solution, 10% SnCl, Baker Analyzed reagent, ACS. Store in plastic container at room temperature. Follow manufacturer's expiration date.

6. Hydrochloric acid, HCl, 36.5% to 38.0%, Fisher Trace Metal Grade reagent, 1.194 g/mL or equivalent. Store in glass container at room temperature. Follow manufacturer's expiration date.

7. Sulfuric Acid, H2SO4, 95.0% to 98.0%, Fisher ACS Grade or equivalent. Store in glass container at room temperature. Follow manufacturer's expiration date.

8. Potassium Persulfate Solution (5% K2S2O8)
   1. Weigh approximately 100 +/- 0.2g of K2S2O8 into a beaker.
   2. Transfer the K2S2O8 into a 2000-mL volumetric flask with multiple reagent water rinses.
   3. Bring to approximately 250mL and swirl until K2S2O8 is dissolved. Gentle heat may be necessary.
   4. Dilute to volume with reagent water.
   5. Expiration 6 months

9. 25% Nitric Acid, Store at room temperature.

10. 50% Sulfuric Acid, Store at room temperature.

11. 1.2% Hydroxylamine hydrochloride, stored at room temperature.

C. For the preparation of calibration blanks, ICBs, CCBs, calibration standards, ICVs, CCVs, CRAs, Method Blanks, MRLs, LCSs and Matrix Spikes solutions, see Form *T-MET-WI9084*.

D. General solutions - See Form *T-MET-WI9084*.

NOTE: Method states to use Sulfuric acid when making Stannous Chloride, however, manufacturer requires HCl. The lab practices this deviation in order to maintain instrument performance.

Calibration

Calibration Requirements:

1. The software program has been developed to check the correlation coefficient of the curve, run appropriate ICV and CCVs at proper intervals, and check the percent recoveries of the ICV and CCVs.

2. Due to the instrument software limitations, the calibration blank is included in the correlation coefficient calculation.

3. On the M7600, a recalibration and reread of any associated samples is required for any checks that fall outside the windows. The RA7000cannot reread a sample. If any calibration points or quality checks fail, the digestion and calibration must be restarted..

4. For the frequency, acceptance criteria and corrective action see SOP *T-MET-WI35797*

5. For the preparation of calibration standards, see *T-MET-WI9084*.

6. The calibration is part of each run shown in the LIMs system.

Procedure

A. Sample Digestion

1. Aqueous samples are digested by EPA 7470A according to SOP *T-MET-WI11924*.

2. Aqueous samples are digested by EPA 245.1 according to SOP *T-MET-WI26740*.

3. Solid samples are digested by 7471A/B according to SOP *T-MET-WI11948*.

B. Nippon RA7000A Mercury Analyzer

1. Instrument Setup

a. If needed, turn instrument on (switch is on the side).

b. Empty potassium permanganate bottle and 10% stannous chloride bottle.

c. Fill all reagent bottles with correct reagent.

d. Fill RINSE bottle with 2% hydrochloric acid, empty WASTE and SAMPLE bottles if needed.

e. Select the computer on switch box that corresponds with the instrument being started.

f. Open RA7000AWIN.

g. Open "7470 Water Template" and save as the run number.

h. Click on SELF CHECK tab.

i. Click RUN button

i. Click Start.

ii. Open the lid and feel for a fan blowing air inside the instrument.

iii. Listen to hear a fan running.

iv. Listen to hear a fan running.

v. Click Next.

vi. Put a test tube in position 81 and close lid, click next to start the self check.

vii. Once the Self Check is complete Click Finish.

viii. Register the Self Check by clicking yes in the pop up box.

j. Under MEASURMENT tab, click FILLING

i. Follow the prompts to set the autosampler up with reagents.

ii. Exit filling.

2. **Autosampler and Run Setup**

a. Select Method.

b. Under STD tab, the curve points have already been filled in.

c. Click inside the MEAS box to select all curve points to be run.

c. Under SMP tab, start scanning samples into the program.

NOTE: The ICV, ICB, CRA, CCV, and CCB calibrations have already been filled in for you at the beginning.

i. MUST add a CCV and CCB after every 10^{th} sample scanned.

d. Check the box in the MEAS column to select the samples to be run.

i. Clicking inside the MEAS box will automatically select all samples.

ii. All samples MUST be selected, or they won't be ran.

e. Put mini stir bar into each tube.

f. Fill glass tubes with calibration standards and samples one of two ways, labeling them accordingly.

i. Pour more than 5mL into each tube; the autosampler will volume them down to 5 mL.

ii. Pipette 5 mL into each tube; the autosampler won't volume them.

g. Starting at one, put each tube in the appropriate spot.

h. Close the lid on the autosampler.

i. Once the self check and filling steps are done,all samples have been scanned into the program with a CCV and CCB after every 10th sample, and the auotsampler is loaded, click START for the process to start.

NOTE: This process uses a method of digestion and analysis; if just analysis is needed, under the STD tab select Method, and change the drop down box to "Analysis Only".

C. M7600 Operation

1. Setup

a. If needed, turn ON the power to the instrument and autosampler (switches in the back of each) and the computer.

b. Open the argon tank on the wall, and ensure that argon supply pressure set to 120 psi.

c. Open the QuickTrace software. (Lamp automatically turns on when software starts; lamp will require 30-60 minutes to stabilize).

d. Check that the pump tubing is installed and tension is properly adjusted. Run the peristaltic pump at the desired method rate.

e. Check that the rinse bottle is full. Place rinse tubing into bottle with a 2.0% Hydrochloric Acid (HCl) solution. For preparation of 2.0% HCl solution, see *T-MET-WI9084*. Also place the stannous chloride line in 2 or 10% HCL temporarily for the warmup period and wetting the post.

f. Wet the GLS post and allow up to 1 hour for the lamp and pump to stabilize,or use strip recorder under instrument control to confirm the instruments stability.

g. To wet the post:

1.Disconnect the dryer catridge form the GLS.

2. Click the "WET THE POST" button (automatically sets gas flow ~1000 mL/min and pump to 100%).

3. Open the GLS compartment door and place a Kimwipe at the GLS exhaust port.

4. With the drain tube pinched, the GLS should fill with liquid until a gas bubble propels a “meniscus” upward to wet the post all along its length.

5. The post is now wetted.

6. Turn pumps and gas flows back to analytical conditions (pumps 50%, argon gas at 100ml/min). Then reconnect the Dryer to the GLS.

h. Check that the 10% stannous chloride bottle is full and place tubing into bottle and let liquid uptake stabilize. For preparation of 10% stannous chloride, see *T-MET-WI9084*.

i. Proceed with calibration and analysis.

2. Autosampler Sequence

a. Open worksheet from template (file > open > choose template) and save todays run as YYDDD##M/O.

b. Scan the samples into the sequence page.

c. Check QC order, including CALIBRATION and CCV and CCB every 10 analyses,end CRA if needed.

d. Push Go.

e. The results of the calibration and samples can be observed.

Sample Analysis

1. Filtering Samples

a. Samples that are cloudy or have particulate suspended in solution must be filtered prior to analysis on the M7600. Samples run on the RA7000 cannot be filtered.

b. Difficult matrix samples or samples with limited volume may be filtered using a 10-mL sterile disposable syringe fitted with a 0.45 um PTFE syringe filter.

c. If any samples are filtered, the MB and the LCS on the batch must be filtered.

d. Document all filtrations on the run cover sheet.

2. Dilutions

a. Dilute samples with appropriate matrix matching solution when necessary to yield a response that falls within the calibration range. Dilutions on the RA7000 must be made prior to the digestion at 5ml total volume.

. Stop run if sample is above 4.5ppb. Rinse system and dilute sample immediately. Reanalyze. If the subsequent sample analyzed after an over range sample has a detection, reanalyze the subsequent sample as well.

c. Report the results for the least dilute sample where the concentration measured is within the acceptable calibration range.

3. RA7000 Export

1.Data Export: follow the below step by step instructions

On the instrument

a. When the run is finished, click the STD tab.

b. Right Click
in the chart and select Save as CSV.

c. Save using the run number and adding 'Curve' at the end.

Example: 2509901M13Curve

d. Click the SMP tab.

e. Right click and select Save as CSV.

f. Save using the run number.

Example: 2509901M13

g. Copy both files into L: drive>Env>Dept22>Mercury>RA7000 Prelim data.

h. Combine data from both files into one and rename with run number MMDDD#MXXRAW
save into L: drive>ENV>Dept22>Mercury>RA7000 Raw Data.

i. To shut down autosamper, click Discharge.

j. Follow the prompts to empty and clean the reagent lines.

5. M7600 Export

1. Data Export

a. In Quicktrace Software go to File Menu > Export.

b. Save .CSV file to the desktop using the same name as your run (e.g. YYDDD##M10).

c. Drop .CSV file to IDAT sequence folder on the L-drive.

d. Drop .CSV file to LIMS import folder too.

2. Raw Data

a. open the above CSV file in excel.

b. use the current macro (ctrl+shift+N) to format the raw data.

c. Print the formatted raw data to PDF file and save as "YYDDD##M10_RAW".

d. Attach raw data to AB in the LIMs.

6. Hydra II Shutdown

a. Place Stannous Chloride and rinse tubing into 10% HCl for minimum of 5 minutes.

b. Place tubing into reagent water for a minimum of 5 minutes.

c. Remove tubing from reagent water to allow the aspirating of air for a minimum of 5 minutes.

Never leave bottle of Stannous Chloride and rinse connected to the instrument if the pump clamps are released because siphoning can occur and cause damage to the instrument.

NOTE: Do not turn off power switch to instrument on a daily basis.

7. M7600 Shutdown

a. rinse the liquid interface with 10% HCl followed by reagent water and air (~10 min each).

b. turn off the peristaltic pumps on the autosampler (rinse well) and at the M7600 instrument.

c. release the clamps on the peri pump to preserve the pump tube lifetime.

d. turn off the gas flow and close the main Argon tank valve at the wall.

e. disconnect the vapor tube connecting the GLS to the Nafion dryer catridge.

f. Main power can stay on, turn lamp off.

Calculations

1. Final Result

a. Water sample (ug/L)

$$\text{Instrument Reading} \times \frac{\text{Dilution Volume}}{\text{Aliquot Volume}} \times \frac{\text{Final Volume}}{\text{Sample Volume}}$$

b. Solid sample (mg/kg)

$$\text{Instrument Reading} \times \frac{\text{Dilution Volume}}{\text{Aliquot Volume}} \times \frac{\text{Final Volume}}{\text{Sample Weight (grams)}}$$

2. Relative percent different (RPD)

$$RPD = \frac{S - D}{(S + D)/2} \times 100$$

Where:

S = first sample value

D = duplicate sample value

3. Spike recovery

$$\%\,Recovery = \frac{SSR - SR}{SA} \times 100$$

Where:

SSR = spiked sample result

SR = sample result

SA = spike added

4. Correlation Coefficient

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{N}}{\sqrt{(\sum X^2 - \frac{(\sum X)^2}{N})(\sum Y^2 - \frac{(\sum Y)^2}{N})}}$$

Where :

X = the known concentration

Y = the instrument response

N = the total number of data points

5. Serial Dilution

$$\% \, Difference = \frac{(5 \times SDR) - SR}{SR} \times 100$$

Where:

SDR = serial dilution result

SR = sample result

6. Methods of standard additions (MSA)

Take 4 identical aliquots of the same sample. Leave one unspiked. Spike the other 3 aliquots with different levels of a standard solution. Add blank solution to sample aliquots so that the final volume is the same for all. Use small volumes of spiking solution to avoid diluting the sample more than 10%. Analyze the 4 aliquots and record the instrument readings in absorbance. Use the readings and spike values to find the slope and x- and y- intercepts. The x- intercept is the result.

$$\text{Slope} = m = \frac{\sum x_i y_i - (\sum x_i \sum y_i)/n}{\sum x_i^2 - (\sum x_i)^2/n}$$

$$\text{Y-Intercept} = b = \bar{y} - m\bar{x}$$

$$\text{Result} = -\frac{b}{m}$$

$$\text{Correlation Coefficient} = r = \frac{\sum \{(x_i - \bar{x})(y_i - \bar{y})\}}{\sqrt{\left[\sum (x_i - \bar{x})^2\right]\left[\sum (y_i - \bar{y})^2\right]}}$$

The correlation coefficient (r) for the least squares fit must be ³0.995. If the r value is <0.995, the MSA must be repeated at the same dilution. If the r value is again low, the result with the higher r value is verified and both are flagged with a "+" in the data package. If the r value is <0.990, the sample is run at an interference dilution to overcome matrix effects. This usually requires a raised limit of quantitation. If a client requests a particular limit of quantitation that prohibits further dilution, then the sample is repeated at the same dilution and the best of the two results is verified.

Statistical Information/Method Performance
Generate MDLs and LOQs according to *QA-SOP11892*. The department supervisor maintains annual study data.

QC limits for MS/MSD, and LCS/LCSD are established through statistical analysis of historical data. The limits are maintained in the LIMS for the relevant analysis numbers.

The department supervisor requests that a Quality Assurance Specialist update to the LIMS as needed. Update the department database via a download from the LIMS.

Quality Assurance/Quality Control
Batch Quality Control

1. For the preparation and concentrations of Batch Quality Control see *T-MET-WI9084*.

2. For the frequency, acceptance criteria and corrective action see *T-MET-WI35797*.

3. For EPA 7470A, 7471A, and 7471B, a digestion batch is up to 20 samples. Each batch must contain a MB, LCS, BKG, DUP, MS and MSD (an LCSD is used if there is insufficient sample for an MSD).

4. For EPA 245.1 Rev 3, a digestion batch is up to 10 samples. Each batch must contain a MB, LCS, BKG, DUP, and MS (an LCSD is used if there is insufficient sample for an MSD).

NOTE: Arizona Drinking Water samples require the preparation and analysis of an MRL.

Data Review

1. To view imported analytical batch in the LIMS, follow these steps:
    a. Go to Analyst
    b. Choose Analyst Desktop II
    c. Select the instrument where the data is pulled from on the left hand side by expanding the Instrument option
    d. Data will be listed with a designated analytical batch number given by the LIMs system under the instrument where it was analyzed.
    e. Record this designated analytical batch number on prep batch paperwork.

2. How to complete 1st level review of analytical batch
    a. Once analytical batch is located from following steps in #1 double click to open the batch
    b. Choose Edit button
    c. When asked if data should be processed choose No
    d. Edit Standards/Batch QC
        i. Scan calibration standards from prep batch sheet
    e. If PDS is on analytical run enter PDS data
        i. Go to the Reagents tab at the bottom
        ii. Scan lot number of spike used in PDS
        iii. Enter volume of spike used for PDS. Normally this would be 0.1mL to a final volume of 10mL
        iv. Go to Worksheet Tab and enter a final volume for the PDS. Normally, this would be 10mL
    f. Calculate Results
        i. Go to Samples Results Tab
        ii. Highlight all samples by using Ctrl + L
        iii. Right click and choose Identify
        iv. Once samples are and calibration and all identified it is always a good practice to recalculate by hitting F6

    g. Evaluate the Results
        i. Go to the Sample List tab
        ii. Either look at each line individually to ensure calibration and data are valid or filter by job number and evaluate data
        iii. Look for recoveries in the spiked calibration as well as the batch QC
        iv. Look for contamination in blanks
        v. Look for E flags for samples that need to be diluted. If they were diluted check that the dilution makes sense.

    h. Enter Batch Information
        i. Prior to saving batch right click and chose View Batch Information or press Ctrl + 1
            a. If you try to save batch without going to this screen the program will prompt you
        ii. Enter analyst
        iii. Enter Stannous Chloride ID lot #
        iv. Enter tube lot #s if dilutions were made, filtering of samples occurred, or PDS was used
        v. Enter lot number of filters used
        vi. Hit Ok to save

    i. Attach Raw Data
        i. Go to IDAT Sequence folder \\lldata\Env\IDAT-Sequences
        ii. Find the analytical run by searching the unique run number given to it by the analyst.
        iii. Double Click on file once located
        iv. Once file is open, Save As pdf file and name the file the analytical run number give to the data by the LIMs system.
        v. Open Sharefile in Google Chrome
        vi. Go into the Personal Folder and choose Browse Files
        vii. Find File and select Upload
        viii. Once uploaded into Sharefiles go into the analytical batch in the LIMs system and choose Docs button at top
        ix. Right click and select Add New Document
        x. Select the document in the Personal Folder in Sharefiles and hit Select
        xi. Hit OK and now the raw data file is attached into the analytical batch

    j. 1st level data
        i. Once data has been confirmed by analyst to be valid and the raw data is attached go to Sample List tab
        ii. Highlight calibration and samples that are valid (if all samples Ctrl +L to highlight)
        iii. Either do Ctrl + Shift + 1 to turn status to 1st Level or right click, Review Sample, Choose 1st Level Review

Instrument Maintenance and Repair

A. Routine Maintenance

1. Replace the pump tubing as needed under normal daily usage.
    a. Inspect tygon supply lines for discoloration and cloudiness
    b. Check peri-pump lines for flattening

2. As needed for foamy samples, replace liquid/gas separator
    a. Remove and rinse the clear front panel
    b. For severe foam replace entire gas box module

3. If liquid has entered the optical cell, check the optical cell and windows, and if needed, clean the optical cell.

    a. Wipe the optical cell with a soapy solution (one drop of liquid Ivory soap to 500 mL reagent water) and warm tap water.

b. Rinse with reagent water and dry. To speed the drying of the optical cell, connect the heater plug to the optical cell with the windows off for several minutes.

c. Clean the quartz windows with methanol and a piece of lens paper.

4. Document any maintenance in the Mercury maintenance logbook.

NOTE: Detailed instructions for the maintenance and troubleshooting of the Nippon RA7000A Mercury Analyzer or M7600 can be found in the appropriate instrument manual

B. Taking an instrument/analysis out of service/returning an instrument/analysis to service.

NOTE: In the event of an equipment failure, perform the steps in SOP *QA-SOP11901*:

1. Document the nature of the failure in the maintenance logbook.

2. Document how and when the defect was discovered.

3. Notify a supervisor or experienced analyst to determine a person who can decide on appropriate action to take.

4. The instrument must be clearly tagged as Out of Service. The tag must be printed from Q-E*QA-FRM6871* contain the following information:

a. Date taken out of service.

b. Employee who took the instrument out of service.

c. Reason for tagout.

5. The date taken out of service and the date returned to service must be documented in the logbook.

6. Document any corrective action that was taken and the result of that corrective action (i.e., system calibration within specifications, etc.) to bring the equipment back into service.

7. Supervisory personnel must perform a documented evaluation and review of instrumentation/equipment where a major or uncommon failure has occurred to assess the potential impact the failure could have on the calibration and/or qualification of the instrument.

8. After a repair, document whether the function has been fixed. Calibration or verification activities are to be performed before the instrumentation is put back into service.

QA-FRM6871 Do Not Use - Environmental
QA-SOP11178 Demonstrations of Capability
QA-SOP11886 Processing Regulatory Compliance (i.e. SDWA, NPDES) Samples
QA-SOP11892 Determining Method Detection Limits and Limits of Quantitation
QA-SOP11896 Establishing Control Limits
QA-SOP11901 Instrument Maintenance and Calibration
T-MET-FRM8776 Hg/VGA Maintenance Log
T-MET-WI11924 Digestion of Aqueous Samples by SW-846 Method 7470A
T-MET-WI11948 Preparation of Solids by EPA 7471A or B for Mercury Analysis
T-MET-WI26740 Digestion of Aqueous Samples for Mercury by EPA 245.1
T-MET-WI35797 Metals Data Verification Process
T-MET-WI9084 Preparation of Mercury Solutions and Standards

End of document

Version history

Version	Approval	Revision information	
22	02.MAY.2024		
23	06.FEB.2025		
24	02.MAY.2025		

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Appendix I

Revision Log

Revision: 18	**Effective Date:**	This version
Section	**Justification**	**Changes**
Revision Log	Formatting requirement	Removed revision logs up to the previous version
Reference	Addition	Added USEPA Drinking Water Manual
Personnel Training and Qualifications	Addition	Added Arizona Drinking Water requirement for MDLs
Reagent and Standards	Addition	Added MRL
Procedure A. 2.	Addition	Added Arizona MRL requirement
Procedure A. 5.	Addition	Added MRL
Quality Assurance/Quality Control B.	Addition	Added MRL requirement.

Revision: 17	**Effective Date:**	30.May.2024
Section	**Justification**	**Changes**
Revision Log	Formatting requirement	Removed revision logs up to the previous version
Procedure 5.	Clarification	added note for 2 ICVs for 200.7

Reference

1. *Test Methods for Evaluating Solid Wastes*, SW-846 Method 6010B, December 1996.

2. *Test Methods for Evaluating Solid Wastes*, SW-846 Method 6010C, February 2007.

3. *USEPA Manual for the Certification of Laboratories Analyzing Drinking Water, Criteria and Procedures, Quality Assurance, Fifth Edition.*

4. *Test Methods for Evaluating Solid Wastes*, SW-846 Method 6010D, Rev.4, July 2014.

5. *Test Methods for Evaluating Solid Wastes*, SW-846 Method 6010D, Rev.5, July 2018.

6. Method 200.7 (rev. 4.4), Determination of Metals and Trace Metals in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry, USEPA 600/R-94/111 May 1994.

7. ICAP™ 6000 Series ICP-OES Spectrometer Operator Manual, 2005/2006.

8. *Hardness Calculation SM 2340 B-1997, 20th edition.*

9. *Hardness Calculation SM 2340 B-2011.*

10. *Chemical Hygiene Plan*, current version.

Cross Reference

Document	Document Title
S-SS-WI10695.	Liquid Sample Preservation, Sample Splitting, and Turbidity for metals by EPA Methods 200.7 and 200.8
T-MET-WI12063	Preparation of ICP Solutions and Standards Preparations
T-MET-WI9082	Working Instructions for Prep Solutions and Standards
QA-SOP11892	Determining Method Detection Limits and Limits of Quantitation
T-MET-WI11938	Digestion of Waters by EPA 200.7/200.8 for Analysis of Metals by ICP/ICPMS
T-MET-WI11941	Digestion of Water and Leachates by EPA 3010A for Metals
T-MET-WI8636	Sample Prep of Sediments Sludges,Soils,and Tissues by SW846 3050B for ICP and ICP-MS
T-MET-WI8639	Sample Preparation of Waters for Analysis of Total Recoverable Metals by IPC-OES and IPC-MS
QA-SOP11896	Establishing Control Limits
T-MET-WI35797	Metals Data Verification Process

Scope

This procedure applies to analyses performed in the Metals department using Inductively Coupled Plasma (ICP) Atomic Emissions Spectroscopy for identification and quantitation of metallic constituents by Methods 6010B/C/D (aqueous, solid, tissue) and EPA 200.7 (aqueous).

The Reporting Limits (RLs) are based on annual statistical evaluation of laboratory data and are subject to change without notification. The current method detection limits (MDLs) and RLs are maintained in the laboratory information management system (LIMS).

This SOP also outlines the proper operation and maintenance of the ICP instrumentation and provides consistent guidelines for the evaluation of ICP data.

Routine Methods

Elements routinely analyzed on the Thermo Scientific iCAP 6000 and 7000 Series Analyzers:

Element	Wavelength (nm)
Ag	328.06
Al	308.21
As	189.04

B	249.67
Ba	455.4
Be	313.04
Ca	317.93
Cd	226.5
Co	228.62
Cr	267.72
Cu	327.4
Fe	261.19
K	766.49
Li	670.78
Mg	285.21
Mn	257.61
Mo	202.03
Na	589.59
Ni	231.6
P	177.49
Pb	220.35
S	182.03
Sb	206.83
Se	196.09
Si	251.6
Sn	189.99
Sr	421.55
Th	401.913
Ti	334.94
Tl	190.86
V	292.4
W	207.911
Zn	213.86
Zr	339.19

Basic Principles

If required, samples are digested with acids and heated to solubilize metals. Samples are received from the prep area in digestion vials.
After the analytical batch is prepared it is loaded onto the autosampler for trace metals analysis.

Samples are transported to a nebulizer via an autosampler and peristaltic pump. The nebulizer introduces an aerosol into a spray chamber; the resulting mist is then transported to an argon plasma torch where excitation of atoms occurs. Characteristic atomic-line emission spectra are produced by a radio-frequency (R.F.) inductively coupled plasma. The spectra are dispersed by a diffraction grating and the intensities of the light at each wavelength are monitored by a photosensitive device. The signals from the photosensitive device are processed by a computer. A background correction technique is required to compensate for variable background contribution to the spectra of trace elements.

Interferences

Spectral interferences are caused by background emission, stray light from high concentration elements or overlap from a spectral line from another element. Spectral interferences are compensated for by the use of background points, alternate wavelengths and interelement corrections.

Physical and chemical interferences caused by the change in sample matrix affecting sample transport and/or nebulization must be compensated for by using internal standardization. Yttrium is used as the internal standard. Sample results are adjusted by the software using the intensity of Yttrium in the calibration blank and comparing it to the intensity of Yttrium in each sample and standard. Cesium is used as an ionization buffer that allows the ICP plasma to compensate for changes to the plasma excitation conditions.

Memory interference, or carryover, is the contribution of analyte signal from a previous sample onto the next sample analysis. Adequate rinse time of the autosampler tubing overcomes any memory interference.

Safety Precautions and Waste Handling

All laboratory waste is accumulated, managed, and disposed of in accordance with all federal, state and local laws and regulations.

See *Chemical Hygiene Plan* for general information regarding employee safety, waste management, and pollution prevention.

Preparing samples for inorganic analysis involves working with concentrated acids and other chemicals which are dangerous if not handled carefully:

Nitric acid (HNO3) – This acid can cause skin burns. Add nitric acid to samples in a hood to avoid exposure to toxic fumes.

Hydrochloric acid (HCl) – This acid can cause skin burns. Never mix HCI with concentrated H2SO4 to avoid a violent reaction. Always use in a fume hood.

When diluting strong acids, never add water to acid; always add acid to water.

Store concentrated acids in the prep room acid lockers. Only acids are to be stored in these lockers. (Store solvents in the flammable liquid storage cabinet.) Fill reagent bottles in an operating fume hood using caution to avoid spills.

Dispose of acid waste properly. Collect all acid digestions, waste solutions, and expired reagent solutions in waste containers. When the acid waste containers are full, a designated acid waste handler transfers the waste to the acid neutralization tank.

In case of spills contact the Emergency Response Team.

Personnel Training and Qualifications

All personnel performing this procedure must have documentation of reading, understanding, and agreeing to follow the current version of this SOP and an annual documented Demonstration of Capability (DOC) which is maintained in the analyst's training records.

Initially, each analyst performing the instrumental analysis must work with an experienced analyst for a period of time until they can independently calibrate the instrument, use the sequence editor to set up the run, perform calculations, interpret raw data, and enter data into the LIMS. Proficiency is measured through documented audits of the tasks listed and over checking of data as well as an IDOC (Initial Demonstration of Capability).

The IDOC consists of aliquots spiked at 1-4X the RL that are carried through all steps of the prep and analysis and meet the defined acceptance criteria. The criteria include the calculation of mean accuracy of 50 - 150% and standard deviation of </= 20%.

Arizona Drinking Water requires that each analyst perform an MDL study that consist of 7 spikes over 3 days.

Various options are available for a DOC and can include four laboratory control samples (LCS) or one blind sample. The mean recovery of four LCSs must meet the accuracy criteria of an LCS, and the standard deviation must be </= 20%.

Sample Collection, Preservation, and Handling

A. Preservation and Holding time

1. All samples are typically shipped and stored at 0°to 6°C, not frozen, but room temperature is acceptable. Samples are analyzed within 6 months of collection.

2. Aqueous samples are collected in plastic or glass containers and are preserved to pH <2 with nitric acid. If samples are received > pH 2, they are preserved at the lab and held at least 24 hours until digestion. See *S-SS-WI10695*.

3. Drinking water samples are digested if the turbidity is > 1 NTU. See *S-SS-WI10695*.

4. Dissolved metals must be filtered within 15 minutes of sampling. If this is not done, the lab filters the samples of unpreserved bottles within 5 days of submission to the laboratory. Lab-filtered samples are preserved to pH <2 with nitric acid after filtration.

5. Solid samples are collected in glass containers with no chemical preservation.

6. Sample digestates are stored in plastic bottles at room temperature.

B. Sample Discard - The general practice in the metals group is to discard the digestions after all the required metals from a batch of samples have been analyzed and verified in the LIMS. Samples which require the digestate to be held for long term storage are periodically evaluated for discard.

Apparatus and Equipment

The following is a list of the hardware and apparatus necessary for ICP analysis. More detailed hardware information is located in the *Operator's Manuals*.

1. 15-mL graduated polypropylene test tubes with caps (certified ±1%)

2. 10-mL sterile disposable syringes

3. syringe filters, PTFE, 0.45-µm

4. 30-mL polypropylene medicine cups

5. Calibrated hand-held pipettes and tips (10 – 5000 µL) - FisherBrand or equivalent.

6. Spectrometer - The Thermo Scientific iCAP™ 6000, 6500, and 7000 series Trace Analyzer utilizes a high performance solid state Charge Injection Device (CID) camera system to deliver high contrast/low noise imaging and quantification of all wavelengths in the analytical range. With the entire spectrometer and foreoptics purged with either Argon or Nitrogen, it features a 52.91 grooves/mm grating and dual-view detector.

7. Auto-sampler – The ESI SC-14 auto-sampler and integrated "FAST" system offer increased capacity and reduce sample introduction times. The parameters for each automated run are entered into the auto-sampler table in the iTEVA™ software as described in Instrument Operation, Section A of this SOP.

8. Coolflow –The ThermoFlex™ 900 cooling device for the iCAP™ 6000 series Trace Analyzer operates at 17°C.

9. Personal computer – The iCAP™ 6000 series Trace Analyzer is controlled by PCs.

Reagents and Standards

Reagent and standard information and the preparation of the following standard and solutions are located in *T-MET-WI12063*:

Initial Calibration (ICAL)
Blank (ICIS) and Calibration Standard (STD1)
Initial Calibration Verification (ICV) standard
Continuing Calibration Verification (CCV) standard
Rinse/Carrier and Profile Solutions
Interference Check Solutions (ICSA and ICSAB)
Low Level Check (CRI) standards
Post Digestion Spike (PDS)
Serial Dilution (SD)
Linear Range Standards (LRC)
Initial Calibration Blank (ICB)
Continuing Calibration Blank (CCB)
Internal Standard Solution
Instrument Detection Limit (IDL) and MDL Solutions
Method Reporting Limit (MRL)

Calibration

See T-MET-WI35797 for the frequency, acceptance criteria and corrective action of the ICAL, ICV, ICB, CRI, ICSA/ICSAB.

Procedure

A. Setting up an ICP run sequence file

1. Determine the batches to be analyzed and determine any special requirements by viewing Batch notes and/or Comments that are with the batch paperwork delivered from the metals prep area.

2. Complete necessary pouring for the prep batch following Section B

   a. Batches with only field blanks or equipment blanks do not need a post-digest spike or a serial dilution.

   b. "As Received" samples must be run with a blank and LCS, LCSD (prepared and documented in the LIMs system by the analyst).

   NOTE: Arizona Drinking Water samples require the preparation and analysis of an MRL

3. Open run template following Instrument Operations Section 2.

4. Scan samples by digestate bottle into program.

5. When setting up a run, Batch QC must be placed in the same block of ten or fewer samples. If there are two LCSs, they must be placed one after the other. [The order of the batch QC is typically MB, LCS, (LCSD), BKG, PDS, DUP, MS, (MSD) and SD.]

NOTE: Arizona Drinking Water samples require the preparation and analysis of an MRL. MRL can be placed after the MB.

a. ICV/ICB must be analyzed immediately after the calibration curve. (NOTE: 200.7 requires the analysis of 2 ICVs. The RSD of both ICVs must be <3%)

b. CRI, ICSA, ICSAB, CCV, CCB must immediately follow the ICV/ICB.

c. 6010D requires analysis of LRCs prior to beginning the analytical run

c. CCV/CCB must be analyzed after every ten analytical samples.

d. Additional QC are added per client requirements at the end of the run: CRI, ICSA, ICSAB.

e. Any deviations from protocol must be noted in the LIMs system

6. Edit dilution factors (DF) and auto-sampler locations as needed.

7. Remove all unnecessary QC standards by selecting individual lines and clicking on the remove samples icon at the top of the screen.

8. Save the sequence file

B. Pouring ICP samples and QC samples

It is important to minimize any chance of contamination, both of yourself and the samples. Keep your hands and the work area clean at all times. Do not re-use any pipette tips.

Run QC standards are prepared separately, and kept in separate auto-sampler racks to be obtained at the time of analysis.

1. Use the prep paperwork to document the following information when pouring samples: initials, employee number, PDS lot number, test tube lot number, filter lot number(if applicable) and the date.

2. Carefully examine the batch to ensure there are no discrepancies between the Batch Preparation Sheet and the physical placement of samples in the batch.

3. Obtain and label all required test tubes, and place them in test tube racks.

4. Prepare and label the PDS required for each new batch (sample volume permitting).

a. A PDS is prepared using 0.2 mL of a custom-ordered PDS solution into 9.8 mL of background sample.

i. If sample volume is limited, reduce volumes but keep ratios equivalent (i.e. 0.1 mL PDS solution into 4.9 mL background sample.)

ii. If the background sample must be diluted, add a reduced volume of background sample and bring to volume with the appropriate matrix.

5. Prepare a DF5 serial dilution(SD) of the background sample by pipetting 2 mL of background sample into 8 mL of the matrix solution.

a. If the background sample chosen for serial dilution has been diluted due to matrix interference or to bring the concentration into the linear range of the instrument, the serial dilution must also be diluted by 5 times the dilution factor of the background (i.e., if Bkg = DF5, S.D. must = DF25).

6. If samples need to be filtered due to cloudiness or contain particulate, then the corresponding method blank (MB) and laboratory control sample (LCS) must be filtered.

a. Filter using a 10-mL sterile disposable syringe fitted with a 0.45 µm PTFE syringe filter.

b. Document lot of filters on the preparation batch sheet and mark each sample lid with an "F" to indicate that it was filtered.

7. Perform any additional spiking or dilutions and document on the preparation batch sheet

8. Cover the samples with lids or with plastic wrap to prevent contamination.

9. Place the poured batch on the bench top to await analysis, or return samples to their ICP sample storage location.

10. Take **NOTE** of the following:

a. A PDS and a serial dilution (SD) must be performed on one sample in each digestion batch unless the batch contains only field blanks or equipment blanks.

b. Analysis information, including standard lot numbers, run number, method, analyst and date of analysis, are captured in the LIMs system

c. Documentation is of utmost importance. Double check all entries.

d. Dilute samples when necessary to yield a response that falls within the calibration range. When there are multiple analytes over range, only run a maximum of three tubes, the DF 1 if needed, the highest dilution required for the highest analyte, and a dilution in between.
Exception: If analytes are over range at a DF1, and the next dilution they are ND, take the data

e. If a batch requires re-analysis, it is acceptable to re-use dilutions and/or spiked samples that were prepared for the previous analysis. A "P" on the preparation batch sheet is used to indicate that a previously poured test tube is being re-used.

Instrument Operations

A. iTEVA™ software: The Thermo Scientific iCAP instrument is operated through iTEVA™ software. From the Start menu, select "iTEVA™ Control Center" to start the software.

1. Plasma ignition

a. Open the plasma status window by clicking on the icon at the bottom of the screen.

b. Verify that all parameters are within acceptable range for ignition as indicated by a green light.

c. Ensure that the drain tubing for the spray chamber is properly connected to the peristaltic pump and positioned to drain into a waste carboy.

d. Select "Ignite plasma". After the plasma has ignited, the instrument automatically performs optimization of the nebulizer gas pressure, and then starts the on-board peristaltic pump.

e. If the plasma does not light, repeat steps b-d.

f. Once the plasma operating parameters have engaged, exit the Plasma status window by clicking on Close.

g. If the plasma has been off for more than 15 minutes let the instrument warm up for 30 minutes. If the plasma has been off less than 15 minutes, let the instrument warm up 5 to 10 minutes.2. Automated analysis using the iTEVA™ software

a. Open the Analyst window from the Control Center by clicking on the Analyst icon. When prompted, select the appropriate method.

b. In the Analyst window, click on the Sequence tab at the bottom of the screen.

c. From the Auto-session menu, select New Autosampler.

d. The "New automation-session" window opens.

e. Click on "New" to add a sequence and the "New sequence" window appears.

f. Click on the "Import from delimited text file" option and choose an appropriate template or previously prepared run sequence from the drop-down menu for the run to be entered.

g. Change the sequence name to reflect the run number, but do not change the method revision number in the parentheses.

h.Click OK at the bottom of the New Automation session window to continue.

i. The sequence template is loaded. When prompted in the import warning window, click OK to choose the populate the auto-sampler.

j. Right-click on the most recent auto-sampler session and select "Auto-locate All" to have autosampler positions automatically assigned.

k. Click on the "list view" icon and scan calibration information into the table using barcodes provided.

l. Scan client samples into table from digestate bottle to include sample number and hand enter the dilution factor if greater than a DF1.

m. Additional samples and QC are added using the "Add sample" and "Add QC" icons, respectively, at the top of the screen. Unused rows are removed by selecting the entire row(s) and using the "remove sample" icon at the top of the screen.

n. Verify that the sample list you entered into the autosampler sequence matches the samples loaded.

o. Carefully examine the batch to ensure there are no discrepancies between the preparation batch sheet, auto-sampler sequence table and the physical placement of samples in the batch.

p. Click on the "Run auto-session" icon to start the run sequence. If a run sequence is to be started at a sample or standard other than the initial calibration, open auto session run using the plus sign. Open the run and use the plus sign to open the required sample or standards. Right-click on the appropriate sample or standard and choose "Start Auto-Session Run at this Sample". Deselect the reslope (or Calibration option if running Multi Point Method) and QC, then click OK.

3. Running an AutoPeak in iTEVA™

a. In an open autosampler session (autosampler must be initialized), right-click on the location of the AutoPeak solution, and choose "Go to..."

b. Click on the Analysis tab to open the Analysis window.

c. From the Instrument menu, select Perform AutoPeak.

d. Click on All elements, then OK.

e. When prompted to aspirate the high standard (STD1,ICV or CCV), click OK. The AutoPeak is now performed.

f. When the AutoPeak has finished, click on Done.

4. Manual analysis in iTEVA™

a. In an open autosampler session (autosampler must be initialized), add sample(s) to be analyzed to a new or existing sequence as detailed in section A.2 of this section.

b. To start analysis, right-click on the appropriate sample and choose "Start Auto-Session Run at this Sample" and elect not to run the "start actions."

c. When analysis is complete, results can be printed from the Analysis tab by right-clicking on the sample name and selecting "Print Sample…"

5. Performing an interelement correction (IEC) in iTEVA™

a. Prepare a solution of the interfering element at the linear range of the instrument. Perform manual analysis according to section A.4 of this section.

b. Note results of elements with a known interference that are greater than the limit of quantitation.

c. Divide the result of each interfered element by that of the interfering element. These values represent the amount the current IECs need to be adjusted.

d. In the Method window, click on Elements to expand the list of elements in the method.

e. Click on the targeted element to view the settings for that element.

f. Click on the IECs tab to view the current IECs for that element.

g. Add each calculated result to the correction factors currently in the first column corresponding to each pair of elements.

h. Enter the new correction factors in the table.

i. Repeat steps d-f as needed.

j. Click on the Save method icon to save the method.

k. For routine IECs that are completed every six months, an experienced analyst updates the LIMs database with the information provided by a calculated analytical run. For non-routine IECs the analyst must document changes in the instrument log book with updated information.

B. Import Analytical and Raw data into LIMs System

1. Within the "Analyst" tab of ITeva, right click on the calibration bracket and select export all samples.

2. Enter the most recent run number that was documented in the instrument laboratory data logbook.

3. Highlight the run number and type Control C on the keyboard.

4. Individually select all of the brackets that acquired after the cal, and export the file as listed above. The Control V function will paste the run number originally typed.

5. Make sure all brackets have been exported and in the proper order.

6. Once again right click on the calibration bracket and select "Print Selected Samples".

7. When the printer box opens, select "pdf Factory Pro" from the drop down list, then hit "OK".

8. Print all of the brackets that acquired after the calibration using the same steps listed above in steps 6 and 7.

9. Open the pdf Pro document that was created at the bottom of the screen. Click on the save tab then hit Control V again to populate the run number. Hit "Save".

10. Within the "Sequence" tab of ITeva, select the upper left hand box of the spreadsheet to highlight the entire sequence.

11. Press the Print Samples List Icon at the top of the screen, and select
'pdf Factory Pro" from the drop down list. Hit "OK".

12. Open the pdf Pro document, and select the save tab. Type Control V to enter the run number. Append "Runlog" to the end of the file name and hit "Save".

NOTE: For DOD samples these steps must be taken

a. Right click on run number and select edit report option

b. Select output mode to intensity ratio for unknowns as well as QC standards.

c. Right click on run number after and post process samples.

d. Export with same name used in step 2 with "RAW" at the end of the file

e. Do this for both the Calibration file and the Sample file.

13. Insert a Thumb Drive into the Instrument PC tower.

14. Locate the files you just created within the favorites tab, and copy all associated files onto the Thumb Drive.

15. Right Click on the external Thumb Drive and select "Eject".

16. Remove the Thumb Drive.

17. Insert the Thumb Drive into a PC with a network connection.

18. Locate the (\\corptalsapp19\410-ELLE-RawData\Metals) folder. Copy the export "txt" file from the Thumb Drive and paste it to the correct instrument folder.

19. Copy the samples pdf, runlog pdf, and DOD raw data pdf files from the Thumb Drive and paste them into the correct instrument raw data folder on the public drive.

20. Once the pdfs have been copied to the public drive, copy the sample pdfs to your mapped personal folder. If the run included DOD samples, copy the "Raw" sample pdfs to this folder as well.

21. Open the LIMS and select Analyst - Analyst Desktop II.

22. Expand the Equipment Tab in the upper left of the screen, and scroll down to find the correct instrument folder.

23. Expand the Instrument folder and select the top folder from the list. This will open the file in analyst desktop.

24. Hit the edit button at the top of the screen. When asked if you want to process the samples , select "No".

25. Hit the Reagent Tab at the bottom of the screen.

26.Rename the "S0" that acquired at the beginning of the run as "ICIS".

27. Rename the "S1" as "STD1".

28. Locate the tab called MT_IJ_RINSE at the top of the screen. Enter "#" for the matrix rinses that acquired before the calibration and for the "ICIS".

29. Locate the Enter/Scan New Reagent box at the bottom of the screen. Type the correct LIMS Lot # for the "S1" standard used.

30. Once added, the "S1" standard will appear as one of the reagent tabs across the top of the screen.

31. Locate the "S1" tab and enter a "#" into the associated box.

32. Type the current "PDS" or Post Digestion Spike reagent into the New Reagent box at the bottom of the screen.

33. Locate the "PDS" tab that was created, and enter 0.2 into the amount column for all associated post digestion spikes.

34. Select the Worksheet tab at the bottom of the screen. Enter 10 ml as the final amount for all associated post digestion spikes.

35. Go to the "Docs" tab at the top of the screen. Right click within the box and select "Add New Document". Navigate to your personal folder and locate the raw data file from the run. Select them and hit "OK" to add them to the analyst desktop batch.

36. Right click anywhere within Analyst Desktop and select " View Batch Information". Populate this box with the correct Lot numbers used to prep/run the samples. Add your name to the Analyst Tab in the top right of the date box and hit "OK".

37. Press "F6" on the keyboard to process all of the samples in the run.

38. Save the Analyst Desktop Batch.

Routine Maintenance for the ICAP™ 6000 Duo Analyzer

A. Sample introduction system removal and cleaning: Remove and clean the sample introduction system when instrument performance declines (See **Figure 1**). Any adjustment to an instrument (replacement of parts, etc.) must be documented in the appropriate instrument logbook.

1. Turn plasma off and let instrument cool for approximately 5 to 10 minutes.

2. Remove spray chamber and nebulizer.

    a. Unclamp spray chamber from spray chamber adapter by gently squeezing clamp with one hand while supporting the spray chamber with the other hand.

    b. Gently remove the nebulizer from the spray chamber by pulling it out.

    c. Disconnect the argon and sample tubing from the nebulizer by pinching the Luer lock and pulling the tubing off the nebulizer.

    d. Remove the drain tubing from the spray chamber.

3. Prepare ultrasonic bath. Make sure the bath is at least ½ full with clean reagent water.

4. Clean radial cup
    a. remove gently from box by wiggling back and forth

    b. place radial cup in medicine cup and fill inside radial cup and medicine cup with matrix rinse or 1:1 HCL

    c. allow it to soak for approximately 10 minutes and then rinse off with reagent water

    d. dry radial cup and place back in torch box prior to reconnecting the torch

5. Clean torch, injector tip, and nebulizer.

    a. Invert the torch with tip assembly in a 250-mL vacuum flask of 50% HCl and place in the sonicator for approximatley 10 minutes. After sonication, rinse the torch with reagent water. (Be careful not to get a lot of water down into the base of the torch.) Carefully dry the torch with a paper towel.

    b. For a plastic nebulizer, use a syringe to force the 50% HCl solution through the nebulizer to clean and/or remove any clogs.

    c. Clean the spray chamber by filling with 50% HCL letting sit for approximately 5 minutes and then rinsing with reagent water.

6. Removal and disassemble the torch and tip if dirty or damaged (cracked,melted,ect)

a. Gently pull the spray chamber adapter out of the torch assembly.

b. Unlock the torch assembly by turning it clockwise and remove it from the instrument.

c. Turn the injector tip assembly counter clockwise to separate it from the torch housing.

d. Gently pull the center tube out of housing to clean.

Note: If the torch and tip is disassembled a torch alignment must be performed before an ICAL is ran

B. Reassemble the sample introduction system: (See **Figure 1**)

1. Torch.

a. Inspect The o-rings on the metal torch mount and replaced if any wear or damage is visible.

b. Push on the quartz torch to ensure that it is firmly seated in the housing assembly

c. The circular "target" design on the torch **MUST** align with the circular notch on the torch mount.

d. Make sure the tip is fully inserted into the center tube holder.

e. Mount the torch assembly back into the instrument by inserting it straight through the torch hole and coil, being careful not to disturb the quartz bonnet above the radial view lens.

f. Turn the assembly counter-clockwise to lock it into position.

g. Gently push the spray chamber adapter into the back of the center tube assembly.

2. Reassemble the spray chamber and nebulizer.

a. Reattach the drain tube to the spray chamber.

b. With a twisting motion, insert the nebulizer into the spray chamber so that the collar is a tight fit.

c. Attach the sample and nebulizer gas tubing to the nebulizer.

d. Clamp the spray chamber to the spray chamber adapter.

3. Ignite the plasma.

C. Changing the pump tubing: Change pump tubing on the peristaltic pump when routine maintenance is performed or when the tubing shows wear. Inspect all tubing to insure that it is secure and in good condition.

D. Documentation for instrument/analysis tag out and return to service.

NOTE: The following information is taken from QA-SOP11901: In the event of an equipment failure, the following must be performed:

1. Document the nature of the failure in the maintenance logbook

2. Document how and when the defect was discovered

3. Notification of supervisor or responsible person who can decide on appropriate action to take

4. The instrument must be clearly tagged as *Out of Service*. The tag must contain the following information:

a. Date taken out of service

b. Employee who took the instrument out of service

c. Reason for tagout

Form Q-EQA-FRM6871is used for "tagging out".

5. The date taken out of service and the date returned to service must be documented in the maintenance logbook.

6. Document any corrective action that was taken to bring the equipment back into service.

7. Results of the corrective action (i.e., system calibration within specifications, etc.)

8. Supervisory personnel must perform a documented evaluation and review of instrumentation/equipment where a major or uncommon failure has occurred to assess the potential impact the failure could have on the

calibration and/or qualification of the instrument. This is done on a case-by-case basis.

9. After repair, document whether the function has been fixed. Then determine if calibration or verification activities need to be performed before the instrumentation is put back into service.

Calculations

1. Final Result

a. Water sample (mg/L)

$$\text{Instrument Reading} \times \frac{\text{Dilution Volume}}{\text{Aliquot Volume}} \times \frac{\text{Final Volume}}{\text{Sample Volume}}$$

b. Solid sample (mg/kg)

$$\text{Instrument Reading} \times \frac{\text{Dilution Volume}}{\text{Aliquot Volume}} \times \frac{\text{Final Volume}}{\text{Sample Weight (grams)}}$$

2. Relative percent different (RPD)

$$RPD = \frac{S - D}{(S + D)/2} \times 100$$

Where:

S = first sample value

D = duplicate sample value

3. Spike recovery

$$\%\,Recovery = \frac{SSR - SR}{SA} \times 100$$

Where:

SSR = spiked sample result

SR = sample result

SA = spike added

4. Correlation Coefficient

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{N}}{\sqrt{\left(\sum X^2 - \frac{(\sum X)^2}{N}\right)\left(\sum Y^2 - \frac{(\sum Y)^2}{N}\right)}}$$

Where :

X = the known concentration

Y = the instrument response

N = the total number of data points

5. Serial Dilution

$$\%\ Difference = \frac{(5 \times SDR) - SR}{SR} \times 100$$

Where:

SDR = serial dilution result

SR = sample result

6. Total Hardness Calculation (SM2340B), Standard Methods 2340B-2011. The calcium result (mg/l) is multiplied by a factor of 2.497, the magnesium result is multiplied by a factor of 4.118, and the two values are added together for the hardness result.

7. Trivalent Chromium (7199_CR3) water and soils. Calculation is performed by subtracting hexavalent chromium from total chromium.

8. Ferric Iron (3500_F+3_B_Calc) is calculated by subtracting ferrous iron from the total iron.

Statistical Information/Method Performance

Generate MDLs and RLs according to *QA-SOP11892*. Perform an MDL study on each instrument used for the analysis. Determine the MDL by taking seven spiked replicates through the entire digestion and analysis procedure. Compare and pool results to determine the final reporting MDL. The department supervisor maintains annual study data. The department supervisor requests that a Quality Assurance Specialist update to the LIMS as needed. Update the department database via a download from the LIMS.

QC acceptance limits (MS, MSD, LCS and LCSD) are established as statistical limits (see *QA-SOP11896* for guidance). Limits are evaluated every 6 months by the department and updated in LIMS by QA as directed by the department supervisor.

Quality Assurance/Quality Control

A. For 6010B, 6010C, and 6010D each digestion batch (up to 20 samples) must contain a method blank (MB), LCS, unspiked sample (BKG), Duplicate (DUP), MS, and MSD. If there is not sufficient sample or per client requirement and LCSD is included.

B. For 200.7, each digestion batch (up to 10 samples) must contain a MB, LCS, BKG, DUP, and MS. If there is not sufficient sample or per client requirement and LCSD is included.

NOTE: Arizona Drinking Water samples require the preparation and analysis of an MRL.

C. Batch Quality Control - For the preparation and concentrations see *T-MET-WI12063* and for the frequency, acceptance criteria and corrective action see SOP T-MET-WI35797.

D. Data Quality Checks

1) For SPLP and TCLP samples, an MSA (method of standard additions, EPA 1311 section 8.4.2, EPA 1312 section 8.4.2) is required if:

a. The sample concentration falls between 80% to 100% of the regulatory limits, AND

b. The SPLP or TCLP Matrix Spike (QA) recovers < 50%.

2) For all EW samples (samples from public drinking water sources); check the results against the MCL (maximum contaminant level). If an analyte **exceeds** the MCL, notify a verifier at once. An automated email is sent to the Client Service Representative and the state for the analytes listed in QA-SOP11886. Suppliers must be notified within 24 hours.

F. When raw data checks are complete, check the following:

1. All samples requiring reread/redigestion are listed on the reread/redigestion schedule forms. Any dilutions required have been calculated correctly and added to the reread/redigestion form. Specific instrument has been noted for client requirements if necessary.

2. Data for samples following Good Laboratory Practices (GLP) must be retained as permanent storage.

G. Instrument detection limits are performed when an instruments detector is changed or a new instrument is added to the lab. Method detection limits (MDLs) follow guidelines in SOP ***QA-SOP11892***. Inter-Element Correction factors (IECs) are checked routinely every 6 months for each analytical instrument. Linear ranges are verified semi-annually.

H. For data review reference SOP T-MET-WI35797

Appendix I

Definitions and explanations of the codes and symbols used on the raw data

A. Sample table information

1. The run number.

2. The page number.

3. The tube number.

4. The sample number.

5. The first and second of four asterisks denote whether the sample is a background (U*), duplicate (D*), spike (R*), MSD (M*), post-digestion spike (UP), serial dilution (UL), or not a QC sample (**).

6. The weight to volume or volume to volume digestion ratio, consisting of the initial quantity of sample used and the final digest volume.

7. The dilution factor – Indicating if the digest solution was diluted prior to analysis. An undiluted sample is labeled DF1.

8. Digestion batch number – Assigned when designated samples are scheduled for preparation, this number is used to track samples and QC prepared together.

9. The protocol by which the data is reviewed (SW-846, EPA-600).

10. Date and time of the sample injection into the instrument.

11. The ICAP identification number.

B. The ICP scans all of the method elements simultaneously during the analysis. The QC review lists all the samples on the run. The QC review lists elements verified, good phantom, and elements/phantom that are bad (need to be reread for run or batch QC). The reviewer or verifier documents on the QC review if any element(s)/sample(s) were selected/deselected.

C. The following are error codes in the iTEVA™ software.

1. S = Saturation – The concentration of the element is more than the detector can quantify.

2. K = The Elements Affected by a Saturated Element – The concentration listed is not accurate, and a more accurate result can be obtained by running the sample at a dilution.

D. Along with the average concentration (in ppm), the average intensity, %RSD and all three replicates are shown for each analyte. Internal standard values are intensities (cts/s).

Attachment:
Figure 1 (.doc)

QA-SOP11892 Determining Method Detection Limits and Limits of Quantitation
QA-SOP11896 Establishing Control Limits
S-SA-WI10695 Liquid Sample Preservation Checks, Turbidity Checks, and Sample Splitting
T-MET-WI11938 Digestion of Waters by EPA 200.7/200.8 for Analysis of Metals by ICP/ICPMS
T-MET-WI11941 Digestion of Water and Leachates by EPA 3010A for Metals
T-MET-WI12063 Preparation of ICP Solutions and Standards
T-MET-WI35797 Metals Data Verification Process
T-MET-WI8636 Sample Prep of Sediments, Sludges, Soils, and Tissues by SW846 3050B for ICP and ICP-MS
T-MET-WI8639 Digestion of Waters and Leachates by EPA 3005A for Analysis of Metals by ICP/ICPMS
T-MET-WI9082 Working Instructions for Prep Solutions and Standards

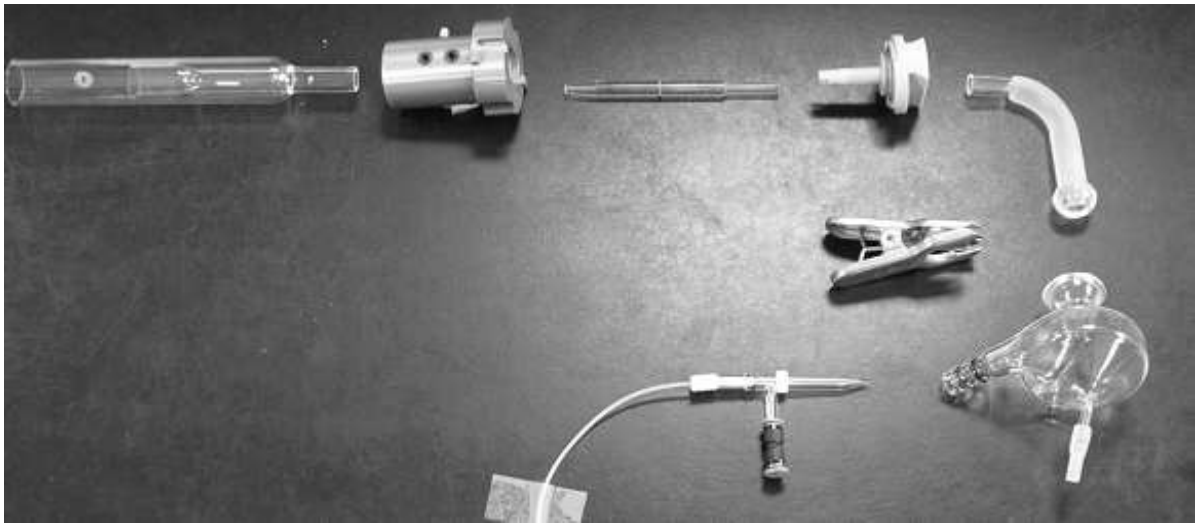
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End of document

Version history

Version	Approval	Revision information	
16	03.MAY.2023		
17	30.MAY.2024		
18	06.FEB.2025		

Figure 1







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Revision Log
Reference
Cross Reference
Scope
Routine Methods
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Revision Log

Revision: 15	**Effective Date:**	This version
Section	**Justification**	**Changes**
Revision Log	Formatting requirement	Removed revision logs up to the previous version
Reference	Addition	Added USEPA Drinking Water Manual
Personnel Training and Qualifications	Addition	Added Arizona Drinking Water requirement for MDLs
Procedure D. 8.	Addition	Added Arizona MRL requirement
Procedure D. 12.	Addition	Added Arizona Drinking Water requirement
Quality Assurance/Quality Control B.	Addition	Added Arizona MRL requirement

01.AUG.2024

Revision: 14	Effective Date:	
Section	**Justification**	**Changes**
Revision Log	Formatting requirement	Removed revision logs up to the previous version
Throughout	Reflect current practice	Removed all references to 6020 and 6020A, added explanation of acronyms and removed an archived form reference.
Cross reference	Update	Update to current SOP names
Personnel Training and Qualifications	Addition	Addition of current IDOC requirements

Reference

1. Method 200.8 (rev 5.4), Determination of Metals and Trace Metals in Water and Wastes by Inductively Coupled Plasma-Mass Spectrometry, USEPA 600/R-94/111 May 1994.

2. Test Methods for Evaluating Solid Wastes, SW-846 Method 6020B, Rev. 2, July 2014.

3. USEPA Manual for the Certification of Laboratories Analyzing Drinking Water, Criteria and Procedures, Quality Assurance, Fifth Edition.

4. ESI SC Manual.

5. Agilent 7700 and 7900 Series ICP-MS MassHunter Workstation Guide and Hardware Maintenance Manual.

6. Chemical Hygiene Plan, current version.

Cross Reference

Document	Document Title
T-MET-WI12065	Preparation of ICP-MS Solutions and Standards
S-SA-WI10695	Liquid Sample Preservation Checks Turbidity Checks and Sample Splitting
T-MET-WI21590	Instrument Maintenance for Agilent 7900
T-MET-WI35797	Metals Data Verification Process
T-MET-WI11925	Client Specific - 3030 C. Treatment for Acid-Extractable Metals for North Carolina Groundwater Samples
T-MET-WI11938	Digestion of Waters by EPA 200.7/200.8 for the Analysis of Metals by ICP or ICPMS
T-MET-WI11941	Digestion of Water and Leachates by EPA 3010A for Metals
T-MET-WI8636	Sample Prep of Sediments, Sludges, Soils, and Tissues by SW846 3050B for ICP and ICP-MS
T-MET-WI8639	Digestion of Water and Leachates by EPA 3005A for Analysis of Metals by ICP/ICPMS

Document	Document Title
T-MET-WI8732	Lab and Field Filtered Waters and <1NTU Drinking Water Preparation for ICP (EPA 200.7, 6010B/C/D) or ICP-MS (EPA 200.8, 6020/A/B)

Scope

This procedure applies to analyses performed at Eurofins Lancaster Laboratories Environmental (ELLE) using ICP-MS for identification and quantitation of metallic constituents.

Aqueous undigested samples and digestates (aqueous and solid matrices) are analyzed via this SOP.

Limits of Quantitation (LOQs/RLs), Method Detection Limits (MDLs) and linear ranges are maintained in the LIMS. These are subject to change without notification.

This procedure is used for analysis and instrument operation for the Agilent 7700 and 7900 series ICPMS instruments.

Routine Methods

Analyte	Mass
Be	9
B	11
Na	23
Mg	24
Al	27
K	39
Ca	44
Ti	47
V	51
Cr	52
Mn	55
Fe	57
Co	59
Ni	60
Cu	63
Zn	66
As	75
Se*	78
Se**	82
Sr	88
Mo	98
Ag	107
Cd	111
Sn	120
Sb	121
Ba	137
Tl	203
Pb 206	206
Pb 207	207
Pb 208***	208
U	238
*Se 78 is the mass reported from collision cell ICPMS only **Se 82 is the mass reported from non-collision cell ICPMS only ***For Pb masses 206, 207 and 208 are summed for calibration and analysis	

Basic Principles

ICP-MS is an analytical instrument that uses the energy of inductively coupled plasma to generate ions to be analyzed in the mass spectrometer.

The instruments use a discrete sampling system that first loads the sample into a Teflon sample loop. The sample is then pushed by a carrier solution using a computer controlled peristaltic pump that delivers the sample from the loop into the nebulizer attached to a cooled Scott double pass spray chamber.

The Agilent 7700 (E05) and 7900 (E07/E08/E09) can analyze samples in 3 different modes of operation, although typically analysis is done in 3 mode or No Gas mode only:

1. Mode 1 – no gas. This mode does not use a collision or reaction gas. Elements with a low atomic mass or that have no interferences can be analyzed using the "no gas" mode.

2. Mode 2 – Hydrogen (H_2) mode. This mode uses H_2 as a reaction gas, since it reacts quickly and efficiently with the Argon-based interfering species, but reacts slowly or not at all with the analyte(s) of interest. In this mode, interferences can be reduced to the level of baseline noise, allowing lower detection limits to be achieved for some difficult elements.

3. Mode 3 – Helium (He) mode. This mode uses He as a collision gas for reliable, predictable removal of unknown matrix interferences. No new interferences are formed in the cell, and no analytes are lost by a reaction.

Interferences

ICP-MS interferences include isobaric elemental interferences and polyatomic ion interferences derived from the plasma gas, reagents, and/or sample matrix. The Agilent 7900 utilize helium as an inert collision gas to reduce or eliminate many types of polyatomic ion interferences.

Physical interferences caused by the change in sample matrix affecting sample transport and/or nebulization must be compensated for using internal standardization.

Memory interference is the contribution of analyte signal from a previous sample onto the next sample analysis. Adequate rinse time with an appropriate rinse solution of the sample introduction system overcomes any memory interference.

Safety Precautions and Waste Handling

All laboratory waste is accumulated, managed, and disposed of in accordance with all federal, state and local laws and regulations.
See the *Chemical Hygiene Plan* for general information regarding employee safety, waste management, and pollution prevention.

Preparing samples for inorganic analysis involves working with concentrated acids and other chemicals which are dangerous if not handled carefully:

Hydrochloric acid (HCl) – This acid can cause skin burns. Only mix with approved solutions. Always use this chemical in a fume hood.

Hydrofluoric acid (HF) – This acid is very toxic and absorbs through the skin without pain. This acid is found at trace levels in standard solutions.
Hydrogen Peroxide 30% (H2O2) **-** This oxidizer can cause skin burns. Always use in a fume hood.

Nitric acid (HNO3) – This acid can cause skin burns and burning of the respiratory tract. Add nitric acid to samples in a fume hood to avoid exposure to toxic fumes.

When diluting strong acids, never add water to acid; always add acid to water.
Store concentrated acids in the prep room acid cabinets. Only acids are to be stored in these cabinets. Flammable solvents are stored in flammable liquid storage cabinets. Some concentrated acids are kept in the acid reagent bottles on prep room counters. Fill reagent bottles in an operating fume hood using caution to avoid spills.

Large spills are cleaned by HSE. For large spills of concentrated acid, immediately evacuate the area and dial 1-1-1. HSE will use spill pillows to absorb large acid spills (small spills are cleaned with wet paper towels.)

Dispose of acid waste properly. Collect all acid digestions, waste solutions, and expired reagent solutions in waste containers. When the acid waste containers are full, a designated acid waste handler

transfers the waste to the acid neutralization tank.

Personnel Training and Qualifications

All personnel performing this procedure must have documentation of reading, understanding, and agreeing to follow the current version of this SOP and an annual documented Demonstration of Capability (DOC) which is maintained in the analyst's training records.

Initially, each analyst performing the instrumental analysis must work with an experienced analyst for a period of time until they can independently calibrate the instrument, use the sequence editor to set up the run, perform calculations, interpret raw data, and enter/transfer data into the LIMS. Proficiency is measured through documented audits of the tasks listed, and checking of data as well as an IDOC (Initial Demonstration of Capability) and continued DOCs (Demonstration of Capability) as defined in *QA-SOP11178*.

The IDOC consists of aliquots spiked at 1-4X the RL that are carried through all steps of the prep and analysis and meet the defined acceptance criteria. The criteria include the calculation of mean accuracy of 50 - 150% and standard deviation of </= 20%.

Arizona Drinking Water requires that each analyst perform an MDL study that consist of 7 spikes over 3 days.

Various options are available for a DOC and can include four laboratory control samples (LCS) or one blind sample. The mean recovery of four LCSs must meet the accuracy criteria of an LCS, and the standard deviation must be </= 20%.

Sample Collection, Preservation, and Handling

Aqueous undigested samples, aqueous digestates, and solid digestates are analyzed via this SOP. Samples must be analyzed within 6 months of collection for all methods in this SOP.

Aqueous samples are collected in plastic or glass containers. Drinking Water samples are collected in 1-L plastic or glass containers. Aqueous samples are preserved with nitric acid with a pH of < 2 and stored at 0° to 6°C, not frozen, or at room temperature.

Aqueous digestates are digested per the method in *T-MET-WI11938* (aqueous samples 200.8), *T-MET-WI8639* (aqueous samples 3005A). Aqueous non-digested samples are prepared per the method in SOP *T-MET-WI8732* (lab and field filtered waters and <1NTU Drinking water). Aqueous samples are stored in 50 ml plastic vials at room temperature.

Solid samples are collected in glass containers and stored at 0° to 6°C, not frozen. Digestates are digested per the method in SOP *T-MET-WI8636*. Solid samples are stored in 100 ml plastic vials at room temperature.

Store standards and digestates separately.

The general practice in the metals group is to discard the digestions after all the required metals from a batch of samples have been analyzed and lab completed in the LIMS. Samples which require the digestate to be held for long term storage are periodically evaluated for discard.

Apparatus and Equipment

A. The following is a list of the hardware used in the Agilent 7700 and 7900 ICP-MS systems.

1. Inductively Coupled Plasma Mass Spectrometers (ICP-MS)

a. The Agilent 7700 and 7900 - The sample introduction system consists of an ESI FAST discrete sampling system, Teflon nebulizer and cooled spray chamber attached to a concentric quartz tube plasma torch.

2. Autosampler

a. The Agilent 7700 and 7900 (E08) systems use an ESI SC-8 FAST autosampler. The Agilent 7900 (E07 & E09) systems use an ESI SC-14 FAST autosampler. The autosampler parameters for each

automated run are entered into the Sample List in MassHunter software.

3. Coolflow

a. The Agilent 7700 and 7900 G3292A Recirculating Chillers are set up to deliver cooling liquid to the ICP-MS at a regulated pressure of ~40 psi.

4. Computer

a.The Agilent 7700 and 7900 are controlled by a Windows-based IBM compatible PC with MassHunter software installed.

5. Vacuum Pumps

a. The Agilent 7700 and 7900 both have a 2-stage vacuum system. A rotary pump evacuates the interface chamber; a turbo molecular pump evacuates the ion lens chamber and the analyzer chamber.

B. The following is a list of the apparatus necessary for the setup of an ICP-MS run for analysis:

1. ICP-MS prep batch sheets.
2. Test tube racks
3. Graduated 15-mL polypropylene tubes and caps
4. 50-mL polypropylene screw cap tubes
5. FilterMate 2 µm filters and plungers
6. 10-mL sterile disposable syringes
7. 25-mm syringe filters, PTFE, 0.45µm
8. 30-mL polypropylene medicine cups
9. Fixed volume hand-held pipettes (25 – 2000 µL) - Eppendorf or equivalent.

NOTE: For routine operation, calibration, and maintenance of fixed-volume, hand-held pipettes, see *QA-SOP11880*.

Reagents and Standards

Refer to Form *T-MET-WI12065* for reagent and standard information and the preparation of the following standards and solutions

1. ICP-MS Calibration Standards and ICP-MS LOQ Check Standard Solution (CRI)
2. ICP-MS Initial and Continuing Calibration Verification Standards
3. Interference Check Solutions
4. Rinse/Carrier, Tuning, and Calibration Solutions
5. Internal Standard Solution
6. PDS Solutions
7. General Acids and Chemicals

Calibration

Before calibration is performed, allow the instrument to warm up for the recommended time, usually at least 15 minutes, if the plasma has been off for 15 minutes or less, or at least 30 minutes if the plasma has been off for more than 15 minutes. Daily tuning requirements must be performed prior to calibration

of the instrument and after warm up occurs. Full Tuning and Optimization is done as needed, or when required by the Group Leader or Manager.

Calibration is performed daily. Calibrations consist of a blank and one to three standards, followed by analysis of an ICV, ICB, CCV, CRI, ICSA/ICSAB, LRC, CCV, and CCB.

A single point calibration, consisting of a blank and one standard, is used for all analysis, except Non-TNI samples requiring a multi-point calibration (either MA MCP or CT RCP protocol or a lab note indicating a multi-point calibration is needed). For samples requiring a multi-point calibration the calibration consists of a blank, "S1", "S2", and "S3" standards. The concentrations of the calibration standards are defined in *T-MET-WI12065*.

For data review, acceptance criteria, and corrective action, see *T-MET-WI35797*.

Procedure

A. Instrument Start Up

This procedure is the same for the Agilent 7700 (E05) and the 7900 (E07/E08/E09) instruments.

1. Power on the ESI autosampler and start the ESI software.

2. Make sure the instrument is powered on before starting the ICP-MS software – the light on the front of the instrument will be red (shutdown mode), orange (standby mode) or green (analysis mode).

3. If the instrument is powered down: flip the main power switch on the back of the instrument to the on position, and then make sure the Foreline Pump (red switch) is also in the on position.

4. Make sure the recirculating chiller power switch is in the on position. If the orange light on the front of the chiller is on, you will need to turn off the chiller and add coolant before turning the chiller back on.

5. Verify that the program is in Online mode – the Hardware tab will have a green check mark if it is online.

6. If the Hardware tab has a red x instead of the green check, click on the arrow down in the Hardware tab and select Communication. Select Online and click OK.

7.Check the Instrument Status pane. The instrument should be in one of three modes: Shutdown (plasma and vacuum off, red light on the front of instrument); Standby (plasma off but vacuum on, orange light on the front of instrument); Analysis (plasma and vacuum on, green light on the front of instrument).

8. If in Shutdown mode click on the Hardware tab arrow down and select Vacuum On – the Foreline pump will start and the instrument will transition to Standby mode.

9. Once Standby mode has been reached select Plasma On from the Plasma tab arrow down.

10. When asked if you want to "Run 'Startup' after plasma ignition?", select No.

11. The plasma will ignite and the instrument will transition to Analysis mode.

12. Once Analysis mode is achieved you must allow the instrument to warm up for at least 20 minutes before running the EPA Daily Tune check sample.

B. Running the Daily Tune Check

1. To run the EPA Daily Tune check place both probes into the EPA Tune Solution and allow sufficient time for the solution to flush through both lines.

2. Make sure the FAST valve is in the LOAD position.

3. Once the EPA Tune Solution is aspirating into the spray chamber take the following steps to start the EPA Daily Tune check.

4. Click on the arrow down for the Batch tab.

5.Open the batch "~ICPMS.b" by clicking on the file in the drop down menu or the pop up menu if necessary.

6. In the Batch pane select the Acq Method tab then the Tune tab.

7. Right click in the Signal Monitor grid and select Report, then Generate Tune Report.

8. In the window that appears verify that the Report Template selected is as follows:

C:\Agilent\ICPMH\Report Templates\en\Letter\Tune Report\TuneCheckReport.xltx

9. Click Generate. The software will acquire the tune check data from the instrument and a report will be printed.

10. If the EPA Daily Tune fails any of the criteria rerun the tune a second time. If it fails a second time take corrective action before running the EPA Daily Tune check again (maintenance or optimization of tuning parameters).

C. Sample analysis

1. Once the EPA Daily Tune passes all criteria, place the internal standard probe in the internal standard solution and place the carrier probe into the carrier solution.

2. Once the carrier and internal standard solution have flushed through the tubing and are aspirating into the spray chamber, sample analysis can begin.

3. In MassHunter open the method batch file used for analysis. Use ~ICPMS.b for non-potable waters and solids analyses, and ~ICPMS_nogas.b for drinking water analysis.

4. Save the batch with a new name:

YYMDDR## where:

YY is the two digit year
M is the letter of the alphabet corresponding to the month (A for January, B for February, etc.)
DD is the two digit day of the month
R is the letter of the alphabet that changes for each attempted run sequence

Example: For the first run started on March 19 in the year 2012 the batch folder would be named 12C19A01.b

5. Enter the calibration standards and lot numbers in the order of:

ICV/ICB/CRI/ICSA/ICSAB/LRC(s)/Rinse(s)/CCV/CCB

6. Scan all samples into the sample list and add PDS/SD and/or dilutions as needed.

7. Add a CCV/CCB block after every 10 samples (or ending the run) as well as an ending CRI/ICSA/ICSAB as needed per method or project note.

8. Enter the locations of the samples to match the rack in which they will loaded onto the auto-sampler. Ensure that the order of the samples on the batch paperwork/re-read sheet match the order in which they are loaded.

9. Right click on the sample list and print a copy.

10. Use the print out to confirm the sample ID(s) and locations of the samples on the auto-sampler.

11. Load the auto-sampler based off of the printed out sample list. Sign off on the sample list with your initials, employee number and the date.

12. Keep the sample list with the batch(es) paperwork until the batch is imported into the LIMS. Note the analytical and prep batch(es) numbers on the sample list and give to the Group Leader.

D. Pouring an ICP-MS run (Waters only in 50 mL digestion tubes):

It is important to minimize any chance of contamination, to both yourself and the samples. Keep your hands and the work area clean at all times. Wear appropriate PPE at all times to prevent exposure to chemicals and samples including lab coat, gloves, and safety glasses, and additional PPE as required by project or health and safety.

NOTE: See Form *T-MET-WI12065* for standards and solutions used during the analytical run.

1. Choose the appropriate prep batch sheet.

NOTE: When retrieving the batch from the shelf for the first time, record the batch location on the cap of the prep blank in black sharpie. This saves time when returning the batch to the proper location after analysis and shows that the batch has been poured before and verified to be in the correct order. To prevent more than one batch from being assigned to the same location, the digestion trays all have the location written on the foam holder.

2. Verify that each digestion tube is in the correct order according to the prep sheet. If anything is missing, correct the prep sheet and notify PREP or the Group Leader to correct the LIMS and put the sample back in for digestion. If the order is incorrect, reorder the sample digestion tubes to match the paperwork.

3. For batches prepared in hot blocks in 50-mL digestion tubes or prepared by the MTL_ND method:

a. The only tubes that typically need to be poured for the initial run are the post digestion spike (PDS) and serial dilution (SD)samples. These are prepared using the background sample (BKG) or the duplicate background sample (DUP) when limited sample volume is available.

b. All other samples remain in the 50-mL digestion tubes for analysis.

4. Samples that need to be poured into test tubes:

a. Obtain the appropriate number of tubes.

b. Write the last four digits of the sample number and the dilution factor if greater than 1 on each tube. If the MB or LCS must be in tubes, write MB/LCS and the prep batch number/location on the tubes.

c. Place tubes in test tube racks in the same order as the samples on the prep batch cover sheet and/or re-read.

d. The analyst must ensure that tubes are labeled correctly, that dilutions are performed accurately, and that the dilutions are recorded on the prep cover sheet and/or re-read.

5. Post-digest spike (PDS):

a. A PDS is required for each batch (sample volume permitting).

b. A PDS is prepared by pipetting 0.2 mL of the appropriate PDS solution into a 15-mL graduated test tube, and bringing it to a volume of 10 mL with the background sample, "BKG". If the PDS must be diluted, pipette 0.2 mL of the PDS solution into a 14 mL graduated test tube, add the appropriate amount of background sample, "BKG", and dilute to 10 mL using matrix rinse. If there is limited volume for the background sample, "BKG", then the "DUP" may be used for dilutions of the PDS or SD. If the duplicate is used for PDS or SD, make an internal NCM on the analytical batch after analysis.

c. Record the lot number of the PDS solution used on the prep batch cover sheet and/or re-read.

6. Serial dilution (SD)

a. Prepare the SD by diluting the background sample at a dilution that is equal to 5× the dilution factor of the PDS sample (i.e.if PDS= DF1, SD must = DF5; if PDS=DF5, SD must=DF25).

7. Filtering samples

a. Samples that are cloudy or have particulate suspended in solution must be filtered prior to analysis to prevent clogging of the sample introduction system, which causes run failures and instrument down time to correct the problem.

b. Samples that are in the 50-mL digestion tubes may be filtered using the FilterMate filtration devices and plunger or a syringe and syringe filter.

c. Attach a filtration device to the plunger and very carefully insert the filter into the digestion tube until the filter reaches the bottom of the digestion tube.

d. Remove and discard the plunger.

e. An alternative for samples in any type of vessel is to filter using a 10-mL sterile disposable syringe fitted with a 0.45µm PTFE syringe filter.

f. If any samples are filtered, the MB and LCS must also be filtered. If any QC sample is filtered (BKG, DUP, MS, or MSD), then all QC including the MB and LCS must be filtered.

g. Document all filtrations on the prep batch cover sheet.

NOTE: It is not necessary to filter all samples (in 50 mL digestion tubes only) that contain particulate, as long as all of the particulate is settled to the bottom of the tube below the 5-mL mark in 50-mL digestion vessels. The sampling depth of the autosampler probe is set such that the tip of the probe is approximately 100 mm above the bottom of the digestion tube. It is necessary to filter all solid samples and to dilute to DF2 prior to analysis.

8. Verify that all samples in the hotblock tray are in the correct position and/or pour each sample (or sample filtrate) into the appropriate tube. Usually, the order of the batch QC is MB, LCS, (LCSD), Bkg, PDS, DUP, MS, (MSD), and SD. Most importantly, the actual positions of the samples in the tray must match the autosampler table used for analysis.

NOTE: Arizona Drinking Water samples require the preparation and analysis of an MRL. MRL can be placed after the MB.

NOTE: Immediately prior to beginning analysis, the analyst must visually verify that each sample is in the position indicated in the autosampler table used for the run.

9. If not being analyzed immediately, cap any poured tubes to prevent contamination of the samples (digestion tubes and dilutions prepared in graduated test tubes must be capped tightly except during pouring and/or analysis).

10. Return samples to sample storage, being sure to place the batch back into the location recorded on the prep batch sheet.

11. Record the following on the prep batch cover sheet: initials, employee number, and the date, and lot numbers for PDS, filters, test tubes, as used).

12. NOTES:

a. A PDS and a SD are performed on one sample in each digestion batch. Typically, the background sample is chosen. If the batch QC is split between two samples, the PDS is performed on the background sample accompanied by a matrix spike; the SD is performed on the background sample accompanied by a matrix duplicate. If sample volume is limited, it is acceptable to use the duplicate for the PDS and SD.

b. Batches with only field blanks or equipment blanks do not need a PDS or a SD.

c. Air filter batches need only a SD on one sample in the batch (a PDS is not required).

d. "As Received" samples are analyzed with a blank and LCS, LCSD (prepared by the analyst).

NOTE: Arizona Drinking Water samples require the preparation and analysis of an MRL

e. Documentation is of utmost importance. Verify all entries.

E. Data analysis and Import

1. Once the sample run is complete you will switch to or open the Offline ICP-MS Data Analysis program to make any changes to internal standard selection and generate the file for import into LIMS. Note, the Attachment Internal Standard Reference includes the appropriate internal standards to reference for each metal.

2. Once in the Offline ICP-MS Data Analysis program open the batch that contains the run data you are going to process by clicking Open Analysis File (open folder icon or from the File drop down menu).

3. Evaluate appropriate internal standard selection based on the Quality Control section of this SOP and method requirements for the samples analyzed.

4. If it is appropriate to change internal standard selection from the defaults in the method used click the DA Method Editor button (skip to step e. if alternate internal standard selection is not needed).

a. Under Method Development Tasks (in the left pane of the DA Method Editor window) select "FullQuant" under item number 4 (Set up Analysis Parameters).

b. Under the analyte list that appears in the right hand pane of the DA Method Editor you will see a list of the analytes.

c. Change internal standards for any analytes where alternate internal standard selection is both necessary and appropriate.

d. Then click "Return to Batch-at-a-Glance" in the left hand pane.

e. When prompted to "Update Analysis Method?" select "Yes".

f. Click the "Process Batch" button to recalculate all concentration values in the batch folder using the internal standard selections you made while in the DA Method Editor.

5. To generate the file for import into LIMS you must first select all the data rows needed for your run, starting with the ICIS down to the last row in your run. If you restarted the run only select the most recent ICIS and all samples below it.

6. Once the appropriate rows of data are selected click on Tools and select "Upload to TALs" to run the script that compiles the file for import.

7. A pop up will appear once the script is complete stating that the file was created successfully. While the batch is still highlighted click on the Report tab. Generate the raw data PDF's and save them into the respective run's folder.

8. Open the ITUNE app and select the .rep file that was generated along with the tune file for that day. This will generate a new .rep file that will then be copied to the import folder. This will put the run into the LIMs system.

Calculations

1. Final Result

   a. Water sample

$$\text{Instrument Reading} \times \frac{\text{Dilution Volume}}{\text{Aliquot Volume}} \times \frac{\text{Final Volume}}{\text{Sample Volume}}$$

   b. Solid sample (mg/kg)

$$\text{Instrument Reading} \times \frac{\text{Dilution Volume}}{\text{Aliquot Volume}} \times \frac{\text{Final Volume}}{\text{Sample Weight (grams)}}$$

2. Relative percent different (RPD)

$$RPD = \frac{S - D}{(S + D)/2} \times 100$$

Where:

S = first sample value

D = duplicate sample value

3. Spike recovery

$$\%\ Recovery = \frac{SSR - SR}{SA} \times 100$$

Where:

SSR = spiked sample result

SR = sample result

SA = spike added

4. Correlation Coefficient

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{N}}{\sqrt{(\sum X^2 - \frac{(\sum X)^2}{N})(\sum Y^2 - \frac{(\sum Y)^2}{N})}}$$

Where :

X = the known concentration

Y = the instrument response

N = the total number of data points

5. Serial Dilution

$$\%\ Difference = \frac{(5 \times SDR) - SR}{SR} \times 100$$

Where:

SDR = serial dilution result

SR = sample result

6. Methods of standard additions (MSA)
Take either 4 identical aliquots (for 3 point MSA) or 2 identical aliquots (for one point MSA) of the same sample. Leave one unspiked. Spike the other 3 aliquots with different levels of a standard solution (for 3 point MSA) and spike the other aliquot at approximately the indigenous concentration of the sample

(for one point MSA). Add blank solution to sample aliquots so that the final volume is the same for all. Use small volumes of spiking solution to avoid diluting the sample more than 10%. Analyze the 4 aliquots or 2 aliquots and record the instrument readings in absorbance. Use the readings and spike values to find the slope and x- and y- intercepts. The x- intercept is the result.

$$\text{Slope} = m = \frac{\sum x_i y_i - (\sum x_i \sum y_i)/n}{\sum x_i^2 - (\sum x_i)^2/n}$$

$$\text{Y-Intercept} = b = \bar{y} - m\bar{x}$$

$$\text{Result} = -\frac{b}{m}$$

$$\text{Correlation Coefficient} = r = \frac{\sum\{(x_i - \bar{x})(y_i - \bar{y})\}}{\sqrt{\left[\sum (x_i - \bar{x})^2\right]\left[\sum (y_i - \bar{y})^2\right]}}$$

The correlation coefficient (r) for the least squares fit must be ³0.995. If the r value is <0.995, the MSA must be repeated at the same dilution. If the r value is again low, the result with the higher r value is verified and both are flagged with a "+" in the data package. If the r value is <0.990, the sample is run at an interference dilution to overcome matrix effects. This usually requires a raised limit of quantitation. If a client requests a particular limit of quantitation that prohibits further dilution, then the sample is repeated at the same dilution and the best of the two results is verified.

7. Average, Standard Deviation and Relative Standard Deviation

The average result, $\bar{x}$, is calculated by summing the individual results and dividing this sum by the number (n) of individual values:

$$\bar{x} = \frac{x_1 + x_2 + x_3 + x_4 + \ldots x_n}{n}$$

Standard deviation is a measure of how precise the average is or how well the individual numbers agree with each other.

$$\text{Standard deviation, } S = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + (x_3 - \bar{x})^2 + \ldots + (x_n - \bar{x})^2}{n-1}}$$

Relative standard deviation (RSD) is expressed in percent and is obtained by multiplying the standard deviation by 100 and dividing this product by the average.

$$\text{Relative standard deviation, RSD} = \frac{100 \times S}{\bar{x}}$$

Statistical Information/Method Performance

MDLs and LOQs are calculated annually according to *QA-SOP11892*.

Refer to *QA-SOP11896* for statistical information.

Quality Assurance/Quality Control

A. For 6020B, each digestion batch (up to 20 samples) must contain a method blank, LCS, and either an BKG, DUP, MS, MSD or an LCS/LCSD (limited volume or approved by manager and QA only).

B. For 200.8, each digestion batch (up to 10 samples) must contain a method blank, LCS, and either an BKG, DUP, MS or an LCS/LCSD (limited volume or approved by manager and QA only). An additional BKG and MS are added for batches over 10 samples up to 20 samples.

NOTE: Arizona Drinking Water samples require the preparation and analysis of an MRL

C. QC limits for MS/MSD, and LCS/LCSD are established through statistical analysis of historical data.

1. The limits are maintained in the LIMS in Method Limit Groups.

2. The limits are evaluated every 6 months and updated as needed.

3. The limits are subject to change without notification.

D. Batch Quality Control

1. For the preparation and concentrations of Quality Control samples see *T-MET-WI12065*.

2. For the frequency, acceptance criteria and corrective action see *T-MET-WI35797*.

E. Raw data quality checks

1. Make sure that the run is correctly labeled, and dated and that the corresponding prep sheet is attached to the run.

2. Verify that the appropriate Tuning Report is with the run.

3. For run and batch QC/Calibration frequency, acceptance criteria and corrective action, see *T-MET-WI35797* tables.

4. Spike levels of batch QC are available in the LIMS and on T-MET-WI9082.

5. LOQs (RLs), MDLs, and IDLs are available to analysts in the LIMS in Method Limit Groups and Equipment Limit Groups.

6. Check to make sure that all results are not> 90% of the Linear Range, according to LIMS Equipment Limit Groups. If a sample reading is above 90% of the linear range, then reread

the sample at a dilution sufficient to bring the sample concentration to approximately the middle of the calibration range.

7. Check that the **absolute** value of all non-detected analytes is less than the RL. A technical decision must be made as to whether a reread is warranted for readings <|RL|.

8. Check for carryover between samples. Sample RSD >20%, with a concentration > the LOQ decreasing progressively over time (i.e., Reading 3<2<1). Flag any suspect samples for reread.

NOTE: Whenever a sample is encountered that exceeds the calibration range, the following sample must be checked for carryover for the over range analyte (s) and any suspect results must be deselected and reanalyzed. During reanalysis the sample order must be modified as needed to avoid carryover from any over range sample(s).

9. For all EW (samples from public drinking water sources), highlighted mint green in the LIMS, check the results against the MCL (maximum contaminant level) by reviewing the limits tab in analyst desktop II. If an analyte **exceeds** the MCL, is a certified analyte for the SDWA method, and is associated with a mint green compliance drinking water sample, notify the verification group at once by NCM or email. An automated email is sent to the Client Service Representative and the state for the analytes listed below with the exception of Pb and Cu which follow the 90^{th} percentile rule (the CSR tracks the lead and copper and notifies the supplier when necessary). Suppliers must be notified within the required time limit as stated in QA-SOP11886.

10. To avoid the risks associated with polyatomic interferences in wastewater and soil matrices all analytes must be analyzed on the collision cell ICP-MS instruments which include Agilent 7900, Equipment E07 - 27813, Equipment E08 - 30647, Equipment E09 - 30921).

a. Because EPA 200.8 rev. 5.4 does not currently allow the analysis of drinking water samples using collision cell ICP-MS all drinking water samples must be analyzed using a method with no gas mode for all analytes on the Agilent 7700, which includes Equipment E05 - 19204.

11. Check the internal standard level for the entire run. Reference the Internal Standard Reference attachment in this SOP for the appropriate internal standards to use for each metal. If the internal standard reading for any sample is out of the acceptance range of the S0 reading, evaluate whether this is a result of the sample matrix or drift from other samples in the run. Only reread the sample at a dilution if the internal standard appears to be out of range due to the sample matrix. For samples where an internal standard is above the acceptance range it is acceptable to reprocess the data using an alternate internal standard. This is the preferred approach in order to avoid raised reporting limits. The acceptance criteria differ based on the method being used. Refer to *T-MET-WI35797* for the method acceptance criteria.

NOTE: The internal standard is added in equal concentration to all of the samples and standards via a dedicated line on the peristaltic pump. The analytical lines referenced to an internal standard report a corrected concentration value based on the ratio of analyte to internal standard intensities. All the calculations for determining concentration are based on Intensity Ratio (IR). The IR is defined as the background corrected intensity signal of the analyte line (Ia) divided by the internal standard value (Iis). IR= Ia/Iis.

12. For TCLP and SPLP samples, an MSA (method of standard additions) is required if:

a. The sample concentration falls between 80% and 100% of the regulatory limit.

b. If the TCLP or SPLP matrix spike (QA) recovers <20%, all samples in the leachate batch must be reanalyzed using the method of standard additions for that analyte.

13. When items 1 – 12 are complete, check the following:

a. All samples requiring reread/redigestion are listed on the reread paperwork, and redigestions are communicated to the verification group by email.

b. The data are uploaded to LIMS via data transfer to TALS.

Figure I - Daily Performance Acceptance Criteria and Tuning Solution Concentrations

Be (9)	10 or 100 PPB
Mg (24)	10 or 100 PPB
Co (59)	10 or 100 PPB
In (115)	10 or 100 PPB
Pb (208)	10 or 100 PPB
CeO/Ce	<3%
Ce++/Ce	<3%
Background	<30 cps @ Mass 220
RSD	<5%
Peak Width at 10% Peak Height	<0.9 AMU
Res/Axis	< +/- 0.1 AMU from unit mass

Appendix I - Metal Acronyms

CCB: Continuing Calibration Blank
CCV: Calibration Check Verification
CPS: Counts per second (instrument response)
CRA: (Contract required detection limit) - LOQ Check Standard or Low Level Calibration Verification
CRI: (Contract required detection limit) - LOQ Check Standard or Low Level Calibration Verification
DF: Dilution Factor
DU: Matrix Duplicate
IBLK: Instrument Blank
ICAL: Initial Calibration
ICB: Initial Calibration Blank
ICSA: Interference Check Standard A
ICSAB: Interference Check Standard AB
ICV: Initial Calibration Verification
IDL: Instrument Detection Limit
IDOC: Initial Demonstration of Capability
ISTD: Internal Standard
LCS: Laboratory Control Sample
LOD: Limit of Detection
LOQ: Limit of Quantitation (or Reporting Limit, RL)
LRC: Linear Range Check
MB: Method Blank
MDL: Method Detection Limit
MDS: Matrix Spike Duplicate
MRL: Method Reporting Limit
MS: Matrix Spike
MSA: Method of Standards Addition
ND: Non Detect
PDS: Post-Digestion Spike
QC: Quality Control
RL: Reporting Limits (or Limit of Quantitation, LOQ)

RPD: Relative Percent Difference
RSD: Relative Standard Deviation
SD: Serial Dilution

Attachment:
Internal Standard Reference (.pdf)

QA-SOP11178 Demonstrations of Capability
QA-SOP11880 Laboratory Support Equipment - Calibrations, Verifications, and Maintenance
QA-SOP11892 Determining Method Detection Limits and Limits of Quantitation
QA-SOP11896 Establishing Control Limits
QA-SOP11901 Instrument Maintenance and Calibration
S-SA-WI10695 Liquid Sample Preservation Checks, Turbidity Checks, and Sample Splitting
T-MET-FRM8822 ICPMS Analysis
T-MET-WI11925 Client Specific - 3030 C. Treatment for Acid-Extractable Metals for North Carolina Groundwater Samples
T-MET-WI11938 Digestion of Waters by EPA 200.7/200.8 for Analysis of Metals by ICP/ICPMS
T-MET-WI11941 Digestion of Water and Leachates by EPA 3010A for Metals
T-MET-WI12065 Preparation of ICP-MS Solutions and Standards
T-MET-WI21590 Instrument Maintenance for Agilent 7900
T-MET-WI35797 Metals Data Verification Process
T-MET-WI8636 Sample Prep of Sediments, Sludges, Soils, and Tissues by SW846 3050B for ICP and ICP-MS
T-MET-WI8639 Digestion of Waters and Leachates by EPA 3005A for Analysis of Metals by ICP/ICPMS
T-MET-WI8732 Lab and Field Filtered Waters and <1NTU Drinking Water Preparation for ICP (EPA 200.7, 6010C/D) or ICP-MS (EPA 200.8, 6020B)

End of document

Version history

Version	Approval	Revision information	
13	27.JUL.2022	Reviewed on the week on 07.19.2023, no changes needed	
14	01.AUG.2024		
15	06.FEB.2025		

Mass - Element	Possible ISTD	Internal Standard Elements				
		Sc - 45	Ge - 72	In - 115	Tb - 159	Bi - 209
9 - Be	Sc	DEFAULT INTERNAL STANDARD	Possible Use As Internal Standard	DEFAULT INTERNAL STANDARD	Possible Use As Internal Standard	DEFAULT INTERNAL STANDARD
11 - B	Sc					
23 - Na	Sc + Ge					
24 - Mg	Sc + Ge					
27 - Al	Sc + Ge					
39 - K	Sc + Ge					
44 - Ca	Sc + Ge					
47 - Ti	Sc + Ge					
51 - V	Sc + Ge					
52 - Cr	Sc + Ge					
55 - Mn	Sc + Ge					
57 - Fe	Sc + Ge + In					
59 - Co	Sc + Ge + In					
60 - Ni	Sc + Ge + In					
63 - Cu	Sc + Ge + In					
66 - Zn	Sc + Ge + In					
75 - As	Sc + Ge + In					
78 - Se	Sc + Ge + In					
88 - Sr	Ge + In					
98 - Mo	Ge + In					
107 - Ag	Ge + In + Tb					
111 - Cd	Ge + In + Tb					
120 - Sn	Ge + In + Tb					
121 - Sb	Ge + In + Tb					
137 - Ba	In + Tb					
203 - Tl	Tb + Bi					
208 - Pb	Tb + Bi					
238 - U	Tb + Bi					

ISTD Elements
Sc - 45
Ge - 72
In - 115
Tb - 159
Bi - 209

eurofins	Always check on-line for validity **Determination of Inorganic Anions by Ion Chromatography EPA Method 300 SW-846 Method 9056A**	Level: **Standard Operating Procedure**
Document number: **PIT-ORG-IC-SOP45791**		
Old Reference: **PT-GC-009**		
Version: **25**		Organisation level: **4-Business Unit**
Approved by: **OA3Z, SBB9** Effective Date: **10-MAR-2025**	Document users: **6_EUUS79_PIT_Organic_GC_IC**	Responsible: **5_EUUS79_PIT_Organics Department Manager**

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1) Scope and Application
2) Summary of Method
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1) Scope and Application

1.1) This method covers the determination of fluoride, chloride, nitrite-nitrogen, bromide, nitrate-nitrogen and sulfate in drinking water, surface water, mixed domestic and industrial wastewaters, groundwater, reagent waters, solids (after extraction 10.1.2) and leachates (when no acetic acid is used).

1.2) On occasion clients may request slight modifications to this SOP. Any modification to this procedure must be approved by the QA department of the Laboratory or Technical Director, and documented fully in an NCM that accompanies the analytical batch.

1.3) The reporting limits for each anion are listed below. Limits for soil are based on an extraction of 1 unit of soil / 10 of water.

Analyte	Water RL (mg/L)	Soil RL (mg/kg)
Bromide	0.10	2.0
Chloride	1.0	10.0
Fluoride	0.10	1.0
Nitrate-N	0.10	0.50
Nitrite-N	0.05	0.50
Sulfate	1.0	10.0

2) Summary of Method

2.1) A 10uL volume of sample is introduced into the ion chromatograph. The sample is pumped through three different ion exchange columns and into a conductivity detector. The first two columns, a pre-column or guard column and a separator column, are packed with low-capacity, strongly basic anion exchange resin. Ions are separated into discrete bands based on their affinity for the exchange sites of the resin. The last column is a suppresser column that reduces the background conductivity of the eluent to a low or negligible level and converts the anions in the sample to their corresponding acids. The separated anions in their acid form are measured using an electrical conductivity cell. Anions are identified based on their retention times compared to known standards.

Quantitation is accomplished by measuring the peak height or area and comparing it to a linear calibration curve generated from known standards.

3) Definitions

3.1) LIMS – Eurofins Laboratory Information Management System (TALS)

3.2) NCM - Non-Conformance Memo – a system within LIMS (TALS) for the lab to communicate to project management and others when there is an anomaly seen with the samples or batch, or a QC failure.

3.3) Refer to the glossary in the Pittsburgh Laboratory Quality Manual (*PIT-QA-QM45117*) for additional definitions.

4) Interferences

4.1) Interferences can be caused by substances with retention times that are similar to and overlap those of the anion of interest. Large amounts of an anion can interfere with the peak resolution of an adjacent anion. Sample dilution and/or fortification can be used to solve most interference problems associated with retention times.

4.2) The water dip or negative peak that elutes near, and can interfere with, the fluoride peak can usually be eliminated by the addition of concentrated eluent to each standard and sample. Due to the chromatographic conditions used, the addition of eluent to standards and samples is typically not necessary because the water dip is sufficiently resolved from the earliest eluting target anion (fluoride).

4.3) Method interferences may be caused by contaminants in the reagent water, reagents, glassware and other sample processing apparatus that lead to discrete artifacts or an elevated baseline in the ion chromatograms.

4.4) Any anion that is not retained by the column or only slightly retained will elute in the area of fluoride and interfere. Known co-elution is caused by carbonate and other small organic anions. At concentrations of fluoride above 1.5 mg/L, this interference may not be significant; however, it is the responsibility of the user to generate precision and accuracy information in each sample matrix.

4.5) The acetate anion elutes early during the chromatographic run. The retention times of the anions also seem to differ when large amounts of acetate are present. Therefore, this method is not recommended for leachates of solid samples when acetic acid is used for pH adjustment.

5) Safety

5.1) Employees must abide by the policies and procedures in the NBLSC Environmental Health and Safety Manual (*NDSC-US-EHS-QP46060*), the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*) and this document. This procedure may involve hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum.

5.2) Specific Safety Concerns or Requirements

5.2.1) Exercise caution when using syringes with attached filter assemblies. Application of excessive force has, upon occasion, caused a filter disc to burst during the process.

5.3) Primary Materials Used

5.3.1) A complete list of materials used in the method can be found in the reagents and materials section. No chemicals used with this method pose any safety concerns.

5.4) Employees must review the information in the SDS for each material before using it for the first time or when there are major

changes to the SDS. Eye protection that protects against splash, laboratory coat, and appropriate gloves must be worn while samples, standards, solvents, and reagents are being handled. Cut resistant gloves must be worn doing any other task that presents a strong possibility of getting cut. Disposable gloves that have been contaminated will be removed and discarded; other gloves will be cleaned immediately.

5.5) Eye protection against splashing, laboratory coat, and appropriate gloves must be worn while samples, standards, solvents, and reagents are being handled. Cut resistant gloves must be worn when performing any task that presents a strong possibility of getting cut. Disposable gloves that have been contaminated must be removed and properly discarded. Other types of contaminated gloves will be cleaned immediately.

5.6) Exposure to chemicals must be maintained as low as reasonably achievable, therefore; unless they are known to be non-hazardous, all samples must be opened, transferred and prepared in a fume hood, or under other means of mechanical ventilation when possible. Solvent and waste containers will be kept closed transfers are being made.

5.7) All work must be stopped in the event of a known or potential compromise to the health and safety of a Eurofins associate. The situation must be reported immediately to a laboratory supervisor or the EH&S coordinator.

6) Equipment and Supplies

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met.

6.1) Instrumentation

6.1.1) Ion Chromatograph -- Analytical system complete with injector/autosampler, analytical columns, detectors and all necessary accessories.

Anion guard column: A protector of the separator column, usually packed with same substrate as the separator column. If the guard column is omitted from the system the retention times will be shorter.

- For INTEGRION & IC2100B - 2 x 50 mm, Dionex IonPac AG18, P/N 060555
- For INUVION -2 x 30 mm, Dionex IonPac AG22-Fast, P/N 072785

Anion separator column:

- For INTEGRION, IC2100B - 2 x 250mm, Dionex IonPac AS18, P/N 060553
- For INUVION - 2 x 150 mm, Dionex IonPac, AS22-Fast-4um, P/N 088488

Anion suppresser device: Dionex AERS 500 Carbonate Electrolytically Regenerated Suppressor, 2mm for IC2100B and Integrion (P/N 085028). This suppressor eliminates the need for a regeneration solution.

Detector -- Conductivity cell: approximately 1.25 uL internal volume

Dionex –Chromeleon Data Chromatography Software

CHROM data processing software is used for data reporting

6.1.2) Eurofins Pittsburgh currently has three Dionex Ion Chromatographs

All models except the INUVION have an eluent generator, which allows facilitation of isocratic or gradient elution via the instrumentation's software program. This eluent gradiation may be performed to improve the chromatography of the instrument and to reduce the analysis runtime. The eluent for the INUVION is prepared following the instructions in Section 7.3.5.1.

6.1.3) Refer to *PIT-QA-EQT-SOP45625*, Equipment Maintenance SOP, for routine instrument maintenance procedures.

6.2) Supplies

6.2.1) Analytical Balance capable of accurately weighing to the nearest 0.0001 g

6.2.2) Volumetric flasks, Class A, various sizes

6.2.3) Fixed or variable volume pipettors, calibration verified quarterly

7) Reagents and Standards

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements of this SOP can be met.

Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

7.1) Reagent water: Distilled or deionized water, free of the anions of interest. Water should contain particles no larger than 0.20 microns.

7.2) Dionex EGC III KOH Eluent Generator Cartridge, purchased from Thermo Scientific or equivalent vendor, is used by INTEGRION, IC2100B.

7.3) All stocks are purchased from commercial sources. Primary and secondary sources are required for each target analyte.

7.3.1) Primary Commercial IC solution A (CCV/CCVL): F^- - 125 mg/L, Cl^- - 2500 mg/L, Br^-- 500 mg/L, NO_3^- - N- 125 mg/L, SO_4^{-2}- 2500 mg/L

7.3.2) Primary Commercial IC solution B (CCV/CCVL): NO_2^- - N- 125 mg/L

7.3.3) Secondary Commercial stock solution A (ICV/LCS): F^- - 25 mg/L, Cl^- - 500 mg/L, Br^-- 100 mg/L, NO_3^- - N- 25 mg/L, SO_4^{-2}- 500 mg/L

7.3.4) Secondary Commercial stock solution B (ICV/LCS): NO_2^- - N- 25 mg/L

7.3.5)
Eluent Concentrate (for INUVION), Dionex AS22, P/N 063965

7.3.5.1)
To make 1L of eluent, add 10 mL of concentrate into a 1L volumetric flask and dilute to a final volume of 1L using DI water. Fill eluent reservoir as needed.

7.4) Working standards: Prepare calibration standards fresh daily in reagent grade water. Final concentrations of working standards are shown below:

NOTE: The following standard preparation tables are for example purposes and equivalent preparation volumes may be used.

Calibration Standard #1: take 0.05 mL of calibration STD #6 and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	0.025 mg/L
Chloride	0.50 mg/L
Nitrite	0.025 mg/L
Bromide	0.100 mg/L
Nitrate	0.025 mg/L
Sulfate	0.50 mg/L

Calibration Standard #2: take 0.1 mL of calibration STD #6 and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	0.050 mg/L
Chloride	1.00 mg/L
Nitrite	0.050 mg/L

Bromide	0.200 mg/L
Nitrate	0.050 mg/L
Sulfate	1.00 mg/L

Calibration Standard #3: take 0.5 mL of calibration STD #6 and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	0.250 mg/L
Chloride	5.00 mg/L
Nitrite	0.250 mg/L
Bromide	1.00 mg/L
Nitrate	0.250 mg/L
Sulfate	5.00 mg/L

Calibration Standard #4: take 0.5 mL of calibration STD #8 and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	0.500 mg/L
Chloride	10.00 mg/L
Nitrite	0.500 mg/L
Bromide	2.00 mg/L
Nitrate	0.500 mg/L
Sulfate	10.00 mg/L

Calibration Standard #5: take 1.0 mL of calibration STD #8 and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	1.00 mg/L
Chloride	20.00 mg/L
Nitrite	1.00 mg/L
Bromide	4.00 mg/L
Nitrate	1.00 mg/L
Sulfate	20.00 mg/L

Calibration Standard #6: take 0.1 mL of Primary solution A (7.3.1) and 0.1 mL of Primary solution B (7.3.2) and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	2.50 mg/L
Chloride	50.00 mg/L
Nitrite	2.50 mg/L
Bromide	10.00 mg/L
Nitrate	2.50 mg/L
Sulfate	50.00 mg/L

Calibration Standard #7: take 0.15 mL of Primary solution A (7.3.1) and 0.15 mL of Primary solution B (7.3.2) and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	3.75 mg/L
Chloride	75.00 mg/L
Nitrite	3.75 mg/L
Bromide	15.00 mg/L
Nitrate	3.75 mg/L
Sulfate	75.00 mg/L

Calibration Standard #8: take 0.2 mL of Primary solution A (7.3.1) and 0.2 mL of Primary solution B (7.3.2) and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	5.00 mg/L
Chloride	100.00 mg/L
Nitrite	5.00 mg/L
Bromide	20.00 mg/L
Nitrate	5.00 mg/L

Sulfate	100.00 mg/L

Calibration Standard #9: take 0.3 mL of Primary solution A (7.3.1) and 0.3 mL of Primary solution B (7.3.2) and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	7.50 mg/L
Chloride	150.00 mg/L
Nitrite	7.50 mg/L
Bromide	30.00 mg/L
Nitrate	7.50 mg/L
Sulfate	150.00 mg/L

Calibration Standard #10: take 0.4 mL of Primary solution A (7.3.1) and 0.4 mL of Primary solution B (7.3.2) and dilute to 5.0 mL final volume.

Analyte	Final Conc.
Fluoride	10.0 mg/L
Chloride	200.00 mg/L
Nitrite	10.0 mg/L
Bromide	40.0 mg/L
Nitrate	10.0 mg/L
Sulfate	200.00 mg/L

7.4.1) **Continuing Calibration Verification**

Dilute 0.20mL of primary stock standards 7.3.1 and 7.3.2 to 10mL to prepare the CCV solution with the concentrations listed below. Prepare fresh daily.

CCV Solution Concentrations

Analyte	Final Conc.
Fluoride	2.5 mg/L
Chloride	50.0 mg/L
Nitrite	2.5 mg/L
Bromide	10.0 mg/L
Nitrate	2.5 mg/L
Sulfate	50.0 mg/L

7.4.2) Dilute 1.0 mL of secondary stock standards A in 7.3.3 and B in 7.3.4 to 10.0mL to prepare the LCS solution with the concentrations listed below for all instruments. For soil sample batches, the LCS is taken through the leaching process along with the samples. Prepare LCS solution fresh daily.

LCS Solution Concentrations

Analyte	Final Conc.
Fluoride	1.25 mg/L
Chloride	25.0 mg/L
Nitrite	1.25 mg/L
Bromide	5.0 mg/L
Nitrate	1.25 mg/L
Sulfate	25.0 mg/L

7.4.3) Matrix Spike Solution: Add 0.100 mL of primary stocks (7.3.1, and 7.3.2) dilute to 5 mL with sample. Final spike concentrations are the same as for the LCS listed in the table above.

7.4.4) Using the secondary stock standard(s) A and B described in Section 7.3.3 and 7.3.4. Dilute these stock standards to as indicated in the table below to prepare the mixture to be used for the ICV solution. Prepare fresh daily.

ICV Solution:

Analyte	mL of Stock	Stock Source	Final Vol.	Final Conc. mg/L

Fluoride	0.6 mL	7.3.3	5 mL	3.0
Chloride	0.6 mL	7.3.3	5 mL	60
Nitrite	0.6 mL	7.3.3	5 mL	3.0
Bromide	0.6 mL	7.3.3	5 mL	12
Nitrate	0.6 mL	7.3.3	5 mL	3.0
Sulfate	0.6 mL	7.3.3	5 mL	60

7.4.5) The ability to accurately detect concentrations at the reporting limit must be verified at a minimum with each calibration curve. The Reporting Limit Standard, (LLOQ, ICVL, or CCVL) is prepared by diluting 0.10mL of primary stock standards 7.3.1 and 7.3.2 to 250mL. The concentrations of this solution are listed below. Prepare fresh daily.

LLOQ/CCVL Solution Concentrations

Analyte	**Final Conc.**
Fluoride	0.05 mg/L
Chloride	1.00 mg/L
Nitrite	0.05 mg/L
Bromide	0.20 mg/L
Nitrate	0.05 mg/L
Sulfate	1.00 mg/L

NOTE: All standards should be stored in the dark at > 0.0°C but ≤6.0 °C. Replace these standards when instrument response indicates target analyte degradation may have occurred or after the standard has expired, whichever occurs first. Stock standards are purchased from a vendor and have vendor assigned expiration dates. Nitrite is particularly light and oxygen sensitive and should be prepared daily if needed.

8) Sample Collection, Preservation, Shipment and Storage

8.1) Samples should be collected in plastic bottles. All bottles must be thoroughly cleaned and rinsed with reagent water. The volume collected should be sufficient to ensure a representative sample, allow for replicate analysis, if required, and minimize waste disposal.

8.2) Sample preservation and holding times for the anions that can be determined by this method for water samples are as follows:

Method	**Analyte**	**Preservation**	**Holding Time**	**Reference**
300.0/9056A	Fluoride	>0.0°C but ≤6.0 °C	28 days	40CFR Part 136 Table II
300.0/9056A	Chloride	>0.0°C but ≤6.0 °C	28 days	40CFR Part 136 Table II
300.0/9056A	Nitrite	>0.0°C but ≤6.0 °C	48 hours	40CFR Part 136 Table II
300.0/9056A	Bromide	>0.0°C but ≤6.0 °C	28 days	40CFR Part 136 Table II
300.0/9056A	Nitrate	>0.0°C but ≤6.0 °C	48 hours	40CFR Part 136 Table II
300.0/9056A	Sulfate	>0.0°C but ≤6.0 °C	28 days	40CFR Part 136 Table II

Note: Soil leachates (i.e DI Leach, ASTM Leach, SPLP, etc.) will follow the same holding times as the water samples; starting from the time of extraction. See Section 10.1.2 for the soil extraction procedure. If project specific requirements exist for sample handling, follow the project specific protocols.

9) Quality Control

9.1) The following quality control samples are prepared and analyzed with each batch of 20 or fewer samples of the same matrix.

QC Samples	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Method Blank (MB)	1 per batch of 20 samples per matrix	< MDL – Method 300.0 < RL – Method 9056A	Rerun once, reanalyze all samples since the last acceptable MB
Laboratory Control Sample (LCS)	1 per batch of 20 samples	90-110% - Method 300.0 80-120% - Method 9056A	Reanalyze all samples associated with unacceptable LCS
Matrix Spike Sample (MS/MSD)[1]	For Method 300.0: 1 MS/MSD pair per 10 samples For Method 9056A: 1 MS/MSD pair per batch or 20 samples	Meets laboratory limits Method 300.0: 90-110% ±20% RPD Method 9056A: 80-120% ±15% RPD	Supervisor's technical judgment

[1]The parent sample for MS/MSD is randomly selected, unless specifically requested by a client.

9.1.1) Method Blank (MB): One method blank must be processed with each batch of 20 or fewer samples of similar matrix. The method blank for aqueous samples consists of reagent grade water that is filtered along with the samples. The method blank is used to identify any system and process interferences or contamination of the analytical system that may lead to the reporting of elevated analyte concentrations or false positive data. Because there is no preparation step for aqueous samples, the method blank and CCBs are the same for this analysis. The method blank should not contain any analyte of interest above the MDL for method 300.0, or above the RL for method 9056A. All samples are associated with the immediately preceding MB/CCB.

NOTE: A solid matrix (simulated using glass or plastic beads or Teflon chips because purified sand still contains chloride contamination) will be prepared and tumbled with soils extracted using the 1-Hour DI Leaching procedure found in SOP *PIT-WC-MISC-SOP45363*.

- If the MB contains any of the target anions above the MDL/RL, the source of the contamination should be investigated and corrected, and all associated samples reanalyzed, unless one of the following situations exists.
    - If the MB is contaminated, but associated samples results are >10x the MB concentration, results may be reported using the "Method Blank – Report, 10X" NCM.
    - If the contamination anion is not detected above the MDL/RL in the associated samples, results may be reported with qualifier and using the "Method Blank – Report, ND" NCM.
    - If neither of the above criteria are met, but a reanalysis will be outside the holding time, contact the Project Manager for approval from the client to perform the reanalysis.

9.1.2)

Laboratory Control Sample (LCS): One LCS must be processed with each batch of 20 or fewer samples of similar matrix. The LCS is filtered along with samples. The LCS is used to monitor the accuracy of the analytical process. On-going monitoring of the LCS results provides evidence that the laboratory is performing the method within acceptable accuracy and precision guidelines. The LCS consists of reagent grade water* containing a known amount of target analytes. The LCS is prepared from the secondary stock standard used to prepare ICV. The LCS recovery must be within 90-110% of the true value for method 300.0 and 80-120% for method 9056A. Because the LCS is prepared from the secondary source standard, has no additional prep procedures and must meet the same acceptance criteria, the LCS can serves as a CCV for method 300.0. For QC batch purposes all samples are associated with the immediately preceding LCS/CCV.

***NOTE**: A solid matrix (simulated using plastic beads or Teflon chips) LCS will be prepared with soils extracted using the 1-Hour DI Leaching procedure found in SOP *PIT-WC-MISC-SOP45363*.

- If the LCS recovery falls outside the method acceptance limits, all associated samples must be reanalyzed with an acceptable LCS unless one of the following situations exists:
    - If the LCS fails with recovery above the upper control limit, and the associated sample result is non-detect, results may be reported with qualifier and the "LCS/LCSD - %R High" NCM.
    - If the reanalysis will be outside the holding time, contact the Project Manager for approval from the client to perform reanalysis.

9.1.3)

Matrix Spike/Matrix Spike Duplicate (MS/MSD): For method 9056A, one MS/MSD pair must be processed for each batch of 20 or fewer samples of similar matrix. For method 300.0 an MS/MSD pair must be analyzed for every 10 samples analyzed. A matrix spike (MS) is a field sample to which a known concentration of target analyte has been added. A matrix spike duplicate (MSD) is a second aliquot of the same sample (spiked identically as the MS) prepared and analyzed along with the sample and matrix spike. Some client specific DQO's may require the use of sample duplicates in place of or in addition to MS/MSD's. The MS/MSD results are used to determine the effect of a matrix on the precision and accuracy of the analytical process. Due to the potential variability of the matrix of each sample, these results may have immediate bearing only on the specific sample spiked. Spiking levels should be similar to the concentrations expected in the samples, if known, otherwise, the MS/MSD shall be spiked the same as the LCS values.

- If the recovery of the MS or MSD is outside the limits, corrective action must be taken. Corrective action may include re-preparation and reanalysis of the parent sample and MS/MSD.
    - If the LCS recovery is within control limits, MS failure may be due to a matrix interference. Results may be reported with qualifier and the "MS/MSD- %R, LCS Pass" NCM.
    - If the MS/MSD recovery or RPD falls outside the acceptance range, the recovery of the analyte must be in control for the LCS. If the native analyte concentration in the MS/MSD exceeds 4x the spike level for that analyte, the recovery data are reported with qualifier and the failure explained in the case narrative.
    - If a MS/MSD is not possible due to limited sample volume then a LCS duplicate may be analyzed. The RPD of the LCS and LCSD must meet the MD/MSD %RPD limit. If the MS/MSD pair cannot be run, the "MS/MSD/DUP – Insufficient Volume" NCM must be applied to the batch.

9.1.4) **If samples in the batch are filtered prior to analysis, the MB and LCS must also be filtered using the same method. If the parent sample is filtered, the MS and MSD must also be filtered using the same method.**

9.2) Instrument QC

9.2.1) Initial Calibration Verification (ICV): An ICV must be analyzed at the beginning of the sequence each day the instrument is used and immediately following the initial calibration of the instrument. The ICV is used to monitor the initial calibration curve. If the result is outside established control limits, the system is out of control and corrective action must occur. The ICV consists of reagent grade water containing a known amount of target analytes that has been injected into the ion chromatography system. The ICV is prepared from a separate stock standard from a different manufacturer than the stock used to prepare the calibration standards. ICV recovery must be within 90-110% of the true value.

9.2.2) Continuing Calibration Verification (CCV): Continuing calibration stability is verified by analyzing a near mid-range calibration verification standard after every ten (10) samples and at the end of the analytical sequence. CCV recovery must be within 90-110%.

If a CCV falls outside control limits for a target anion to be reported, all samples after the last acceptable CCV must be re-analyzed, unless the recovery is high and the associated sample results are non-detect. If results are associated with a failed CCV, they must be reported with qualifier in all cases.

9.2.3) A Continuing Calibration Blank (CCB) is analyzed immediately following each CCV to monitor low level accuracy and system cleanliness. CCB results must be < MDL. Corrective actions for CCB failures are the same as for Method Blanks (see section 9.1.1).

9.3) Lower Limit of Quantitation (LLOQ): the lowest concentration level that can be measured within stated accuracy limits, varies for each individual analyte anion and as a function of sample size. The LLOQ standard is analyzed after an initial calibration curve. The LLOQ recoveries must be within ± 50% of the true value to verify the reporting limit.

10) Procedure

10.1) Sample Preparation

10.1.1) No sample preparation is required for aqueous samples. Aqueous samples are pre-screened for conductivity to determine if any dilutions are required for sample detections to fall within the calibrated range and to avoid overloading the analytical column (see Table 2).

10.1.2) See SOP *PIT-WC-MISC-SOP45363* for solid sample preparation using the 1-Hour DI Leaching procedure. Filter the resulting slurry before injecting using a 0.45 um membrane type filter. A Leach Blank and a solid matrix LCS will also be prepared and analyzed along with solid samples.

10.1.3) All samples and QC (MB, LCS and MS/MSD) are filtered using a 0.45 um filter before loading onto the instrument.

10.1.4) The Soil LCS and MS/MSD pair is spiked onto the soil/teflon chip matrix **PRIOR** to the addition of DI water.

10.2) Calibration and Standardization

10.2.1) Establish ion chromatographic operating parameters equivalent to those indicated in Table 1. When using the fast chromatographic run for chloride, bromide, nitrate and sulfate only the guard column is used. Refer to Table 3 for analyte elution order on each column type.

10.2.2) For each analyte of interest, prepare a calibration blank and 10 calibration standards by adding accurately measured volumes of one or more stock standards to a volumetric flask and dilution to volume with reagent water. If a sample analyte concentration exceeds the calibration range the sample may be diluted to fall within the range. If this is not possible then three new calibration concentrations must be chosen, two of which must bracket the concentration of the sample analyte of interest. Each attenuation range of the instrument used to analyze a sample must be calibrated individually.

10.2.3) Using an injection volume of 10 uL of each calibration standard, tabulate peak height or area responses against the concentration and prepare a calibration curve for each analyte. During this procedure, retention times must be recorded.

10.2.4) Calibration curves are plotted by the instrument software as either peak height or peak area vs concentration. Peak height is preferred for anions that produce sharp, symmetrical peaks though-out the calibrated range. Otherwise, peak area is used.

10.2.5) Curves plots are calculated using either weighted or un-weighted linear regression. The calibration model is chosen based on the best fit to the data to meet the criteria listed below.

- Calculate the %Error for each standard read back to the plotted curve. CHROM software will perform this calculation. The %E for each point above the lowest must be < 20%, for the lowest calibration standard the %E must be <50%.
- The linear correlation coefficient (r^2), must be >0.995. The absolute value of the intercept must not be above the reporting limit and should be < ½ RL.
- The progression of curve models by preference is:
  Weighted Linear ($1/x^2$)
  Un-weighted Linear
  Linear Forced through Zero

  NOTE: Curves associated with the analysis of any samples from Wisconsin may not be forced through zero. It may be necessary to shorten the calibrated range to achieve linearity with good precision at lower concentrations without forcing the curve plot through the origin.

10.2.6) It is expected that the same curve model should be used for an anion/column combination for each calibration. A need to change the calibration model may indicate that instrument or column maintenance is required.

10.2.7) Retention Time Monitoring

10.2.7.1) The mean retention times for the analytes in the calibration standards will be determined and the retention times of the ICV and CCV will be compared to them.

10.2.7.2) If the retention times of any analyte(s) in the ICV or CCV vary by more than ±10% from the mean retention time determined from the initial calibration, a new calibration curve will need to be analyzed and all samples not bracketed by a compliant ICV/CCV or CCV/CCV pair will need to be reanalyzed.

10.2.7.3) Daily Retention Time Windows

Establish the center of the retention time windows from the calibration verification at the beginning of the analytical shift. For samples run during the same shift as an initial calibration, use the retention time of the mid-point standard of the initial calibration. Retention time windows can be updated every 12 hours. However, they are usually only updated at the onset of a continuing calibration sequence or after maintenance has been performed.

10.3) Sample Analysis

10.3.1) Table 1 summarizes the recommended operating conditions for the ion chromatograph. Included in this table are estimated retention times that can be achieved by this method. Other columns, chromatographic conditions, or detectors may be used if the requirements of the QC Table under Section 9 are met.

10.3.2) Check system calibration daily and, if required, recalibrate as described in Section 10.2.

10.3.3) Load and inject a fixed amount (10 uL) of settled & filtered sample. Refer to *PIT-SM-SUB-SOP45639* for subsampling procedures. If the sample is cloudy then it should be filtered prior to loading into the autosampler polyvial. Filtration will be performed using a 0.45 um filter. If samples are filtered, the method blank and LCS are also filtered**.** Use the same size loop for standards and samples. Record the resulting peak size in area or peak height units. An automated constant volume injection system may also be used.

10.3.4) The width of the retention time window used to make identifications should be based upon measurements of actual retention time variations of various concentrations. Three times the standard deviation of a retention time can be used to calculate a suggested window size for each analyte. However, the experience of the analyst should weigh heavily in the interpretation of chromatograms since retention time is concentration dependent for most analytes.

10.3.5) If the response for the peak exceeds the working range of the system, dilute the sample with an appropriate amount of reagent water and reanalyze.

10.3.6) If the resulting chromatogram fails to produce adequate resolution, or if identification of specific anions is questionable, fortify the sample with an appropriate amount of standard and reanalyze.

NOTE: Retention time is affected by concentration. Nitrate and sulfate exhibit the greatest amount of change, although all anions are affected to some degree. In some cases this peak migration may produce poor resolution or identification.

10.3.7) Should more complete resolution be needed between peaks, the first step would be diluted analysis of the sample. In extreme cases, the eluent (7.3 or 7.4) can be diluted. This will spread out the run but will also cause the later eluting anions to be retained longer. The analyst must determine to what extent the eluent is diluted. A calibration curve must be run with the diluted eluent prior to sample analysis. This dilution should not be considered a deviation from the method.

11) Calculations/Data Reduction

11.1) Prepare a calibration curve for each analyte by plotting instrument response against standard concentration. Compute sample concentration by comparing sample response with the standard curve. Multiply answer by appropriate dilution factor.

11.2) Report only those values that fall between the lowest and the highest calibration standards. Samples exceeding the highest standard should be diluted and reanalyzed.

11.3) Report results in mg/L for aqueous samples and mg/kg for 1-hour leachates and mg/L for 18-hour leachates of solid samples.

11.4) Report

NO_2^- as N

NO_3^- as N

11.5) When performing manual integration, the reason for it must be clearly documented. For manual integration requirements and documentation refer to SOP *NDSC-ETHC-SOP43862*.

12) Method Performance

12.1) The supervisor has responsibility to ensure that an analyst who performs this procedure is properly trained in its use and has the required experience. Performance is monitored through internal QC and outside performance evaluation samples. Please refer to the QA Manual for additional information concerning Precision and Accuracy.

12.2) Demonstration of Capabilities – Prior to the analysis of samples, a Demonstration of Capabilities (DOC) as described in the QA Manual, must be performed initially, annually and any time a significant change is made to the analytical system.

12.3) A Method Detection Limit (MDL) study, as described in the Detection Limit SOP, *PIT-QA-DR-SOP45621*, must be performed initially and whenever a significant change is made to the analytical system. The MDL must be re-evaluated from quarterly MDL points at least every 12 months.

12.4) For Method 300.0, the Linear Calibration Range must be verified every 6 months to ensure that the instrument response is linear beyond the regular calibration range. The criteria used to evaluate the Linear Calibration Range standard is ± 10% of the true value of the standard.

13) Pollution Control

13.1) It is Eurofins policy to evaluate each method and look for opportunities to minimize waste generated (i.e., examine recycling options, ordering chemicals based on quantity needed, preparation of reagents based on anticipated usage and reagent stability). Employees must abide by the policies in Section 13 of the NBLSC Environmental Health and Safety Manual (*NDSC-US-EHS-QP46060*) for "Waste Management and Pollution Prevention." and the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*).

13.2) This method does not contain any specific modifications that serve to minimize or prevent pollution.

14) Waste Management

14.1) Waste management practices are conducted consistent with all applicable rules and regulations. Excess reagents, samples and method process wastes are disposed of in an accepted manner. Waste description rules and land disposal restrictions are followed. Waste disposal procedures are incorporated by reference to SOP *PIT-EHS-HS-SOP45640*. The following waste streams are produced when this method is carried out. The following waste streams are produced when this method is carried out.

14.1.1) Alkaline and/or acidic waste generated by the analysis. This waste is collected in a waste container identified as "Waste Water". This waste is checked with pH paper and neutralized to a final pH between 6 and 9, if needed, and discharged down into a lab sink.

14.2) Contaminated plastic materials such as IC syringes, filters, caps and vials utilized for sample preparation. This waste is placed in trash containers and disposed as regular trash.

15) References/Cross-References

15.1) Method 300.0, "Determination of Inorganic Anions by Ion Chromatography", Environmental Monitoring Systems Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio, Revision 2.1, August 1993

15.2) Method 9056A, "Determination of Inorganic Anions by Ion Chromatography", SW846, Test Methods for Evaluating Solid Waste, Revision 1, February 2007

15.3) SOP *PIT-QA-QAS-SOP45635* Procurement of Standards and Materials; Labeling and Traceability

15.4) SOP PT-QA-015, Maintaining Time Integrity

15.5) SOP *PIT-QA-QAS-SOP45629*, Nonconformance & Corrective Action System

15.6) SOP *PIT-QA-EQT-SOP45625*, Equipment Maintenance

15.7) SOP *PIT-SM-RCT-SOP45637*, Internal Chain of Custody

15.8) SOP *PIT-SM-SUB-SOP45639*, Subsampling

15.9) SOP *PIT-QA-QAS-SOP45631*, Quality Control Program

15.10) NDSC SOP *NDSC-ETHC-SOP43862*, Manual Integration

15.11) SOP *PIT-QA-DR-SOP45621*, Detection Limits

15.12) SOP *PIT-WC-MISC-SOP45363*, DI Leachate Procedure for Solids (1 Hour Routine DI Leach and 18 Hour ASTM DI Leachate Procedure)

15.13) *PIT-QA-QM45117*, Pittsburgh Laboratory Quality Manual

15.14) *PIT-EHS-HS-SOP45640*, Pittsburgh Facility Addendum EH&S Manual

16) Method Modifications

16.1) None

17) Attachments

17.1) Attachment 1 - Method Flow Chart

17.2) Table 1 - Standard Instrument Operating Parameters

17.3) Table 2 – Eurofins Pittsburgh IC Dilution Table Based on Conductivity

17.4) Table 3 – Elution Order for Column Types

18) Revision History

18.1) Revision 8, 09/14/2007

18.2) Revision 9, 07/14/2008

18.3) Revision 10, 7/27/2009

18.4) Revision 11, 7/28/2010

18.5) Revision 12, 7/3/2012

18.6) Revision 13, 11/12/2012

18.7) Revision 14, 5/29/2014

18.8) Revision 15, 3/3/2015

18.9) Revision 16, 4/19/2017

18.10) Revision 17, 7/6/2017

18.11) Revision 18, 5/31/2019

18.12) Revision 19, 4/28/2020

18.13) Revision 20, 5/25/2020

18.14) Revision 21, 11/30/2020

18.15)
Revision 22, 9/6/2022

18.16)
Revision 23, 5/13/24

18.17)
Revision 24, 3/3/2025

18.18) Changes to current revision

SOP section	Change from	Change to	Reason

6.1.2		Added that the INUVION does not have an eluent generator	Correction

19) Appendix

19.1)

TABLE 1
Standard Instrument Operating Parameters

Standard Conditions for all instrumentation:

Eluent Pump Rate: 0.30 mL/min
Sample Loop: 10 uL (partial loop injection)
Eluent: range of 28 to 36 mM KOH using the Eluent Generator Cartridge
Detector Output: Total conductivity < 1.0 uS prior to sample analysis.
Columns: AS18 (2 x 250mm)

19.2)

Table 2
IC Dilution Table Based on Conductivity

Conductivity(µS)	Dilution Required	Dilution Formula[1]
< 600	Undiluted	1 mL of undiluted sample
600 - 1500	Undiluted and 5x	1 mL of undiluted sample 1 mL sample : 4 mL DI water
1500 - 3000	Undiluted and 10x	1 mL of undiluted sample 100 uL sample : 900 uL DI water
3000 - 5000	2x and 20x	2.5 mL sample : 2.5 mL DI water 100 uL of 2x : 900 uL DI water
5000 - 7000	2.5x and 25x	2 mL sample : 3 mL DI water 100 uL of 2.5x : 900 uL DI water
7000 - 15000	5x and 50x	1 mL sample : 4 mL DI water 100 uL of 5x : 900 uL DI water
15000 - 30000	10x and 100x	500 uL sample : 4.5 mL DI water 100 uL of 10x : 900 uL DI water
30000 - 50000	20x and 200x	250 uL sample : 4.75 mL DI water 100 uL of 20x : 900 uL DI water
50000 - 70000	25x and 250x	200 uL sample : 4.8 mL DI water 100 uL of 25x : 900 uL DI water
70000 - 150000	50x and 500x	100 uL sample : 4.9 mL DI water 100 uL of 50x : 900 uL DI water
150000 - 300000	100x and 1000x	50 ul sample : 4.95 mL DI water 100 uL of 100x : 900 uL DI water
300000 - 500000	200x and 2000x	25 uL sample : 4.975 mL DI water 100 uL of 200x : 900 uL DI water
500000 - 700000	250x and 2500x	20 uL sample : 4.98 mL DI water 100 uL of 250x : 900 uL DI water
700000 - 1500000	500x and 5000x	20 uL sample : 9.98 mL DI water 100 uL of 500x : 900 uL DI water
QC Sample	**Dilution Required**	**QC Reagent Formula**
ICV	NA	600 uL of Secondary A STD + 600 uL of Secondary B STD + 3.8 mL DI Water
CCV	NA	0.2 mL Primary A STD + 0.2 mL Primary B STD + 9.6 mL DI Water
LCS	NA	1 ml Secondary A STD + 1 mL Secondary B STD + 8.0 mL DI Water
MS/MSD	Undiluted	100 uL of Primary A + 100 uL of Primary B + 4.8 mL of sample
MS/MSD	2x	100 uL of Primary A + 100 uL of Primary B + 2.5 mL of sample + 2.3 mL DI Water
MS/MSD	2.5x	100 uL of Primary A + 100 uL of Primary B + 2.0 mL of sample + 2.8 mL DI Water
MS/MSD	5x	100 uL of Primary A + 100 uL of Primary B + 1.0 mL of sample + 3.8 mL DI Water
MS/MSD	10x	100 uL of Primary A + 100 uL of Primary B + 500 uL of sample + 4.3 mL DI Water
MS/MSD	20x	100 uL of Primary A + 100 uL of Primary B + 250 uL of sample + 4.55 mL DI Water
MS/MSD	25x	100 uL of Primary A + 100 uL of Primary B + 200 uL of sample + 4.6 mL DI Water
MS/MSD	50x	100 uL of Primary A + 100 uL of Primary B + 100 uL of sample + 4.7 mL DI Water

MS/MSD	100x	100 uL of Primary A + 100 uL of Primary B + 50 uL of sample + 4.75 mL DI Water
MS/MSD	200x	100 uL of Primary A + 100 uL of Primary B + 25 uL of sample + 4.775 mL DI Water
MS/MSD	250x	100 uL of Primary A + 100 uL of Primary B + 20 uL of sample + 4.78 mL DI Water
MS/MSD	500x	200 uL of Primary A + 200 uL of Primary B + 20 uL of sample + 9.58 mL DI Water

19.3)

TABLE 3
ELUTION ORDER FOR COLUMN TYPE

AS22 COLUMN ELUTION ORDER	AS18 COLUMN ELUTION ORDER
Fluoride	Fluoride
Chloride	Chloride
Nitrite	Nitrite
Bromide	Sulfate
Nitrate	Bromide
Sulfate	Nitrate

NDSC-ETHC-SOP43862 Manual Integrations
NDSC-US-EHS-QP46060 Environmental Health and Safety (HSE) Manual
PIT-EHS-HS-SOP45640 Environmental Health and Safety Manual Pittsburgh Facility Addendum
PIT-QA-DR-SOP45621 Detection Limits
PIT-QA-EQT-SOP45625 Equipment Maintenance
PIT-QA-QAS-SOP45629 Nonconformance & Corrective Action System
PIT-QA-QAS-SOP45631 Laboratory Quality Control Program
PIT-QA-QAS-SOP45635 Procurement of Standards and Materials; Labeling and Traceability
PIT-QA-QM45117 Pittsburgh QA Manual
PIT-SM-RCT-SOP45637 Internal Chain of Custody
PIT-SM-SUB-SOP45639 Subsampling
PIT-WC-MISC-SOP45363 DI-Leachate Procedure for Solids (1 Hour Routine DI Leachate Procedure), Method ASTM D 3987-85 Modified

End of document

Version history

Version	Approval	Revision information	
23	09.MAY.2024		
24	03.MAR.2025		
25	06.MAR.2025	Reviewed SBB9 03/19/25	

eurofins	Always check on-line for validity **Total Organic Carbon (TOC) and Total Inorganic Carbon (TIC), Methods SM 5310C and SW-846 9060A**	Level: **Standard Operating Procedure**
Document number: **PIT-WC-DMD-SOP45341**		
Old Reference: **PT-WC-017**		
Version: **23**		Organisation level: **4-Business Unit**
Approved by: **SBB9, AAM4** Effective Date: **09-JUN-2025**	Document users: **6_EUUS79_PIT_Wet Chemistry_Demand TOC**	Responsible: **5_EUUS79_PIT_QA All**

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13) Pollution Control
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1) Scope and Application

1.1) The purpose of this SOP is to provide a procedure for the determination of Total Organic Carbon (TOC) or Total Inorganic Carbon (TIC) in waters and similar matrices. This SOP is based on SW-846 Method 9060A and Standard Methods 5310C.

1.2) The working linear range is 1 mg/L to 100 mg/L on the Aurora 1030 instrument. For soils the sample must undergo a leaching process prior to analysis, such as ASTM Leach. Sediment samples undergo elutriate generation prior to analysis. The reporting limit is 1 mg/L.

1.3) On occasion clients may request slight modifications to this SOP. Any modifications to this procedure must be approved by the QA department or the Laboratory or Technical Director and documented fully in an NCM that accompanies the analytical batch.

2) Summary of Method

2.1) Organic carbon is converted to carbon dioxide (CO_2) using chemical oxidation. The CO_2 is then measured by an infrared detector. The amount of CO_2 in a sample is directly proportional to the concentration of carbonaceous material in the sample.

3) Definitions

3.1) TALS – Laboratory Information Management System (LIMS)

3.2) NCM – Non-Conformance Memo – a system within TALS for the lab to communicate to project management and others when there is an anomaly seen with the samples or batch, or a QC failure.

3.3) Refer to the glossary in the Pittsburgh Laboratory Quality Assurance Manual, *PIT-QA-QM45117*, for other common laboratory terms.

4) Interferences

4.1) Contaminants in solvents, reagents, glassware, and other processing apparatus that lead to discrete artifacts may cause method interferences. All of these materials must be routinely demonstrated to be free from interferences under conditions of the analysis by running laboratory method blanks as described in the Quality Control section. Specific selection of reagents may be required to avoid introduction of contaminants.

4.2) Carbonate and bicarbonate interfere but are eliminated by the acidification and purging step of the instrument.

5) Safety

5.1) Employees must abide by the policies and procedures in the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*), the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*) and this document. This procedure may involve hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum.

5.2) The auto sampler has a probe that is sharp; use caution not to stick yourself.

5.3) The Sodium Persulfate is a strong oxidizer. Avoid contact with combustible materials, organic materials, strong reducing agents, and excess heat.

5.4) The following is a list of the materials used in this method, which have a serious or significant hazard

rating. NOTE: This list does not include all materials used in the method. The table contains a summary of the primary hazards listed in the SDS for each of the materials listed in the table. A complete list of materials used in the method can be found in the reagents and materials section. Employees must review the information in the SDS for each material before using it for the first time or when there are major changes to the SDS.

Material (1)	Hazards	Exposure Limit (2)	Signs and symptoms of exposure
Sulfuric Acid	Corrosive Oxidizer Dehydra-dator	1 mg/m^3	This material will cause burns if comes into contact with the skin or eyes. Inhalation of vapors will cause irritation of the nasal and respiratory system.
Phosphoric Acid	Corrosive	3 $\underline{mg}/m^3$ PEL 1ppm STEL	Inhalation is not an expected hazard unless misted or heated to high temperatures. May cause redness, pain, and severe skin burns. May cause redness, pain, blurred vision, eye burns, and permanent eye damage.
Sodium Persulfate	Oxidizer Corrosive	0.1 $\underline{mg}/m^3$-TWA as Persulfates	Causes irritation to the respiratory tract. Symptoms may include sore throat, shortness of breath, inflammation of nasal passages, coughing, and wheezing. Causes severe irritation or burns to the skin and eyes. Symptoms include redness, itching, pain and burns. May cause allergic skin reactions. Can cause eye damage.
1 – Always add acid to water to prevent violent reactions.			
2 – Exposure limit refers to the OSHA regulatory exposure limit.			

5.5) Eye protection that protects against splash, laboratory coat, and appropriate gloves must be worn while samples, standards, solvents, and reagents are being handled. Cut resistant gloves must be worn doing any other task that presents a strong possibility of getting cut. Disposable gloves that have become contaminated will be removed and discarded; other gloves will be cleaned immediately.

5.6) Exposure to chemicals must be maintained as low as reasonably achievable, therefore, unless they are known to be non-hazardous, all samples must be opened, transferred, and prepared in a fume hood or under other means of mechanical ventilation. Solvent and waste containers will be kept closed unless transfers are being made.

5.7) The preparation of standards and reagents will be conducted in a fume hood with the sash closed as far as the operation will permit.

5.8) All work must be stopped in the event of a known or potential compromise to the health and safety of a Eurofins associate. The situation must be reported immediately to a laboratory supervisor or EH&S coordinator.

6) Equipment and Supplies

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met.

6.1) OI Corporation Model 1030 TOC Analyzer, with 1088 vial multisampler

6.2) Nitrogen gas and regulator

6.3) Class A Volumetric flasks, various sizes

6.4) Class A Volumetric pipettes, various sizes

6.5) Vials: 40mL Amber glass with stir bars

6.6) Class A Graduated cylinders, various sizes

6.7) pH strips, wide range

6.8) Top loading balance capable of weighing to ± 0.01g

6.9) Automatic Re-pipetter

6.10) 0.45 µm filters

7) Reagents and Standards

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met. Please refer to the SDS prior to the use of any reagent or standard.

Reagent grade chemicals must be used, unless otherwise indicated. If a certificate of analysis is not available, or the purity of a reagent or standard is questionable, analyze the reagent/standard prior to using for the analysis of any client samples. Document the purity check in the TALS Reagent module with the entry for the reagent/standard.

7.1) Sodium Persulfate

7.1.1) Sodium Persulfate Solution: Add 100g sodium persulfate ($Na_2S_2O_8$) to a 1L volumetric flask and dilute to 1L final volume with reagent water. This solution is given a 6 month expiration date.

7.2) Phosphoric Acid, concentrated

7.2.1) Phosphoric Acid Solution: Carefully add 59mL concentrated phosphoric acid (H_3PO_4) to 900mL of reagent water in a 1L volumetric flask. Dilute to 1L final volume with reagent water. This solution is given a 6 month expiration date.

7.3) Sulfuric Acid, concentrated

7.4) TOC Primary Stock Standard, 1000 ppm: This is a commercially purchased, certified standard. Follow the manufacturer’s expiration date and storage requirements.

7.5) TOC Secondary Stock Standard, 1000 ppm: This certified standard is commercially purchased from a different source than the primary stock. The manufacturer's expiration date and storage requirements are used.

7.5.1) If necessary, a 1000 ppm TOC stock can be prepared as follows: Dilute 1.06g KHP (potassium acid phthalate) to volume in a 500mL volumetric flask. KHP is oven dried overnight at 180°C and stored in a dessicator for at least an hour before use.

7.6) TOC Calibration Standards: Prepare the calibration standards listed below from the primary stock standard (7.4). Prepare standards fresh weekly for calibration use.

Concentration (mg/L)	Stock Volume (mL)	Stock Concentration (mg/L)	Final Volume (mL)
100	10	1000	100
50	5	1000	100
25	2.5	1000	100
10	1	1000	100
1	0.1	1000	100

7.7) Initial Calibration Verification (ICV) – This is a second source standard analyzed as part of initial calibration verification. A 40 mg/L standard is prepared by transferring 4 ml of the secondary stock (7.5) to a 100 ml volumetric flask and diluting to volume with reagent grade water. Prepare this standard fresh weekly.

7.8) Continuing Calibration Verification (CCV): Prepare a 10mg/L verification standard by adding 2.0mL of the secondary stock standard (7.5) to a 200mL volumetric flask and diluting to volume. Prepare this standard fresh weekly.

7.9) Laboratory Control Sample (LCS): Prepare a 20 mg/L standard by adding 4 mL of the primary stock standard (7.4) to a 200 ml volumetric flask and diluting to volume with reagent grade water. Prepare this standard fresh weekly.

7.10) Matrix Spike/Matrix Spike Duplicate: Add 400µL of the secondary stock standard (7.5) to 40 mL of sample for a final concentration of 10 mg/L. (Spike concentration may be varied as appropriate to the native sample concentrations expected.)

7.11) TIC stock standard, 1000 mg/L: This is purchased commercially from the same vendor with different lot numbers for the primary and secondary source standards. If necessary it may also be prepared as follows: Prepare by adding 3.5g Na_2HCO_3 (sodium bicarbonate) to a 1L flask. Dilute to volume with reagent water. Keep tightly stoppered. Do not acidify.

7.11.1) TIC Calibration Standards: Prepare in the same manner as the TOC calibration standards (7.6) using the TIC primary stock standard (7.11). Prepare standards fresh weekly as needed.

7.11.2) TIC Verification Standard (CCV): Prepare in the same manner as the TOC verification standard (7.8) using the TIC secondary stock standard (7.11). Prepare standard fresh weekly.

7.11.3) TIC removal check standard (analyzed semi-annually): Prepare a solution of TOC and TIC, each at 10

mg/L, by adding 1 mL of the 1000 ppm TOC primary standard and 1 mL of the 1000 ppm TIC primary standard to a 100 mL volumetric flask and diluting to volume with reagent grade water.

8) Sample Collection, Preservation, Shipment and Storage

Listed below are the holding times and the references that include preservation requirements.

Matrix	Sample Container	Minimum Sample Size	Preservation	Holding Time
Water	Amber Glass VOA Vial	40 mL	pH < 2 with Sulfuric acid; Cool >0.0°C but ≤ 6.0°C (No acid for Total Inorganic Carbon)	28 days from collection

NOTE: Unpreserved samples must be filtered and then preserved within 48 hours of collection for Dissolved Organic Carbon. If this is not done at the time of collection, it can be done at the laboratory. If the filtration and preservation has not been completed with 48 hours of sample collection, an NCM must be created.

9) Quality Control

The following quality control samples are prepared with each batch of samples.

Quality Controls	Frequency	Control Limit
ICV	After the ICAL	90-110%
ICB	After the ICV	< RL (9060A)[5] <½ RL (SM5310C)[5]
MB	1 per preparation batch[1]	< RL (9060A) <½ RL (SM5310C)
LCS	1 per preparation batch[1]	85-115%[2]
LCSD	If insufficient sample provided for an MS/MSD	85-115%[2]; 20% RPD
MS/MSD[3]	Every 10 samples	75-125%; 20% RPD for 9060A, 85-115%; 15% RPD for SM5310C
Sample Duplicate[3,4]	Every 10 samples	15% RPD (SM5310C)
CCV	Every 10 samples	90-110%
CCB	Every 10 samples	< RL (9060A)[5] <½ RL (SM5310C)[5]
MRL (Reporting Limit Verification)	One per analytical batch (SM5310C)	50-150%

[1]A batch is limited to 20 samples.

[2]Statistical control limits may be developed per SOP *PIT-QA-QAS-SOP45631*, but must be 85-115% or tighter.

[3]The sample used for MS/MSD pair or Duplicate are randomly selected, unless specifically requested by a client.

[4]The sample duplicate requirement for method SM5310C can also be met with an MSD.

[5]For samples from West Virginia, the ICB and CCB must be below the MDL.

9.1) The initial and continuing calibration requirements are listed in section 10.1 below. If the initial calibration, or initial calibration verification fails to meet criteria, prepare fresh standards and repeat calibration. If a continuing calibration check standard or blank fails to meet criteria, repeat the analysis once. If the failure repeats, prepare and analyze a fresh calibration curve and repeat the analysis of all samples analyzed after the last passing calibration check.

9.2) One Method Blank (MB) must be analyzed along with each batch of 20 or fewer samples. The method blank matrix is laboratory reagent water. If samples are filtered by the laboratory for Dissolved Organic Carbon analysis, a MB must be filtered and analyzed along with the samples.

9.2.1) The average (reported) Method Blank results must be less than the RL for method 9060A, and less than ½ the RL for method 5310C. Sample results associated with MB's that have hits above the MDL shall be reported with "B" qualifiers. If the MB has a hit above the RL (or ½ the RL for method 5310C), all associated samples shall be reanalyzed unless one of the following situations exists:

- If the target analyte is not detected above the RL in client samples, the data may be reported with qualifiers and using the "Method Blank – Report, ND" NCM.
- If the sample concentration is greater than 10 times the MB concentration, results may be reported with qualification and using the "Method Blank – Report, 10X" NCM.
- If neither of the above criteria are met and reanalysis is not possible due to limited sample volume, the sample data must be qualified. These results must be reported using the "Method Blank – Insufficient Sample" NCM.
- If reanalysis cannot occur for another reason, the client must be contacted and their response documented in the case narrative of the report.

NOTE: If the individual results as well as the average are reported, each individual injection must meet the MB criteria above.

9.3) Laboratory Control Sample (LCS) – One LCS is analyzed along with each batch of 20 or fewer samples, prepared according to section 7.9 above. The average (reported) LCS matrix is the same as for the MB. LCS recovery must be within 85-115%. If samples are filtered by the laboratory for Dissolved Organic Carbon analysis, an LCS must be filtered and analyzed along with the samples.

9.3.1) If recovery is outside the control limits, re-inject the standard once. If failure repeats, all associated sample must be reanalyzed unless one of the following situations exists:

- If LCS recovery is greater than 115% and the sample results are < RL, the data may be reported with qualification and using the "LCS/LCSD - %R High" NCM.
- If the above criteria are not met and reanalysis is not possible due to limited sample volume, the sample data must be qualified. These results must be reported using the "LCS/LCSD – Insufficient Sample" NCM.
- If reanalysis cannot occur for another reason, the client must be contacted and their response documented in the case narrative of the report.

NOTE: If the individual results as well as the average are reported, each individual injection must meet the LCS criteria above.

9.4) One sample per every 10 is also used for matrix spike and matrix spike duplicate analysis. The sample is spiked with a known amount of organic carbon per section 7.10 above. Percent recovery of the spike must be within 75-125% for method 9060A and 85-115% for method 5310C, and the %RPD for the pair must be $\leq$20% for method 9060A and $\leq$ 15% for method 5310C.

9.4.1) If the MS or MSD recovery is outside acceptance criteria, and the LCS recovery was within criteria, it is possible that the matrix of the sample contained an interference. Results may be reported with proper qualification using the MS/MSD - %R, LCS Pass" NCM.

- If the native analyte concentration in the MS/MSD exceeds 4x the spike level for that analyte, the recovery data are reported with a "4" qualifier in TALS LIMS.

9.4.2) If there is insufficient sample for MS/MSD, a LCS and LCSD may be prepared and analyzed. The recovery for LCS/LCSD must be ± 15 % and the RPD must be within ± 20% for method 9060A and ± 15% for method 5310C. If an LCSD is necessary, document the lack of sufficient volume to perform an MS/MSD using the "MS/MSD – Insufficient volume" NCM.

9.4.3) Samples identified as field blanks cannot be used for MS/MSD analysis.

9.5) A sample duplicate is required to be analyzed for every 10 samples for method 5310C. A sample duplicate is a second portion of a sample that is analyzed in the same way as the parent sample. The RPD between the original sample and the sample duplicate must be < 15% RPD.

- The sample duplicate requirement for method 5310C can also be met by analyzing an MSD instead of a sample duplicate.
- Samples identified as field blanks cannot be used for duplicate analysis.

9.6) Semiannually, the inorganic purging efficiency of the instrument must be checked by analyzing a second aliquot of the LCS, spiked with the Inorganic Carbon spike (7.11.3). Recovery of this TIC spiked sample and the batch LCS must agree within 10% RPD of the true value of 10 ppm. Alternatively, the TIC evaluation can be accomplished by analyzing 2 PT samples per year for TIC.

9.6.1) If inorganic carbon carry-over is evident in the spiked sample, adjust sample containers, volume, purge gas flow rate and/or purge time to obtain complete removal of inorganic carbon. Any changes made will be noted in the instrument maintenance log and will be a permanent change to the procedure.

9.7) A Reporting Limit Verification Standard (MRL) must be analyzed once per analytical batch for method 5310C. This standard is prepared from either the primary or secondary stock standard at a concentration 1-2 times the reporting limit and is analyzed in quadruplicate. The average result must be within 50-150% of the true value.

9.7.1) If recovery of the MRL is outside control limits, prepare a fresh standard and reanalyze. If the failure repeats, flag affected samples results.

10) Procedure

10.1) **Calibration**

10.1.1)
Initial setup

Constant Settings	
STD Mass	6.76ug C
Sample Volume	2.4mL
Acid Volume	1.0mL
Oxidant Volume	1.5mL

10.1.2) Adjust the nitrogen to 50-60 psi using the flow valve on the tank. The gauge should always be set at 50-60 psi when the instrument is not in use. (NOTE: The pressure reading on the instrument should read 20 psi when the tank pressure is between 50-60 psi.)

10.1.3) If the main valve reads < 200 psi, the tank should be changed. Do not allow the tank to go empty.

10.1.4) Remove the reagent bottles and fill with appropriate reagents (phosphoric acid solution and sodium persulfate). Do not fill bottles completely full; leave a small amount of air space. Loosely reconnect caps (and tubing), and replace the bottles into the instrument.

10.1.5) Calibrate the instrument at least every 6 months, or more often as needed when CCVs or CCBs fail to meet acceptance criteria, or when other problems are encountered. Calibrate using blank and minimum five calibration standards.

10.1.6) Choose "sequences" from the "databases" menu option, open up the calibration template.

10.1.7) Confirm all information.

10.1.8) Analyze an ICV/ICB immediately after the curve. ICV is from a second source, which is separate source from the curve.

10.1.9) Save the file using the current date as the filename.

10.1.10) Evaluate the data. The instrument uses the equation y = mx + b to calculate the linear 1st order calibration curve, where $r^2 \geq 0.995$. The correlation coefficient of the original curve must be $r^2 \geq 0.995$ or recalibration is required.

- Calculate the %Error for each calibration standard read back against the plotted curve. For method SM 5310C, calibration points 3 to 5 times the RL must have a %Error of ≤ 20% and calibration points greater than 5 times the RL must have a %Error ≤ 10%. Standards at or less than the RL must have a %Error ≤ 50%. For method 9060A, the %Error for each point above the lowest calibration standard must be ≤ 20% and for the lowest calibration standard the %Error must be ≤50%. *PIT-WC-FRM62975* can be used to calculate the %Error for each point. Include a pdf copy of this (or any other) form used as raw data with the AD batch.

10.1.11) ICV/CCV (Initial &Continuing Calibration): The run is checked at the beginning (ICV – separate source from the curve), after every ten environmental samples (CCV – same source as ICV), and at the end of the run of the same species (TOC or TIC) using a midrange CCV made from a secondary source (Section 7.8 or 7.11.2) to verify continued linearity. A reported CCV value cannot vary from the original curve by more than ± 10% or recalibration is required.

- If CCV recovery is greater than 110% and the sample results are below the RL, the data may be reported with qualification and an NCM specifying the CCV, its recovery and the <RL samples being reported. Repeated CCV failure will require a new calibration curve to be analyzed.

NOTE: If the individual results as well as the average are reported, each individual injection must meet the ICV or CCV criteria above.

10.1.12) System cleanliness is checked every ten environmental samples and at the end of the run using a Continuing Calibration Blank (CCB). A reported CCB value cannot contain the analyte of interest above the reporting limit (9060A) or ½ reporting limit (SM5310C), or recalibration is required.

- If the target analyte is not detected above the RL in client samples, the data may be reported with qualifiers and NCM specifying the CCB above the RL (or ½ RL) and the associated non-detect samples

reported.

- If the sample concentration is greater than 10 times the CCB concentration, results may be reported with qualification and an NCM specifying the CCB, its concentration, and the associated >10x samples reported.

NOTE: If the individual results as well as the average are reported, each individual injection must meet the CCB criteria above.

NOTE: For samples from West Virginia, the ICB and CCB must be below the MDL.

10.1.13) All prepared standards are logged into the reagent module of TALS. All standards are assigned a unique number for identification.

10.2) **Sample Preparation**

10.2.1) The TOC samples, which come from the field in containers ready for analysis, are sparged by the instrument prior to TOC analysis to remove inorganic carbons that may be present. Samples requiring both TOC & TIC are received as two separate samples that are analyzed separately.

10.2.2) The instrument has analytical modes for TIC, TOC & TC analysis. Analysis after sparging is calculated by the instrument as TOC. Unsparged analysis is calculated as TC. The difference between the two results is calculated as TIC. All calculations are performed by the instrument software program based on calibration curves.

10.2.3) All sample preparation and analysis information will be documented in TALS. Raw data will be scanned and attached to the appropriate TALS batch for inclusion in the report.

10.2.4) Sample size is selected in the instrument set-up and is the same for all sample, calibration, and QC injections. The samples containing particulates will be stirred with a magnetic stirrer. The needle depth can be adjusted if necessary.

10.2.5) Samples and associated QC (i.e. Blanks, LCS, MS/MSD, ICV and CCV's) analyzed according to SM5310C will be analyzed in quadruplicate until the injection of consecutive measurements obtained are reproducible to within $\pm$ 10% RSD.

10.2.5.1) For samples outside of $\pm$ 10% RSD criteria, the laboratory will perform one additional quadruplicate analysis of the sample, taking the most consistent results and initiate a non-conformance indicating that the results are not within criteria due to the nature of the sample matrix. If for any reason the laboratory is not provided with enough sample to perform the analysis in replicate an NCM should be created and a notation will be made in the case narrative.

NOTE: It is not necessary to reanalyze samples with RSDs > 10% if the sample results are below the RL.

10.2.6) Samples and associated QC (i.e. Blanks, LCS, MS, ICV and CCVs) analyzed according to SW-846 Method 9060A will be analyzed in quadruplicate. Quadruplicate can mean 4 injections from the same vial or 2 injections each from 2 vials of the same sample or 1 injection each from 4 vials of the same sample depending on how the client performs the sampling process. If for any reason the laboratory is not provided with enough sample to perform the analysis in quadruplicate a notation will be made in the case narrative.

10.2.7) CCB/CCV's are analyzed per 10 samples, not injections, for both Method 5310C and 9060A.

10.2.8) The pH of TOC samples will be taken after analysis and documented in the appropriate field in the TALS Batch Worksheet. An NCM will be generated for any sample found to have a pH of > 2 so that this information can be pulled into the job-specific Case Narrative.

10.2.9) See the manufacturer's instructions for an instrument-troubleshooting guide and maintenance requirements.

11) Calculations/Data Reduction

11.1)
Total Organic Carbon, mg/L = Instrument Value x Dilution

Where replicate measurements are performed:

TOC, mg/L = average of the 4 instrument values* x dilution

* The four values will be considered to have an acceptable level of consistency, if each of the values lies within ± 35% of the mean. If analysis of any replicate exceeds the 35%, reanalysis will be performed and the findings narrated.

11.2) MS/MSD % Recovery = ((observed spike-sample conc.)/true spike)x100

11.3) Duplicate Sample (Relative Percent Difference):

$$RPD = \frac{|X_1 - X_2|}{\left(\frac{X_1 + X_2}{2}\right)} \times 100\ \%$$

Where:
X_1 = Original Result
X_2 = Duplicate

11.4)
LCS Percent Recovery:

$$\text{LCS \% Recovery} = \left(\frac{\text{Observed Conc. in LCS}}{\text{True LCS Conc.}}\right) \times 100\%$$

11.5)
Calculation of TIC

TIC = TC – TOC
Where:
TIC = Total Inorganic Carbon

TC = Total Carbon
TOC = Total Organic Carbon

Note: the calculation for TC, TOC and TIC is a function of the instrument's analytical software.

11.6) All instrument data is uploaded into TALS. Raw data is attached to the TALS Batch as a pdf.

11.7)
%Error calculation for curve readback:

$$\%E = \frac{|\text{true conc} - \text{found conc}|}{\text{True conc.}} * 100\%$$

11.8) Percent relative standard deviation (%RSD):

$$\%RSD = \frac{\text{Standard Deviation}}{\overline{RF_i}} \times 100$$

$$\overline{RF_i} = \text{Mean of RF values in the curve}$$

12) Method Performance

12.1) The supervisor has responsibility to ensure that an analyst who performs this procedure is properly trained in its use and has the required experience. Performance is monitored through internal QC and outside performance evaluation samples. Please refer to the QA Manual for additional information concerning Precision and Accuracy.

12.2) Demonstration of Capabilities – Prior to the analysis of samples, a Demonstration of Capabilities (DOC) as described in the QA Manual and SOP *PIT-QA-TR-SOP45633*, formerly PT-QA-001, must be performed initially, annually and any time a significant change is made to the analytical system.

12.3) Method Detection Limit Study – A Method Detection Limit (MDL) study, as described in NDSC Detection Limits SOP (*NDSC-QA-SOP42091*), must be performed initially and any time a significant change is made to the analytical system. The MDL must be evaluated at least every 12 months.

13) Pollution Control

13.1) It is Eurofins policy to evaluate each method and look for opportunities to minimize waste generated (i.e., examine recycling options, ordering chemicals based on quantity needed, preparation of reagents based on anticipated usage and reagent stability). Employees must abide by the policies in Section 13 of the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*) for "Waste Management and Pollution Prevention" and the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*).

14) Waste Management

14.1) Waste management practices are conducted consistent with all applicable rules and regulations. Excess

reagents, samples and method process wastes are disposed of in an accepted manner. Waste description rules and land disposal restrictions are followed. Waste disposal procedures are incorporated by reference to *PIT-EHS-HS-SOP45640*. The following waste streams are produced when this method is carried out.

14.1.1) Acidic waste from the auto-analyzer. (This waste is collected in a waste container identified as "Acid Waste", Waste #33. This waste is neutralized to a final pH between 6 and 9 and discharged down into a lab sink.

15) References/Cross-References

15.1) SW846, Test Methods for Evaluating Solid Waste, Third Edition, Total Organic Carbon, Method 9060A, Revision 1, November 2004

15.2) Standard Methods for the Examination of Water and Wastewater, Method 5310C, 2000, editorial revision 2011, 2014, 2022

15.3) Eurofins Pittsburgh Quality Assurance Manual, *PIT-QA-QM45117*

15.4) *PIT-QA-TR-SOP45633*, Employee Orientation & Training

15.5) SOP *PIT-QA-QAS-SOP45635*, Procurement of Standards and Materials; Labeling and Traceability

15.6) SOP *PIT-QA-DR-SOP45621*, Detection Limits

15.7) *PIT-QA-DR-SOP54622*, Rounding and Significant Figures

15.8) SOP PT-QA-014, Reporting Limits

15.9) *PIT-QA-QAS-SOP45629*, Nonconformance & Corrective Action System

15.10) *PIT-QA-EQT-SOP55450*, Aqueous Pipette Calibration – Gravimetric Method

15.11) *PIT-QA-QAS-SOP45631*, Quality Assurance Program

15.12) *PIT-QA-EQT-SOP45625*, Equipment Maintenance

15.13) *PIT-SM-RCT-SOP45637*, Internal Chain of Custody

15.14) SOP *PIT-EHS-HS-SOP45640*, Pittsburgh Facility Addendum EH&S Manual to the *NDSC-US EHS-QP46060*, NBLSC Health and Safety Manual for "Waste Management and Pollution Prevention", current revision

15.15) NBLSC SOP *NDSC-QA-SOP42091*, Detection Limits

16) Method Modifications

16.1) If samples require dilution or smaller volumes than specified in this method, the RL will be elevated.

17) Attachments

17.1) None.

18) Revision History

18.1) Revision 5, 8/3/07

18.2) Revision 6, 09/10/2009

18.3) Revision 7, 4/8/2010

18.4) Revision 8, 6/28/2010

18.5) Revision 9, 9/9/2010

18.6) Revision 10, 11/10/2010

18.7) Revision 11, 12/23/2011

18.8) Revision 12, 10/15/2012

18.9) Revision 13, 1/15/2013

18.10) Revision 14, 12/2/2013

18.11) Revision 15, 12/23/2015

18.12) Revision 16, 11/24/2017

18.13) Revision 16.1, 5/13/2019

18.14) Revision 17, 2/14/2020

18.15)
Revision 18, 10/4/2022

18.16)
Revision 19, 1/12/2024

18.17)
Revision 20, 3/22/2024

18.18)
Revision 21, 10/1/2024

18.19)
Revision 20, 3/5/2025

18.20) Changes to current revision

SOP section	Change from	Change to	Reason
10.1.10		Updated calibration curve % Error acceptance criteria for both methods	Clarification

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NDSC-US-EHS-QP46060 Environmental Health and Safety (HSE) Manual
NDSC-US-TS-SOP42091 Detection and Quantitation Limits
PIT-EHS-HS-SOP45640 Environmental Health and Safety Manual Pittsburgh Facility Addendum
PIT-QA-DR-SOP45621 Detection Limits
PIT-QA-DR-SOP45622 Rounding and Significant Figures Policy
PIT-QA-EQT-SOP45625 Equipment Maintenance
PIT-QA-EQT-SOP55450 Aqueous Pipette / Dispenser Calibration – Gravimetric Method
PIT-QA-QAS-SOP45629 Nonconformance & Corrective Action System
PIT-QA-QAS-SOP45631 Laboratory Quality Control Program
PIT-QA-QAS-SOP45635 Procurement of Standards and Materials; Labeling and Traceability
PIT-QA-QM45117 Pittsburgh QA Manual
PIT-QA-TR-SOP45633 Employee Orientation & Training
PIT-SM-RCT-SOP45637 Internal Chain of Custody
PIT-WC-FRM62975 Calibration Standard Percent Error Calculation

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End of document

Version history

Version	Approval	Revision information	
21	01.OCT.2024		
22	05.MAR.2025		
23	09.JUN.2025	Clarifying calibration standard % Error criteria	

eurofins	Always check on-line for validity **Electrometric pH, Methods 9040C and 9045D and SM4500-H+B**	Level: **Standard Operating Procedure**
Document number: **PIT-WC-ISE/P-SOP45358**		
Old Reference: **PT-WC-026**		
Version: **17**		Organisation level: **4-Business Unit**
Approved by: **SBB9, TFU4** Effective Date: **01-OCT-2024**	Document users: **6_EUUS79_PIT_Wet Chemistry_ISE pH**	Responsible: **5_EUUS79_PIT_QA All**

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1) Scope and Application
2) Summary of Method
3) Definitions
4) Interferences
5) Safety
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....

1) Scope and Application

1.1) This method is applicable to the determination of pH in waters, wastewaters, solids and wastes. It is based on SW846 Methods 9040C and 9045D and Standard Method 4500-H+B. The working range is 1 - 14 pH units.

1.2) For pH in waste, sediment, or sludge, if water is present at < 20% of the total sample volume, by visual estimate, the sample is treated as a solid, and method 9045D is used. If water is present at > 20% of the total volume, the sample may be analyzed using method 9040C.

1.3) On occasion clients may request slight modifications to this SOP. Any modifications to this procedure must be approved by the QA department or the Laboratory or Technical Director and documented fully in an NCM that accompanies the analytical batch.

2) Summary of Method

2.1) The pH is determined electrometrically. The pH meter is calibrated with a series of known pH buffers. The impact of the actual sample temperature is electronically compensated for using Automatic Temperature Compensation (ATC).

NOTE: The use of ATC does not adjust the pH reading at the current sample temperature to what it would be at 25^{o}C. If the pH at a specified temperature, such as 25^{o}C, is required, the sample must be warmed/cooled in a water bath before analysis.

2.2) The analysis may be performed by the Autotitrator for clean water samples.

3) Definitions

3.1) TALS – Laboratory Information Management System (LIMS)

3.2) NCM – Non-Conformance Memo - a system within TALS for the lab to communicate to project management and others when there is an anomaly seen with the samples or batch, or a QC failure.

3.3) Refer to the glossary in the Laboratory Quality Assurance Manual (*PIT-QA-QM45117*) for additional definitions.

4) Interferences

4.1) Samples with very low or very high pH may give incorrect readings on the meter. For samples with a true pH of >10, the measured pH may be incorrectly low. This error can be minimized by using a low-sodium-error electrode.

4.2) Extreme temperatures can affect the pH reading even with the automatic temperature compensation. Samples should be analyzed near room temperature.

4.3) Coatings of oily material or particulate matter can impair electrode response. These may be removed by gentle wiping or detergent washing the electrode followed by a deionized water rinse. Treatment with 1:10 HCl may be necessary to remove the film, followed by a deionized water rinse.

4.3.1) Samples may not be filtered to remove particles prior to analysis.

5) Safety

5.1) Employees must abide by the policies and procedures in the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*), the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*) and this document. This procedure may involve hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum.

The following is a list of the materials used in this method, which have a serious or significant hazard rating. This list does not include all materials used in the method. The table contains a summary of the primary hazards listed in the SDS for each of the materials listed in the table. A complete list of materials used in the method can be found in the reagents and materials section. Employees must review the information in the SDS for each material before using it for the first time or when there are major changes to the SDS.

Material (1)	Hazards	Exposure Limit (2)	Signs and symptoms of exposure
Hydrochloric Acid	Corrosive Poison	5 ppm-Ceiling	Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death. Can cause redness, pain, and severe skin burns. Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
1 – Always add acid to water to prevent violent reactions.			
2 – Exposure limit refers to the OSHA regulatory exposure limit.			

5.2) Eye protection that protects against splash, laboratory coat, and appropriate gloves must be worn while samples, standards, solvents, and reagents are being handled. Cut resistant gloves must be worn doing any other task that presents a strong possibility of getting cut. Disposable gloves that have been contaminated will be removed and discarded; other gloves will be cleaned immediately.

5.3) All work must be stopped in the event of a known or potential compromise to the health and safety of a Eurofins associate. The situation must be reported immediately to a laboratory supervisor or EH&S coordinator.

6) Equipment and Supplies

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met.

6.1)
pH meter with combination pH electrode and automatic temperature compensation

- Accumet XL15, Accumet AR25, or equivalent

6.2) Snap Top Bottles, 2 oz and 4 oz

6.3) Top loading balance: Capable of accurately weighing ± 0.01 g

6.4) Stir plate and stir bars

6.5) Mechanical Shaker

6.6) Automated analysis option: Man-Tech MT-100 Autotitrator with PC-Titrate™ software and Automax73 autosampler with 50 mL sample tubes

6.7) Ross Sure-Flow combination pH electrode with glass body, waterproof BNC connector; Cat. No. 8172BNWP

7) Reagents and Standards

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met. Please refer to the SDS prior to the use of any reagent or standard.

7.1) **Standards**

7.1.1) pH 2, 4, 7, 10 and pH 13 buffers, purchased with certificate of analysis, use manufacturer's expiration date. Store buffers at room temperature.

7.1.2) Second source pH 7 buffer, purchased with certificate of analysis, purchased from a different vendor than the pH 7 buffer used for calibration. Use manufacturer's expiration date. Store buffer at room temperature.

7.1.3) Fresh buffers are poured from the main container into closed lid cups for daily use.

7.1.4) Concentrated Hydrochloric acid (HCl)

7.1.4.1) 1:10 HCl Cleaning Solution – slowly add 20 mL concentrated HCl to 100 mL of laboratory reagent water in a 200 mL volumetric flask. Mix well and dilute to volume.

7.1.5) Acetone may be used to remove oily substances from the probe, followed by a thorough water rinse.

8) Sample Collection, Preservation, Shipment and Storage

8.1) Samples may be collected in glass or plastic containers.

8.2) This analysis should be performed in the field within 15 minutes of sampling for all matrices. If samples are analyzed in the laboratory, beyond the 15 minutes, results shall be reported with an "HF" qualifier to indicate that the technical holding time was exceeded.

8.3) Samples are to be shipped and stored at >0.0°C but ≤6.0°C. No chemical preservation is required or permitted.

9) Quality Control

9.1) A batch is a group of 20 or fewer samples of similar matrix excluding QC samples (LCS, and sample DUP) that are processed together in the same 24 hour period.

9.2) Duplicates - Sample duplicates are performed at a minimum frequency of one per every 10 samples (or fewer) of the same matrix. The %RPD between sample and duplicate must be ≤ 2%.

9.2.1) If the %RPD exceeds 2%, two fresh portions of sample and duplicate must be analyzed until the readings stabilize within the required limit.

9.3) ICV/LCS: second source pH buffer 7 is analyzed after the initial calibration. The pH readings must be 6.95 to 7.05 pH units.

9.3.1) If the ICV reading is outside the range, repeat once with a fresh portion of second source buffer. If the failure repeats, the initial meter calibration must be repeated with fresh buffers. Sample analysis must not proceed until the meter calibration is verified successfully.

9.4) CCV: pH buffer 7, same source as the calibration, is analyzed after every 10 samples and at the end of the sequence. The pH readings must be 6.95 to 7.05 pH units.

9.4.1) If a CCV falls outside the required range, repeat once with a fresh portion of buffer. If the failure repeats, the initial meter calibration must be repeated with fresh buffers. All samples analyzed after the last passing CCV must be reanalyzed.

9.5) Any unauthorized deviations from this procedure must also be documented as a nonconformance, using the appropriate NCM.

10) Procedure

10.1) **Calibration**

10.1.1) **Initial Calibration**

10.1.1.1) Refer to the manufacturer's manual for instrument specific calibration steps.

10.1.1.2)
Prior to taking any pH readings:

- Check that the fill hole at the top of the pH probe is open.
- Check that there is ample amount of filling solution in the electrode and that there are no air bubbles.
- Filling solution volume should always be higher than the volume of the sample that you are reading.
- Remove the probe from the storage solution.
- KCl crystals from the electrode/storage solution can form on the electrode during storage.

- Rinse off any crystallization with reagent water.

10.1.1.3)
The following procedure is applied when calibrating the manual pH meter:

- Clear out the previous day's calibration by pressing the STD button on the meter then CLEAR.
- The meter is now in standardization mode.
- Pour out fresh buffers daily, prior to calibration.
- Place the pH 2 buffer on the electrode and allow it to stabilize. Once stable, press the STD button to store the pH 2 buffer reading.
- Rinse with reagent water.
- Place probe in the pH 4 buffer. Again, allow the meter to stabilize, and hit STD to store the pH buffer 4 reading.
- Repeat these steps for the remainder of the pH buffers (7, 10, and 13).

The pH meter must be calibrated daily or each day it is used. The calibration is recorded on the analytical log sheet. The slope of the calibration must meet $\geq$ 95%, or the manufacturer's requirements if tighter. If the manufacturer's slope requirement is not met, the meter will display an error message. Pour fresh buffer solutions into the cups and repeat the calibration. If this does not resolve the problem, change the KCl solution in the electrode. If still having a problem the probe may need to be changed. Note any needed maintenance in the meter maintenance log, including electrode maintenance.

10.1.1.4)
Read back the pH buffers once calibration is complete, this time including the second source pH 7 buffer. Record in the pH calibration logbook.

- Read-back of the pH buffers must be within 0.05 pH units of each buffer solution value. If not repeat adjustments on successive portions of the two buffer solutions until the readings are within 0.05 pH units (s.u.).

10.1.1.5) The following procedure is applied when calibrating the Autotitrator:

- Fill the DI Rinse jugs with reagent water before beginning calibration / analysis.
- Fill autosampler tubes with fresh 2, 4, 7, 10 and 13 pH buffers. Use one tube per buffer, the instrument will pull multiple aliquots.
- Click load template and select **pH CAL.**
- Click **START**. The meter will proceed with the calibration and will indicate if any of the slope and individual pH readings do not meet criteria.

The Autotitrator requires the following calibration criteria:

- Slope = -65.00 to -53.00
- Intercept = -30.00 to 30.00
- Correlation Coefficient = 0.99 to 1.00

The Calibration Report from the Autotitrator shows a Calibration Validity of "True" or "False". "True" means that the calibration was within the specified ranges. "False" means the calibration was NOT within the specified ranges. A "False" designation would require recalibration.

10.1.1.6) If the pH meter has been turned off, it must be calibrated prior to use.

10.1.1.7) After the calibration the ICV/LCS, a second source pH 7 buffer, is analyzed before sample analysis. The pH readings must be 6.95 – 7.05 pH units. This standard also serves as the LCS.

10.1.2) **Calibration Check / Continuing Calibration**

10.1.2.1) The CCV, which is a pH 7 buffer of the same source as the calibration standard, is analyzed after every ten samples to ensure the calibration remains linear.

10.1.2.2) The pH meter must be recalibrated if the buffer is not within 6.95-7.05 pH units. If this range is exceeded, reanalyze all samples analyzed since the last pH buffer that met criteria.

10.1.2.3) If samples of extreme pH are included in the batch (<4 or >10), it may be appropriate to analyze a CCV buffer close to the pH of the samples, in addition to the CCV pH 7 buffer.

10.2) **Sample Preparation**

10.2.1) **Waters (Method 4500H+ B or 9040C)**

10.2.1.1) No preparation necessary for waters and wastewaters.

10.2.1.2) Waters should be allowed to equilibrate to near room temperature prior to analysis. Temperature is recorded on worksheet or the data sheet from the pH Titrator. The pH meter is equipped with a temperature probe, and calibration is verified quarterly.

10.2.2) **Solids (Method 9045D)**

10.2.2.1) Place 20 g (± 0.5 g) of sample into a beaker or other suitable container. (A sample size of less than 20 g can be used as long as the 1:1 weight to volume relationship is maintained.)

10.2.2.2) Add 20 mL of reagent water and mix or shake for five minutes.

NOTE: In the event a sample absorbs the water, additional water will be added at 5 mL increments until sufficient liquid is obtained to cover the pH probe. An NCM will be written to document this anomaly.

10.2.2.3) Allow soil samples to stand for one hour and waste samples to stand for 15-minutes to allow the solids to settle out or centrifuge off the aqueous phase for pH measurement.

10.2.2.4) Sediments, sludges and wastes: based upon the nature of the sample matrix, the analyst will use appropriate technical judgment, per section 1.2, and prepare the sample according to either 10.2.1 or 10.2.2.

10.3) **Sample Analysis**

Prior to taking any pH readings, check that the fill hole at the top of the pH probe is open.

10.3.1) **Manual Waters**

10.3.1.1) Place 2 aliquots of the sample in 2 clean Snap Top bottles using a sufficient volume to cover the sensing elements of the electrode (approximately 20 mL). Allow the pH to stabilize (swirling or stirring may quicken stabilization). Record the pH on the analytical log sheet. Remove the electrodes from the sample. Rinse and gently dab off the electrodes between each measurement. Repeat measurement on a second aliquot of the sample. The two values must differ by $\leq$ 0.1 pH units. If they do not, repeat measurements on successive aliquots of sample until this is achieved. Report the last reading that is within acceptance range. Store the electrodes in pH 4 buffer or manufacturer's storage solution when not in use.

10.3.2) **Autotitrator Waters**

10.3.2.1) Load Template **pH CAL**.

10.3.2.2) Click **Add rows** and type in the number of spaces for samples and QC in the batch.

10.3.2.3) Scan in samples and type in QC IDs.

10.3.2.4) Click and drag the number of vials down in the vial column.

10.3.2.5) Click and drag the schedule and order number columns down. (Hold CTRL, click on the cell and drag it down to the last cell.)

10.3.2.6) Save the Template as MMDDYYPH, for example 100120PH.

10.3.2.7) Fill autosampler tubes according to the schedule. Use one tube per sample and QC, the instrument will pull multiple aliquots.

10.3.2.8) Click **START**.

10.3.2.9) Example Sequence:

ICV/LCS
Tap
DI Rinse
LCS
Sample
Sample Duplicate
8 more samples
CCV

- CCV after every 10 samples
- Close with CCV and 2 DI Rinses

10.3.3) **Solids (Supernatant)**

10.3.3.1) Immerse the pH electrodes in the supernatant layer of the sample - be careful not to stir up solids. Allow pH to stabilize and record it on the analytical log sheet. Remove and rinse the electrodes between each measurement. Store electrodes in pH 4 buffer or manufacturer's storage solution when not in use.

10.3.3.2) If the sample contains oil or other substances that will coat or damage the electrodes, the pH should be analyzed using pH Paper Method if client allows this change.

10.3.4) If the pH of the sample is >12.0, the pH must be measured at 25 ± 1 ºC. Use a water bath set at this temperature to warm a portion of the sample in a closed container.

10.4) **Autotitrator Data Upload**

Printing the raw data:

- Exit out of the pop up report that appears after the run is complete
- Go to the Reporting Tab of the software, then click Prepare and /or Print Shazam reports…
- Click on the Open Report icon (looks like an open folder)
- In the "look in" section of the Open Report Folder window, select Recent Items
- Go to the "pH reports" folder
- Click on the "Run Date" cell below and change the date to reflect the date of the run you need (be sure the filter says "IS EQUAL TO"), then click OK
- Click the "Preview Report" tab at the top of the window, and it should show you the Water Analysis Historical Data Report with the results of your selected run
- Print this Report to be attached as Raw Data in TALS

10.4.1) To begin the data export to TALS, select "Export" under the "File" option at the top left of the screen of the Water Analysis Historical Data Report. A box will pop up with options for file type and file name:

- Change the File Type by selecting "Fixed Field ASCII File"(.TXT)" from the drop down menu.
- Change the File Name by clicking the "..." box next to the File Name box, Recent Items, MantechFT. Name the file for the date of the run and analysis type (for example: 102120PH).
- Click "OK" to save the file.

10.4.2) To export the data to TALS:
Open the software "ManTech FT" from the PC desktop.

10.4.3) Open the saved data file in .TXT form by clicking the "…" box located to the right of the "Raw Data File" option. Select the appropriate data file and click "OK".

10.4.4) DO NOT CHANGE THE IMPORT PATH.

10.4.5) On the bottom of the ManTech FT software page, click "Load Preset".

10.4.6) In the box that pops up, select pH. This preset ensures that all pH and temperature readings are transferred to the TALS batch.

10.4.7) Be sure to select pH, pH2, pH3, and Temperature, temp2 and temp3 from the Available Analytes list to report all readings.

10.4.8) After verifying that the data series selected are correct, click "Transfer File". A box will pop up to let the user know that the file transfer has been completed. The data will be exported to TALS under the PHTITRATOR instrument.

10.5) **Analytical Documentation**

10.5.1) All analytical information, results and associated QC, are electronically recorded in TALS as the analysis is performed, including the analytical data from standards and any corrective actions or modifications to the method. The time of the individual sample readings is documented in the TALS batch. (Autotitrator will upload analysis times.)

10.5.2) All standards are logged into the TALS reagent module. All standards are assigned a unique number for identification, and this number is recorded in each analytical batch. Standards entry is reviewed by the supervisor or designee.

10.5.3) Daily meter calibration is documented in the Meter Calibration log, specific to each pH meter. The Autotitrator calibration will be included with the raw data.

11) Calculations/Data Reduction

11.1) Any sample with a pH < 2 or > 13 will need to have a "cn" qualifier added plus an NCM stating "The pH is estimated because the result is outside the calibrated range of pH 2-13."

11.2) Temperature must be reported with all pH results.

12) Method Performance

12.1) The supervisor has responsibility to ensure that an analyst who performs this procedure is properly trained in its use and has the required experience. Performance is monitored through internal QC and outside performance evaluation samples.

12.2) Demonstration of Capability - Prior to analysis of any client samples, the analyst must demonstrate their ability to successfully analyze samples. This demonstration shall consist of calibrating the pH meter (slope meeting manufacturer's control limit) and analyzing 4 LCS (pH 7) standards. The results of the 4 LCSs must all be within 6.95-7.05. DOCs are repeated annually and any time a significant change Is made to the analytical procedure.

12.3) Determination and verifications of MDL and RL are not applicable to this procedure.

13) Pollution Control

13.1) All waste will be disposed of in accordance with Federal, State and Local regulations. Where feasible, technological changes have been implemented to minimize the potential for pollution of the environment. Employees will abide by this method and the policies in section 13 for "Waste Management and Pollution Prevention" of the NBLSC Environmental Health & Safety Manual (*NDSC-US EHS-QP46060*) and the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*).

13.2) This method does not contain any specific modifications that serve to minimize or prevent pollution.

14) Waste Management

14.1) Waste management practices are conducted consistent with all applicable rules and regulations. Excess reagents, samples and method process wastes are disposed of in an accepted manner. Waste description rules and land disposal restrictions are followed. Waste disposal procedures are incorporated by reference to *PIT-EHS-HS-SOP45640*. The following waste streams are produced when this method is carried out.

14.2) The following waste streams are produced when this method is carried out.

14.2.1) Acidic sample waste generated by the analysis. This waste is checked with pH paper, neutralized to a pH between 6 and 9 and discharged down a lab sink.

14.2.2) Alkaline sample waste generated by the analysis. This waste is checked with pH paper, neutralized to a pH between 6 and 9 and discharged down a lab sink.

14.2.3) Exhausted oil samples utilized in the analysis. This waste is collected in waste containers identified as "Mixed Flammable Solvent Waste", Waste #3.

14.2.4) Solvent waste generated by the analysis. This waste is collected in waste containers identified as "Mixed Flammable Solvent Waste", Waste #3.

14.2.5) Exhausted acidic and/or alkaline buffer solutions utilized in the analysis. This waste is checked with pH paper, neutralized to a pH between 6 and 9 and discharged down a lab sink.

14.2.6) Exhausted soil samples utilized in the analysis. This is collected in containers identified as "Lab Trash", Waste #12.

15) References/Cross-References

15.1) SW846, Test Methods for Evaluating Solid Waste, 3rd Edition, pH Electrometric Measurement, Method 9040C

15.2) SW846, Test Methods for Evaluating Solid Waste, 3rd Edition, Soil pH, method 9045D

15.3) Standard Methods for the Examination of Water and Wastewater, method 4500-H+ B, 2011 and 2021 editorial revision

15.4) NDSC Environmental Health & Safety Manual, *NDSC-US EHS-QP46060*

15.5) Pittsburgh Facility Addendum EH&S Manual, *PIT-EHS-HS-SOP45640*

15.6) Pittsburgh Quality Assurance Manual, *PIT-QA-QM45117*

15.7) *PIT-QA-TR-SOP45633*, Employee Orientation and Training

15.8) *PIT-QA-QAS-SOP45631*, Quality Assurance Program

15.9) *PIT-QA-QAS-SOP45635*, Procurement of Standards and Materials; Labeling and Traceability

15.10) *PIT-QA-QAS-SOP45629*, Nonconformance & Corrective Action System

15.11) *PIT-SM-RCT-SOP45637*, Internal Chain of Custody

16) Method Modifications

16.1) None

17) Attachments

17.1) Attachment 1 – TALS Screenshots for pH Data and Reagents

18) Revision History

18.1) Revision 6, 09/21/07

18.2) Revision 6.1, 10/17/07

18.3) Revision 7, 10/14/2009

18.4) Revision 8, 3/2/2011

18.5) Revision 9, 5/15/2012

18.6) Revision 10, 7/3/2013

18.7) Revision 11, 8/28/2014

18.8) Revision 12, 11/29/2016

18.9) Revision 13, 11/30/2018

18.10) Revision 13.1, 5/14/2019

18.11) Revision 14, 4/9/2020

18.12) Revision 15, 10/28/2020

18.13)
Revision 16, 8/24/2022

18.14)
Changes to current revision:

SOP section	Change from	Change to	Reason
Entire SOP	Removed reference to 9040B and 9045C		No longer supporting this method version
5.1 and 13.1	NDSC	NBLSC	Naming Correction
15.3		Added editorial revision year 2021 for SM4500H+B	Correction

19) Appendix

Attachment 1 – TALS Screenshots for pH Data and Reagents

Batch Editor

Batch: 263112 SubContract Batch Normal Status: APPROVED

Method: 180 9045D Start Date/Time: 11/16/18 08:56 Analyst: Smith, Abbey V

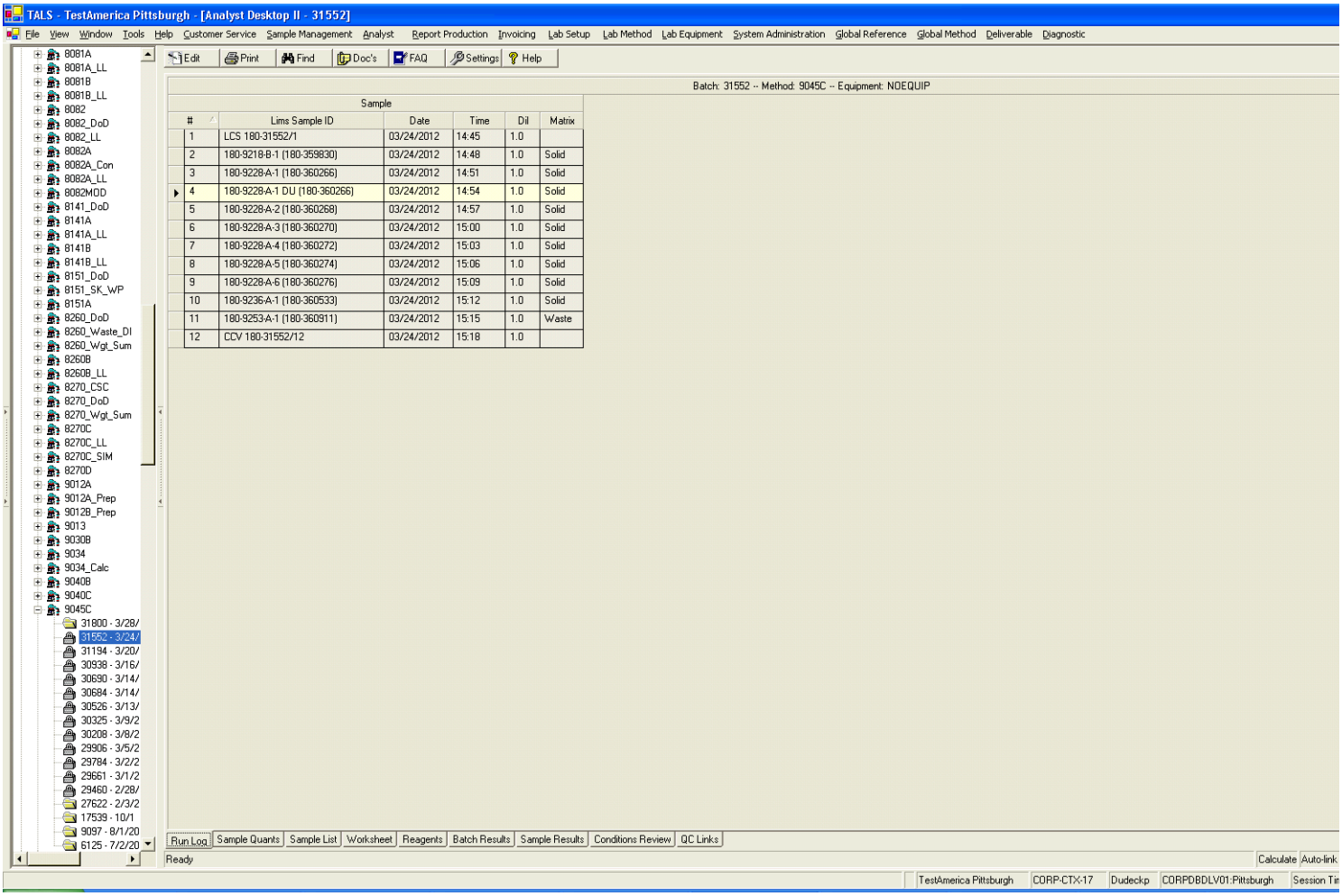
Equipment: NOEQUIP End Date/Time: Apply all prep factors to reagents

Batch Notes

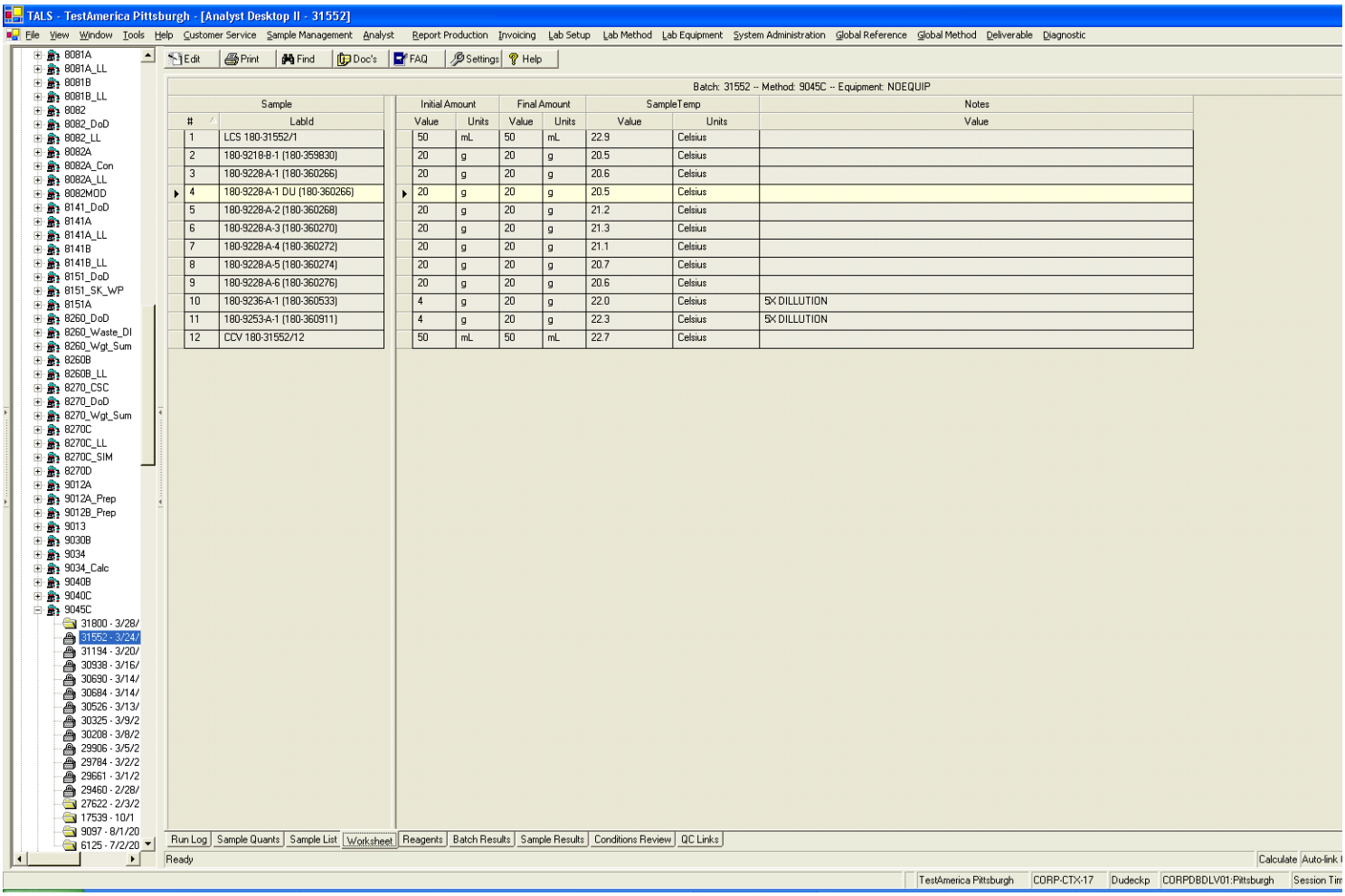
Description	Value	Units
pH Meter ID	Accumet AR25 SNAR93315378	NONE
Probe ID	VWP1 13876	NONE
Thermometer ID	AR93315378	NONE
pH Buffer 1 ID	2655162 pH 2.00 = 2.00	NONE
pH Buffer 2 ID	2655163 pH 4.00 = 4.02	NONE
pH Buffer 3 ID	2504342 pH 7.00 = 7.00	NONE
pH Buffer 4 ID	2835600pH 10.00 = 9.97	NONE
pH Buffer 5 ID	2580012 pH 13.00 = 13.04	NONE
pH Buffer 6 ID	2621677 pH 7.00 buffer second source	NONE
pH Meter Calibration Slope	95.6	NONE
Calibration Date and Time	11/16/2018 09:35	NONE
Balance ID	8946	NONE
Pipette/Syringe/Dispenser ID	NA	NONE
Sufficient volume for sample dup	yes	NONE
Batch Comment	start shake: 9:25 end shake: 9:30 settle: 9:30- 10:25	NONE

Ok Cancel

Attachment 1 – TALS Screenshots for pH Data and Reagents (cont.)



Attachment 1 – TALS Screenshots for pH Data and Reagents (cont.)



NDSC-US-EHS-QP46060 Environmental Health and Safety (HSE) Manual
PIT-EHS-HS-SOP45640 Environmental Health and Safety Manual Pittsburgh Facility Addendum
PIT-QA-QAS-SOP45629 Nonconformance & Corrective Action System
PIT-QA-QAS-SOP45631 Laboratory Quality Control Program
PIT-QA-QAS-SOP45635 Procurement of Standards and Materials; Labeling and Traceability
PIT-QA-QM45117 Pittsburgh QA Manual
PIT-QA-TR-SOP45633 Employee Orientation & Training
PIT-SM-RCT-SOP45637 Internal Chain of Custody

End of document

Version history

Version	Approval	Revision information	
16	23.AUG.2022	D4 Template for Analytical SOPs -	
17	01.OCT.2024		

eurofins	Always check on-line for validity **Specific Conductance (Hand Held Meter), Methods 120.1, 9050A, SM 2510B**	Level: **Standard Operating Procedure**
Document number: **PIT-WC-ISE/P-SOP45359**		
Old Reference: **PT-WC-013**		
Version: **11**		Organisation level: **4-Business Unit**
Approved by: **SBB9, TFU4** Effective Date: **01-OCT-2024**	Document users: **6_EUUS79_PIT_Wet Chemistry_ISE Cond**	Responsible: **5_EUUS79_PIT_Inorganic Department Manager**

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1) Scope and Application

1.1) This SOP is used for sample analysis and daily conductance measurement of the lab water system. This SOP applies to specific conductance (conductivity) analysis of ground, surface and saline water, domestic and industrial wastes, and soils.

1.1.1) Resistivity may also be reported following this SOP.

1.2) The reporting limit (RL) is 1 µmho/cm for Conductance and 1 ohm/cm for Resistivity.

1.3) On occasions clients may request slight modifications to this SOP. Any modifications to this procedure must be approved by the QA department of the Laboratory or Technical Director, and documented fully in an NCM that accompanies the analytical batch.

2) Summary of Method

2.1) The Specific Conductance of a sample is measured using a Wheatstone-bridge-type conductivity meter or equivalent. The sample is analyzed at a temperature of 25°C or temperature corrections are made and results are reported at 25°C.

3) Definitions

3.1) LIMS – Laboratory Information Management System (TALS).

3.2) NCM - Non-Conformance Memo – a system within TALS for the lab to communicate to project management and others when there is an anomaly seen with the samples or batch, or a QC failure.

3.3) Refer to the glossary in the Pittsburgh Laboratory Quality Assurance Manual (*PIT-QA-QM45117*) for definitions.

4) Interferences

4.1) Oily substances can coat the conductivity cell and cause slow or erratic response. Samples high is dissolved solids, if not properly rinsed away, can cause scaling to form on the cell, leading to erratic response. Ensure that the cell is rinsed well between samples.

4.1.1) If an oily film or scaling is visible on the cell, use isopropyl alcohol or a foaming, non-abrasive household cleaner. Rinse the cell with laboratory grade water and verify the meter with a blank and known standard before using again for sample analysis.

5) Safety

5.1) Employees must abide by the policies and procedures in the NBLSC Environmental Health & Safety Manual (*NDSC-US EHS-QP46060*), the Pittsburgh Facility EH&S Manual (*PIT-EHS-HS-SOP45640*), and this document.

5.1) This procedure may involve potentially hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum.

5.2) This procedure may involve potentially hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum.

5.3) The following is a list of the materials used in this method, which have a serious or significant hazard rating. This list does not include all materials used in the method. The table contains a summary of the primary hazards listed in the SDS for each of the materials listed in the table. A complete list of materials used in the method can be found in the reagents and materials section. Employees must review the information in the SDS for each material before using it for the first time or when there are major changes to the SDS.

Material (1)	Hazards	Exposure Limit (2)	Signs and symptoms of exposure
Potassium Chloride	irritant	None	Slightly hazardous in case of contact, may cause irritation to skin, eyes and respiratory tract.
1 – Always add acid to water to prevent violent reactions.			
2 – Exposure limit refers to the OSHA regulatory exposure limit.			

5.4) Eye protection that protects against splash, laboratory coat, and appropriate gloves must be worn while samples, standards, solvents, and reagents are being handled. Cut resistant gloves must be worn doing any other task that presents a strong possibility of getting cut. Disposable gloves that have been contaminated will be removed and discarded; other gloves will be cleaned immediately.

5.5) Exposure to chemicals must be maintained as low as reasonably achievable, therefore, unless they are known to be non-hazardous, all samples must be opened, transferred and prepared in a fume hood, or under other means of mechanical ventilation. Solvent and waste containers will be kept closed unless transfers are being made.

5.6) The preparation of standards and reagents (and glassware cleaning procedures that involve solvents such as methylene chloride) will be conducted in a fume hood with the sash closed as far as the operation will permit.

5.7) All work must be stopped in the event of a known or potential compromise to the health and safety of a Eurofins Pittsburgh associate. The situation must be reported immediately to a laboratory supervisor.

6) Equipment and Supplies

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met.

6.1) Conductivity meter with conductivity cell –Myron L Company Ultrameter II, model 6Psi, or equivalent. (Equivalent meter must also measure sample temperature and correct conductivity reading to 25^{o}C.)

6.2) Beakers: various sizes.

7) Reagents and Standards

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met. Please refer to the SDS prior to the use of any reagent or standard.

7.1) Reagents

7.1.1) Reagent Grade or Deionized water – Laboratory pure water which has a specific conductance < 1mmho/cm.

7.2) Standards

7.2.1) Reference Standards

7.2.1.1) Potassium Chloride Standard Solution: 1413mmhos/cm - prepared by weighing 0.746g KCl and dilute to 1000mL into a class A volumetric flask or the standard is purchased in solution from a vendor. This standard is used for calibration for the daily water conductivity tests performed on the laboratory's DI Water. This solution is stored at room temperature and expires one year after preparation, or according to the manufacturer's expiration date if purchased.

7.2.1.2) 100,000µS (1µS = 1 µmho/cm) Potassium Chloride Standard. This standard is purchased with a certificate of analysis. Any unused portion of this standard must be discarded **4 months after the date opened.** This standard is used for calibration for the sample analysis procedure. (100,000µS = 100mS).

7.2.2) QC Standards

7.2.2.1) Laboratory Control Sample (LCS): LabChem Standard LC187501 - 84µmhos/cm Conductance and 11905 ohms/cm Resistivity.

7.2.2.2) Continuing Calibration Verification (CCV): LabChem Standard LC187602 - 500µmhos/cm Conductance and 1984 ohms/cm Resistivity.

7.2.2.3) Equivalent standards may be purchased from other vendors, and concentrations may vary. Exact standard sources and true values shall be documented in the analytical batch.

8) Sample Collection, Preservation, Shipment and Storage

8.1) Listed below are the container, preservation and holding time requirements for these methods.

Matrix	Sample Container	Min. Sample Size	Preservation	Holding Time	Reference
All	Plastic or Glass	250 mL	Cool >0 to < 6.0oC	28 days from collection	40 CFR Part 136

No chemical preservation is required or appropriate for this test

9) Quality Control

9.1)

The following quality control samples are analyzed along with each sample batch.

Quality Control Type	Frequency	Control Limit
Blank (MB/ICB/CCB)	1 per 10 samples (MB per 20 samples)	< RL
Initial Calibration Verification / Laboratory Control Sample (ICV/LCS)	Beginning of analytical sequence and 1 per 20 samples	90-110 % Recovery
Calibration Verification (CCV)	1 per 10 samples	90-110% Recovery
Sample Duplicate (SD)	1 per 10 samples	≤20% RPD

9.2) An ICV/LCS is analyzed prior to sample analysis, and per every 20 or fewer samples in an analytical batch. The LCS standard is purchased (7.2.2.1). The control limits for the ICV/LCS are 90-110% recovery.

9.3) A Continuing Calibration Verification (CCV), of a different source than the ICV/LCS standard, is analyzed after every 10 samples (every analysis counts towards the 10) and at the end of the batch. The CCV standard is purchased (7.2.2.2). The control limits for the CCV are 90-110% recovery.

9.3.1) If the ICV/LCS/CCV recovery is outside the control limits, reanalyze the standard once.

- If recovery is still outside control limits, recalibrate the meter and reanalyze all samples run after the last acceptable standard
- If recovery of the standard is above 110%, but below 120%, and sample results are below the reporting limit, results may be reported qualified with the "LCS/LCSD- %R High" NCM, with the text modified as necessary if the standard is a CCV
- If reanalysis is not possible due to limited sample quantity, the laboratory project manager will be notified, and the results shall be reported with the "LCS/LCSD – Insufficient sample" NCM, with the text modified as necessary if the standard is a CCV
- If reanalysis will be outside of the holding time, the client shall be notified and approval from the client obtained before reanalysis

9.4) An ICB/CCB (Initial and Continuing Blanks) are analyzed after each ICV/CCV, after every 10 analyses. The ICB serves as the batch method blank (MB). If more than 20 samples are analyzed in the run, the CCB prior to the second batch of 20 samples serves as the MB for that batch. All ICB/CCB/MB concentrations must be less than the reporting limit. If a Blank fails criteria, clean the cell with several fresh portions of DI water and reanalyze the Blank once.

- If the Blank is still above the RL, determine the source of contamination, recalibrate the meter and reanalyze all samples run after the last acceptable Blank.
- If reanalysis is not possible due to limited sample quantity, the laboratory project manager will be notified, and the results shall be reported with the "Method Blank – Insufficient sample" NCM, with text modified as necessary if the Blank is a CCB.
- If reanalysis will be outside of the holding time, the client shall be notified and approval from the client obtained before reanalysis.

NOTE: If the laboratory deionized water gives a blank reading above the RL, contact your supervisor, as this may indicate a problem with the water generating system

9.4.1) Blanks are not applicable to Resistivity.

9.5) A duplicate sample is analyzed with every set of 10 or fewer samples. The sample duplicated is chosen at random from all the samples included in the analytical batch, unless a client specifies a sample to use for QC. The relative percent difference – RPD (calculated by equation 11.3 below) between the original and duplicate sample concentrations must be <20%.

9.5.1) If the RPD exceeds this limit, repeat the sample and duplicate analysis until consecutive readings meet the criterion.

10) Procedure

10.1) Calibration and Standardization

10.1.1) The Conductivity Meter is calibrated each day of use.

- Rinse the cell with 3 portions of the 100,000µmhos/cm calibration standard (7.2.1.2) and fill with a fourth. Ensure that no air bubbles are present in the cell.
  - For the daily DI water conductivity checks, the meter is calibrated using the 1413µmhos/cm standard (7.2.1.1) in place of the 100,000µmohs/cm standard.
- Press COND, then CAL/MCLR. "CAL" will appear on the display.
- Adjust the displayed reading to match the certified standard value using the up or down arrow button.

- Press CAL/MCLR again to accept the adjusted standard reading. The "CAL" icon will disappear.
- Document the calibration standard ID and adjusted reading on the Specific Conductance Logsheet

10.1.2) Quarterly the Automatic Temperature Compensator (ATC) in the meter must be verified using the following procedure:

- Adjust the temperature of a portion of conductivity standard (84 or 1413 µmohs/cm) to between 24 and 26^{O}C. Record the exact temperature taken with an NIST traceable thermometer.
- Immediately pour the sample into the meter cell, and, following the procedure below, document the temperature and the conductivity reading of the standard from the meter.
- Place a portion of the same conductivity standard into the refrigerator and lower the temperature to the lowest temperature that a sample could be analyzed at, or to approximately 10^{O}C. Record the exact temperature taken with an NIST traceable thermometer.
- Immediately pour the sample into the meter cell, and, following the procedure below, document the temperature and the conductivity reading of the standard from the meter.
- The specific conductance value of the standard must be within 10% of the true value at both temperatures. If readings do not meet this criterion, the meter must be repaired, or a temperature range that will meet this criterion must be established and documented for the meter.

10.2.1) Soil Sample Preparation Procedure

10.2.1) If soil samples are to be analyzed, prepare by 1 hour DI leaching procedure in SOP *PIT-WC-MISC-SOP45363* and analyze the extract in the same manner as water samples.

10.2.2) A matrix duplicate analysis shall be performed for soils, however no other solid matrix QC is available.

10.2.3) All soil samples must be reported with the "Conductivity/Resistivity" NCM, which states, "The procedure for Specific Conductance by Method 9050A or SM2510B is applicable to liquid samples and has been modified to provide the enclosed results on the soil matrix. The modification involves a DI leach of the soil followed by electrometric measurement of the leachate. The values provided are a measure of the leachable components' conductance for a given mass to volume of water, rather than the conductance of the soil itself.

10.3) Sample Analysis Procedure

10.3.1) The meter corrects the conductance reading to 25^{O}C regardless of the actual sample temperature, however extreme temperatures can damage the meter. Allow samples to come to room temperature before reading the conductance.

NOTE: The calibration of the internal thermometer is verified on a quarterly basis

10.3.2) Rinse the cell 3 times with the sample to be measured and fill with a fourth. Additional rinses may be required if a highly concentrated sample or standard was analyzed prior.

10.3.3) Press COND if the meter is not already in conductivity mode. Record both the conductance and temperature readings on the Specific Conductance Logsheet.

10.3.4) Any sample that has a conductivity value greater than 100,000µmhos/cm will be flagged with an "E" qualifier in TALS LIMS to note that the value is estimated. Samples measured for conductivity are not diluted.

11) Calculations/Data Reduction

11.1) The meter will display the final Conductance result corrected for the cell calibrations and temperature compensation. No manual calculations are necessary.

11.2)

Resistance, R, is the inverse of Conductance, G.

R (ohms/cm) = 1/G

TALS will calculate the Resistance from the Conductance data entered

11.3) Duplicate Sample (Relative Percent Difference)

$$RPD = \frac{|X_1 - X_2|}{(X_1+X_2/2)} \times 100\%$$

Where:
X_1 = Original sample result
X_2 = Duplicate sample result

12) Method Performance

12.1)
The supervisor has responsibility to ensure that an analyst who performs this procedure is properly trained in its use and has the required experience. Performance is monitored through internal QC and outside performance evaluation samples. Please refer to the QA Manual for additional information concerning Precision and Accuracy.

12.2) Demonstration of Capabilities – Prior to the analysis of samples, a Demonstration of Capabilities (DOC), must be performed initially, annually and any time a significant change is made to the analytical system. See SOP *PIT-QA-TR-SOP45633* and the QA Manual (*PIT-QA-QM45117*) for IDOC and CDOC details.

12.3) MDLs are not applicable to this procedure.

12.4) A Linear Range Study must be conducted on a least an annual basis to verify that the meter readings are accurate within the range of use. This study is performed using a minimum of 5 standards that bracket the range of use of the meter. Suggested standards are 1, 84, 500, 1413, and 100,000µmohs/cm. Standards must recover within 90-100% of the true value. If readings fall outside this range, a new cell constant must be determined and entered into the meter and the study repeated. Reported samples with concentrations near the failing standard since the last cell constant determination must be investigated for bias.

12.5)
The RL (1 µmhos/cm) must be verified annually. Analysis of a standard at or near the RL must recover within $\pm$ 30% of the true value for the the Mettler Toledo DG111-SC (OZ) instrument and within $\pm$ 50% for a hand-held meter or maintenance will need to be performed.

This standard will also be included in the annual Linear Range Study found in section 12.4.

13) Pollution Control

13.1) It is Eurofins Pittsburgh's policy to evaluate each method and look for opportunities to minimize waste generated (i.e., examine recycling options, ordering chemicals based on quantity needed, preparation of reagents based on anticipated usage and reagent stability). Employees must abide by the policies in Section 13 of the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*) for Waste Management and Pollution.

14) Waste Management

14.1) There is no special waste generated by this process.

15) References/Cross-References

15.1) EPA, Methods for Chemical Analysis of Water and Wastes, Conductance (Specific Conductance, mmhos at 25°C), Method 120.1, Approved for NPDES (Editorial Revision 1982).

15.2) Standard Methods for the Examination of Water and Wastewater, Conductivity, Method 2510B, 1997, (2011 and 2021 editorial revision).

15.3) SW-846 Method 9050A Specific Conductance, Revision 1, December 1996.

15.4) *PIT-QA-QM45117*, Pittsburgh Laboratory Quality Assurance Manual.

15.5) *PIT-QA-QAS-SOP45631*, Quality Assurance Program

15.6) *PIT-SM-RCT-SOP45637*, Internal Chain of Custody.

15.7) *PIT-WC-MISC-SOP45363*, DI Leachate Procedure for Solids

15.8) *PIT-EHS-HS-SOP45640*, Pittsburgh Facility Addendum Environmental Health & Safety Manual

15.9) Myron L, Ultrameter II, Models 6Psi & 4P, Operation Manual, 09/08/2010

16) Method Modifications

16.1) None

17) Attachments

17.1) Figure 1 – Example of Specific Conductance Data Sheet

17.2) Figure 2 - Example of Specific Conductance Standard in TALS Reagent Log

17.3) Figure 3 – Example of DI Water Conductivity Logbook

18) Revision History

18.1) Revision 2, 06/30/08

18.2) Revision 3, 6/23/2010

18.3) Revision 4, 5/29/2012

18.4) Revision 5, 9/1/2014

18.5) Revision 6, 7/9/2015

18.6) Revision 7, 9/27/2017

18.7) Revision 7.1, 5/13/2019

18.8) Revision 8, 12/20/2019

18.9) Revision 9, 1/21/2021

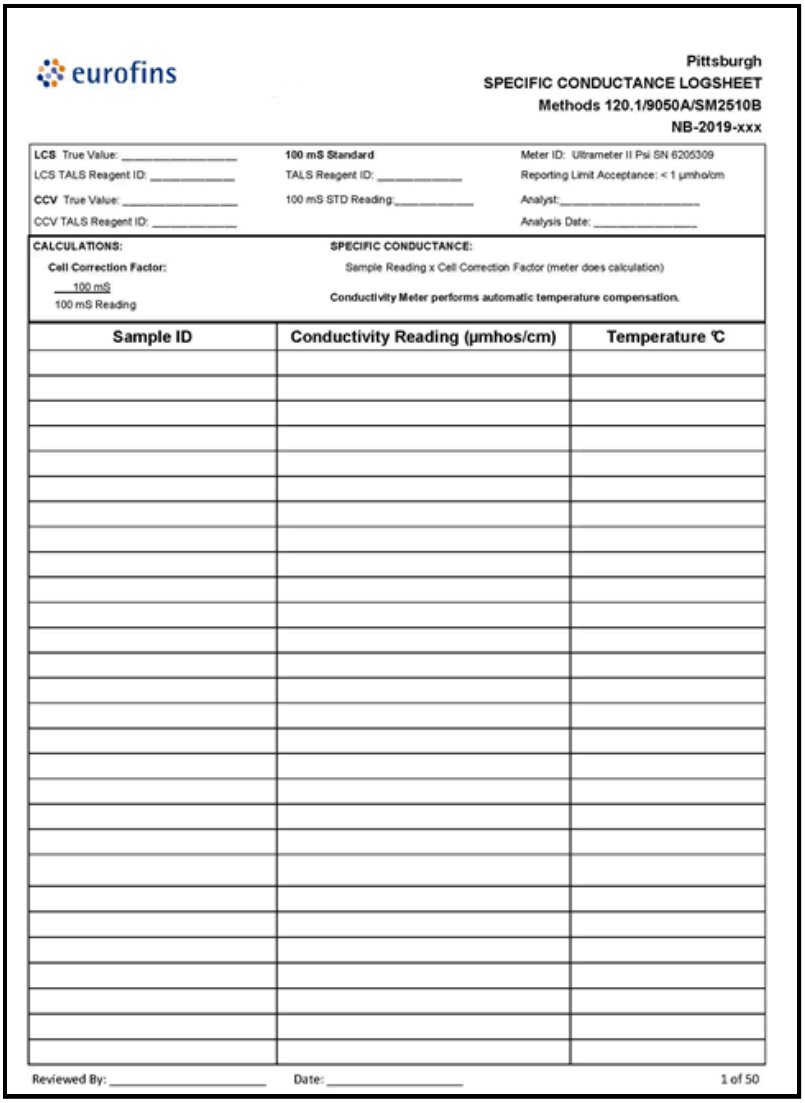
18.10)
Revision 10, 10/3/2022

18.11) Changes to current revision

SOP Section	Change from	Change to	Reason
5.1, 13.1	NDSC	NBLSC	Name Change
15.2		added 2021	Method Reference Year Update

19) Appendix

19.1)
Figure 1 – Example of Specific Conductance Data Sheet



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SPECIFIC CONDUCTANCE LOGSHEET
Methods 120.1/9050A/SM2510B
NB-2019-xxx

LCS True Value: _____ | 100 mS Standard | Meter ID: Ultrameter II Psi SN 6205309
LCS TALS Reagent ID: _____ | TALS Reagent ID: _____ | Reporting Limit Acceptance: < 1 µmho/cm
CCV True Value: _____ | 100 mS STD Reading:_____ | Analyst:_____
CCV TALS Reagent ID: _____ | | Analysis Date: _____

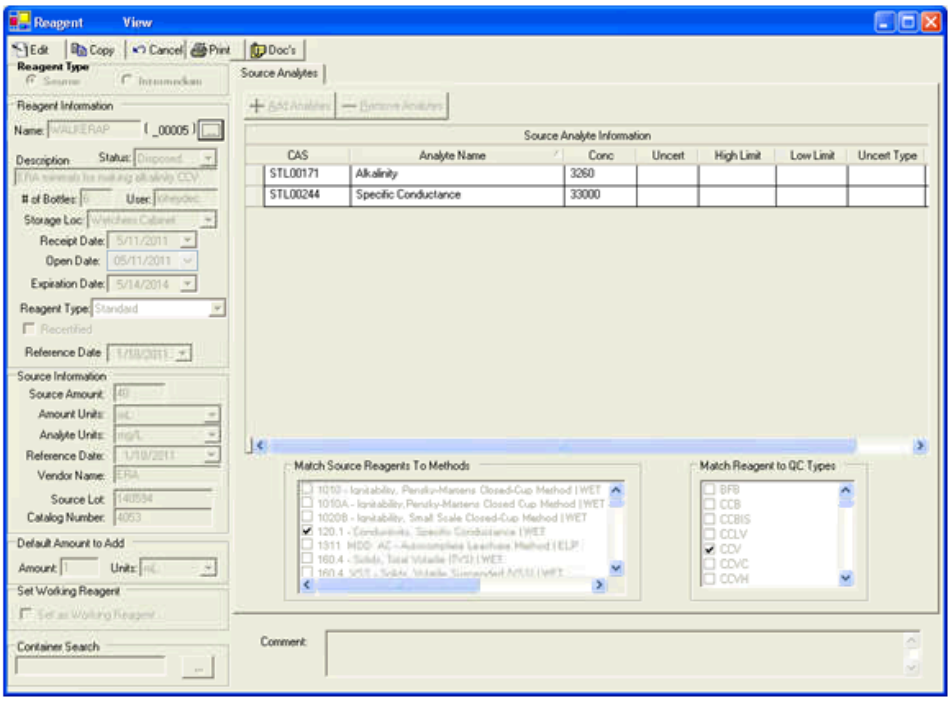
CALCULATIONS:
Cell Correction Factor:
___100 mS
100 mS Reading

SPECIFIC CONDUCTANCE:
Sample Reading x Cell Correction Factor (meter does calculation)
Conductivity Meter performs automatic temperature compensation.

Sample ID	Conductivity Reading (µmhos/cm)	Temperature °C

Reviewed By: _____ Date: _____ 1 of 50

19.2) **Figure 2 - Example of Specific Conductance Standard in TALS Reagent Log**



19.3) **Figure 3 – Example of DI Water Conductivity Logbook**

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DI WATER CONDUCTIVITY LOGSHEET
NB-2019-040

METER SERIAL NO. 6205309	SUPER-Q ACCEPTANCE LIMIT: < 1.0 µmhos/cm	NORMALITY KCl STANDARD: 1413 µmhos/cm
MODEL NO. ULTRAMETER II 6Psi	METER STANDARDIZED TO MEASURE AT 25°c PER MANUAL	REAGENT ID:

WEEK OF:	METER CALIBRATION		SAMPLE READING µmhos/cm				
	TEMPERATURE	METER VALUE	MS/VOA ROOM 154	ORGANIC PREP ROOM 114	METALS ROOM 102A	WET CHEMISTRY LAB	ANALYST/DATE
MONDAY							REVIEWED BY/DATE
TUESDAY							REVIEWED BY/DATE
WEDENSDAY							REVIEWED BY/DATE
THURSDAY							REVIEWED BY/DATE
FRIDAY							REVIEWED BY/DATE
SATURDAY							REVIEWED BY/DATE
SUNDAY							REVIEWED BY/DATE

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NDSC-US-EHS-QP46060 Environmental Health and Safety (HSE) Manual
PIT-EHS-HS-SOP45640 Environmental Health and Safety Manual Pittsburgh Facility Addendum
PIT-QA-QAS-SOP45631 Laboratory Quality Control Program
PIT-QA-QM45117 Pittsburgh QA Manual
PIT-QA-TR-SOP45633 Employee Orientation & Training
PIT-SM-RCT-SOP45637 Internal Chain of Custody
PIT-WC-MISC-SOP45363 DI-Leachate Procedure for Solids (1 Hour Routine DI Leachate Procedure), Method ASTM D 3987-85 Modified

End of document

Version history

Version	Approval	Revision information	
10	03.OCT.2022	D4 Template for Analytical SOPs -	
11	01.OCT.2024		

eurofins	Always check on-line for validity **Oxidation Reduction Potential (ORP), Method SM 2580B**	Level: **Standard Operating Procedure**
Document number: **PIT-WC-ISE/P-SOP45360**		
Old Reference: **PT-WC-037**		
Version: **9**		Organisation level: **4-Business Unit**
Approved by: **SBB9, TFU4** Effective Date: **05-MAR-2025**	Document users: **6_EUUS79_PIT_Wet Chemistry_ORP**	Responsible: **5_EUUS79_PIT_QA All**

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1) Scope and Application

1.1) This SOP is for the determination of the oxidation-reduction potential (ORP) or Eh of water and soil/sediment samples.

1.2) ORP is reported in mV. The reporting limit for all matrices is 10 mV.

2) Summary of Method

2.1) ORP is the measure of the ratio of oxidizing activity to reducing activity in a solution. It is the potential of a solution to give up electrons (oxidize) or gain electrons (reduce). The increase of one is at the expense

of the other, so a single voltage is called the Oxidation-Reduction Potential, with a positive voltage (mV) indicating an oxidizing environment and a negative voltage (mV) indicating a reducing one.

2.2) An ion selective electrode meter is utilized with a redox probe consisting of a platinum (Pt) electrode and a silver (Ag) reference electrode to measure millivolt (mV) output.

3) Definitions

3.1) TALS – Laboratory Information Management System (LIMS).

3.2) NCM - Non-Conformance Memo – a system within TALS for the lab to communicate to project management and others when there is an anomaly seen with the samples or batch, or a QC failure.

3.3) Refer to the glossary in the Pittsburgh Laboratory Quality Assurance Manual (*PIT-QA-QM45117*), current version.

4) Interferences

4.1) Contaminants on the electrode surface, salt bridge or internal electrolyte can lead to excessive drift, poor electrode response and artifact potentials. If any of the above problems are encountered, clean the electrode per the manufacturer's directions. Organic material, sulfide and bromide may also cause this problem. If excessive drift occurs after cleaning, refilling or regeneration, discard the electrode and use a new one.

5) Safety

5.1) Employees must abide by the policies and procedures in the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*), the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*) and this document. This procedure may involve hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum.

5.2) The following is a list of the materials used in this method, which have a serious or significant hazard rating. This list does not include all materials used in the method. The table contains a summary of the primary hazards listed in the SDS for each of the materials listed in the table. A complete list of materials used in the method can be found in the reagents and materials section. Employees must review the information in the SDS for each material before using it for the first time or when there are major changes to the SDS.

Material (1)	Hazards	Exposure Limit (2)	Signs and symptoms of exposure

Sulfuric Acid	Corrosive Oxidizer Dehydrator Poison Carcinogen	1 mg/m^3-TWA	Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. Symptoms may include irritation of the nose and throat, and labored breathing. Symptoms of redness, pain, and severe burn can occur. Contact can cause blurred vision, redness, pain and severe tissue burns. Can cause blindness.
[1] – Always add acid to water to prevent violent reactions.			
[2] – Exposure limit refers to the OSHA regulatory exposure limit.			

5.3) Eye protection that protects against splash, laboratory coat, and appropriate gloves must be worn while samples, standards, solvents, and reagents are being handled. Cut resistant gloves must be worn doing any other task that presents a strong possibility of getting cut. Disposable gloves that have been contaminated will be removed and discarded; other gloves will be cleaned immediately.

5.4) Exposure to chemicals must be maintained as low as reasonably achievable, therefore, unless they are known to be non-hazardous, all samples must be opened, transferred and prepared in a fume hood, or under other means of mechanical ventilation. Solvent and waste containers will be kept closed unless transfers are being made.

5.5) All work must be stopped in the event of a known or potential compromise to the health and safety of a Eurofins Pittsburgh associate. The situation must be reported immediately to a laboratory supervisor.

6) Equipment and Supplies

The following items are recommended for performing this procedure. Equivalent items should only be used when they result in an improvement in quality, efficiency, productivity, or cost. An item can be considered equivalent if with its use, the analytical and QA/QC requirements in this SOP can be met.

6.1) Myron L Company Model 6Psi Ultrameter II

6.1.1) This meter uses a Ag/AgCl electrode with a saturated KCl solution for reference.

6.2) Plastic Beakers/cups: open lid and closed lid

6.3) Top loading balance capable of accurately weighing ± 0.01 g

6.4) Stir plate and stir bars

6.5) Shaker

7) Reagents and Standards

7.1) Cleaning reagents – Use any of the three below:

7.1.1) pH/ORP Sensor Storage solution (purchased from Myron L Company), which consists of a mixture of potassium hydrogen phthalate, potassium chloride, potassium chloride, antimicrobials and water

7.1.2) 4M Potassium Chloride solution saturated with silver chloride

7.1.3) Reagent Water

7.2) Reference Standards

7.2.1) pH 2, 7 and 13 buffers, purchased with certificate of analysis. Store at room temperature and follow manufacturer's assigned expiration date. Use a fresh portion of buffer daily.

7.2.2) LCS – ORP Standard, purchased with certificate of analysis. Follow the manufacturer's instructions for storage and expiration date. NOTE: This standard contains sulfuric acid. Zobell's or Light's Solutions may be used.

7.2.3) CCV - ORP Standard, 465 mv, purchased with certificate of analysis. Follow manufacturer's instructions for storage and expiration date. NOTE: This standard contains sulfuric acid.

8) Sample Collection, Preservation, Shipment and Storage

8.1) Listed below are the sampling, preservation and holding times for this procedure.

Matrix	Sample Container	Minimum Sample Size	Preservation	Holding Time*
Water	Plastic or glass	100 mL	Cool to >0.0°C and ≤ 6.0°C	24 hours from sampling
Soil	Plastic or glass	20 g	Cool to >0.0°C and ≤ 6.0°C	24 hours from start of DI Leach

*Holding times: ORP analysis should be performed in the field immediately after sampling.

8.2) No chemical preservation is required.

9) Quality Control

9.1)
The following quality control samples are prepared with each batch of samples.

Quality Controls	Frequency	Control Limit
Continuing Calibration Verification (CCV)	After every 10 samples and at the end of the analytical batch	Reading within ±10 mV (or 2%) of known value
Laboratory Control Sample (LCS)	1 per batch of 20 samples, prior to sample analysis	Reading within ±10 mV (or 2%) of known value
Duplicate	1 per batch of 20 samples	20% RPD

9.2) One Laboratory Control Sample (LCS) is analyzed after the meter zero is set using a pH 7 buffer and

prior to the analysis of any samples. One Continuing Calibration Verification (CCV) is analyzed after every 10 samples and at the end of the analytical batch.

9.2.1) The mV reading must be within ±10 mV (or 2%) of the certified value. If the reading is outside this range, clean the cell (see 7.1), repeat the meter zeroing, and re-analyze the standard. If a continuing CCV fails to meet the ±10 mV (or 2%) criteria, the CCV may be reread once. If the LCS or CCV failure repeats, the sample results must be qualified.

- To clean the cell rinse it with reagent water and then soak it with either the pH/ORP Sensor Storage solution or the 4M Potassium Chloride solution saturated with silver chloride for approximately 5-10 minutes depending on the sample matrix.

9.3) One per every 20 client samples is analyzed in duplicate. The sample is chosen at random, unless a client specifies a sample to be used for QC. Duplicate analysis must not be performed on known blank samples such as field blanks or equipment blanks.

9.3.1) If the RPD between the parent sample and duplicate is >20%, the sample and duplicate must be reanalyzed once. If the failure repeats, report results using the "MS/MSD/DUP - %RPD" NCM.

10) Procedure

10.1) Initial Calibration

10.1.1) The Myron L Company Model 6PSi Ultrameter has an electronic ORP calibration. This causes the zero point on the electrode to be set whenever calibration is done. See Figure 2 for calibrating the meter with pH 2, 7 and 13 buffers.

- The meter calibration date and time and pH buffers used for calibration must be documented in the TALS Batch Information comments.

NOTE: This meter does not display a slope for the pH calibration. Calibration for ORP is verified by analysis of an LCS.

10.2) Sample Preparation Procedure

10.2.1) Aqueous Samples

10.2.1.1) Water samples should be allowed to equilibrate to room temperature prior to analysis.

10.2.2) Solid Samples

10.2.2.1) Place 20 g (± 0.5 g) of sample in a beaker or other suitable container. Record the weight in the DI Leach method in TALS.

10.2.2.2) Add 20 mL of reagent water and mix for five minutes.

10.2.2.3) Allow sample to stand for one hour to allow the solids to settle out. Use the supernatant for analysis.

10.3) Sample Analysis Procedure

10.3.1) Rinse the sensor well three times with the sample to be measured. Shake out each sample to remove any residual liquid. Refill the sensor well with the sample to be measured.

10.3.2) Press the 'ORP' key to take the reading. Record the pH, Eh and temperature on the TALS analytical batch worksheet.

10.3.3) Repeat measurement on successive volumes of sample until values differ by less than ± 10 mV. Measurements must be completed within a 10 minute time period. Report the last reading that is within acceptance range.

11) Calculations/Data Reduction

11.1) No calculations are required for final results. Results are reported directly from the meter readings.

11.2) Duplicate Sample (Relative Percent Difference):

$$RPD = \frac{|X_1 - X_2|}{\left(\frac{X_1 + X_2}{2}\right)} \times 100\ \%$$

X_1 = Original Results
X_2 = Duplicate

11.3) See Figure 1 to determine if the sample is reducing or oxidizing based on the plot of Eh versus pH.

12) Method Performance

12.1) The supervisor has responsibility to ensure that an analyst who performs this procedure is properly trained in its use and has the required experience. Performance is monitored through internal QC analysis.

12.2) Demonstration of Capabilities – Prior to independent analysis of client samples, a Demonstration of Capability (DOC) as described in the QA Manual, must be performed. DOCs are repeated annually and any time a significant change is made to the analytical system.

12.3) MDL studies are not applicable to this procedure.

13) Pollution Control

13.1) It is Eurofins Pittsburgh's policy to evaluate each method and look for opportunities to minimize waste generated (i.e., examine recycling options, ordering chemicals based on quantity needed, preparation of reagents based on anticipated usage and reagent stability). Employees must abide by the policies in Section 13 of the NBLSC Environmental Health and Safety Manual (*NDSC-US EHS-QP46060*) for "Waste Management and Pollution Prevention" and the Pittsburgh Facility Addendum EH&S Manual (*PIT-EHS-HS-SOP45640*).

14) Waste Management

14.1) Waste management practices are conducted consistent with all applicable rules and regulations. Excess reagents, samples and method process wastes are disposed of in an accepted manner. Waste description rules and land disposal restrictions are followed. Waste disposal procedures are incorporated by reference to *PIT-EHS-HS-SOP45640*.

14.2) There is no special waste generated by this process.

15) References/Cross-References

15.1) Standard Methods for the Examination of Water and Wastewater, Oxidation-Reduction Potential, Method 2580B, 2009, editorial revision 2011

15.2) Myron L Company Ultrameter II Model 6Psi Operation Manual, September 2010

15.3) *PIT-QA-QM45117*, Eurofins Pittsburgh Laboratory Quality Manual

15.4) *PIT-QA-QAS-SOP45629*, Nonconformance & Corrective Action System

15.5) *PIT-QA-AUD-SOP45620*, Technical Data Review Requirements

15.6) *PIT-QA-QAS-SOP45631*, Quality Assurance Program

15.7) *PIT-QA-QAS-SOP45635*, Procurement of Standards and materials; Labeling and Traceability

15.8) *PIT-SM-RCT-SOP45637*, Internal Chain of Custody

15.9) *PIT-EHS-HS-SOP45640*, Pittsburgh Facility Addendum EH&S Manual

16) Method Modifications

16.1) None

17) Attachments

17.1) Figure 1 - Example Eh/pH Phase Diagram

17.2) Figure 2 – Calibration Procedure for ORP meter

18) Revision History

18.1) Revision 0, 8/20/07

18.2) Revision 1, 11/24/08

18.3) Revision 2, 3/2/201

18.4) Revision 3, 4/16/2013

18.5) Revision 4, 8/12/2015

18.6) Revision 5, 9/27/2017

18.7) Revision 5.1, 5/14/2019

18.8) Revision 6, 12/19/2019

18.9)
Revision 7, 10/3/2022

18.10)
Revision 8, 10/24/2024

18.11)
Changes to current revision:

SOP section	Change from	Change to	Reason
9.1	Changed frequency of LCS to 1/20	Added CCV	Correction
9.1, 9.2.1	10%	$\pm$ 10 mV or 2%	PA DEP audit finding
9.2		Added that one CCV is analyzed after every 10 samples	Correction
9.2.1	LCS Renumbered Section from 9.3 to 9.2.1	CCV	Correction

9.2.1		Added criteria for a repeat LCS or CCV failure	Clarification
9.3, 9..1	Renumbered Sections from 9.4 and 9.4.1		Correction

19) Appendix

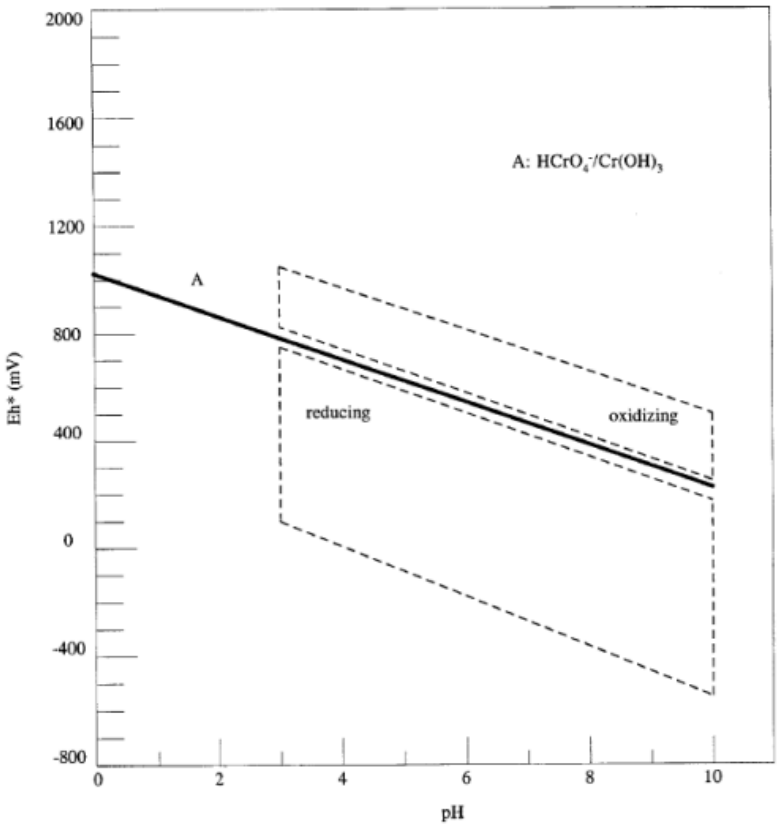
Figure 1
Example ORP Form (PIT-WC-ISE/P-WI54546)– Eh/pH Phase Diagram

eurofins	Always check on-line for validity. **ORP Form - Eh/pH Phase Diagram**	Level: **Work Instruction**
Document number: **PIT-WC-ISE/P-WI54546**		
Old Reference: **PT-WC-WI-002**		
Version: **3**		Organisation level: **5-Sub-BU**
Approved by: **LU4M** Effective Date **19-SEP-2022**	Document users: **6_EUUS79_PIT_Wet Chemistry_ORP, 6_EUUS79_PIT_Wet Chemistry_Spec Cr6**	Responsible: **5_EUUS79_PIT_Inorganic Department Manager**

Analyst:	Date:
Job#:	Sample #:
Eh value (mV):	pH: Temperature (°C):

FIGURE 2
Eh/pH PHASE DIAGRAM

The dashed lines define Eh-pH boundaries commonly encountered in soils and sediments.



* Note the Eh values plotted on this diagram are corrected for the reference electrode voltage: 244 mV units must be added to the measured value when a separate calomel electrode is used, or 199 mV units must be added if a combination platinum electrode is used.

End of document

Figure 2 – Calibration Procedure for ORP meter

reduce your variation from factory setting by pressing (MS) *or* (MR).

6. Press (CAL/MCLR) to accept the new value. The pH Zero Calibration is now complete. You may continue with pH Gain Calibration or exit by pressing any measurement key.

b. pH Gain Calibration (6Psi)

Important: Always calibrate or verify your Ultrameter II with a pH 7 buffer solution before adjusting the gain with acid or base buffers, i.e., 4 and/or 10, etc. Either acid or base solution can be used for the 2nd point "Gain" calibration and then the opposite for the 3rd point. The display will verify that a buffer is in the sensor well by displaying either "**Acd**" or "**bAS**".

1. The pH calibration mode is initiated by either completion of the pH Zero Calibration, or verifying 7 buffer and pressing the (CAL/MCLR) key twice while in pH measurement mode.
2. At this point the "**CAL**", "**BUFFER**" and "**Acd**" or "**bAS**" annunciators will be displayed (see Figures 7 and 8).

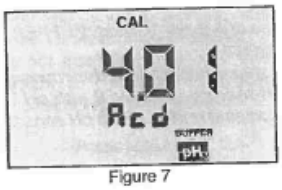


Figure 7

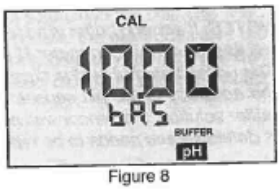


Figure 8

***NOTE:** If the "**Acd**" and "**bAS**" indicators are blinking, the unit is indicating an error and needs either an acid or base solution present in the sensor well.*

3. Rinse sensor well 3 times with acid or base buffer solution.
4. Refill sensor well again with same buffer solution.
5. Press (MS) or (MR) until display agrees with buffer value.

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Figure 2 – Calibration Procedure for ORP meter (cont.)

6. Press (CAL/MCLR) to accept 2nd point of calibration. Now the display indicates the next type of buffer to be used.

Single point Gain Calibration is complete. You may continue for the 3rd point of Calibration (2nd Gain) or exit by pressing any measurement key. Exiting causes the value accepted for the buffer to be used for both acid and base measurements.
To continue with 3rd point calibration, use basic buffer if acidic buffer was used in the 2nd point, or vice-versa. Again, match the display to the known buffer value as in step 2 and continue with the following steps:

7. Repeat steps 3 through 6 using opposite buffer solution.

8. Press (CAL/MCLR) to accept 3rd point of calibration, which completes the Calibration procedure. Fill sensor well with Myron L Storage Solution and replace protective cap.

6. ORP Calibration (6Psi)

ORP electrodes rarely give false readings without problems in the reference electrode. For this reason, and because calibration solutions for ORP are highly reactive and potentially hazardous, your Ultrameter II has an electronic ORP calibration. This causes the zero point on the reference electrode to be set whenever pH 7 calibration is done.

7. Temperature Calibration

Temperature calibration is not necessary in the Ultrameter II.

VIII. CALIBRATION INTERVALS

There is no simple answer as to how often one should calibrate an instrument. The Ultrameter II is designed to not require frequent recalibration. The most common sources of error were eliminated in the design, and there are no mechanical adjustments. Still, to ensure specified accuracy, any instrument must be checked against chemical standards occasionally.

A. Suggested Intervals

On the average, we expect calibration need only be checked monthly for the Conductivity, RES or TDS functions. The pH (6Psi) function should be checked every 2 weeks to ensure accuracy. Measuring some solutions will require more frequent intervals.

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NDSC-US-EHS-QP46060 Environmental Health and Safety (HSE) Manual
PIT-EHS-HS-SOP45640 Environmental Health and Safety Manual Pittsburgh Facility Addendum
PIT-QA-AUD-SOP45620 Technical Data Review Requirements
PIT-QA-QAS-SOP45629 Nonconformance & Corrective Action System
PIT-QA-QAS-SOP45631 Laboratory Quality Control Program
PIT-QA-QAS-SOP45635 Procurement of Standards and Materials; Labeling and Traceability
PIT-QA-QM45117 Pittsburgh QA Manual
PIT-SM-RCT-SOP45637 Internal Chain of Custody

End of document

Version history

Version	Approval	Revision information	
7	03.OCT.2022	D4 Template for Analytical SOPs -	
8	24.OCT.2024		
9	05.MAR.2025		

eurofins	Always check on-line for validity. **Reactive Sulfide (titration) by SW-846 9034 (1996) Prepared by Chapter 7.3.4 (1996) in Waste**	Level: **Work Instruction**
Document number: **T-WC-WI11572**		
Old Reference: **1-P-QM-WI-9013032**		
Version: **13**		Organisation level: **5-Sub-BU**
Approved by: **X6TJ** Effective Date: **12-OCT-2023**	Document users: **EUUSLA_Water Quality_Manager, EUUSLA_Water Quality_Sulfide, EUUSLA_Water Quality_Verification**	Responsible: **EUUSLA_Water Quality_Manager**

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Revision Log
Reference
Cross Reference
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Basic Principles
Reference Modifications
Interferences
Safety Precautions and Waste Handling
Personnel Training and Qualifications
Sample Collection, Preservation, and Handling
Apparatus and Equipment
Reagents and Standards
Calibration
Procedure
Calculations
Statistical Information/Method Performance
Quality Assurance/Quality Control

Revision Log

Revision:	13	**Effective Date:**	This version
Section		**Justification**	**Changes**
Revision Log		Formatting requirement	Removed revision logs up to the previous version
Header		Update	Update to reflect current company name
Cross Reference		Remove	Removed WI10360 no longer needed
QA/QC		Remove	Removed WV requirements not required

Revision:	12	**Effective Date:**	November 9,2021
Section		**Justification**	**Changes**

Revision:	12	Effective Date:	November 9,2021
Revision Log		Formatting requirement	Removed revision logs up to the previous version
Throughout Document		7.3.3 is the cyanide prep	Removed references to 7.3.3
Personnel Training and Qualifications		Clarification	Added specific criteria
Calculation		Correction	Removed 16030, replaced with 32.06g/2eq.

Reference

1. *Test Methods for Evaluating Solid Wastes*, SW-846, Chapter 7.3, 1996.

2. *Test Methods for Evaluating Solid Wastes*, SW-846 9034, 1996.

2. *Chemical Hygiene Plan*, Lancaster Laboratories, current version.

Cross Reference

Document	Document Title
T-WC-WI11574	Reactivity of Waste

Scope

This method is applicable to the measurement of sulfide in solid or liquid wastes following prep method 7.3.4.

This method is not applicable to wastes that form explosive mixtures when combined with acids.

Chapter 7.3 states the total releasable sulfide is 500 mg H2S/kg waste.

Basic Principles

Sulfide is extracted from a sample using prep method 7.3.4 and is trapped in a sodium hydroxide scrubber solution. Excess iodine is added to a portion of the scrubber solution. Under acidic conditions, the iodine oxidizes the sulfide in the scrubber solution to sulfur. The excess iodine is then backtitrated with sodium thiosulfate to determine the concentration of sulfide in the scrubber solution.

Reference Modifications

Not applicable.

Interferences

The iodometric method suffers interference from reducing substances that react with iodine including thiosulfate, sulfite, and various organic compounds.

Safety Precautions and Waste Handling
All laboratory waste is accumulated, managed, and disposed of in accordance with all federal, state and local laws and regulations.

See *Chemical Hygiene Plan* for general information regarding employee safety, waste management, and pollution prevention.

Personnel Training and Qualifications
All personnel performing this procedure must have documentation of reading, understanding, and agreeing to follow the current version of this SOP and a documented Demonstration of Capability which is maintained in the analyst's training records.

Initially, each technician performing these techniques must work with an experienced technician for a period of time until they can independently perform the procedure. Proficiency is measured through an Initial Demonstration of Capability (IDOC).

The IDOC consists of four aliquots spiked at 1-4X the RL that are carried through all steps of the procedure. The criteria include the calculation of mean accuracy of 50 - 150% and standard deviation of less than 20%.

The DOC consists of four laboratory control spikes (or alternatively, one blind sample for the DOC) that are carried through all steps of the procedure and meet the LCS acceptance criteria and standard deviation of less than 20%.

Sample Collection, Preservation, and Handling
Analyze scrubber solution obtained from prep method 7.3.4 as soon as possible after extraction is completed.

If not analyzing immediately, seal the scrubber bottle and store at 0 to 6°C, not frozen.

Apparatus and Equipment
1. Analytical balance.

2. Class A burette with burette stand, or equivalent

3. 500-mL Erlenmeyer flasks or equivalent

4. pH indicator strips

Reagents and Standards
Alternate weights and volumes are acceptable as long as final concentrations remain the same.

1. Hydrochloric acid (1 + 1) – Mix equal portions of concentrated hydrochloric acid (HCI) and deionized water. Store in a glass container at room temperature and re-evaluate yearly.

2. Starch indicator – Purchased. Store at room temperature. See manufacturer’s label for expiration date.

3. Potassium iodide (KI) crystals – Purchased. Store at room temperature and re-evaluate yearly.

4. 0.025 N potassium bi-iodate – Dry KH (IO3)2 for at least 2 hours at 103° to 105°C and cool approximately one hour in a desiccator. Dissolve 0.8124 ± 0.0002 g KH (IO3)2 in deionized water and dilute to 1000 mL in a volumetric flask. Store in amber glass bottle at room temperature. Stable 1 year.

5. 0.1 N sodium thiosulfate – Purchased. Store at room temperature. See manufacturer's label for expiration date.

6. 0.025 N sodium thiosulfate (Na2S2O3) – Dilute 250 mL of 0.1 N Na2S2O3 (purchased) to 1000 mL with deionized water. Hold time is determined by manufacturer's expiration date for 0.1 N sodium thiosulfate. Store at room temperature. **Standardize weekly** against 0.025 N potassium bi-iodate.

7. 0.025 N iodine solution – Dissolve 20 to 25 g KI in approximately 800 mL of deionized water and add 3.20 ± 0.05 g iodine. Allow plenty of time to dissolve and then dilute to 1000 mL with deionized water in a volumetric flask. Hold time is 1 year. Store in amber glass bottle at room temperature. **Standardize weekly** against 0.025 N sodium thiosulfate.

Calibration

A. Standardization:

Record all standardization in department's solution standardization logbook.

1. 0.025N Sodium thiosulfate

   a. Dissolve approximately 2.0 g KI in an Erlenmeyer flask with approximately 150 mL deionized water. Add a few drops of concentrated H2SO4. Swirl.

   b. Add by pipette, 20 mL of 0.025 N potassium bi-iodate.

   c. Dilute to approximately 200 mL with deionized water. Immediately titrate the liberated iodine with 0.025 N Na2S2O3 titrant to a pale yellow color.

   d. Add enough starch indicator to turn the solution blue, then titrate to the first colorless endpoint.

   e. Perform duplicate trials and average the results.

$$Na_2S_2O_3N = \frac{(20mL KH(IO_3)_2) \times (0.025N\,KH(IO_3)_2)}{mL\ of\ sodium\ thiosulfate\ titrated}$$

2. Iodine

   a. Pipette 10 mL of 0.025 N iodine solution into an Erlenmeyer flask.

   b. Add approximately 90 mL of deionized water.

   c. Titrate immediately with the Na2S2O3 (previously standardized) to a pale yellow color.

   d. Add a few drops of starch solution and titrate to the first colorless endpoint.

   e. Perform duplicate trials and average the results.

$$IodineN = \frac{(mL\ of\ Na_2S_2O_3\ titrated)\ (standardized\ normality\ of\ Na_2S_2O_3)}{10.0\ mL\ iodine\ solution}$$

B. A balance calibration check and level check must be performed each day before use.

Procedure

Add reagents to the Erlenmeyer flask in the exact order stated in this procedure to ensure no sulfide gas is liberated before the titration is performed.

1. Pipette 10 mL of the standardized iodine solution into a 500-mL Erlenmeyer flask.

2. Bring the volume up to approximately 20 mL with deionized water.

3. Add approximately 10 mL of 1 + 1 HCl.

4. Pipette 200 mL of the scrubber solution into the flask, discharging the scrubber solution under the iodine solution surface.

5. Swirl gently.

If the iodine color disappears, add more iodine until the color remains. Record the total amount of iodine solution used. Titrate as usual. Then perform a second trial, adding enough iodine before adding the scrubber solution to maintain the yellow color after the scrubber solution addition.

6. Titrate immediately with standardized $Na_2S_2O_3$ solution to a pale yellow.

7. Add enough starch indicator to turn the solution blue and then titrate to a colorless endpoint.

8. Record the amount of titrant and iodine used.

9. Check the pH of the titrated solution. If the 10 ml of 1 + 1 HCl does not bring the pH down to at least 2, then repeat the titration using enough 1 + 1 HCl to bring the pH down to 2.

10. Document the pH check in LIMS.

Calculations

mg/kg sulfide = [[(A x B) - (C x D)] x (32.06 g/2 eq.) x [(1000mg/g)] / E]x PF

Where:

A = mL of iodine solution
B = Normality of iodine solution
C = mL of Na2S2O3 solution
D = Normality of Na2S2O3 solution
E = mL of sample titrated (200mL)
PF = prep factor (10 g initial to 500mL final volume = 50)

Statistical Information/Method Performance

The method detection limit (MDL) is determined annually by following the procedure outlined in QA-SOP11892.

The quality control acceptance windows are generated annually by following the procedure outlined in QA-SOP11896.

Quality Assurance/Quality Control

1. Batch size - a batch contains up to 20 samples, analyzed within a 24 hour period

2. See Table I for QC acceptance criteria. If acceptable results cannot be obtained and the client requests that the data be reported, the data must be qualified to note that the method criteria were not met.

3. For every batch, a MB, LCS, MS, and MSD must be analyzed. When there is not enough sample to perform a MS/MSD, a DU and LCSD must be performed. See T-WC-WI11574 for the spike preparation instructions.

4. If there are NPDES samples from South Carolina in the batch, then a DU is required in addition to the MS/MSD.

5. Follow Project Notes in the LIMS for any additional unique client requirements.

6. See LIMS for current quality control acceptance windows.

Table I - QC Frequency and Acceptance Criteria

QC Check	Minimum Frequency	Acceptance Criteria	Corrective Action
Method Blank (MB)	1 per batch	<1/2 RL	Re-analyze samples if MB>1/2 RL.
Laboratory Control Sample (LCS) 570 mg/kg	1 per batch	statistical, see LIMS	If reanalysis cannot be performed, data must have an NCM explaining the LCS qualification.
LCSD 570 mg/kg	Per Client or regulatory requirement, OR insufficent sample for MS/MSD	statistical, see LIMS	If reanalysis cannot be performed, data must have an NCM explaining the LCS qualification.
Sample Duplicate (DU)	1 per batch	statistical, see LIMS	Data are qualified
Matrix Spike (MS) 570 mg/kg	1 per batch	statistical, see LIMS	Data are qualified
MSD 570 mg/kg	1 per batch	statistical, see LIMS	Data are qualified

T-WC-WI11574 Reactivity of Waste

End of document

Version history

Version	Approval	Revision information	
11	24.NOV.2020		
12	09.NOV.2021		
13	28.SEP.2023	Reviewed, by UKA1 on 10/3/24 and no changes needed	

Geosyntec
consultants

APPENDIX B

Safety Recommendation for Installation, Operation, & Maintenance of the Free Rotor Mixer & Extruder (Operating Manual for the Mixer/Extrusion Machine)

September 2025

Technical Process & Engineering, Inc.

SAFETY RECOMMENDATIONS for INSTALLATION, OPERATION, & MAINTENANCE



WARNING

- Failure to heed the manufacturer's warnings and/or recommendations regarding the safe installation, operation, and maintenance of the Free Rotor Mixer & Extruder may result in machine failure, serious bodily injury, and/or death. All personnel, no matter how remotely involved in the operation and/or maintenance of the FR mixer, should be thoroughly trained in safe startup, operation, shutdown, lockout, and emergency shutdown procedures.

- Water can cause a potentially hazardous condition when combined with certain chemical compounds or materials during processing.

Index

SAFETY

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Appendix A

I. - WARNING Sign locations on the FR Mixer and auxiliary machinery [Isometric Drawing]

II. - WARNING SIGNS

A. DANGER - Pressure relief device

B. DANGER - HIGH VOLTAGE

C. DANGER - Watch your hands and fingers

D. HAZARD - HOT



1.1

WARNINGS

** Rubber and/or plastic compounds, when mixed together, may have the potential to cause fire and/or explosions. Do not attempt to mix compounds with this potential in the FR mixer;*

** Compounding should be performed in well-lighted, well-ventilated areas;*

** Keep all foreign objects out of the feed hopper and feed throat to avoid possible damage to machinery and/or injury to personnel;*

** The FR mixer contains rotating internal components. Do not operate the FR mixer if any guards and/or covers have been removed; are damaged; or, are inoperable;*

** Do not operate the FR mixer if any mechanical and/or electrical safety features on the machine have been bypassed or defeated;*

** The manufacturer strongly recommends following the Safety Lockout guidelines, contained herein, before attempting to perform any cleaning; maintenance; rotor change-outs; and/or, repair functions on the FR mixer;*

** It is recommended that operators and support personnel wear appropriate eye and ear protection at all times during the operation of the FR mixer;*

** Never reach into, or lean over, the feed hopper or feed throat opening while the FR mixer rotors is running;*

** Never put any part of your body or foreign objects into the mixer feed throat opening or rotor shaft area;*



1.2 **WARNINGS, continued**

** Clean the orifice regularly to ensure safe, reliable operation of the FR mixer (refer to "Shutdown" and "Lockout" procedures herein);*

** Only materials of recommended consistency should ever be permitted into the feed hopper, or feed throat opening. Over-sized materials, and materials of inconsistent size, may tend to block the feed hopper, feed throat, or cause unnecessary stressing of the rotors and other machine parts;*

** The FR mixer and its auxiliary equipment may have operating temperatures in excess of 300 degrees Fahrenheit (149 degrees Celsius) depending upon the process. It is strongly recommended that all contact with discharge stock and/or any part of the mixer and its auxiliary machines be avoided during operation;*

** Due to momentum, the FR mixer will continue to turn for a short time after the electric has been turned off. Keep clear of the feed hopper, feed throat, and orifice discharge areas until the machine has completely come to a stop;*

** Never leave a machine running when unattended;*

** Shut down the machine if anything interferes with its safe operation;*

** All operators and support personnel should be thoroughly trained in all Standard Operational Procedures (SOP's), including emergency shutdown procedures.*



1.3 OPERATOR SAFETY, RECOMMENDATIONS

The manufacturer strongly recommends:

** adhering to all Safety Recommendations herein;*

** that all operators and support personnel wear proper ear and eye protection at all times during the operation of the FR mixer.*

** refraining from working at, or near, the FR mixer with long, free-flowing hair, or loose clothing. Hair should be worn up, shirt tails should be tucked in, and wearing ties at, or around the machine should be avoided. Proper footwear should also be worn to help minimize the potential of being burned by hot compounds;*

** that any broken, inoperable, or missing electrical or mechanical safety device or guard be replaced before operating the FR mixer;*

** that electrical interlock equipment and/or other safety mechanisms be kept in good operating order and never be by-passed or defeated;*

** that all emergency stop devices, controls, and instrumentation be checked on a regular basis for proper operation and never be by-passed or defeated;*

** that operators and/or support personnel immediately inform their supervisor of any problems with operation of the FR mixer;*

** that the FR mixer be cleared of all unnecessary tools, equipment, and personnel before startup;*

** that only qualified, (trained) necessary personnel be at, or around, the FR mixer during startup, operation; or shutdown;*

** no foreign materials ever be permitted to enter the hopper or feed area of the FR mixer.*

1.4 TRAINING PROGRAMS

As a condition of the purchase of an FR mixer, the manufacturer provides in-house orientation for the safe startup, operation, shutdown, and emergency shutdown of the FR mixer.

It is strongly recommended that the purchaser develop and implement an in-house Training Program for the continuing education of all operators and support personnel.



1.5 EMERGENCY SHUTDOWN PROCEDURE

Whenever there is a possibility of a fire or explosion (for example, when the batch temperature rises above the established safe limit), the emergency procedure objective is to cool down the FR mixer and its batch as quickly and as safely as possible.

If the stock temperature rises above the established safe limit, follow the steps below to cool the mix:

1. Turn off the heat to the mixing chamber;

2. Move the divert chute into “divert” position;

3. Open the orifice to the “Full Open” position; and,

4. Reduce rotor speed and increase feed rate, being careful not to stall the machine.

If these measures fail to reduce the stock temperature, refer to your ‘Emergency Stop’ Standard Operational Procedures.



1.6 EMERGENCY STOP PROCEDURE

The manufacturer strongly recommends establishing specific in-plant emergency procedures based upon, but certainly not limited to, the following guidelines.

IMMEDIATELY SHUT OFF POWER TO THE DRIVE MOTORS OF THE FR MIXER AND ALL AUXILIARY MACHINERY.

IMMEDIATELY CLEAR THE AFFECTED AREA AT, AND AROUND, THE MACHINE OF ALL NON-EMERGENCY PERSONNEL.

DO NOT ATTEMPT TO OPEN THE MACHINE.

The steps to follow in emergency situations should be clearly stated in your "Standard Operational Procedures" (SOP's). TP&E suggests the inclusion of the following guidelines in your SOP's, in addition to your own procedures:

Notify the fire department and/or other necessary emergency personnel.



If it is suspected that noxious or toxic fumes are, or may be, present, clear the atmosphere as quickly as possible, keeping all non-emergency personnel away from the mixer until a qualified person has determined that the atmosphere has cleared.



For additional information see
HAZARDOUS SUBSTANCES SECTION 2.6
in this manual.

Do not attempt to open the mixer until qualified personnel have determined that conditions have returned to a safe level.

1.7 TRANSPORTATION and ASSEMBLY

The transporter is responsible to your company for the safe delivery of the FR. Inspect shipment immediately to ensure no damage occurred during shipment. Upon inspection carefully unpack all equipment from wooden shipping crates.

INSTALLATION RECOMMENDATIONS FOR THE FR MIXER

1.8

The installation area as well as the work area at, and around, the FR mixer should be well-illuminated, contain a fume ventilation hood / nozzle above the mixer, and should comply with all trade, local, state, and federal codes and regulations.

Set FR Mixer / Extruder unitized - frame in place.

All water connections for, and to, the FR mixer should be performed only by qualified personnel, and should comply with all trade, local, state, and federal codes and regulations.

All electrical installations for, and to, the FR mixer should be preformed only by qualified personnel, and should comply with all trade, local, state, and federal codes and regulations.

The manufacturer recommends that all electrical installations and grounding requirements comply with at least the following trade guidelines, codes, and regulations:

- National Electrical Code / IEC
- National Standards for Industrial Machines / European Standards for Safety of Machinery
- OSHA Standards / EU OSHA Standards for General Industry
- Comply with all current local, state, and federal codes including, NFPA/Europe-NFPA Codes and OSHA / EU OSHA Regulations.

1.9 **PRE-OPERATIONAL MACHINE CHECK LIST**

The following checklist includes the general features of the FR / EXT. Do Not attempt to start or run the machine before this checklist is completed, to confirm that the machine is ready for operation.

- Is the machine installed according to the instructions in the installation recommendations?
- Are the bearing blocks filled with grease?
- Is the Sumitomo extruder reducer filled with oil?
- Is the water cooling connected to the FR?
- Is the internal water connection between the FR and Extruder done?
- Is the electrical power connected to the control panel and properly grounded?
- Is the electrical power properly phased?
- Is the internal electrical connection made between the FR and Extruder made?
- Are heaters working properly?



2.0 SAFETY 'STARTUP RECOMMENDATIONS FOR THE FR MIXER

The manufacturer recommends drafting and implementing Standard Operating and Training Procedures for the safe startup, operation, shutdown, and maintenance of the FR mixer.

Consistency in the operation of the FR mixer will help to reduce the possibility of damage to the machine and potential injury to operators and/or support personnel.

All operators and maintenance personnel should be thoroughly trained to detect and report any/all unsafe conditions that may exist with the FR mixer.

The manufacturer strongly recommends developing and implementing a continuing safety education program for all operators and support personnel for standard and emergency shutdown scenarios.

The work area at, and around, the FR mixer should be well-lit, well-ventilated, and free of debris and clutter.

Do not operate the FR mixer if mechanical or electrical safety devices, including guards, are removed or rendered inoperable. Immediately repair or replace any guards or other safety devices which are broken, missing, or inoperable.

Never mask or remove any of the "WARNING" signs attached to the FR mixer. These signs are for your personal safety. Immediately replace any sign that has become worn, damaged, or illegible.

Developing and implementing a "Preventive Maintenance" requiring regular periodic inspections of the FR mixer by qualified personnel can help to ensure that the machine is well-maintained and operating properly.



SAFETY STARTUP RECOMMENDATIONS

2.0

For safe operation of the FR mixer, keep the machine and surrounding area clear of all clutter and debris.

Do not run the machine with guards and/or covers removed.

Do not allow metal and/or other foreign objects to enter into the hopper or feed throat of the machine.

When cleaning the FR mixer, do not use tools that could potentially scratch, gouge, or in any other way compromise the hard finish on the inside of the feed hopper, feed throat opening, rotors, liners, or vent plunger, or any other part of the machine.

The Operator's touch screen can be cleaned with a soft, dry cloth.

Be sure all grease points are serviced at the start of each shift.

Check fasteners for tightness.

Check electrical plugs for complete connections.

Extreme care should be taken when cleaning plastic from, and around, the thermocouples, heater wires, and flexible conduit to avoid electrocution and/or damaging electrical connections.

Allow a cold empty mixer and extruder to pre heat for fifteen minutes after it has reached its set temperature before feeding material.

Check to ensure that there is free water flow to the FR mixer.

Allow the mixer to reach its set speed before introducing material.



SAFETY STARTUP RECOMMENDATIONS

2.0 Immediately address any/all mixer alarm issues before proceeding with start-up, operation, or shutdown of the FR mixer.

Use care not to crush flexible conduit containing wiring for heaters, thermocouples, vent plungers, and/or other electrical apparatus.

2.1 MAINTENANCE SAFETY RECOMMENDATIONS



Before beginning any repairs or inspections of the FR mixer, first, make sure the main electrical supply in the "OFF" position.



Never attempt to perform any maintenance or inspection until you have determined that the FR mixer has come to a complete stop and that the main electrical supply is in the "OFF" position.



Ensure that all moving parts have come to a complete stop before performing any cleaning or maintenance of internal components. Never remove any guards or safety devices until the FR mixer has been shut down and the power has been turned off to the FR.



Take all necessary precautions to prevent the possibility of intentional or accidental mixer component activation.

Always use appropriate tools and equipment to perform maintenance and inspection.

Always contact Technical Process & Engineering, Inc. for all FR mixer replacement parts.

Be sure to replace all guards and/or safety devices before initiating the start-up sequence for the FR mixer.

For optimum operating efficiency and safety, always keep the FR mixer and surrounding area free of debris and clutter.

FR MIXER MOTOR REPLACEMENT RECOMMENDATIONS

2.2



Never attempt to perform any maintenance or inspection until you have determined that the FR mixer has come to a complete stop and that the main electrical supply is in the "OFF" position.

Always use appropriate tools and equipment to perform maintenance and inspection.

The electrical wiring should removed from the motor, and moved away from the FR mixer.

Remove the yellow coupling guard, which covers the output shaft of the motor. This will expose the drive coupling for the FR mixer.

The drive coupling halves will now need to be loosened on the shafts, and moved apart from one another to make a gap between the shafts.

The weight of the motor is 379 lbs. (172 kg.) The chain used must be of the correct size, and capacity to lift the motor with the supplied lifting eye.

The equipment used to lift the motor must also be of adequate size for the lift.

The lifting equipment and the chain can now be connected to the motor, and the four mounting bolt can be loosened and removed.

The motor can now be lifted from the FR mixer base assembly.

The new motor can be installed in the reverse order as the old motor was removed.
Once the new motor has been mounted on the base, be sure to replace all guards and/or safety devices before initiating the start-up sequence for the FR mixer.

2.3 

HAZARDOUS SUBSTANCES

Recommended Base Resins

Polypropylene	Ethylene Vinyl Acetate
Polystyrene	Polyester
Polyvinylchloride	Nylon
Polycarbonate	Acrylic



UNKNOWN MATERIALS DISCLAIMER

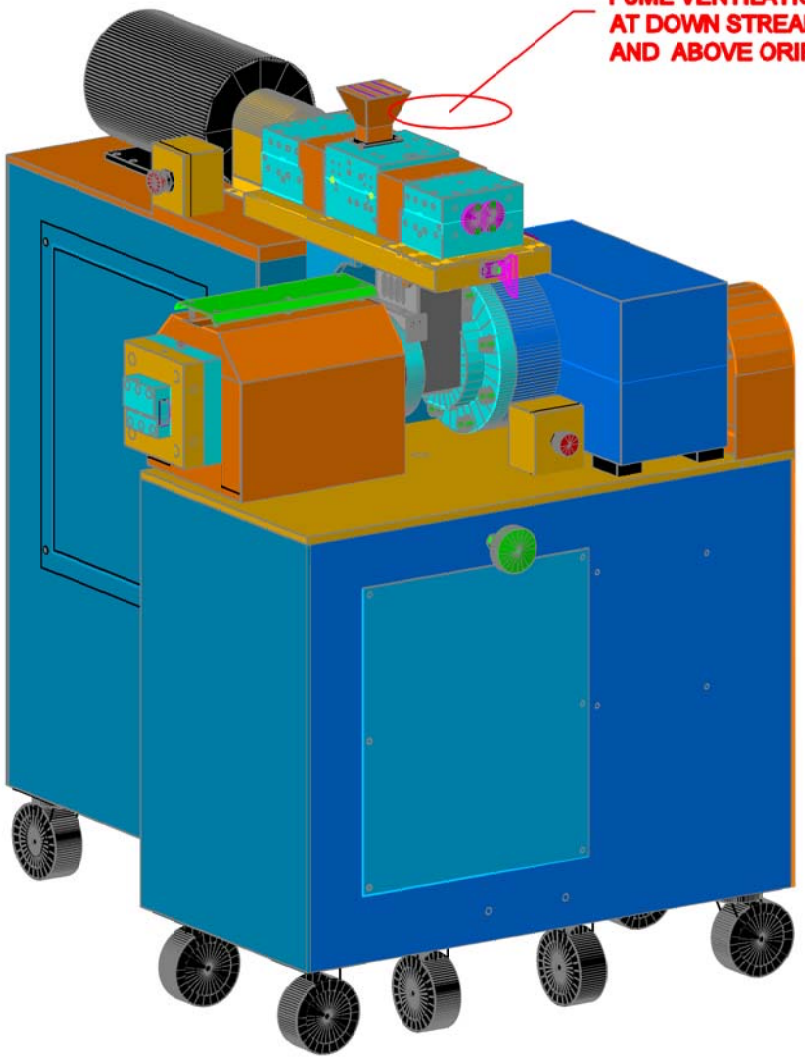
****** It is the responsibility of the end user to verify the safety of the materials to be compounded within the machine. The chemistry of ALL materials must be known to assure safe operation, and prevent unwanted reactions.***
TPEI accepts no responsibility for any damages to machinery, personnel, or facilities resulting from unsafe formulations. ***

2.4 

NOXIOUS or TOXIC FUMES

Polymer fumes can be noxious and/or toxic. TPEI recommends the placement of a Fume Ventilation Hood / Nozzle above the FR mixer. *(See print next page for recommended Fume Ventilation location.)*

FUME VENTILATION



TECHNICAL PROCESS & ENGINEERING,INC			
CONFIDENTIAL / PROPRIETARY INFORMATION NOT TO BE COPIED WITHOUT WRITTEN PERMISSION			
DATE: 01/18/16	SCALE: none	DRAWN BY: DEW	
		APPROVED BY	CHECKED BY
TITLE: FUME VENTILATION			
RSS: 1FR-S	DRAWING NUMBER: SHEET NO. 1 OF 1		1FRS1816

2.8 CLEANING SAFETY RECOMMENDATIONS

Shut down at the control panel and be positive all moving parts have stopped before beginning any cleaning activities on the FR.

 **WARNING**: NEVER ENTER THE MIXER OR INSERT ANY PART OF YOUR BODY OR FOREIGN OBJECT INTO THE MIXING CHAMBER WHILE THE FR MIXER IS RUNNING!!

The manufacturer recommends wearing safety glasses and appropriate protective clothing whenever working on, or around, the FR mixer.

The manufacturer recommends using a clean-out compound for purging the mixing chamber and rotor surfaces between compound runs. The clean-out compound should have a higher viscosity than the compounds previously mixed and should have good thermal stability within standard operating range. A natural rubber is useful as a clean-out material if the machine is being used to mix rubber.

- TP&E recommends using high-density polyethylene pellets as a clean-out compound when the machine has been used to mix plastics.

NEVER, under ANY circumstances, use ridged steel tools to clean the mixer.

Use ONLY brass, or other soft tools, to remove or loosen material from the mixer body rotors and other components.

TP&E recommends using only the following tools for efficient cleaning:

- Brass scrapers of varying shapes and sizes.
- Copper wool.
- Rotary bronze, or brass, wire brushes (used with portable, electric, or pneumatic drills or grinders).

3.0 # OPERATION

MIXER & EXTRUDER

These pages outline basic procedures for startup and operation of the FR Mixer and the Extruder. Prior to the first production run of the machine insure that the Pre-Operation Checklist has been completed.

3.1 DAILY PRE-OPERATION CHECKLIST

Daily Safety Check

- ☐ All electrical connections are properly functioning.
- ☐ Water supply and return lines functioning.
- ☐ Extruder gearbox properly lubricated.
- ☐ All grease fittings have been serviced.
- ☐ All guards are properly affixed.
- ☐ Machine is free from all dirt debris and foreign objects.



*****ALERT ALL PERSONNEL IN THE AREA, AND ENSURE THEY ARE CLEAR OF THE MACHINE BEFORE PERFORMING MOTOR TESTS*****

3.2 MOTOR ROTATION CHECKS

- Main Motor Test instructions:
  a) Uncouple
  b) Verify rotational direction
  c) Confirm RPM and Motor Load displays are accurate
- Reconnect motor coupling
- Briefly activate motor to verify correct rotation of machine components

STARTUP



*****ALL OPERATING PERSONNEL MUST READ & UNDERSTAND THE SAFETY MANUAL!!*****

3.3

MIXER START-UP

The machine requires no “break in procedure” a dry run is suggested to verify proper cooling of the bearing blocks and proper heater function. This time should also be used to familiarize oneself with the machine controls and functions.

GENERAL

1) Turn on main power.
2) Energize control cabinet.
3) Set cooling supply and return lines to open position.

MIXER HEATER STARTUP

1) Turn on mixer heat zones.
2) Set to 250°F (121°C)
3) Check that the heaters are functioning properly, and that the correct controllers are controlling the proper zone.
4) Verify thermocouple function.
5) Increase heater set point to 300°F (149°C). Allow the machine reach the temperature set point. Again set the temperature to 250°F (121°C). Verify proper cooling function.

3.4

EXTRUDER STARTUP

1) Follow the same procedure for each of the extruder's temperature zones.
2) Set the extruder to 5 RPM and verify that the screw turns freely.

*****DO NOT RUN THE EXTRUDER EMPTY FOR EXTENDED PERIODS OF TIME. DOING SO WILL DAMAGE THE SCREW AND BARREL*****

3) Once proper function has been verified power down the machine.
4) Allow the machine to return to room temperature.
5) Remove the barrel cover. Check the straps of the band heaters for tightness. Tighten if necessary. Solid contact will prolong heater life.

3.5

OPERATING / RUNNING

The Mixer and Extruder will provide years of low maintenance operation if properly cared for and operated.

This section will illustrate basic points of operation and describe several process variables that can be manipulated to produce the best results. The variety of compounds that can be created in the FR is nearly infinite so specific definition of process parameters for all materials is impossible.

The operator can control:

- Feed Rate
- Rotor Speed
- Orifice Opening
- Process Temperature
- Extruder Screw Speed

These are the variables that allow the machine to adapt to the materials being compounded.

PRE-HEAT

Before operation pre-heat the machine as follows:

1) Turn on the control panel.
2) Turn on the heat controllers.
3) Set the desired temperature for the various temperature zones.
4) Allow the machine to heat up to the desired set point. If there is residual material left in the machine from a previous run, extend the pre-heat time to ensure that all material has melted.

3.6 **PRE-OPERATIONAL CHECKS**

The following checklist is to be completed before operating the machine.

- Clean the area surrounding the FR mixer.
- Clean the FR mixer itself.
- Ensure that all fasteners are tightened.
- Remove loose tools and objects from the machine and its surrounding area.
- Verify that all safety switches and interlocks are functioning properly.
- Check gear reducer oil level.
- Apply grease to grease fittings if needed.
- Confirm that all ancillary equipment is ready to run i.e. feeders, pelletizers.

STARTING PROCEDURE

3.7 MIXER

1) Move the extruder feed throat guard to the divert position.
2) Set the mixer rotor speed to the desired RPM.
3) Close the orifice gate
4) Set feeder controls to 30% of maximum anticipated production rate. DO NOT START THE FEEDER AT THIS TIME
5) Start the mixer.
6) Start the feeder.
7) Observe the mixer ammeter. When the amp load rises begin to open the orifice until fluxed material is observed in the extruder feed throat.

3.8 EXTRUDER

1) Set the extruder control to 5 RPM's.
2) Start the extruder.
3) Move the extruder feed throat guard to the feed position.
4) Adjust the extruder screw speed to maintain a small ball of material in the feed throat.
5) Follow the manufacturer's instructions for all downstream processing equipment.

SHUTDOWN PROCEDURE

3.9 BASIC EMPTYING SHUTDOWN

1) Stop feeder.
2) Turn off mixer heats.
3) Place the extruder feed throat guard in the divert position.
4) Reduce rotor speed
5) Fully open the orifice
6) Stop the rotors
7) Carefully remove plastic from the orifice.
8) Fully close the orifice.
9) Run the extruder until it no longer discharges material.
10) Shut down the motors and heaters.
    a. Open the extruder swing gate. Allow the screw to pump out the rest of the material. Stop the screw
    b. Open the extruder feed throat and remove any material from the feed throat.
11) Turn off the cooling supply and return lines.
12) Turn off the power to the main control panel.

4.0 PURGING SHUTDOWN

Purge by feeding at a low rate:

- Purging compound
- Base resin from the finished run
- Stiffer resin

Continue feeding until all of the previous material is removed from the machine. Once the purge is complete proceed with the **Basic Emptying Shutdown.**

PLACE HANDS AND FINGERS
SIGN IN THIS AREA
BY MIXER FEEDTHROAT

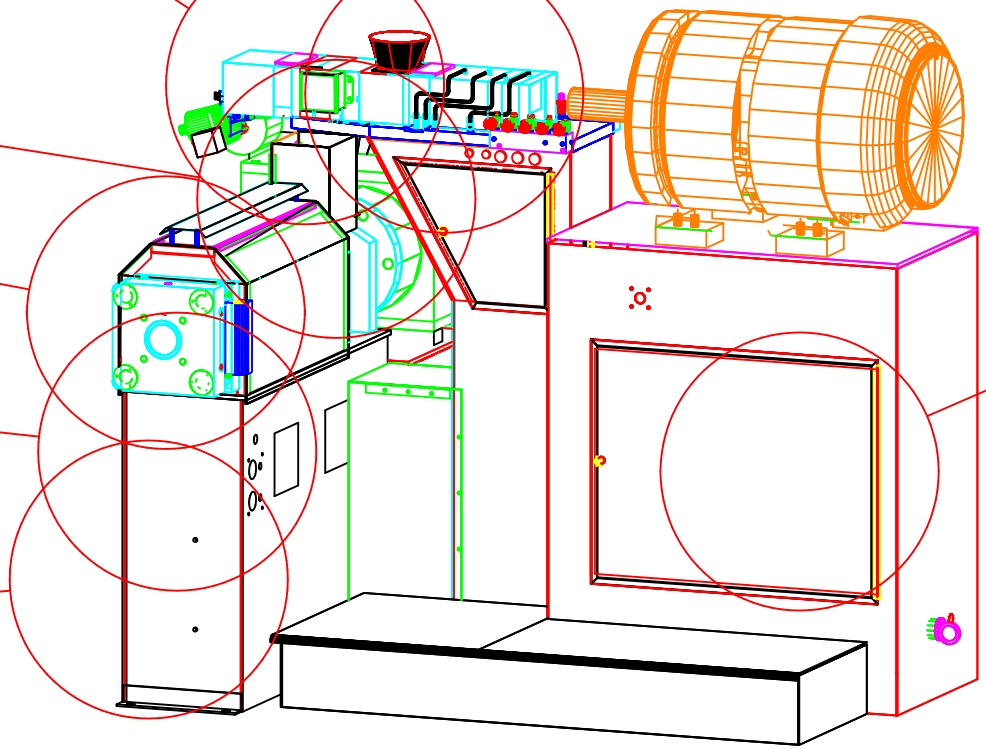
PLACE HOT SIGN
VISIBLE IN
THIS AREA

PLACE HANDS AND FINGERS
SIGN IN THIS AREA
BY EXTRUDER FEEDTHROAT

PLACE HOT SIGN
VISIBLE IN
THIS AREA

PLACE PRESSURE RELIEF
DEVICE SIGN
VISIBLE IN THIS AREA

PLACE HIGH VOLTAGE
SIGN ON JIC BOX
INSIDE EXTRUDER BASE

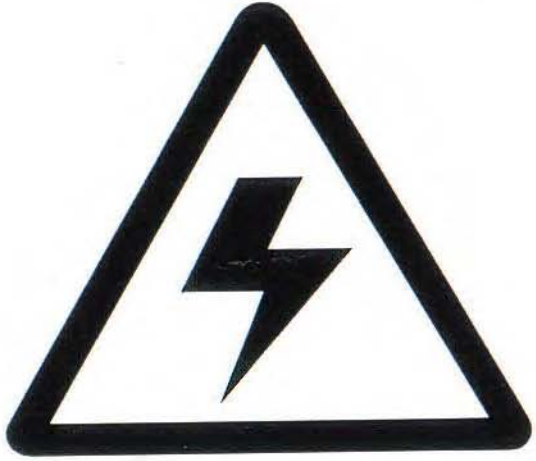


PLACE HIGH VOLTAGE
SIGN ON JIC BOX
INSIDE MIXER BASE

TECHNICAL PROCESS & ENGINEERING,INC			
DATE 9/17/03	SCALE none	DRAWN BY: REB	
		APPROVED BY	CHECKED BY
TITLE DANGER SIGN PLACEMENT			
RES:	DRAWING NUMBER		
	SHEET NO. 1 OF 1		

DANGER

HIGH VOLTAGE, TURN OFF POWER BEFORE SERVICING



17881



HOT

48964



PRESSURE RELIEF DEVICE

YOU MAY BE INJURED BY A LOUD NOISE, VENTING LIQUIDS OR GASES, OR FLYING DEBRIS.

A6778-1

USA

DANGER

WATCH YOUR HANDS AND FINGERS



48962

Geosyntec consultants

APPENDIX C

Example LLDPE SDS Specification Sheet

September 2025

MATERIAL SAFETY DATA SHEET

Linear Low Density Polyethylene (LLDPE)

1. SUBSTANCE/PREPARATION & COMPANY/UNDERTAKING IDENTIFICATION

Chemical Name & Synonyms	: Linear Low Density Poly Ethylene (LLDPE)
Trade Name	: OPALENE-LL
Chemical Family	: Polyolefin
C.A.S. No.	: **25087-34-7**
Manufacturer's Name	: **ONGC Petro additions Limited**
Address	: Polymer Marketing Group: 1st Floor, Omkara Complex, Sai Chowkdi,
	Manjalpur, Vadodara-390011, Gujarat, India
Telephone No.	: +91 265 6192600
Fax No.	: +91 265 6192666
Corporate Site	: www.opalindia.in

2. COMPOSITION & INFORMATION ON INGREDIENTS

CHEMICAL NAME	CONTENT (Normal)*	CAS NUMBER	EXPOSURE LIMITS IN AIR		
			ACGIH TLV-TWA	ACGIH TLV-STEL	IDLH
Linear Low Density Polyethylene	>=99 wt%	25087-34-7	10 mg/m^3 (inhalable fraction)	NA	NA
Proprietary additives	<=1 wt%	Mixture	NA	NA	NA
Hazardous Components	None	NA	NA	NA	NA
* For different grades of LLDPE, minor changes may be there.					

3. HAZARDS IDENTIFICATION

- Physio-chemical properties : No hazards resulting from material as supplied.
- Properties affecting health : No hazards resulting from material as supplied.
- Environmental properties : No hazards resulting from material as supplied.

Classification System

- This material is not hazardous by OHSA hazard communication definition.
- Dust may form explosive mixtures with air.
- At process Temperature irritating fumes may be produced.
- The preparation does not meet the criteria for classification in accordance with Directive 1999/45/EC and Directive 1272/2008/EC

4. FIRST AID MEASURES

GENERAL INFORMATION
At room temperature the product is neither an irritant nor gives off hazardous vapours. The measures listed below apply to critical situations (Fire, incorrect process conditions).

- **Skin Contact**
  If molten material contacts the skin it may cause thermal burns, immediately flush with large amounts of cold water to cool the affected skin and polymer. Do not attempt to peel the polymer from skin. Obtain immediately emergency medical attention if burn is deep or extensive.
- **Eye Contact**
  Dust, fines and process vapours may irritate the eyes. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek medical attention if discomfort persists.
- **Inhalation**
  Dust and process vapours may irritate the nose, throat and respiratory tract. If symptoms are experienced, move victim to fresh air. Obtain medical attention if breathing difficulty persists.
- **Ingestion**
  Adverse health effects due to ingestion are not anticipated. Do not induce vomiting. If symptoms develop, obtain medical attention.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	As appropriate for surrounding fire. Extinguish preferably with foam, carbon Dioxide, water/water mist or dry chemical.
Unsuitable Extinguishing Media	Do not use high volume water jet or waterspray.
Fire Fighting Protective Equipment	A self-contained breathing apparatus and suitable protective clothing, eye protection etc should be used in fire conditions.
Hazardous Decomposition Product	Combustion or thermal decomposition will evolve toxic and irritant vapours.
Unusual Fire & Explosion hazards	Polymer dust particles in the atmosphere are combustible and may be explosive. CO, olefinic and paraffinic compound, trace amount of organic acids, ketones, aldehydes and alcohols may be formed during combustion.
Other	Can melt and burn in a fire. Molten material tends to flow or drip and will propagate fire.

6. ACCIDENTAL RELEASE MEASURES

- **Personal Precautions :**
  - Avoid generating dust. Potential dust explosion hazard. Use only non-sparking tools.
  - Material creates dangerous slipping hazard on hard surfaces.
  - Ensure adequate ventilation, especially in confined areas. In case of insufficient ventilation wear suitable respiratory equipment.
- **Environmental Precautions :**
  - Avoid release to environment. Do not allow to enter drains, sewers or watercourses.
- **Methods of cleaning up**
  - Take up mechanically and collect in suitable container for disposal.
  - Good housekeeping must be maintained to avoid potential slipping problem.
  - Keep walking surface free of spilled material to avoid slipping hazard.

7. HANDLING AND STORAGE

- **Handling :**
  - No special requirements necessary, if handled at room temperature.
  - Avoid spilling the product, as this might cause falls.
  - Will accumulate static charges that may cause an electric spark (ignition source).
  - Take precautionary measures against static discharges.
  - Do not eat, drink or smoke at the work place.
  - After handling, wash face and hands before eating, drinking or smoking.

- **Storage :**

Requirements to be met by storerooms and containers:

- This product may react with strong oxidising agents & should not be stored near such materials.
- Store the bags in areas protected with automatic sprinklers.
- Storage temperature should be ambient. (preferably below 50 ^{o}C)
- Open flames prohibited.
- Store the product in bags, car silos, container, or large cartons to avoid contamination.

Further information about storage conditions:

- Protect from heat and direct sunlight.
- Store container in a well ventilated position.
- Store under dry conditions.
- **Specific applications:** For industrial use only**,** for safe stacking follow the storage recommendations specific for this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

Use in a well-ventilated area. If handling results in dust generation, special ventilation may be needed to minimize dust exposure. If heated material generates vapour or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure.

Occupational Exposure Limits:

Substance	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m^3)	STEL (ppm)	STEL (mg/m^3)	Remark
Linear Low Density Polyethylene	25087-34-7	No Occupational Exposure limit assigned				
Inert or Nuisance Dust	-		15			Total dust
			5			Respirable dust

* The USA-OSHA PEL for respirable dust is 5.0 mg/m^3 and 15.0 mg/m^3 for total dust.
* The ACGIH Guideline for respirable dust is 3.0 mg/m^3 and 10.0 mg/m^3 for total dust.

PERSONAL PROTECTIVE EQUIPMENT:

- **Respiratory system**

Product processing, heat sealing of film or operations involving the use of wires or blades heated above 300°C may produce dust, vapour or fumes. To minimize risk of over exposure to dust, vapour or fumes it is recommended that a local exhaust system is placed above the equipment, and that the working area is properly ventilated. If ventilation is inadequate, use certified respirator that will protect against dust/mist.

- **Skin and body**

Hot material: Wear heat-resistant protective gloves, clothing and face shield able to withstand the temperature of the molten product. Cold material: None required; however, use of gloves is good industrial practice.

- **Hand**

Hot material: Wear heat-resistant protective gloves able to withstand the temperature of the molten product. Cold material: None required; however, use of gloves is good industrial practice.
The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

- **Eyes**

Safety glasses with side shields. Use dust goggles if high dust concentration is generated.

- **Environmental Protection**

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information	
Form	Solid Granules
Colour	Translucent to White
Odour	Odourless
Melting point/Melting range	115-135°C
Boiling Point (^{o}C)	Not Applicable
Flash point	> 300^{o}C
Auto Ignition temperature	> 300°C
Decomposition temperature	> 300°C
Danger of explosion	Product is not explosive.
Density	0.910-0.950 g/cm^{3}
pH (Value)	Not Applicable
Vapour Pressure (Pascal)	Not Applicable
Percent Volatile by volume (%)	<0.1
Solubility in / Miscibility with Water	Insoluble

10. STABILITY AND REACTIVITY

- **Chemical stability**

This product is stable under normal use conditions for shock, vibration, pressure or Temperature. Decomposes at prolonged heating above 300^{0}C.

- **Chemical stability - Condition to Avoid**

Avoid strong oxidizing agents. Avoid Processing Material over 300°C. Avoid Heat & direct sunlight.

- **Hazardous Polymerisation**

Not likely to occur

- **Corrosivity**

Product is not corrosive

- **Materials to avoid**

Direct contact with open flames, self-igniting and explosive materials.

- **Dangerous products of decomposition:**

No hazardous decomposition products known at room temperature. At elevated temperature the material will begin to decompose producing fumes that can contain CO_2, CO, Ketones & Aldehydes.

11. TOXICOLOGICAL INFORMATION

Low toxicity under normal conditions of handling and use.

ACUTE TOXICITY:

Primary irritant effect:

- **On the skin** : No irritant effects from normal handling and use. Dust may have irritant effect on skin.
- **On the eye** : No irritant effect. Dust may have irritant effect on eyes. Permanent damage is unlikely.
- **Sensitization** : No sensitizing effect known.
- **Ingestion** : Low oral toxicity. Linear Low Density Polyethylene:LD50, oral (rat) : >5000 mg/kg
- **Inhalation** : Low acute toxicity. Dusts and vapours or fumes evolved during thermal processing may cause irritation to the respiratory system.

CHRONIC TOXICITY:

On long term exposure: Chronic effects unlikely

- Carcinogenic effects : No information available
- Mutagenic effects : No information available
- Reproductive toxicity: No information available

ADDITIONAL TOXICOLOGICAL INFORMATION:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

12. ECOLOGICAL INFORMATION

- **Information about elimination (persistence and degradability):** The product is not biodegradable.
- **Effect of material on Plants or Animals :** Eco-toxicity is expected to be minimal based on the low water solubility of polymers.
- **Toxicity:** This material is not volatile and it is insoluble in water. Low toxicity to aquatic organisms.
- **Effect on Effluent Treatment:** Unlikely to affect biological treatment processes.

General notes:
The product is not toxic, small particles can have physical effects on water and soil organisms.

13. DISPOSAL CONSIDERATIONS

Product:
Recommendation:

- Recycle (Reprocess)
- Do not allow to enter drains, sewers or watercourses.
- Disposal through landfilled or controlled incineration or authorised waste dump in accordance with Local, State or National Regulations.
- Waste generators must determine whether a discarded chemical is classified as a hazardous waste.

Uncleaned Packaging:
Recommendation:

- Disposal must be done according to local/official regulations. Refer to manufacturer/supplier for information on recovery/recycling.

14. TRANSPORT INFORMATION

- Land transport
  ADR/RID Class: Not classified as dangerous in the meaning of transport regulations.
- Sea transport
  IMDG Class: Not classified as dangerous in the meaning of transport regulations.
- Air transport
  ICAO/IATA Class: Not classified as dangerous in the meaning of transport regulations.

15. REGULATORY INFORMATION

National regulations, other regulations, limitations and prohibitive regulations

- EC Classification : Not classified as dangerous for supply/use.
- Hazard Symbol : Not applicable.
- Risk Phrases : Not applicable.
- Safety Phrases : Not applicable.

LLDPE manufactured by OPaL shall meet the requirement stipulated in IS: 10146 on ñSpecification for Polyethylene and its copolymer for safe use in contact with foodstuff, Pharmaceuticals & Drinking Waterò Additives incorporated in this product shall conform to the positive list of constituents as prescribed in IS: 10141. The product & additives incorporated in it shall also comply with FDA: CFR Title 21,177.1520 Olefin Polymers.

For specific regulatory compliance related information please contact OPaL.

16. OTHER INFORMATION

The information provided in this Material Safety Data Sheet has been based upon the current level of information available, for the purpose of specifying the requirements regarding environment, health and safety in conjunction with the product. They are not to be interpreted as a warranty for specific product characteristics. OPaL takes no responsibility for inappropriate use, processing and handling by purchasers and users of the product. The data provided here is applicable only to the Product sold by OPaL and not to products sold by others. It relates only to the Product and does not relate to its use in combination with any other product or material or in any process. Local laws and regulations and conditions of use and suitability of the product for particular uses are beyond the control of OPaL; all risks of use, storage, handling, transportation and disposal of the Product are therefore assumed by the user and OPaL expressly disclaims all warranties of every kind and nature, including warranties of merchantability and fitness for a particular purpose in respect to the use or suitability of the Product. OPaL shall not be responsible for any damage or injury resulting from abnormal use of the Product, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the Product. Appropriate warnings and safe handling procedures should be provided to all handlers and users.

Geosyntec
consultants

APPENDIX D

Laboratory Reports from Eurofins Laboratory

September 2025

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Paul Canevaro
Republic Services Inc
106130 W. Sam Houston Parkway N
Suite 300
Houston, Texas 77064

Generated 1/29/2025 11:58:31 AM

JOB DESCRIPTION

Republic Services Mercury Project REVISE

JOB NUMBER

180-179481-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.

my EOL

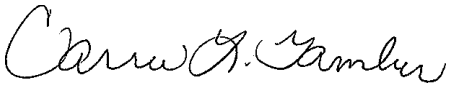
Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

Authorization



Generated
1/29/2025 11:58:31 AM

Authorized for release by
Carrie Gamber, Senior Project Manager
Carrie.Gamber@et.eurofinsus.com
(412)963-2428

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CASE NARRATIVE

Client: Republic Services Inc

Project: Republic Services Mercury Project REVISE

Report Number: 180-179481-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 09/06/2024; the samples arrived in good condition. The temperature of the cooler at receipt time was 19.1°C. Thermal preservation not required.

METALS
The following samples were initially analyzed within the hold time, but was reanalyzed outside of analytical holding time to confirm results. Only the out of hold analysis was reported: LCS T01 (180-179481-74), LCS T02 (180-179481-75), LCS T05 (180-179481-78), LCS T06 (180-179481-79) LCS T07 (180-179481-80), LCSD T01 (180-179481-83),), LCSD T05 (180-179481-87), LCSD T06 (180-179481-88) and LCSD T07 (180-179481-89).

Several samples were re-analyzed outside of analytical holding time both results were reported.

Sodium was detected in method blank MB 410-574859/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

GENERAL CHEMISTRY
The DOC raw data for the following samples show the analysis preformed in 2010. This is due to an error that has no affect on the samples. The time in the run log shows the correct time of analysis. R-5877 T09 (180-179481-9), R-5878 T09 (180-179481-18), R-5879 T09 (180-179481-27), (CCB 180-488181/15), (CCV 180-488181/14), (ICB 180-488181/3), (ICV 180-488181/2), (LCS 180-488181/4), (MB 180-488181/5), (180-179481-A-9-A MS) and (180-179481-A-18-A DU)

Definitions/Glossary

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
B	Analyte was found in the blank.
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
!	Laboratory is not accredited for this parameter.
H3	Sample was received and analyzed past holding time. This does not meet regulatory requirements.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	02-00416	04-30-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
5310C-2014		Solid	Dissolved Organic Carbon - Quad
SM 2510B		Solid	Specific Conductance
SM 2580B		Solid	Oxidation Reduction Potential

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-26
A2LA	Dept. of Energy	0001.01	11-30-26
A2LA	ISO/IEC 17025	0001.01	11-30-26
Alabama	State	43200	01-31-25
Alaska	State	PA00009	06-30-25
Alaska (UST)	State	17-027	02-28-25
Arizona	State	AZ0780	03-12-25
Arkansas DEQ	State	88-00660	08-09-25
California	State	2792	01-31-25
Colorado	State	PA00009	06-30-25
Connecticut	State	PH-0746	06-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-25
Delaware (DW)	State	N/A	01-31-26
Florida	NELAP	E87997	06-30-25
Georgia (DW)	State	C048	01-31-25
Hawaii	State	N/A	01-31-25
Illinois	NELAP	200027	01-31-26
Iowa	State	361	03-01-26
Kansas	NELAP	E-10151	10-31-25
Kentucky (DW)	State	KY90088	12-31-25
Kentucky (UST)	State	0001.01	11-30-26
Kentucky (WW)	State	KY90088	12-31-25
Louisiana (All)	NELAP	02055	06-30-25
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-25
Massachusetts	State	M-PA009	06-30-25
Michigan	State	9930	01-31-25
Minnesota	NELAP	042-999-487	12-31-25
Mississippi	State	023	01-31-25
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-26
Nebraska	State	NE-OS-32-17	01-31-25
New Hampshire	NELAP	2730	01-10-26
New Jersey	NELAP	PA011	06-30-25
New York	NELAP	10670	04-01-25
North Carolina (DW)	State	42705	07-31-25
North Carolina (WW/SW)	State	521	12-31-25
North Dakota	State	R-205	01-31-24 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Oklahoma	NELAP	9804	08-31-25
Oregon	NELAP	PA200001	09-11-25
Pennsylvania	NELAP	36-00037	01-31-26
Quebec Ministry of Environment and Fight against Climate Change	PALA	507	09-16-29
Rhode Island	State	LAO00338	12-30-25
South Carolina	State	89002	01-31-25
Tennessee	State	02838	01-31-25
Texas	NELAP	T104704194-23-46	08-31-25
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-25
Virginia	NELAP	460182	06-14-25
Washington	State	C457	04-11-25
West Virginia (DW)	State	9906 C	01-31-25
West Virginia DEP	State	055	07-31-25
Wyoming	State	8TMS-L	01-31-25
Wyoming (UST)	A2LA	0001.01	11-30-26

Sample Summary

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-179481-1	R-5877 T01	Solid	08/27/24 15:00	09/06/24 10:00
180-179481-2	R-5877 T02	Solid	08/27/24 15:00	09/06/24 10:00
180-179481-3	R-5877 T03	Solid	08/27/24 15:00	09/06/24 10:00
180-179481-4	R-5877 T04	Solid	08/27/24 15:00	09/06/24 10:00
180-179481-5	R-5877 T05	Solid	08/27/24 15:00	09/06/24 10:00
180-179481-6	R-5877 T06	Solid	08/27/24 15:00	09/06/24 10:00
180-179481-7	R-5877 T07	Solid	08/27/24 15:00	09/06/24 10:00
180-179481-8	R-5877 T08	Solid	08/27/24 15:00	09/06/24 10:00
180-179481-9	R-5877 T09	Solid	08/27/24 15:00	09/06/24 10:00
180-179481-10	R-5878 T01	Solid	08/28/24 15:00	09/06/24 10:00
180-179481-11	R-5878 T02	Solid	08/28/24 15:00	09/06/24 10:00
180-179481-12	R-5878 T03	Solid	08/28/24 15:00	09/06/24 10:00
180-179481-13	R-5878 T04	Solid	08/28/24 15:00	09/06/24 10:00
180-179481-14	R-5878 T05	Solid	08/28/24 15:00	09/06/24 10:00
180-179481-15	R-5878 T06	Solid	08/28/24 15:00	09/06/24 10:00
180-179481-16	R-5878 T07	Solid	08/28/24 15:00	09/06/24 10:00
180-179481-17	R-5878 T08	Solid	08/28/24 15:00	09/06/24 10:00
180-179481-18	R-5878 T09	Solid	08/28/24 15:00	09/06/24 10:00
180-179481-19	R-5879 T01	Solid	08/29/24 11:00	09/06/24 10:00
180-179481-20	R-5879 T02	Solid	08/29/24 11:00	09/06/24 10:00
180-179481-21	R-5879 T03	Solid	08/29/24 11:00	09/06/24 10:00
180-179481-22	R-5879 T04	Solid	08/29/24 11:00	09/06/24 10:00
180-179481-23	R-5879 T05	Solid	08/29/24 11:00	09/06/24 10:00
180-179481-24	R-5879 T06	Solid	08/29/24 11:00	09/06/24 10:00
180-179481-25	R-5879 T07	Solid	08/29/24 11:00	09/06/24 10:00
180-179481-26	R-5879 T08	Solid	08/29/24 11:00	09/06/24 10:00
180-179481-27	R-5879 T09	Solid	08/29/24 11:00	09/06/24 10:00
180-179481-28	R-5877 T01	Water	11/04/24 11:35	09/06/24 10:00
180-179481-29	R-5877 T02	Water	11/05/24 09:35	09/06/24 10:00
180-179481-30	R-5877 T03	Water	11/06/24 09:35	09/06/24 10:00
180-179481-31	R-5877 T04	Water	11/11/24 09:35	09/06/24 10:00
180-179481-32	R-5877 T05	Water	11/18/24 09:35	09/06/24 10:00
180-179481-33	R-5877 T06	Water	12/02/24 09:35	09/06/24 10:00
180-179481-34	R-5877 T07	Water	12/16/24 09:35	09/06/24 10:00
180-179481-35	R-5877 T08	Water	12/23/24 09:35	09/06/24 10:00
180-179481-36	R-5877 T09	Water	01/06/25 09:35	09/06/24 10:00
180-179481-37	R-5878 T01	Water	11/04/24 11:35	09/06/24 10:00
180-179481-38	R-5878 T02	Water	11/05/24 09:35	09/06/24 10:00
180-179481-39	R-5878 T03	Water	11/06/24 09:35	09/06/24 10:00
180-179481-40	R-5878 T04	Water	11/11/24 09:35	09/06/24 10:00
180-179481-41	R-5878 T05	Water	11/18/24 09:35	09/06/24 10:00
180-179481-42	R-5878 T06	Water	12/02/24 09:35	09/06/24 10:00
180-179481-43	R-5878 T07	Water	12/16/24 09:35	09/06/24 10:00
180-179481-44	R-5878 T08	Water	12/23/24 09:35	09/06/24 10:00
180-179481-45	R-5878 T09	Water	01/06/25 09:35	09/06/24 10:00
180-179481-46	R-5879 T01	Water	11/04/24 11:35	09/06/24 10:00
180-179481-47	R-5879 T02	Water	11/05/24 09:35	09/06/24 10:00
180-179481-48	R-5879 T03	Water	11/06/24 09:35	09/06/24 10:00
180-179481-49	R-5879 T04	Water	11/11/24 09:35	09/06/24 10:00
180-179481-50	R-5879 T05	Water	11/18/24 09:35	09/06/24 10:00
180-179481-51	R-5879 T06	Water	12/02/24 09:35	09/06/24 10:00
180-179481-52	R-5879 T07	Water	12/16/24 09:35	09/06/24 10:00
180-179481-53	R-5879 T08	Water	12/23/24 09:35	09/06/24 10:00
180-179481-54	R-5879 T09	Water	01/06/25 09:35	09/06/24 10:00

Sample Summary

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-179481-74	LCS T01	Water	11/04/24 11:35	09/06/24 10:00
180-179481-75	LCS T02	Water	11/05/24 09:35	09/06/24 10:00
180-179481-76	LCS T03	Water	11/06/24 09:35	09/06/24 10:00
180-179481-77	LCS T04	Water	11/11/24 09:35	09/06/24 10:00
180-179481-78	LCS T05	Water	11/18/24 09:35	09/06/24 10:00
180-179481-79	LCS T06	Water	12/02/24 09:35	09/06/24 10:00
180-179481-80	LCS T07	Water	12/16/24 09:35	09/06/24 10:00
180-179481-81	LCS T08	Water	12/23/24 09:35	09/06/24 10:00
180-179481-82	LCS T09	Water	01/06/25 09:35	09/06/24 10:00
180-179481-83	LCSD T01	Water	11/04/24 11:35	09/06/24 10:00
180-179481-84	LCSD T02	Water	11/05/24 09:35	09/06/24 10:00
180-179481-85	LCSD T03	Water	11/06/24 09:35	09/06/24 10:00
180-179481-86	LCSD T04	Water	11/11/24 09:35	09/06/24 10:00
180-179481-87	LCSD T05	Water	11/18/24 09:35	09/06/24 10:00
180-179481-88	LCSD T06	Water	12/02/24 09:35	09/06/24 10:00
180-179481-89	LCSD T07	Water	12/16/24 09:35	09/06/24 10:00
180-179481-90	LCSD T08	Water	12/23/24 09:35	09/06/24 10:00
180-179481-91	LCSD T09	Water	01/06/25 09:35	09/06/24 10:00

Method Summary

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	ELLE
6020B	Metals (ICP/MS)	SW846	ELLE
7470A	Mercury (CVAA)	SW846	ELLE
5310C-2014	Dissolved Organic Carbon/Persulfate Oxidation	SM	EET PIT
EPA 9040C	pH	SW846	EET PIT
SM 2510B	Conductivity, Specific Conductance	SM	EET PIT
SM 2580B	Reduction-Oxidation (REDOX) Potential	SM	EET PIT
1315	Semi-Dynamic Tank Leaching Procedure	SW846	EET PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	ELLE
7470A	Preparation, Mercury	SW846	ELLE

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5877 T01
Lab Sample ID: 180-179481-1
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			258.9 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 16:58	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			258.9 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 08:55	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			258.9 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			258.9 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 13:10	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5877 T02
Lab Sample ID: 180-179481-2
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 17:45	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:58	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 13:58	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5877 T03
Lab Sample ID: 180-179481-3
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 18:31	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:25	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5877 T03
Lab Sample ID: 180-179481-3
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 14:45	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5877 T04
Lab Sample ID: 180-179481-4
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.8 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484237	11/12/24 21:06	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.8 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			484286	11/13/24 15:19	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.8 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484289	11/13/24 16:54	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.8 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484015	11/11/24 14:11	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5877 T05
Lab Sample ID: 180-179481-5
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.7 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	485605	11/27/24 21:05	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.7 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			485167	11/23/24 09:44	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.7 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484801	11/19/24 18:10	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.7 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484973	11/21/24 10:36	ELS	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5877 T06
Lab Sample ID: 180-179481-6
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.5 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	486040	12/05/24 11:22	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.5 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486092	12/06/24 14:26	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.5 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			485905	12/04/24 17:49	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.5 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			485741	12/03/24 15:43	CMC	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5877 T07
Lab Sample ID: 180-179481-7
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.6 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/23/24 17:19	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.6 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486916	12/18/24 17:10	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.6 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.6 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			486788	12/17/24 13:55	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5877 T08
Lab Sample ID: 180-179481-8
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.1 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/24/24 21:08	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.1 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487211	12/23/24 13:48	SNR	EET PIT
	Instrument ID: OZ									
Leach	Leach	1315			261.1 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5877 T08
Lab Sample ID: 180-179481-8
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.1 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487533	12/31/24 14:01	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5877 T09
Lab Sample ID: 180-179481-9
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.1 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	488181	01/09/25 23:51	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.1 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487928	01/08/25 08:10	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.1 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487866	01/07/25 16:30	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.1 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487837	01/07/25 11:05	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5878 T01
Lab Sample ID: 180-179481-10
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			259.7 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 18:54	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			259.7 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 08:59	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			259.7 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			259.7 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 13:22	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5878 T02
Lab Sample ID: 180-179481-11
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.5 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 19:19	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.5 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 10:01	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.5 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.5 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 14:04	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5878 T03
Lab Sample ID: 180-179481-12
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.3 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 19:42	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.3 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:28	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.3 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.3 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 14:51	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5878 T04
Lab Sample ID: 180-179481-13
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.4 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484237	11/12/24 21:29	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.4 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			484286	11/13/24 15:23	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.4 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484289	11/13/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5878 T04
Lab Sample ID: 180-179481-13
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.4 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484015	11/11/24 14:26	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5878 T05
Lab Sample ID: 180-179481-14
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.3 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	485605	11/27/24 21:52	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.3 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			485167	11/23/24 09:44	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.3 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484801	11/19/24 18:10	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.3 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484973	11/21/24 10:57	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5878 T06
Lab Sample ID: 180-179481-15
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.8 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	486040	12/05/24 11:46	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.8 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486092	12/06/24 14:27	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.8 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			485905	12/04/24 17:49	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.8 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			485741	12/03/24 15:54	CMC	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5878 T07
Lab Sample ID: 180-179481-16
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.8 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/23/24 18:07	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.8 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486916	12/18/24 17:10	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.8 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.8 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			486788	12/17/24 14:08	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5878 T08
Lab Sample ID: 180-179481-17
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.6 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/24/24 21:56	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.6 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487211	12/23/24 13:52	SNR	EET PIT
	Instrument ID: OZ									
Leach	Leach	1315			262.6 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.6 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487533	12/31/24 14:07	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5878 T09
Lab Sample ID: 180-179481-18
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	488181	01/10/25 02:28	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487928	01/08/25 08:18	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487866	01/07/25 16:30	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5878 T09
Lab Sample ID: 180-179481-18
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487837	01/07/25 11:21	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5879 T01
Lab Sample ID: 180-179481-19
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.3 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 20:55	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.3 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:02	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.3 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.3 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 13:28	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5879 T02
Lab Sample ID: 180-179481-20
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.6 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 21:43	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.6 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 10:04	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.6 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.6 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 14:16	ELS	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5879 T03
Lab Sample ID: 180-179481-21
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.9 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 22:30	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.9 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:32	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.9 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.9 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 14:57	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5879 T04
Lab Sample ID: 180-179481-22
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484237	11/12/24 21:52	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			484286	11/13/24 15:26	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484289	11/13/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484015	11/11/24 14:37	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5879 T05
Lab Sample ID: 180-179481-23
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.7 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	485605	11/27/24 22:40	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			261.7 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			485167	11/23/24 09:44	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			261.7 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484801	11/19/24 18:09	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5879 T05
Lab Sample ID: 180-179481-23
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			261.7 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484973	11/21/24 11:07	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5879 T06
Lab Sample ID: 180-179481-24
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.0 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	486040	12/05/24 12:10	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.0 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486092	12/06/24 14:29	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.0 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			485905	12/04/24 17:48	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.0 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			485741	12/03/24 15:59	CMC	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5879 T07
Lab Sample ID: 180-179481-25
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.2 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/23/24 18:55	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.2 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486916	12/18/24 17:10	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.2 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.2 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			486788	12/17/24 14:15	ELS	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5879 T08
Lab Sample ID: 180-179481-26
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.8 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/24/24 23:34	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.8 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487211	12/23/24 13:54	SNR	EET PIT
	Instrument ID: OZ									
Leach	Leach	1315			262.8 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 17:13	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.8 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487533	12/31/24 14:12	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5879 T09
Lab Sample ID: 180-179481-27
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	488181	01/10/25 05:05	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487928	01/08/25 08:21	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487866	01/07/25 16:30	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487837	01/07/25 11:29	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5877 T01
Lab Sample ID: 180-179481-28
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			576836	11/19/24 04:16	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 04:08	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:49	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5877 T02
Lab Sample ID: 180-179481-29
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			576836	11/19/24 04:07	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:49	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:34	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5877 T03
Lab Sample ID: 180-179481-30
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			576836	11/19/24 04:04	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:47	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:43	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5877 T04
Lab Sample ID: 180-179481-31
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574859	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			575177	11/14/24 08:14	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574859	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			576928	11/19/24 15:06	LHF4	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	575162	11/15/24 07:10	UJL8	ELLE
Dissolved	Analysis	7470A		1			576883	11/19/24 13:30	HNC4	ELLE
	Instrument ID: M09 - 65200									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5877 T05
Lab Sample ID: 180-179481-32
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			578589	11/22/24 15:54	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6020B		1			579835	11/26/24 12:06	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	578435	11/24/24 03:11	UJL8	ELLE
Dissolved	Analysis	7470A		1			580313	11/27/24 13:06	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5877 T06
Lab Sample ID: 180-179481-33
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6010D		1			583930	12/10/24 02:24	MT26	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6020B		1			583073	12/06/24 09:22	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	582569	12/11/24 07:48	UJL8	ELLE
Dissolved	Analysis	7470A		1			585449	12/12/24 15:50	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5877 T07
Lab Sample ID: 180-179481-34
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6010D		1			589702	12/23/24 20:22	T8CQ	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6020B		1			589520	12/23/24 12:22	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	588453	12/19/24 23:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			589056	12/21/24 06:10	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:55	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5877 T08
Lab Sample ID: 180-179481-35
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6010D		1			591054	12/30/24 18:37	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6020B		1			591085	12/30/24 15:48	LHF4	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	590881	01/06/25 07:30	UJL8	ELLE
Dissolved	Analysis	7470A		1			592661	01/06/25 13:15	HNC4	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594835	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 17:10	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5877 T09
Lab Sample ID: 180-179481-36
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	593968	01/09/25 21:00	UAMX	ELLE
Dissolved	Analysis	6010D		1			594197	01/10/25 08:25	MT26	ELLE
	Instrument ID: T73 - 18255									
Dissolved	Prep	3005A			50 mL	50 mL	593968	01/09/25 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			594469	01/10/25 19:22	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	593985	01/09/25 21:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			594253	01/10/25 11:37	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594835	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 17:19	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5878 T01
Lab Sample ID: 180-179481-37
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			576836	11/19/24 03:45	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:35	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:53	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5878 T02
Lab Sample ID: 180-179481-38
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			576836	11/19/24 03:42	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:26	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:11	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5878 T03
Lab Sample ID: 180-179481-39
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			576836	11/19/24 04:10	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:56	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:28	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5878 T04
Lab Sample ID: 180-179481-40
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574859	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			575177	11/14/24 08:17	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574859	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			576928	11/19/24 15:08	LHF4	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	575162	11/15/24 07:10	UJL8	ELLE
Dissolved	Analysis	7470A		1			576883	11/19/24 13:32	HNC4	ELLE
	Instrument ID: M09 - 65200									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5878 T05
Lab Sample ID: 180-179481-41
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			578589	11/22/24 16:03	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6020B		1			579835	11/26/24 12:18	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	578435	11/24/24 03:11	UJL8	ELLE
Dissolved	Analysis	7470A		1			580313	11/27/24 13:08	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5878 T06
Lab Sample ID: 180-179481-42
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6010D		1			583930	12/10/24 02:36	MT26	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6020B		1			583073	12/06/24 09:37	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	582569	12/11/24 07:48	UJL8	ELLE
Dissolved	Analysis	7470A		1			585449	12/12/24 15:40	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5878 T07
Lab Sample ID: 180-179481-43
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6010D		1			589702	12/23/24 20:25	T8CQ	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6020B		1			589520	12/23/24 12:24	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	588453	12/19/24 23:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			589056	12/21/24 06:18	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:57	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5878 T08
Lab Sample ID: 180-179481-44
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6010D		1			591054	12/30/24 18:34	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6020B		1			591085	12/30/24 15:46	LHF4	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	590881	01/06/25 07:30	UJL8	ELLE
Dissolved	Analysis	7470A		1			592661	01/06/25 13:13	HNC4	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594835	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 17:14	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5878 T09
Lab Sample ID: 180-179481-45
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	593968	01/09/25 21:00	UAMX	ELLE
Dissolved	Analysis	6010D		1			594197	01/10/25 08:28	MT26	ELLE
	Instrument ID: T73 - 18255									
Dissolved	Prep	3005A			50 mL	50 mL	593968	01/09/25 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			594469	01/10/25 19:24	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	593985	01/09/25 21:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			594253	01/10/25 11:33	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594835	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 17:12	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5879 T01
Lab Sample ID: 180-179481-46
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			576836	11/19/24 04:01	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:45	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:54	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5879 T02
Lab Sample ID: 180-179481-47
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			576836	11/19/24 04:19	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 04:10	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574584	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			576425	11/18/24 13:17	HNC4	ELLE
	Instrument ID: M09 - 65200									

Client Sample ID: R-5879 T03
Lab Sample ID: 180-179481-48
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			576836	11/19/24 04:13	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 04:06	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 16:00	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5879 T04
Lab Sample ID: 180-179481-49
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	574859	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6010D		1			575177	11/14/24 08:11	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574859	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			576928	11/19/24 15:04	LHF4	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	575162	11/15/24 07:10	UJL8	ELLE
Dissolved	Analysis	7470A		1			576883	11/19/24 13:28	HNC4	ELLE
	Instrument ID: M09 - 65200									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5879 T05
Lab Sample ID: 180-179481-50
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			578589	11/22/24 16:06	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6020B		1			579835	11/26/24 12:20	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	578435	11/24/24 03:11	UJL8	ELLE
Dissolved	Analysis	7470A		1			580313	11/27/24 12:34	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5879 T06
Lab Sample ID: 180-179481-51
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6010D		1			583930	12/10/24 02:39	MT26	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6020B		1			583073	12/06/24 09:39	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	582569	12/11/24 07:48	UJL8	ELLE
Dissolved	Analysis	7470A		1			585449	12/12/24 15:52	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5879 T07
Lab Sample ID: 180-179481-52
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6010D		1			589702	12/23/24 20:28	T8CQ	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6020B		1			589520	12/23/24 12:32	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	588453	12/19/24 23:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			589056	12/21/24 06:20	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:49	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5879 T08
Lab Sample ID: 180-179481-53
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6010D		1			591054	12/30/24 18:16	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6020B		1			591085	12/30/24 15:38	LHF4	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	590881	01/06/25 07:30	UJL8	ELLE
Dissolved	Analysis	7470A		1			592661	01/06/25 13:08	HNC4	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594835	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 17:17	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5879 T09
Lab Sample ID: 180-179481-54
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6010D		1			595310	01/14/25 12:26	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6020B		1			595032	01/13/25 16:47	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6020B		1			595507	01/14/25 14:45	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	593985	01/09/25 21:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			594253	01/10/25 11:39	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594835	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 17:15	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: LCS T01
Lab Sample ID: 180-179481-74
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	581727	12/03/24 23:15	UAMX	ELLE
Dissolved	Analysis	7470A		5			582109	12/04/24 14:01	HNC4	ELLE
	Instrument ID: M09 - 65200									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: LCS T02
Lab Sample ID: 180-179481-75
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	581727	12/03/24 23:15	UAMX	ELLE
Dissolved	Analysis	7470A		5			582109	12/04/24 12:45	HNC4	ELLE

Instrument ID: M09 - 65200

Client Sample ID: LCS T03
Lab Sample ID: 180-179481-76
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	575354	11/14/24 22:50	UAMX	ELLE
Dissolved	Analysis	7470A		5			576425	11/18/24 14:39	HNC4	ELLE

Instrument ID: M09 - 65200

Client Sample ID: LCS T04
Lab Sample ID: 180-179481-77
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	575354	11/14/24 22:50	UAMX	ELLE
Dissolved	Analysis	7470A		2			576425	11/18/24 14:37	HNC4	ELLE

Instrument ID: M09 - 65200

Client Sample ID: LCS T05
Lab Sample ID: 180-179481-78
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		5			595456	01/14/25 17:33	HNC4	ELLE

Instrument ID: M10 – 31820

Client Sample ID: LCS T06
Lab Sample ID: 180-179481-79
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	591503	01/02/25 02:30	UJL8	ELLE
Dissolved	Analysis	7470A		5			591839	01/02/25 14:54	HNC4	ELLE

Instrument ID: M10 – 31820

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: LCS T07
Lab Sample ID: 180-179481-80
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		2			595456	01/14/25 17:38	HNC4	ELLE

Instrument ID: M10 – 31820

Client Sample ID: LCS T08
Lab Sample ID: 180-179481-81
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		5			595456	01/14/25 17:55	HNC4	ELLE

Instrument ID: M10 – 31820

Client Sample ID: LCS T09
Lab Sample ID: 180-179481-82
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		2			595456	01/14/25 17:27	HNC4	ELLE

Instrument ID: M10 – 31820

Client Sample ID: LCSD T01
Lab Sample ID: 180-179481-83
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	581727	12/03/24 23:15	UAMX	ELLE
Dissolved	Analysis	7470A		5			582109	12/04/24 12:43	HNC4	ELLE

Instrument ID: M09 - 65200

Client Sample ID: LCSD T02
Lab Sample ID: 180-179481-84
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	575354	11/14/24 22:50	UAMX	ELLE
Dissolved	Analysis	7470A		5			576425	11/18/24 14:35	HNC4	ELLE

Instrument ID: M09 - 65200

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: LCSD T03
Lab Sample ID: 180-179481-85
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	581727	12/03/24 23:15	UAMX	ELLE
Dissolved	Analysis	7470A		5			582109	12/04/24 13:54	HNC4	ELLE

Instrument ID: M09 - 65200

Client Sample ID: LCSD T04
Lab Sample ID: 180-179481-86
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	581727	12/03/24 23:15	UAMX	ELLE
Dissolved	Analysis	7470A		5			582109	12/04/24 12:48	HNC4	ELLE

Instrument ID: M09 - 65200

Client Sample ID: LCSD T05
Lab Sample ID: 180-179481-87
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		5			595456	01/14/25 17:56	HNC4	ELLE

Instrument ID: M10 – 31820

Client Sample ID: LCSD T06
Lab Sample ID: 180-179481-88
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	591503	01/02/25 02:30	UJL8	ELLE
Dissolved	Analysis	7470A		5			591839	01/02/25 14:52	HNC4	ELLE

Instrument ID: M10 – 31820

Client Sample ID: LCSD T07
Lab Sample ID: 180-179481-89
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	594835	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		2			595456	01/14/25 17:45	HNC4	ELLE

Instrument ID: M10 – 31820

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179481-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: LCSD T08
Lab Sample ID: 180-179481-90
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	594835	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		2			595456	01/14/25 17:44	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: LCSD T09
Lab Sample ID: 180-179481-91
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	594835	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		2			596396	01/16/25 14:44	HNC4	ELLE
	Instrument ID: M10 – 31820									

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Analyst References:

Lab: EET PIT

Batch Type: Leach

TCS = Thomas Say

Batch Type: Analysis

BAB = Brooke Batyi
CMC = Candace California
ELS = Edwin Shireman
RAO = Rachel Oster
SNR = Sabra Richart

Lab: ELLE

Batch Type: Prep

UAMX = Annamaria Kuhns
UJL8 = James Mertz

Batch Type: Analysis

F7JF = Dennis Dick
HNC4 = Mindy Schantzenbach
LHF4 = Diamond Boyer
MT26 = Jason Knight
T8CQ = Sera Bargo
X3ZX = Skyler Ruf

Client Sample ID: R-5877 T01
Lab Sample ID: 180-179481-1
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 16:58	1
pH (SW846 EPA 9040C)	**6.2**	**H3**	0.1	0.1	SU			11/09/24 08:55	1
Specific Conductance (SM 2510B)	**1.5**	**!**	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**270**	**!**	10	10	millivolts			11/06/24 13:10	1

Client Sample ID: R-5877 T02
Lab Sample ID: 180-179481-2
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 17:45	1
pH (SW846 EPA 9040C)	**6.7**	**H3**	0.1	0.1	SU			11/09/24 09:58	1
Specific Conductance (SM 2510B)	**1.1**	**!**	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**290**	**!**	10	10	millivolts			11/06/24 13:58	1

Client Sample ID: R-5877 T03
Lab Sample ID: 180-179481-3
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 18:31	1
pH (SW846 EPA 9040C)	**5.8**	**H3**	0.1	0.1	SU			11/09/24 09:25	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**320**	**!**	10	10	millivolts			11/06/24 14:45	1

Client Sample ID: R-5877 T04
Lab Sample ID: 180-179481-4
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/12/24 21:06	1
pH (SW846 EPA 9040C)	**5.7**	**H3**	0.1	0.1	SU			11/13/24 15:19	1
Specific Conductance (SM 2510B)	**1.0**	**!**	1.0	1.0	umhos/cm			11/13/24 16:54	1
Oxidation Reduction Potential (SM 2580B)	**310**	**!**	10	10	millivolts			11/11/24 14:11	1

Client Sample ID: R-5877 T05
Lab Sample ID: 180-179481-5
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/27/24 21:05	1

Client Sample ID: R-5877 T05
Lab Sample ID: 180-179481-5
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.7	H3	0.1	0.1	SU			11/23/24 09:44	1
Specific Conductance (SM 2510B)	1.2	!	1.0	1.0	umhos/cm			11/19/24 18:10	1
Oxidation Reduction Potential (SM 2580B)	310	!	10	10	millivolts			11/21/24 10:36	1

Client Sample ID: R-5877 T06
Lab Sample ID: 180-179481-6
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND		1.0	0.51	mg/L			12/05/24 11:22	1
pH (SW846 EPA 9040C)	5.4	H3	0.1	0.1	SU			12/06/24 14:26	1
Specific Conductance (SM 2510B)	1.6	!	1.0	1.0	umhos/cm			12/04/24 17:49	1
Oxidation Reduction Potential (SM 2580B)	320	!	10	10	millivolts			12/03/24 15:43	1

Client Sample ID: R-5877 T07
Lab Sample ID: 180-179481-7
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/23/24 17:19	1
pH (SW846 EPA 9040C)	5.6	H3	0.1	0.1	SU			12/18/24 17:10	1
Specific Conductance (SM 2510B)	1.5	!	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	300	!	10	10	millivolts			12/17/24 13:55	1

Client Sample ID: R-5877 T08
Lab Sample ID: 180-179481-8
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/24/24 21:08	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			12/23/24 13:48	1
Specific Conductance (SM 2510B)	1.3	!	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	280	!	10	10	millivolts			12/31/24 14:01	1

Client Sample ID: R-5877 T09
Lab Sample ID: 180-179481-9
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			01/09/25 23:51	1
pH (SW846 EPA 9040C)	5.6	H3	0.1	0.1	SU			01/08/25 08:10	1

Client Sample ID: R-5877 T09
Lab Sample ID: 180-179481-9
Date Collected: 08/27/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance (SM 2510B)	1.4	!	1.0	1.0	umhos/cm			01/07/25 16:30	1
Oxidation Reduction Potential (SM 2580B)	310	!	10	10	millivolts			01/07/25 11:05	1

Client Sample ID: R-5878 T01
Lab Sample ID: 180-179481-10
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 18:54	1
pH (SW846 EPA 9040C)	5.8	H3	0.1	0.1	SU			11/09/24 08:59	1
Specific Conductance (SM 2510B)	1.1	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	290	!	10	10	millivolts			11/06/24 13:22	1

Client Sample ID: R-5878 T02
Lab Sample ID: 180-179481-11
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 19:19	1
pH (SW846 EPA 9040C)	6.1	H3	0.1	0.1	SU			11/09/24 10:01	1
Specific Conductance (SM 2510B)	1.0	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	250	!	10	10	millivolts			11/06/24 14:04	1

Client Sample ID: R-5878 T03
Lab Sample ID: 180-179481-12
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 19:42	1
pH (SW846 EPA 9040C)	5.8	H3	0.1	0.1	SU			11/09/24 09:28	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	280	!	10	10	millivolts			11/06/24 14:51	1

Client Sample ID: R-5878 T04
Lab Sample ID: 180-179481-13
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/12/24 21:29	1
pH (SW846 EPA 9040C)	5.6	H3	0.1	0.1	SU			11/13/24 15:23	1
Specific Conductance (SM 2510B)	1.3	!	1.0	1.0	umhos/cm			11/13/24 16:55	1

Client Sample ID: R-5878 T04
Lab Sample ID: 180-179481-13
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential (SM 2580B)	280	!	10	10	millivolts			11/11/24 14:26	1

Client Sample ID: R-5878 T05
Lab Sample ID: 180-179481-14
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/27/24 21:52	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			11/23/24 09:44	1
Specific Conductance (SM 2510B)	1.6	!	1.0	1.0	umhos/cm			11/19/24 18:10	1
Oxidation Reduction Potential (SM 2580B)	290	!	10	10	millivolts			11/21/24 10:57	1

Client Sample ID: R-5878 T06
Lab Sample ID: 180-179481-15
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND		1.0	0.51	mg/L			12/05/24 11:46	1
pH (SW846 EPA 9040C)	5.3	H3	0.1	0.1	SU			12/06/24 14:27	1
Specific Conductance (SM 2510B)	2.3	!	1.0	1.0	umhos/cm			12/04/24 17:49	1
Oxidation Reduction Potential (SM 2580B)	420	!	10	10	millivolts			12/03/24 15:54	1

Client Sample ID: R-5878 T07
Lab Sample ID: 180-179481-16
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/23/24 18:07	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			12/18/24 17:10	1
Specific Conductance (SM 2510B)	2.0	!	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	410	!	10	10	millivolts			12/17/24 14:08	1

Client Sample ID: R-5878 T08
Lab Sample ID: 180-179481-17
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/24/24 21:56	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			12/23/24 13:52	1
Specific Conductance (SM 2510B)	1.3	!	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	380	!	10	10	millivolts			12/31/24 14:07	1

Client Sample ID: R-5878 T09
Lab Sample ID: 180-179481-18
Date Collected: 08/28/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			01/10/25 02:28	1
pH (SW846 EPA 9040C)	**5.4**	**H3**	0.1	0.1	SU			01/08/25 08:18	1
Specific Conductance (SM 2510B)	**1.6**	**!**	1.0	1.0	umhos/cm			01/07/25 16:30	1
Oxidation Reduction Potential (SM 2580B)	**310**	**!**	10	10	millivolts			01/07/25 11:21	1

Client Sample ID: R-5879 T01
Lab Sample ID: 180-179481-19
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 20:55	1
pH (SW846 EPA 9040C)	**5.9**	**H3**	0.1	0.1	SU			11/09/24 09:02	1
Specific Conductance (SM 2510B)	**1.3**	**!**	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**280**	**!**	10	10	millivolts			11/06/24 13:28	1

Client Sample ID: R-5879 T02
Lab Sample ID: 180-179481-20
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 21:43	1
pH (SW846 EPA 9040C)	**6.1**	**H3**	0.1	0.1	SU			11/09/24 10:04	1
Specific Conductance (SM 2510B)	**1.1**	**!**	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**260**	**!**	10	10	millivolts			11/06/24 14:16	1

Client Sample ID: R-5879 T03
Lab Sample ID: 180-179481-21
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 22:30	1
pH (SW846 EPA 9040C)	**5.8**	**H3**	0.1	0.1	SU			11/09/24 09:32	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**290**	**!**	10	10	millivolts			11/06/24 14:57	1

Client Sample ID: R-5879 T04
Lab Sample ID: 180-179481-22
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/12/24 21:52	1

Client Sample ID: R-5879 T04
Lab Sample ID: 180-179481-22
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.8	H3	0.1	0.1	SU			11/13/24 15:26	1
Specific Conductance (SM 2510B)	1.1	!	1.0	1.0	umhos/cm			11/13/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	300	!	10	10	millivolts			11/11/24 14:37	1

Client Sample ID: R-5879 T05
Lab Sample ID: 180-179481-23
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/27/24 22:40	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			11/23/24 09:44	1
Specific Conductance (SM 2510B)	1.5	!	1.0	1.0	umhos/cm			11/19/24 18:09	1
Oxidation Reduction Potential (SM 2580B)	310	!	10	10	millivolts			11/21/24 11:07	1

Client Sample ID: R-5879 T06
Lab Sample ID: 180-179481-24
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND		1.0	0.51	mg/L			12/05/24 12:10	1
pH (SW846 EPA 9040C)	5.2	H3	0.1	0.1	SU			12/06/24 14:29	1
Specific Conductance (SM 2510B)	5.8	!	1.0	1.0	umhos/cm			12/04/24 17:48	1
Oxidation Reduction Potential (SM 2580B)	350	!	10	10	millivolts			12/03/24 15:59	1

Client Sample ID: R-5879 T07
Lab Sample ID: 180-179481-25
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/23/24 18:55	1
pH (SW846 EPA 9040C)	5.4	H3	0.1	0.1	SU			12/18/24 17:10	1
Specific Conductance (SM 2510B)	2.6	!	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	320	!	10	10	millivolts			12/17/24 14:15	1

Client Sample ID: R-5879 T08
Lab Sample ID: 180-179481-26
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/24/24 23:34	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			12/23/24 13:54	1

Client Sample ID: R-5879 T08
Lab Sample ID: 180-179481-26
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance (SM 2510B)	1.3	!	1.0	1.0	umhos/cm			12/28/24 17:13	1
Oxidation Reduction Potential (SM 2580B)	310	!	10	10	millivolts			12/31/24 14:12	1

Client Sample ID: R-5879 T09
Lab Sample ID: 180-179481-27
Date Collected: 08/29/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			01/10/25 05:05	1
pH (SW846 EPA 9040C)	5.4	H3	0.1	0.1	SU			01/08/25 08:21	1
Specific Conductance (SM 2510B)	1.8	!	1.0	1.0	umhos/cm			01/07/25 16:30	1
Oxidation Reduction Potential (SM 2580B)	320	!	10	10	millivolts			01/07/25 11:29	1

Client Sample ID: R-5877 T01
Lab Sample ID: 180-179481-28
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 04:16	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 04:08	1
Sodium	140	J	200	90	ug/L		11/13/24 23:30	11/26/24 04:08	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:49	1

Client Sample ID: R-5877 T02
Lab Sample ID: 180-179481-29
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 04:07	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:49	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:49	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:34	1

Client Sample ID: R-5877 T03
Lab Sample ID: 180-179481-30
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 04:04	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:47	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:47	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:43	1

Client Sample ID: R-5877 T04
Lab Sample ID: 180-179481-31
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/14/24 08:14	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/19/24 15:06	1
Sodium	ND	B	200	90	ug/L		11/13/24 23:30	11/19/24 15:06	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/15/24 07:10	11/19/24 13:30	1

Client Sample ID: R-5877 T05
Lab Sample ID: 180-179481-32
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/22/24 06:42	11/22/24 15:54	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/22/24 06:42	11/26/24 12:06	1
Sodium	ND		200	90	ug/L		11/22/24 06:42	11/26/24 12:06	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/24/24 03:11	11/27/24 13:06	1

Client Sample ID: R-5877 T06
Lab Sample ID: 180-179481-33
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/05/24 22:40	12/10/24 02:24	1

Client Sample ID: R-5877 T06
Lab Sample ID: 180-179481-33
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/05/24 22:40	12/06/24 09:22	1
Sodium	ND		200	90	ug/L		12/05/24 22:40	12/06/24 09:22	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/11/24 07:48	12/12/24 15:50	1

Client Sample ID: R-5877 T07
Lab Sample ID: 180-179481-34
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/23/24 06:52	12/23/24 20:22	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/23/24 06:52	12/23/24 12:22	1
Sodium	ND		200	90	ug/L		12/23/24 06:52	12/23/24 12:22	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:10	1
Mercury	ND	H	0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:55	1

Client Sample ID: R-5877 T08
Lab Sample ID: 180-179481-35
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/30/24 06:37	12/30/24 18:37	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/30/24 06:37	12/30/24 15:48	1
Sodium	ND		200	90	ug/L		12/30/24 06:37	12/30/24 15:48	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/06/25 07:30	01/06/25 13:15	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 17:10	1

Client Sample ID: R-5877 T09
Lab Sample ID: 180-179481-36
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/09/25 21:00	01/10/25 08:25	1

Client Sample ID: R-5877 T09
Lab Sample ID: 180-179481-36
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/09/25 21:00	01/10/25 19:22	1
Sodium	**140**	**J**	200	90	ug/L		01/09/25 21:00	01/10/25 19:22	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/09/25 21:10	01/10/25 11:37	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 17:19	1

Client Sample ID: R-5878 T01
Lab Sample ID: 180-179481-37
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 03:45	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:35	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:35	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:53	1

Client Sample ID: R-5878 T02
Lab Sample ID: 180-179481-38
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 03:42	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:26	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:26	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:11	1

Client Sample ID: R-5878 T03
Lab Sample ID: 180-179481-39
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 04:10	1

Client Sample ID: R-5878 T03
Lab Sample ID: 180-179481-39
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:56	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:56	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:28	1

Client Sample ID: R-5878 T04
Lab Sample ID: 180-179481-40
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/14/24 08:17	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/19/24 15:08	1
Sodium	**96**	**J B**	200	90	ug/L		11/13/24 23:30	11/19/24 15:08	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/15/24 07:10	11/19/24 13:32	1

Client Sample ID: R-5878 T05
Lab Sample ID: 180-179481-41
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/22/24 06:42	11/22/24 16:03	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/22/24 06:42	11/26/24 12:18	1
Sodium	ND		200	90	ug/L		11/22/24 06:42	11/26/24 12:18	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/24/24 03:11	11/27/24 13:08	1

Client Sample ID: R-5878 T06
Lab Sample ID: 180-179481-42
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	**0.092**	**J**	0.50	0.083	mg/L		12/05/24 22:40	12/10/24 02:36	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/05/24 22:40	12/06/24 09:37	1

Client Sample ID: R-5878 T06
Lab Sample ID: 180-179481-42
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND	^+	200	90	ug/L		12/05/24 22:40	12/06/24 09:37	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/11/24 07:48	12/12/24 15:40	1

Client Sample ID: R-5878 T07
Lab Sample ID: 180-179481-43
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/23/24 06:52	12/23/24 20:25	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/23/24 06:52	12/23/24 12:24	1
Sodium	ND		200	90	ug/L		12/23/24 06:52	12/23/24 12:24	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:18	1
Mercury	ND	H	0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:57	1

Client Sample ID: R-5878 T08
Lab Sample ID: 180-179481-44
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/30/24 06:37	12/30/24 18:34	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/30/24 06:37	12/30/24 15:46	1
Sodium	ND		200	90	ug/L		12/30/24 06:37	12/30/24 15:46	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/06/25 07:30	01/06/25 13:13	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 17:14	1

Client Sample ID: R-5878 T09
Lab Sample ID: 180-179481-45
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/09/25 21:00	01/10/25 08:28	1

Client Sample ID: R-5878 T09
Lab Sample ID: 180-179481-45
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/09/25 21:00	01/10/25 19:24	1
Sodium	ND		200	90	ug/L		01/09/25 21:00	01/10/25 19:24	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/09/25 21:10	01/10/25 11:33	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 17:12	1

Client Sample ID: R-5879 T01
Lab Sample ID: 180-179481-46
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 04:01	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:45	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:45	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:54	1

Client Sample ID: R-5879 T02
Lab Sample ID: 180-179481-47
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 04:19	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 04:10	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 04:10	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/18/24 13:17	1

Client Sample ID: R-5879 T03
Lab Sample ID: 180-179481-48
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 04:13	1

Client Sample ID: R-5879 T03
Lab Sample ID: 180-179481-48
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 04:06	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 04:06	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 16:00	1

Client Sample ID: R-5879 T04
Lab Sample ID: 180-179481-49
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/14/24 08:11	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	**76**	**J**	200	65	ug/L		11/13/24 23:30	11/19/24 15:04	1
Sodium	**150**	**J B**	200	90	ug/L		11/13/24 23:30	11/19/24 15:04	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/15/24 07:10	11/19/24 13:28	1

Client Sample ID: R-5879 T05
Lab Sample ID: 180-179481-50
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/22/24 06:42	11/22/24 16:06	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/22/24 06:42	11/26/24 12:20	1
Sodium	ND		200	90	ug/L		11/22/24 06:42	11/26/24 12:20	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/24/24 03:11	11/27/24 12:34	1

Client Sample ID: R-5879 T06
Lab Sample ID: 180-179481-51
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	**0.084**	**J**	0.50	0.083	mg/L		12/05/24 22:40	12/10/24 02:39	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/05/24 22:40	12/06/24 09:39	1

Client Sample ID: R-5879 T06
Lab Sample ID: 180-179481-51
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND	^+	200	90	ug/L		12/05/24 22:40	12/06/24 09:39	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.14**	**J**	0.20	0.079	ug/L		12/11/24 07:48	12/12/24 15:52	1

Client Sample ID: R-5879 T07
Lab Sample ID: 180-179481-52
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/23/24 06:52	12/23/24 20:28	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/23/24 06:52	12/23/24 12:32	1
Sodium	ND		200	90	ug/L		12/23/24 06:52	12/23/24 12:32	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:20	1
Mercury	**0.11**	**J H**	0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:49	1

Client Sample ID: R-5879 T08
Lab Sample ID: 180-179481-53
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/30/24 06:37	12/30/24 18:16	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/30/24 06:37	12/30/24 15:38	1
Sodium	ND		200	90	ug/L		12/30/24 06:37	12/30/24 15:38	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/06/25 07:30	01/06/25 13:08	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 17:17	1

Client Sample ID: R-5879 T09
Lab Sample ID: 180-179481-54
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/13/25 06:46	01/14/25 12:26	1

Client Sample ID: R-5879 T09
Lab Sample ID: 180-179481-54
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/13/25 06:46	01/13/25 16:47	1
Sodium	ND		200	90	ug/L		01/13/25 06:46	01/14/25 14:45	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.10**	**J**	0.20	0.079	ug/L		01/09/25 21:10	01/10/25 11:39	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 17:15	1

Client Sample ID: LCS T01
Lab Sample ID: 180-179481-74
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**11**	**H**	1.0	0.40	ug/L		12/03/24 23:15	12/04/24 14:01	5

Client Sample ID: LCS T02
Lab Sample ID: 180-179481-75
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**10**	**H**	1.0	0.40	ug/L		12/03/24 23:15	12/04/24 12:45	5

Client Sample ID: LCS T03
Lab Sample ID: 180-179481-76
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**11**		1.0	0.40	ug/L		11/14/24 22:50	11/18/24 14:39	5

Client Sample ID: LCS T04
Lab Sample ID: 180-179481-77
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**6.9**		0.40	0.16	ug/L		11/14/24 22:50	11/18/24 14:37	2

Client Sample ID: LCS T05
Lab Sample ID: 180-179481-78
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**12**	**H**	1.0	0.40	ug/L		01/13/25 23:45	01/14/25 17:33	5

Client Sample ID: LCS T06
Lab Sample ID: 180-179481-79
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	11	H	1.0	0.40	ug/L		01/02/25 02:30	01/02/25 14:54	5

Client Sample ID: LCS T07
Lab Sample ID: 180-179481-80
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	6.8	H	0.40	0.16	ug/L		01/13/25 23:45	01/14/25 17:38	2

Client Sample ID: LCS T08
Lab Sample ID: 180-179481-81
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	10		1.0	0.40	ug/L		01/13/25 23:45	01/14/25 17:55	5

Client Sample ID: LCS T09
Lab Sample ID: 180-179481-82
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	3.4		0.40	0.16	ug/L		01/13/25 23:45	01/14/25 17:27	2

Client Sample ID: LCSD T01
Lab Sample ID: 180-179481-83
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	11	H	1.0	0.40	ug/L		12/03/24 23:15	12/04/24 12:43	5

Client Sample ID: LCSD T02
Lab Sample ID: 180-179481-84
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	10		1.0	0.40	ug/L		11/14/24 22:50	11/18/24 14:35	5

Client Sample ID: LCSD T03
Lab Sample ID: 180-179481-85
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	10		1.0	0.40	ug/L		12/03/24 23:15	12/04/24 13:54	5

Client Sample ID: LCSD T04
Lab Sample ID: 180-179481-86
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	11		1.0	0.40	ug/L		12/03/24 23:15	12/04/24 12:48	5

Client Sample ID: LCSD T05
Lab Sample ID: 180-179481-87
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	10	H	1.0	0.40	ug/L		01/13/25 23:45	01/14/25 17:56	5

Client Sample ID: LCSD T06
Lab Sample ID: 180-179481-88
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	11	H	1.0	0.40	ug/L		01/02/25 02:30	01/02/25 14:52	5

Client Sample ID: LCSD T07
Lab Sample ID: 180-179481-89
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	5.4	H	0.40	0.16	ug/L		01/13/25 23:45	01/14/25 17:45	2

Client Sample ID: LCSD T08
Lab Sample ID: 180-179481-90
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	8.4		0.40	0.16	ug/L		01/13/25 23:45	01/14/25 17:44	2

Client Sample ID: LCSD T09
Lab Sample ID: 180-179481-91
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	7.4		0.40	0.16	ug/L		01/13/25 23:45	01/16/25 14:44	2

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 410-574857/1-A
Matrix: Water
Analysis Batch: 576836

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 574857

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/19/24 03:12	1

Lab Sample ID: LCS 410-574857/2-A
Matrix: Water
Analysis Batch: 576836

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 574857

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.35		mg/L		107	90 - 114

Lab Sample ID: MB 410-574859/1-A
Matrix: Water
Analysis Batch: 575177

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 574859

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/13/24 23:30	11/14/24 07:24	1

Lab Sample ID: LCS 410-574859/2-A
Matrix: Water
Analysis Batch: 575177

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 574859

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.34		mg/L		107	90 - 114

Lab Sample ID: MB 410-578204/1-A
Matrix: Water
Analysis Batch: 578589

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/22/24 06:42	11/22/24 15:14	1

Lab Sample ID: LCS 410-578204/2-A
Matrix: Water
Analysis Batch: 578589

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.22		mg/L		104	90 - 114

Lab Sample ID: LCSD 410-578204/3-A
Matrix: Water
Analysis Batch: 578589

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfur	5.00	5.20		mg/L		104	90 - 114	0	20

Lab Sample ID: MB 410-582769/1-A
Matrix: Water
Analysis Batch: 583930

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 582769

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/05/24 22:40	12/10/24 01:47	1

Method: 6010D - Metals (ICP)

Lab Sample ID: LCS 410-582769/2-A
Matrix: Water
Analysis Batch: 583930

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 582769

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.26		mg/L		105	90 - 114

Lab Sample ID: MB 410-588785/1-A
Matrix: Water
Analysis Batch: 589702

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 588785

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/23/24 06:52	12/23/24 19:20	1

Lab Sample ID: LCS 410-588785/2-A
Matrix: Water
Analysis Batch: 589702

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 588785

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.01		mg/L		100	90 - 114

Lab Sample ID: MB 410-590566/1-A
Matrix: Water
Analysis Batch: 591054

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 590566

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/30/24 06:37	12/30/24 17:01	1

Lab Sample ID: LCS 410-590566/2-A
Matrix: Water
Analysis Batch: 591054

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 590566

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.04		mg/L		101	90 - 114

Lab Sample ID: MB 410-593724/1-A
Matrix: Water
Analysis Batch: 595310

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/13/25 06:46	01/14/25 10:45	1

Lab Sample ID: LCS 410-593724/2-A
Matrix: Water
Analysis Batch: 595310

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	4.98		mg/L		100	90 - 114

Lab Sample ID: MB 410-593968/1-A
Matrix: Water
Analysis Batch: 594197

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/09/25 21:00	01/10/25 07:41	1

Method: 6010D - Metals (ICP)

Lab Sample ID: LCS 410-593968/2-A
Matrix: Water
Analysis Batch: 594197

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfur			5.00	4.97		mg/L		99	90 - 114		

Lab Sample ID: LCSD 410-593968/3-A
Matrix: Water
Analysis Batch: 594197

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfur			5.00	4.93		mg/L		99	90 - 114	1	20

Lab Sample ID: 180-179481-53 MS
Matrix: Water
Analysis Batch: 591054

Client Sample ID: R-5879 T08
Prep Type: Dissolved
Prep Batch: 590566

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfur	ND		5.00	4.92		mg/L		98	75 - 125		

Lab Sample ID: 180-179481-53 MSD
Matrix: Water
Analysis Batch: 591054

Client Sample ID: R-5879 T08
Prep Type: Dissolved
Prep Batch: 590566

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfur	ND		5.00	4.86		mg/L		97	75 - 125	1	20

Lab Sample ID: 180-179481-53 DU
Matrix: Water
Analysis Batch: 591054

Client Sample ID: R-5879 T08
Prep Type: Dissolved
Prep Batch: 590566

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfur	ND		ND		mg/L		NC	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 410-574857/1-A
Matrix: Water
Analysis Batch: 579551

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 574857

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:01	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:01	1

Lab Sample ID: LCS 410-574857/2-A
Matrix: Water
Analysis Batch: 579551

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 574857

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Potassium			5000	5350		ug/L		107	90 - 110		
Sodium			5000	5280		ug/L		106	89 - 114		

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 410-574859/1-A
Matrix: Water
Analysis Batch: 576928

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 574859

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/19/24 14:07	1
Sodium	99.8	J B	200	90	ug/L		11/13/24 23:30	11/19/24 14:07	1

Lab Sample ID: LCS 410-574859/2-A
Matrix: Water
Analysis Batch: 576928

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 574859

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	5000		ug/L		100	90 - 110
Sodium	5000	5070		ug/L		101	89 - 114

Lab Sample ID: MB 410-578204/1-A
Matrix: Water
Analysis Batch: 579835

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/22/24 06:42	11/26/24 11:52	1
Sodium	ND		200	90	ug/L		11/22/24 06:42	11/26/24 11:52	1

Lab Sample ID: LCS 410-578204/2-A
Matrix: Water
Analysis Batch: 579835

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4980		ug/L		100	90 - 110
Sodium	5000	5020		ug/L		100	89 - 114

Lab Sample ID: LCSD 410-578204/3-A
Matrix: Water
Analysis Batch: 579835

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Potassium	5000	4990		ug/L		100	90 - 110	0	20
Sodium	5000	4940		ug/L		99	89 - 114	2	20

Lab Sample ID: MB 410-582769/1-A
Matrix: Water
Analysis Batch: 583073

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 582769

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/05/24 22:40	12/06/24 09:07	1
Sodium	ND		200	90	ug/L		12/05/24 22:40	12/06/24 09:07	1

Lab Sample ID: LCS 410-582769/2-A
Matrix: Water
Analysis Batch: 583073

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 582769

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4900		ug/L		98	90 - 110
Sodium	5000	4820		ug/L		96	89 - 114

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 410-588785/1-A
Matrix: Water
Analysis Batch: 589520

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 588785

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/23/24 06:52	12/23/24 12:10	1
Sodium	ND		200	90	ug/L		12/23/24 06:52	12/23/24 12:10	1

Lab Sample ID: LCS 410-588785/2-A
Matrix: Water
Analysis Batch: 589520

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 588785

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4790		ug/L		96	90 - 110
Sodium	5000	4810		ug/L		96	89 - 114

Lab Sample ID: MB 410-590566/1-A
Matrix: Water
Analysis Batch: 591085

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 590566

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/30/24 06:37	12/30/24 15:34	1
Sodium	ND		200	90	ug/L		12/30/24 06:37	12/30/24 15:34	1

Lab Sample ID: LCS 410-590566/2-A
Matrix: Water
Analysis Batch: 591085

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 590566

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4680		ug/L		94	90 - 110
Sodium	5000	4600		ug/L		92	89 - 114

Lab Sample ID: MB 410-593724/1-A
Matrix: Water
Analysis Batch: 595032

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/13/25 06:46	01/13/25 15:52	1

Lab Sample ID: MB 410-593724/1-A
Matrix: Water
Analysis Batch: 595507

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND		200	90	ug/L		01/13/25 06:46	01/14/25 14:34	1

Lab Sample ID: LCS 410-593724/2-A
Matrix: Water
Analysis Batch: 595032

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4550		ug/L		91	90 - 110

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 410-593724/2-A
Matrix: Water
Analysis Batch: 595507

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sodium			5000	4810		ug/L		96	89 - 114		

Lab Sample ID: MB 410-593968/1-A
Matrix: Water
Analysis Batch: 594469

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/09/25 21:00	01/10/25 18:07	1
Sodium	ND		200	90	ug/L		01/09/25 21:00	01/10/25 18:07	1

Lab Sample ID: LCS 410-593968/2-A
Matrix: Water
Analysis Batch: 594469

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Potassium			5000	5160		ug/L		103	90 - 110		
Sodium			5000	5100		ug/L		102	89 - 114		

Lab Sample ID: LCSD 410-593968/3-A
Matrix: Water
Analysis Batch: 594469

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Potassium			5000	5230		ug/L		105	90 - 110	1	20
Sodium			5000	5030		ug/L		101	89 - 114	1	20

Lab Sample ID: 180-179481-53 MS
Matrix: Water
Analysis Batch: 591085

Client Sample ID: R-5879 T08
Prep Type: Dissolved
Prep Batch: 590566

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Potassium	ND		5000	4740		ug/L		95	75 - 125		
Sodium	ND		5000	4790		ug/L		96	75 - 125		

Lab Sample ID: 180-179481-53 MSD
Matrix: Water
Analysis Batch: 591085

Client Sample ID: R-5879 T08
Prep Type: Dissolved
Prep Batch: 590566

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Potassium	ND		5000	4810		ug/L		96	75 - 125	1	20
Sodium	ND		5000	4880		ug/L		98	75 - 125	2	20

Lab Sample ID: 180-179481-53 DU
Matrix: Water
Analysis Batch: 591085

Client Sample ID: R-5879 T08
Prep Type: Dissolved
Prep Batch: 590566

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Potassium	ND		ND		ug/L		NC	20
Sodium	ND		ND		ug/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 410-574582/1-A
Matrix: Water
Analysis Batch: 575280

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 574582

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:07	1

Lab Sample ID: LCS 410-574582/2-A
Matrix: Water
Analysis Batch: 575280

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 574582

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.964		ug/L		96	80 - 118

Lab Sample ID: MB 410-574584/1-A
Matrix: Water
Analysis Batch: 576425

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 574584

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/18/24 12:50	1

Lab Sample ID: LCS 410-574584/2-A
Matrix: Water
Analysis Batch: 576425

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 574584

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.906		ug/L		91	80 - 118

Lab Sample ID: MB 410-575162/1-A
Matrix: Water
Analysis Batch: 576883

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 575162

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/15/24 07:10	11/19/24 13:10	1

Lab Sample ID: LCS 410-575162/2-A
Matrix: Water
Analysis Batch: 576883

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 575162

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.949		ug/L		95	80 - 118

Lab Sample ID: MB 410-575354/1-A
Matrix: Water
Analysis Batch: 576425

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 575354

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 22:50	11/18/24 13:54	1

Lab Sample ID: LCS 410-575354/2-A
Matrix: Water
Analysis Batch: 576425

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 575354

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.975		ug/L		98	80 - 118

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 410-578435/1-A
Matrix: Water
Analysis Batch: 580313

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 578435

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/24/24 03:11	11/27/24 12:30	1

Lab Sample ID: LCS 410-578435/2-A
Matrix: Water
Analysis Batch: 580313

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 578435

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.900		ug/L		90	80 - 118

Lab Sample ID: MB 410-581727/1-A
Matrix: Water
Analysis Batch: 582109

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 581727

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/03/24 23:15	12/04/24 11:40	1

Lab Sample ID: LCS 410-581727/2-A
Matrix: Water
Analysis Batch: 582109

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 581727

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.996		ug/L		100	80 - 118

Lab Sample ID: LCSD 410-581727/3-A
Matrix: Water
Analysis Batch: 582109

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 581727

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	1.00	0.977		ug/L		98	80 - 118	2	20

Lab Sample ID: MB 410-582569/1-A
Matrix: Water
Analysis Batch: 585449

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 582569

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/11/24 07:48	12/12/24 15:12	1

Lab Sample ID: LCS 410-582569/2-A
Matrix: Water
Analysis Batch: 585449

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 582569

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.988		ug/L		99	80 - 118

Lab Sample ID: MB 410-588453/1-A
Matrix: Water
Analysis Batch: 589056

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 588453

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:07	1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 410-588453/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 589056
Prep Batch: 588453

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	1.03		ug/L		103	80 - 118

Lab Sample ID: MB 410-590881/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 592661
Prep Batch: 590881

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/06/25 07:30	01/06/25 12:54	1

Lab Sample ID: LCS 410-590881/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 592661
Prep Batch: 590881

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.991		ug/L		99	80 - 118

Lab Sample ID: MB 410-591503/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 591839
Prep Batch: 591503

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/02/25 02:30	01/02/25 12:25	1

Lab Sample ID: LCS 410-591503/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 591839
Prep Batch: 591503

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.976		ug/L		98	80 - 118

Lab Sample ID: MB 410-593985/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 594253
Prep Batch: 593985

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/09/25 21:10	01/10/25 11:05	1

Lab Sample ID: LCS 410-593985/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 594253
Prep Batch: 593985

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	1.09		ug/L		109	80 - 118

Lab Sample ID: LCSD 410-593985/3-A
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 594253
Prep Batch: 593985

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	1.00	1.10		ug/L		110	80 - 118	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 410-594829/1-A
Matrix: Water
Analysis Batch: 595456

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 594829

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:03	1

Lab Sample ID: LCS 410-594829/2-A
Matrix: Water
Analysis Batch: 595456

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 594829

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	1.01		ug/L		101	80 - 118

Lab Sample ID: LCSD 410-594829/3-A
Matrix: Water
Analysis Batch: 595456

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 594829

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	1.00	1.02		ug/L		102	80 - 118	1	20

Lab Sample ID: MB 410-594835/1-A
Matrix: Water
Analysis Batch: 595456

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 594835

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 17:00	1

Lab Sample ID: LCS 410-594835/2-A
Matrix: Water
Analysis Batch: 595456

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 594835

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.930		ug/L		93	80 - 118

Lab Sample ID: LCSD 410-594835/3-A
Matrix: Water
Analysis Batch: 595456

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 594835

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	1.00	0.933		ug/L		93	80 - 118	0	20

Lab Sample ID: 180-179481-38 MS
Matrix: Water
Analysis Batch: 575280

Client Sample ID: R-5878 T02
Prep Type: Dissolved
Prep Batch: 574582

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	ND		1.00	1.05		ug/L		105	80 - 120

Lab Sample ID: 180-179481-38 MSD
Matrix: Water
Analysis Batch: 575280

Client Sample ID: R-5878 T02
Prep Type: Dissolved
Prep Batch: 574582

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	ND		1.00	0.885		ug/L		89	80 - 120	17	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: 180-179481-38 DU
Client Sample ID: R-5878 T02
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 575280
Prep Batch: 574582

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	ND		ND		ug/L		NC	20

Lab Sample ID: 180-179481-50 MS
Client Sample ID: R-5879 T05
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 580313
Prep Batch: 578435

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	ND		1.00	0.953		ug/L		95	80 - 120

Lab Sample ID: 180-179481-50 MSD
Client Sample ID: R-5879 T05
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 580313
Prep Batch: 578435

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	ND		1.00	0.944		ug/L		94	80 - 120	1	20

Lab Sample ID: 180-179481-50 DU
Client Sample ID: R-5879 T05
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 580313
Prep Batch: 578435

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	ND		ND		ug/L		NC	20

Lab Sample ID: 180-179481-34 MS
Client Sample ID: R-5877 T07
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 589056
Prep Batch: 588453

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	ND		1.00	0.957		ug/L		96	80 - 120

Lab Sample ID: 180-179481-34 MSD
Client Sample ID: R-5877 T07
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 589056
Prep Batch: 588453

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	ND		1.00	0.958		ug/L		96	80 - 120	0	20

Lab Sample ID: 180-179481-34 DU
Client Sample ID: R-5877 T07
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 589056
Prep Batch: 588453

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	ND		ND		ug/L		NC	20

Lab Sample ID: 180-179481-35 MS
Client Sample ID: R-5877 T08
Matrix: Water
Prep Type: Dissolved
Analysis Batch: 592661
Prep Batch: 590881

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	ND		1.00	0.999		ug/L		100	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: 180-179481-35 MSD
Matrix: Water
Analysis Batch: 592661

Client Sample ID: R-5877 T08
Prep Type: Dissolved
Prep Batch: 590881

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	ND		1.00	1.02		ug/L		102	80 - 120	2	20

Lab Sample ID: 180-179481-35 DU
Matrix: Water
Analysis Batch: 592661

Client Sample ID: R-5877 T08
Prep Type: Dissolved
Prep Batch: 590881

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Mercury	ND		ND		ug/L				NC	20

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation

Lab Sample ID: MB 180-484008/5
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			11/07/24 16:35	1

Lab Sample ID: LCS 180-484008/4
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	19.8		mg/L		99	85 - 115

Lab Sample ID: MB 180-484237/5
Matrix: Solid
Analysis Batch: 484237

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			11/12/24 19:31	1

Lab Sample ID: LCS 180-484237/4
Matrix: Solid
Analysis Batch: 484237

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	20.3		mg/L		101	85 - 115

Lab Sample ID: MB 180-485605/5
Matrix: Solid
Analysis Batch: 485605

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			11/27/24 20:41	1

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation (Continued)

Lab Sample ID: LCS 180-485605/4
Matrix: Solid
Analysis Batch: 485605

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	21.0		mg/L		105	85 - 115

Lab Sample ID: MB 180-486040/35
Matrix: Solid
Analysis Batch: 486040

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/05/24 07:45	1

Lab Sample ID: MB 180-486040/5
Matrix: Solid
Analysis Batch: 486040

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/04/24 19:43	1

Lab Sample ID: LCS 180-486040/34
Matrix: Solid
Analysis Batch: 486040

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	20.3		mg/L		101	85 - 115

Lab Sample ID: MB 180-487257/35
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/24/24 04:59	1

Lab Sample ID: MB 180-487257/5
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/23/24 16:55	1

Lab Sample ID: MB 180-487257/67
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/24/24 18:20	1

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation (Continued)

Lab Sample ID: LCS 180-487257/4
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	21.1		mg/L		105	85 - 115

Lab Sample ID: LCS 180-487257/66
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	21.0		mg/L		105	85 - 115

Lab Sample ID: MB 180-488181/5
Matrix: Solid
Analysis Batch: 488181

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			01/09/25 22:32	1

Lab Sample ID: LCS 180-488181/4
Matrix: Solid
Analysis Batch: 488181

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	20.7		mg/L		104	85 - 115

Lab Sample ID: 180-179481-1 MS
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: R-5877 T01
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	ND	!	10.0	8.82		mg/L		88	85 - 115

Lab Sample ID: 180-179481-19 MS
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: R-5879 T01
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	ND	!	10.0	8.95		mg/L		90	85 - 115

Lab Sample ID: 180-179481-2 DU
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: R-5877 T02
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Dissolved Organic Carbon - Quad	ND	!	ND		mg/L		NC	15

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation (Continued)

Lab Sample ID: 180-179481-20 DU
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: R-5879 T02
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Dissolved Organic Carbon - Quad	ND	!	ND		mg/L		NC	15

Lab Sample ID: 180-179481-5 MS
Matrix: Solid
Analysis Batch: 485605

Client Sample ID: R-5877 T05
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	ND	!	10.0	11.2		mg/L		112	85 - 115

Lab Sample ID: 180-179481-14 DU
Matrix: Solid
Analysis Batch: 485605

Client Sample ID: R-5878 T05
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Dissolved Organic Carbon - Quad	ND	!	ND		mg/L		NC	15

Lab Sample ID: 180-179481-7 MS
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: R-5877 T07
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	ND	!	10.0	10.1		mg/L		101	85 - 115

Lab Sample ID: 180-179481-8 MS
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: R-5877 T08
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	ND	!	10.0	11.1		mg/L		111	85 - 115

Lab Sample ID: 180-179481-26 MS
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: R-5879 T08
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	ND	!	10.0	11.2		mg/L		112	85 - 115

Lab Sample ID: 180-179481-16 DU
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: R-5878 T07
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Dissolved Organic Carbon - Quad	ND	!	ND		mg/L		NC	15

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation (Continued)

Lab Sample ID: 180-179481-17 DU
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: R-5878 T08
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Dissolved Organic Carbon - Quad	ND	!		ND		mg/L				NC	15

Lab Sample ID: 180-179481-9 MS
Matrix: Solid
Analysis Batch: 488181

Client Sample ID: R-5877 T09
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Dissolved Organic Carbon - Quad	ND	!	10.0	11.3		mg/L		113	85 - 115		

Lab Sample ID: 180-179481-18 DU
Matrix: Solid
Analysis Batch: 488181

Client Sample ID: R-5878 T09
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Dissolved Organic Carbon - Quad	ND	!		ND		mg/L				NC	15

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-483963/1
Matrix: Solid
Analysis Batch: 483963

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: LCS 180-483963/24
Matrix: Solid
Analysis Batch: 483963

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		101	99 - 101		

Lab Sample ID: LCS 180-484286/1
Matrix: Solid
Analysis Batch: 484286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: LCS 180-485167/1
Matrix: Solid
Analysis Batch: 485167

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Method: EPA 9040C - pH (Continued)

Lab Sample ID: LCS 180-486092/47
Matrix: Solid
Analysis Batch: 486092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-486916/24
Matrix: Solid
Analysis Batch: 486916

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		101	99 - 101

Lab Sample ID: LCS 180-487211/1
Matrix: Solid
Analysis Batch: 487211

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-487928/1
Matrix: Solid
Analysis Batch: 487928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: 180-179481-4 DU
Matrix: Solid
Analysis Batch: 484286

Client Sample ID: R-5877 T04
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	5.7	H3	5.7		SU		0	2

Lab Sample ID: 180-179481-8 DU
Matrix: Solid
Analysis Batch: 487211

Client Sample ID: R-5877 T08
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	5.5	H3	5.6		SU		0.4	2

Lab Sample ID: LB 180-487734/1-A
Matrix: Solid
Analysis Batch: 487928

Client Sample ID: Method Blank
Prep Type: Leach

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	4.8		0.1	0.1	SU			01/08/25 09:24	1

Lab Sample ID: 180-179481-9 DU
Matrix: Solid
Analysis Batch: 487928

Client Sample ID: R-5877 T09
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	5.6	H3	5.6		SU		0.5	2

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 180-483750/50
Matrix: Solid
Analysis Batch: 483750
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			11/06/24 17:17	1

Lab Sample ID: MB 180-483750/74
Matrix: Solid
Analysis Batch: 483750
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			11/06/24 17:17	1

Lab Sample ID: LCS 180-483750/49
Matrix: Solid
Analysis Batch: 483750
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	88.4		umhos/cm		105	90 - 110

Lab Sample ID: LCS 180-483750/73
Matrix: Solid
Analysis Batch: 483750
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	88.4		umhos/cm		105	90 - 110

Lab Sample ID: MB 180-484289/50
Matrix: Solid
Analysis Batch: 484289
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			11/13/24 16:54	1

Lab Sample ID: LCS 180-484289/49
Matrix: Solid
Analysis Batch: 484289
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	84.2		umhos/cm		100	90 - 110

Lab Sample ID: MB 180-484801/2
Matrix: Solid
Analysis Batch: 484801
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			11/19/24 18:01	1

Lab Sample ID: LCS 180-484801/1
Matrix: Solid
Analysis Batch: 484801
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	86.5		umhos/cm		103	90 - 110

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 180-485905/2
Matrix: Solid
Analysis Batch: 485905
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			12/04/24 17:48	1

Lab Sample ID: MB 180-485905/30
Matrix: Solid
Analysis Batch: 485905
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			12/04/24 17:49	1

Lab Sample ID: LCS 180-485905/1
Matrix: Solid
Analysis Batch: 485905
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	85.2		umhos/cm		101	90 - 110

Lab Sample ID: LCS 180-485905/29
Matrix: Solid
Analysis Batch: 485905
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	85.7		umhos/cm		102	90 - 110

Lab Sample ID: MB 180-487398/2
Matrix: Solid
Analysis Batch: 487398
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			12/28/24 16:55	1

Lab Sample ID: MB 180-487398/28
Matrix: Solid
Analysis Batch: 487398
Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			12/28/24 16:55	1

Lab Sample ID: LCS 180-487398/1
Matrix: Solid
Analysis Batch: 487398
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	84.6		umhos/cm		101	90 - 110

Lab Sample ID: LCS 180-487398/27
Matrix: Solid
Analysis Batch: 487398
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	87.4		umhos/cm		104	90 - 110

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 180-487866/2
Matrix: Solid
Analysis Batch: 487866

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			01/07/25 16:29	1

Lab Sample ID: LCS 180-487866/1
Matrix: Solid
Analysis Batch: 487866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	86.8		umhos/cm		103	90 - 110

Lab Sample ID: 180-179481-2 DU
Matrix: Solid
Analysis Batch: 483750

Client Sample ID: R-5877 T02
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	1.1	!	1.14		umhos/cm		0.9	20

Lab Sample ID: 180-179481-3 DU
Matrix: Solid
Analysis Batch: 483750

Client Sample ID: R-5877 T03
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	ND	!	ND		umhos/cm		NC	20

Lab Sample ID: 180-179481-4 DU
Matrix: Solid
Analysis Batch: 484289

Client Sample ID: R-5877 T04
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	1.0	!	1.06		umhos/cm		3	20

Lab Sample ID: 180-179481-13 DU
Matrix: Solid
Analysis Batch: 484289

Client Sample ID: R-5878 T04
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	1.3	!	1.28		umhos/cm		0.8	20

Lab Sample ID: 180-179481-6 DU
Matrix: Solid
Analysis Batch: 485905

Client Sample ID: R-5877 T06
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	1.6	!	1.61		umhos/cm		0	20

Lab Sample ID: 180-179481-18 DU
Matrix: Solid
Analysis Batch: 487866

Client Sample ID: R-5878 T09
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	1.6	!	1.65		umhos/cm		3	20

Method: SM 2580B - Reduction-Oxidation (REDOX) Potential

Lab Sample ID: LCS 180-483740/1
Matrix: Solid
Analysis Batch: 483740

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	481		millivolts		101	90 - 110

Lab Sample ID: LCS 180-483740/26
Matrix: Solid
Analysis Batch: 483740

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	458		millivolts		96	90 - 110

Lab Sample ID: LCS 180-484015/1
Matrix: Solid
Analysis Batch: 484015

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	458		millivolts		96	90 - 110

Lab Sample ID: LCS 180-484015/26
Matrix: Solid
Analysis Batch: 484015

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	480		millivolts		101	90 - 110

Lab Sample ID: LCS 180-484973/1
Matrix: Solid
Analysis Batch: 484973

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	465		millivolts		98	90 - 110

Lab Sample ID: LCS 180-485741/1
Matrix: Solid
Analysis Batch: 485741

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	469		millivolts		99	90 - 110

Lab Sample ID: LCS 180-486788/1
Matrix: Solid
Analysis Batch: 486788

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	466		millivolts		98	90 - 110

Lab Sample ID: LCS 180-487533/26
Matrix: Solid
Analysis Batch: 487533

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	462		millivolts		97	90 - 110

Method: SM 2580B - Reduction-Oxidation (REDOX) Potential

Lab Sample ID: LCS 180-487837/1
Matrix: Solid
Analysis Batch: 487837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Oxidation Reduction Potential			475	456		millivolts		96	90 - 110		

Lab Sample ID: 180-179481-1 DU
Matrix: Solid
Analysis Batch: 483740

Client Sample ID: R-5877 T01
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Oxidation Reduction Potential	270	!		290		millivolts				6	20

Lab Sample ID: 180-179481-13 DU
Matrix: Solid
Analysis Batch: 484015

Client Sample ID: R-5878 T04
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Oxidation Reduction Potential	280	!		280		millivolts				1	20

Lab Sample ID: 180-179481-5 DU
Matrix: Solid
Analysis Batch: 484973

Client Sample ID: R-5877 T05
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Oxidation Reduction Potential	310	!		315		millivolts				3	20

Lab Sample ID: 180-179481-6 DU
Matrix: Solid
Analysis Batch: 485741

Client Sample ID: R-5877 T06
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Oxidation Reduction Potential	320	!		320		millivolts				0	20

Lab Sample ID: 180-179481-7 DU
Matrix: Solid
Analysis Batch: 486788

Client Sample ID: R-5877 T07
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Oxidation Reduction Potential	300	!		290		millivolts				4	20

Lab Sample ID: 180-179481-9 DU
Matrix: Solid
Analysis Batch: 487837

Client Sample ID: R-5877 T09
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Oxidation Reduction Potential	310	!		301		millivolts				4	20

Metals

Prep Batch: 574582

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-28	R-5877 T01	Dissolved	Water	7470A	
180-179481-29	R-5877 T02	Dissolved	Water	7470A	
180-179481-30	R-5877 T03	Dissolved	Water	7470A	
180-179481-37	R-5878 T01	Dissolved	Water	7470A	
180-179481-38	R-5878 T02	Dissolved	Water	7470A	
180-179481-39	R-5878 T03	Dissolved	Water	7470A	
180-179481-46	R-5879 T01	Dissolved	Water	7470A	
180-179481-48	R-5879 T03	Dissolved	Water	7470A	
MB 410-574582/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-574582/2-A	Lab Control Sample	Total/NA	Water	7470A	
180-179481-38 MS	R-5878 T02	Dissolved	Water	7470A	
180-179481-38 MSD	R-5878 T02	Dissolved	Water	7470A	
180-179481-38 DU	R-5878 T02	Dissolved	Water	7470A	

Prep Batch: 574584

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-47	R-5879 T02	Dissolved	Water	7470A	
MB 410-574584/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-574584/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 574857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-28	R-5877 T01	Dissolved	Water	3005A	
180-179481-29	R-5877 T02	Dissolved	Water	3005A	
180-179481-30	R-5877 T03	Dissolved	Water	3005A	
180-179481-37	R-5878 T01	Dissolved	Water	3005A	
180-179481-38	R-5878 T02	Dissolved	Water	3005A	
180-179481-39	R-5878 T03	Dissolved	Water	3005A	
180-179481-46	R-5879 T01	Dissolved	Water	3005A	
180-179481-47	R-5879 T02	Dissolved	Water	3005A	
180-179481-48	R-5879 T03	Dissolved	Water	3005A	
MB 410-574857/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-574857/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 574859

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-31	R-5877 T04	Dissolved	Water	3005A	
180-179481-40	R-5878 T04	Dissolved	Water	3005A	
180-179481-49	R-5879 T04	Dissolved	Water	3005A	
MB 410-574859/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-574859/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 575162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-31	R-5877 T04	Dissolved	Water	7470A	
180-179481-40	R-5878 T04	Dissolved	Water	7470A	
180-179481-49	R-5879 T04	Dissolved	Water	7470A	
MB 410-575162/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-575162/2-A	Lab Control Sample	Total/NA	Water	7470A	

Metals

Analysis Batch: 575177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-31	R-5877 T04	Dissolved	Water	6010D	574859
180-179481-40	R-5878 T04	Dissolved	Water	6010D	574859
180-179481-49	R-5879 T04	Dissolved	Water	6010D	574859
MB 410-574859/1-A	Method Blank	Total Recoverable	Water	6010D	574859
LCS 410-574859/2-A	Lab Control Sample	Total Recoverable	Water	6010D	574859

Analysis Batch: 575280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-28	R-5877 T01	Dissolved	Water	7470A	574582
180-179481-29	R-5877 T02	Dissolved	Water	7470A	574582
180-179481-30	R-5877 T03	Dissolved	Water	7470A	574582
180-179481-37	R-5878 T01	Dissolved	Water	7470A	574582
180-179481-38	R-5878 T02	Dissolved	Water	7470A	574582
180-179481-39	R-5878 T03	Dissolved	Water	7470A	574582
180-179481-46	R-5879 T01	Dissolved	Water	7470A	574582
180-179481-48	R-5879 T03	Dissolved	Water	7470A	574582
MB 410-574582/1-A	Method Blank	Total/NA	Water	7470A	574582
LCS 410-574582/2-A	Lab Control Sample	Total/NA	Water	7470A	574582
180-179481-38 MS	R-5878 T02	Dissolved	Water	7470A	574582
180-179481-38 MSD	R-5878 T02	Dissolved	Water	7470A	574582
180-179481-38 DU	R-5878 T02	Dissolved	Water	7470A	574582

Prep Batch: 575354

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-76	LCS T03	Dissolved	Water	7470A	
180-179481-77	LCS T04	Dissolved	Water	7470A	
180-179481-84	LCSD T02	Dissolved	Water	7470A	
MB 410-575354/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-575354/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 576425

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-47	R-5879 T02	Dissolved	Water	7470A	574584
180-179481-76	LCS T03	Dissolved	Water	7470A	575354
180-179481-77	LCS T04	Dissolved	Water	7470A	575354
180-179481-84	LCSD T02	Dissolved	Water	7470A	575354
MB 410-574584/1-A	Method Blank	Total/NA	Water	7470A	574584
MB 410-575354/1-A	Method Blank	Total/NA	Water	7470A	575354
LCS 410-574584/2-A	Lab Control Sample	Total/NA	Water	7470A	574584
LCS 410-575354/2-A	Lab Control Sample	Total/NA	Water	7470A	575354

Analysis Batch: 576836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-28	R-5877 T01	Dissolved	Water	6010D	574857
180-179481-29	R-5877 T02	Dissolved	Water	6010D	574857
180-179481-30	R-5877 T03	Dissolved	Water	6010D	574857
180-179481-37	R-5878 T01	Dissolved	Water	6010D	574857
180-179481-38	R-5878 T02	Dissolved	Water	6010D	574857
180-179481-39	R-5878 T03	Dissolved	Water	6010D	574857
180-179481-46	R-5879 T01	Dissolved	Water	6010D	574857
180-179481-47	R-5879 T02	Dissolved	Water	6010D	574857

Metals (Continued)

Analysis Batch: 576836 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-48	R-5879 T03	Dissolved	Water	6010D	574857
MB 410-574857/1-A	Method Blank	Total Recoverable	Water	6010D	574857
LCS 410-574857/2-A	Lab Control Sample	Total Recoverable	Water	6010D	574857

Analysis Batch: 576883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-31	R-5877 T04	Dissolved	Water	7470A	575162
180-179481-40	R-5878 T04	Dissolved	Water	7470A	575162
180-179481-49	R-5879 T04	Dissolved	Water	7470A	575162
MB 410-575162/1-A	Method Blank	Total/NA	Water	7470A	575162
LCS 410-575162/2-A	Lab Control Sample	Total/NA	Water	7470A	575162

Analysis Batch: 576928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-31	R-5877 T04	Dissolved	Water	6020B	574859
180-179481-40	R-5878 T04	Dissolved	Water	6020B	574859
180-179481-49	R-5879 T04	Dissolved	Water	6020B	574859
MB 410-574859/1-A	Method Blank	Total Recoverable	Water	6020B	574859
LCS 410-574859/2-A	Lab Control Sample	Total Recoverable	Water	6020B	574859

Prep Batch: 578204

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-32	R-5877 T05	Dissolved	Water	3005A	
180-179481-41	R-5878 T05	Dissolved	Water	3005A	
180-179481-50	R-5879 T05	Dissolved	Water	3005A	
MB 410-578204/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-578204/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 410-578204/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	

Prep Batch: 578435

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-32	R-5877 T05	Dissolved	Water	7470A	
180-179481-41	R-5878 T05	Dissolved	Water	7470A	
180-179481-50	R-5879 T05	Dissolved	Water	7470A	
MB 410-578435/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-578435/2-A	Lab Control Sample	Total/NA	Water	7470A	
180-179481-50 MS	R-5879 T05	Dissolved	Water	7470A	
180-179481-50 MSD	R-5879 T05	Dissolved	Water	7470A	
180-179481-50 DU	R-5879 T05	Dissolved	Water	7470A	

Analysis Batch: 578589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-32	R-5877 T05	Dissolved	Water	6010D	578204
180-179481-41	R-5878 T05	Dissolved	Water	6010D	578204
180-179481-50	R-5879 T05	Dissolved	Water	6010D	578204
MB 410-578204/1-A	Method Blank	Total Recoverable	Water	6010D	578204
LCS 410-578204/2-A	Lab Control Sample	Total Recoverable	Water	6010D	578204
LCSD 410-578204/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010D	578204

Metals

Analysis Batch: 579551

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-28	R-5877 T01	Dissolved	Water	6020B	574857
180-179481-29	R-5877 T02	Dissolved	Water	6020B	574857
180-179481-30	R-5877 T03	Dissolved	Water	6020B	574857
180-179481-37	R-5878 T01	Dissolved	Water	6020B	574857
180-179481-38	R-5878 T02	Dissolved	Water	6020B	574857
180-179481-39	R-5878 T03	Dissolved	Water	6020B	574857
180-179481-46	R-5879 T01	Dissolved	Water	6020B	574857
180-179481-47	R-5879 T02	Dissolved	Water	6020B	574857
180-179481-48	R-5879 T03	Dissolved	Water	6020B	574857
MB 410-574857/1-A	Method Blank	Total Recoverable	Water	6020B	574857
LCS 410-574857/2-A	Lab Control Sample	Total Recoverable	Water	6020B	574857

Analysis Batch: 579835

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-32	R-5877 T05	Dissolved	Water	6020B	578204
180-179481-41	R-5878 T05	Dissolved	Water	6020B	578204
180-179481-50	R-5879 T05	Dissolved	Water	6020B	578204
MB 410-578204/1-A	Method Blank	Total Recoverable	Water	6020B	578204
LCS 410-578204/2-A	Lab Control Sample	Total Recoverable	Water	6020B	578204
LCSD 410-578204/3-A	Lab Control Sample Dup	Total Recoverable	Water	6020B	578204

Analysis Batch: 580313

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-32	R-5877 T05	Dissolved	Water	7470A	578435
180-179481-41	R-5878 T05	Dissolved	Water	7470A	578435
180-179481-50	R-5879 T05	Dissolved	Water	7470A	578435
MB 410-578435/1-A	Method Blank	Total/NA	Water	7470A	578435
LCS 410-578435/2-A	Lab Control Sample	Total/NA	Water	7470A	578435
180-179481-50 MS	R-5879 T05	Dissolved	Water	7470A	578435
180-179481-50 MSD	R-5879 T05	Dissolved	Water	7470A	578435
180-179481-50 DU	R-5879 T05	Dissolved	Water	7470A	578435

Prep Batch: 581727

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-74	LCS T01	Dissolved	Water	7470A	
180-179481-75	LCS T02	Dissolved	Water	7470A	
180-179481-83	LCSD T01	Dissolved	Water	7470A	
180-179481-85	LCSD T03	Dissolved	Water	7470A	
180-179481-86	LCSD T04	Dissolved	Water	7470A	
MB 410-581727/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-581727/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 410-581727/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

Analysis Batch: 582109

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-74	LCS T01	Dissolved	Water	7470A	581727
180-179481-75	LCS T02	Dissolved	Water	7470A	581727
180-179481-83	LCSD T01	Dissolved	Water	7470A	581727
180-179481-85	LCSD T03	Dissolved	Water	7470A	581727
180-179481-86	LCSD T04	Dissolved	Water	7470A	581727
MB 410-581727/1-A	Method Blank	Total/NA	Water	7470A	581727

Metals (Continued)

Analysis Batch: 582109 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 410-581727/2-A	Lab Control Sample	Total/NA	Water	7470A	581727
LCSD 410-581727/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	581727

Prep Batch: 582569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-33	R-5877 T06	Dissolved	Water	7470A	
180-179481-42	R-5878 T06	Dissolved	Water	7470A	
180-179481-51	R-5879 T06	Dissolved	Water	7470A	
MB 410-582569/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-582569/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 582769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-33	R-5877 T06	Dissolved	Water	3005A	
180-179481-42	R-5878 T06	Dissolved	Water	3005A	
180-179481-51	R-5879 T06	Dissolved	Water	3005A	
MB 410-582769/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-582769/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 583073

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-33	R-5877 T06	Dissolved	Water	6020B	582769
180-179481-42	R-5878 T06	Dissolved	Water	6020B	582769
180-179481-51	R-5879 T06	Dissolved	Water	6020B	582769
MB 410-582769/1-A	Method Blank	Total Recoverable	Water	6020B	582769
LCS 410-582769/2-A	Lab Control Sample	Total Recoverable	Water	6020B	582769

Analysis Batch: 583930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-33	R-5877 T06	Dissolved	Water	6010D	582769
180-179481-42	R-5878 T06	Dissolved	Water	6010D	582769
180-179481-51	R-5879 T06	Dissolved	Water	6010D	582769
MB 410-582769/1-A	Method Blank	Total Recoverable	Water	6010D	582769
LCS 410-582769/2-A	Lab Control Sample	Total Recoverable	Water	6010D	582769

Analysis Batch: 585449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-33	R-5877 T06	Dissolved	Water	7470A	582569
180-179481-42	R-5878 T06	Dissolved	Water	7470A	582569
180-179481-51	R-5879 T06	Dissolved	Water	7470A	582569
MB 410-582569/1-A	Method Blank	Total/NA	Water	7470A	582569
LCS 410-582569/2-A	Lab Control Sample	Total/NA	Water	7470A	582569

Prep Batch: 588453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-34	R-5877 T07	Dissolved	Water	7470A	
180-179481-43	R-5878 T07	Dissolved	Water	7470A	
180-179481-52	R-5879 T07	Dissolved	Water	7470A	
MB 410-588453/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-588453/2-A	Lab Control Sample	Total/NA	Water	7470A	
180-179481-34 MS	R-5877 T07	Dissolved	Water	7470A	

Metals (Continued)

Prep Batch: 588453 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-34 MSD	R-5877 T07	Dissolved	Water	7470A	
180-179481-34 DU	R-5877 T07	Dissolved	Water	7470A	

Prep Batch: 588785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-34	R-5877 T07	Dissolved	Water	3005A	
180-179481-43	R-5878 T07	Dissolved	Water	3005A	
180-179481-52	R-5879 T07	Dissolved	Water	3005A	
MB 410-588785/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-588785/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 589056

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-34	R-5877 T07	Dissolved	Water	7470A	588453
180-179481-43	R-5878 T07	Dissolved	Water	7470A	588453
180-179481-52	R-5879 T07	Dissolved	Water	7470A	588453
MB 410-588453/1-A	Method Blank	Total/NA	Water	7470A	588453
LCS 410-588453/2-A	Lab Control Sample	Total/NA	Water	7470A	588453
180-179481-34 MS	R-5877 T07	Dissolved	Water	7470A	588453
180-179481-34 MSD	R-5877 T07	Dissolved	Water	7470A	588453
180-179481-34 DU	R-5877 T07	Dissolved	Water	7470A	588453

Analysis Batch: 589520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-34	R-5877 T07	Dissolved	Water	6020B	588785
180-179481-43	R-5878 T07	Dissolved	Water	6020B	588785
180-179481-52	R-5879 T07	Dissolved	Water	6020B	588785
MB 410-588785/1-A	Method Blank	Total Recoverable	Water	6020B	588785
LCS 410-588785/2-A	Lab Control Sample	Total Recoverable	Water	6020B	588785

Analysis Batch: 589702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-34	R-5877 T07	Dissolved	Water	6010D	588785
180-179481-43	R-5878 T07	Dissolved	Water	6010D	588785
180-179481-52	R-5879 T07	Dissolved	Water	6010D	588785
MB 410-588785/1-A	Method Blank	Total Recoverable	Water	6010D	588785
LCS 410-588785/2-A	Lab Control Sample	Total Recoverable	Water	6010D	588785

Prep Batch: 590566

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-35	R-5877 T08	Dissolved	Water	3005A	
180-179481-44	R-5878 T08	Dissolved	Water	3005A	
180-179481-53	R-5879 T08	Dissolved	Water	3005A	
MB 410-590566/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-590566/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-179481-53 MS	R-5879 T08	Dissolved	Water	3005A	
180-179481-53 MSD	R-5879 T08	Dissolved	Water	3005A	
180-179481-53 DU	R-5879 T08	Dissolved	Water	3005A	

Metals

Prep Batch: 590881

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-35	R-5877 T08	Dissolved	Water	7470A	
180-179481-44	R-5878 T08	Dissolved	Water	7470A	
180-179481-53	R-5879 T08	Dissolved	Water	7470A	
MB 410-590881/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-590881/2-A	Lab Control Sample	Total/NA	Water	7470A	
180-179481-35 MS	R-5877 T08	Dissolved	Water	7470A	
180-179481-35 MSD	R-5877 T08	Dissolved	Water	7470A	
180-179481-35 DU	R-5877 T08	Dissolved	Water	7470A	

Analysis Batch: 591054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-35	R-5877 T08	Dissolved	Water	6010D	590566
180-179481-44	R-5878 T08	Dissolved	Water	6010D	590566
180-179481-53	R-5879 T08	Dissolved	Water	6010D	590566
MB 410-590566/1-A	Method Blank	Total Recoverable	Water	6010D	590566
LCS 410-590566/2-A	Lab Control Sample	Total Recoverable	Water	6010D	590566
180-179481-53 MS	R-5879 T08	Dissolved	Water	6010D	590566
180-179481-53 MSD	R-5879 T08	Dissolved	Water	6010D	590566
180-179481-53 DU	R-5879 T08	Dissolved	Water	6010D	590566

Analysis Batch: 591085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-35	R-5877 T08	Dissolved	Water	6020B	590566
180-179481-44	R-5878 T08	Dissolved	Water	6020B	590566
180-179481-53	R-5879 T08	Dissolved	Water	6020B	590566
MB 410-590566/1-A	Method Blank	Total Recoverable	Water	6020B	590566
LCS 410-590566/2-A	Lab Control Sample	Total Recoverable	Water	6020B	590566
180-179481-53 MS	R-5879 T08	Dissolved	Water	6020B	590566
180-179481-53 MSD	R-5879 T08	Dissolved	Water	6020B	590566
180-179481-53 DU	R-5879 T08	Dissolved	Water	6020B	590566

Prep Batch: 591503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-79	LCS T06	Dissolved	Water	7470A	
180-179481-88	LCSD T06	Dissolved	Water	7470A	
MB 410-591503/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-591503/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 591839

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-79	LCS T06	Dissolved	Water	7470A	591503
180-179481-88	LCSD T06	Dissolved	Water	7470A	591503
MB 410-591503/1-A	Method Blank	Total/NA	Water	7470A	591503
LCS 410-591503/2-A	Lab Control Sample	Total/NA	Water	7470A	591503

Analysis Batch: 592661

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-35	R-5877 T08	Dissolved	Water	7470A	590881
180-179481-44	R-5878 T08	Dissolved	Water	7470A	590881
180-179481-53	R-5879 T08	Dissolved	Water	7470A	590881
MB 410-590881/1-A	Method Blank	Total/NA	Water	7470A	590881

Metals (Continued)

Analysis Batch: 592661 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 410-590881/2-A	Lab Control Sample	Total/NA	Water	7470A	590881
180-179481-35 MS	R-5877 T08	Dissolved	Water	7470A	590881
180-179481-35 MSD	R-5877 T08	Dissolved	Water	7470A	590881
180-179481-35 DU	R-5877 T08	Dissolved	Water	7470A	590881

Prep Batch: 593724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-54	R-5879 T09	Dissolved	Water	3005A	
MB 410-593724/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-593724/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 593968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-36	R-5877 T09	Dissolved	Water	3005A	
180-179481-45	R-5878 T09	Dissolved	Water	3005A	
MB 410-593968/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-593968/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 410-593968/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	

Prep Batch: 593985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-36	R-5877 T09	Dissolved	Water	7470A	
180-179481-45	R-5878 T09	Dissolved	Water	7470A	
180-179481-54	R-5879 T09	Dissolved	Water	7470A	
MB 410-593985/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-593985/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 410-593985/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

Analysis Batch: 594197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-36	R-5877 T09	Dissolved	Water	6010D	593968
180-179481-45	R-5878 T09	Dissolved	Water	6010D	593968
MB 410-593968/1-A	Method Blank	Total Recoverable	Water	6010D	593968
LCS 410-593968/2-A	Lab Control Sample	Total Recoverable	Water	6010D	593968
LCSD 410-593968/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010D	593968

Analysis Batch: 594253

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-36	R-5877 T09	Dissolved	Water	7470A	593985
180-179481-45	R-5878 T09	Dissolved	Water	7470A	593985
180-179481-54	R-5879 T09	Dissolved	Water	7470A	593985
MB 410-593985/1-A	Method Blank	Total/NA	Water	7470A	593985
LCS 410-593985/2-A	Lab Control Sample	Total/NA	Water	7470A	593985
LCSD 410-593985/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	593985

Analysis Batch: 594469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-36	R-5877 T09	Dissolved	Water	6020B	593968
180-179481-45	R-5878 T09	Dissolved	Water	6020B	593968
MB 410-593968/1-A	Method Blank	Total Recoverable	Water	6020B	593968
LCS 410-593968/2-A	Lab Control Sample	Total Recoverable	Water	6020B	593968

Metals (Continued)

Analysis Batch: 594469 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 410-593968/3-A	Lab Control Sample Dup	Total Recoverable	Water	6020B	593968

Prep Batch: 594829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-34	R-5877 T07	Dissolved	Water	7470A	
180-179481-43	R-5878 T07	Dissolved	Water	7470A	
180-179481-52	R-5879 T07	Dissolved	Water	7470A	
180-179481-78	LCS T05	Dissolved	Water	7470A	
180-179481-80	LCS T07	Dissolved	Water	7470A	
180-179481-81	LCS T08	Dissolved	Water	7470A	
180-179481-82	LCS T09	Dissolved	Water	7470A	
180-179481-87	LCSD T05	Dissolved	Water	7470A	
MB 410-594829/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-594829/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 410-594829/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

Prep Batch: 594835

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-35	R-5877 T08	Dissolved	Water	7470A	
180-179481-36	R-5877 T09	Dissolved	Water	7470A	
180-179481-44	R-5878 T08	Dissolved	Water	7470A	
180-179481-45	R-5878 T09	Dissolved	Water	7470A	
180-179481-53	R-5879 T08	Dissolved	Water	7470A	
180-179481-54	R-5879 T09	Dissolved	Water	7470A	
180-179481-89	LCSD T07	Dissolved	Water	7470A	
180-179481-90	LCSD T08	Dissolved	Water	7470A	
180-179481-91	LCSD T09	Dissolved	Water	7470A	
MB 410-594835/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-594835/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 410-594835/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

Analysis Batch: 595032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-54	R-5879 T09	Dissolved	Water	6020B	593724
MB 410-593724/1-A	Method Blank	Total Recoverable	Water	6020B	593724
LCS 410-593724/2-A	Lab Control Sample	Total Recoverable	Water	6020B	593724

Analysis Batch: 595310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-54	R-5879 T09	Dissolved	Water	6010D	593724
MB 410-593724/1-A	Method Blank	Total Recoverable	Water	6010D	593724
LCS 410-593724/2-A	Lab Control Sample	Total Recoverable	Water	6010D	593724

Analysis Batch: 595456

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-34	R-5877 T07	Dissolved	Water	7470A	594829
180-179481-35	R-5877 T08	Dissolved	Water	7470A	594835
180-179481-36	R-5877 T09	Dissolved	Water	7470A	594835
180-179481-43	R-5878 T07	Dissolved	Water	7470A	594829
180-179481-44	R-5878 T08	Dissolved	Water	7470A	594835
180-179481-45	R-5878 T09	Dissolved	Water	7470A	594835

Metals (Continued)

Analysis Batch: 595456 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-52	R-5879 T07	Dissolved	Water	7470A	594829
180-179481-53	R-5879 T08	Dissolved	Water	7470A	594835
180-179481-54	R-5879 T09	Dissolved	Water	7470A	594835
180-179481-78	LCS T05	Dissolved	Water	7470A	594829
180-179481-80	LCS T07	Dissolved	Water	7470A	594829
180-179481-81	LCS T08	Dissolved	Water	7470A	594829
180-179481-82	LCS T09	Dissolved	Water	7470A	594829
180-179481-87	LCSD T05	Dissolved	Water	7470A	594829
180-179481-89	LCSD T07	Dissolved	Water	7470A	594835
180-179481-90	LCSD T08	Dissolved	Water	7470A	594835
MB 410-594829/1-A	Method Blank	Total/NA	Water	7470A	594829
MB 410-594835/1-A	Method Blank	Total/NA	Water	7470A	594835
LCS 410-594829/2-A	Lab Control Sample	Total/NA	Water	7470A	594829
LCS 410-594835/2-A	Lab Control Sample	Total/NA	Water	7470A	594835
LCSD 410-594829/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	594829
LCSD 410-594835/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	594835

Analysis Batch: 595507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-54	R-5879 T09	Dissolved	Water	6020B	593724
MB 410-593724/1-A	Method Blank	Total Recoverable	Water	6020B	593724
LCS 410-593724/2-A	Lab Control Sample	Total Recoverable	Water	6020B	593724

Analysis Batch: 596396

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-91	LCSD T09	Dissolved	Water	7470A	594835

General Chemistry

Leach Batch: 483164

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-1	R-5877 T01	Leach	Solid	1315	
180-179481-10	R-5878 T01	Leach	Solid	1315	
180-179481-19	R-5879 T01	Leach	Solid	1315	
180-179481-1 MS	R-5877 T01	Leach	Solid	1315	
180-179481-19 MS	R-5879 T01	Leach	Solid	1315	
180-179481-1 DU	R-5877 T01	Leach	Solid	1315	

Leach Batch: 483172

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-2	R-5877 T02	Leach	Solid	1315	
180-179481-11	R-5878 T02	Leach	Solid	1315	
180-179481-20	R-5879 T02	Leach	Solid	1315	
180-179481-2 DU	R-5877 T02	Leach	Solid	1315	
180-179481-20 DU	R-5879 T02	Leach	Solid	1315	

Leach Batch: 483173

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-3	R-5877 T03	Leach	Solid	1315	
180-179481-12	R-5878 T03	Leach	Solid	1315	
180-179481-21	R-5879 T03	Leach	Solid	1315	

General Chemistry (Continued)

Leach Batch: 483173 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-3 DU	R-5877 T03	Leach	Solid	1315	

Leach Batch: 483174

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-4	R-5877 T04	Leach	Solid	1315	
180-179481-13	R-5878 T04	Leach	Solid	1315	
180-179481-22	R-5879 T04	Leach	Solid	1315	
180-179481-4 DU	R-5877 T04	Leach	Solid	1315	
180-179481-13 DU	R-5878 T04	Leach	Solid	1315	

Leach Batch: 483175

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-5	R-5877 T05	Leach	Solid	1315	
180-179481-14	R-5878 T05	Leach	Solid	1315	
180-179481-23	R-5879 T05	Leach	Solid	1315	
180-179481-5 MS	R-5877 T05	Leach	Solid	1315	
180-179481-5 DU	R-5877 T05	Leach	Solid	1315	
180-179481-14 DU	R-5878 T05	Leach	Solid	1315	

Leach Batch: 483177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-6	R-5877 T06	Leach	Solid	1315	
180-179481-15	R-5878 T06	Leach	Solid	1315	
180-179481-24	R-5879 T06	Leach	Solid	1315	
180-179481-6 DU	R-5877 T06	Leach	Solid	1315	

Leach Batch: 483179

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-7	R-5877 T07	Leach	Solid	1315	
180-179481-16	R-5878 T07	Leach	Solid	1315	
180-179481-25	R-5879 T07	Leach	Solid	1315	
180-179481-7 MS	R-5877 T07	Leach	Solid	1315	
180-179481-7 DU	R-5877 T07	Leach	Solid	1315	
180-179481-16 DU	R-5878 T07	Leach	Solid	1315	

Leach Batch: 483180

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-8	R-5877 T08	Leach	Solid	1315	
180-179481-17	R-5878 T08	Leach	Solid	1315	
180-179481-26	R-5879 T08	Leach	Solid	1315	
180-179481-8 MS	R-5877 T08	Leach	Solid	1315	
180-179481-26 MS	R-5879 T08	Leach	Solid	1315	
180-179481-8 DU	R-5877 T08	Leach	Solid	1315	
180-179481-17 DU	R-5878 T08	Leach	Solid	1315	

Leach Batch: 483181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-9	R-5877 T09	Leach	Solid	1315	
180-179481-18	R-5878 T09	Leach	Solid	1315	
180-179481-27	R-5879 T09	Leach	Solid	1315	
180-179481-9 MS	R-5877 T09	Leach	Solid	1315	

General Chemistry (Continued)

Leach Batch: 483181 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-9 DU	R-5877 T09	Leach	Solid	1315	
180-179481-18 DU	R-5878 T09	Leach	Solid	1315	

Analysis Batch: 483740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-1	R-5877 T01	Leach	Solid	SM 2580B	483164
180-179481-2	R-5877 T02	Leach	Solid	SM 2580B	483172
180-179481-3	R-5877 T03	Leach	Solid	SM 2580B	483173
180-179481-10	R-5878 T01	Leach	Solid	SM 2580B	483164
180-179481-11	R-5878 T02	Leach	Solid	SM 2580B	483172
180-179481-12	R-5878 T03	Leach	Solid	SM 2580B	483173
180-179481-19	R-5879 T01	Leach	Solid	SM 2580B	483164
180-179481-20	R-5879 T02	Leach	Solid	SM 2580B	483172
180-179481-21	R-5879 T03	Leach	Solid	SM 2580B	483173
LCS 180-483740/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
LCS 180-483740/26	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-179481-1 DU	R-5877 T01	Leach	Solid	SM 2580B	483164

Analysis Batch: 483750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-1	R-5877 T01	Leach	Solid	SM 2510B	483164
180-179481-2	R-5877 T02	Leach	Solid	SM 2510B	483172
180-179481-3	R-5877 T03	Leach	Solid	SM 2510B	483173
180-179481-10	R-5878 T01	Leach	Solid	SM 2510B	483164
180-179481-11	R-5878 T02	Leach	Solid	SM 2510B	483172
180-179481-12	R-5878 T03	Leach	Solid	SM 2510B	483173
180-179481-19	R-5879 T01	Leach	Solid	SM 2510B	483164
180-179481-20	R-5879 T02	Leach	Solid	SM 2510B	483172
180-179481-21	R-5879 T03	Leach	Solid	SM 2510B	483173
MB 180-483750/50	Method Blank	Total/NA	Solid	SM 2510B	
MB 180-483750/74	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-483750/49	Lab Control Sample	Total/NA	Solid	SM 2510B	
LCS 180-483750/73	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-179481-2 DU	R-5877 T02	Leach	Solid	SM 2510B	483172
180-179481-3 DU	R-5877 T03	Leach	Solid	SM 2510B	483173

Analysis Batch: 483963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-1	R-5877 T01	Leach	Solid	EPA 9040C	483164
180-179481-2	R-5877 T02	Leach	Solid	EPA 9040C	483172
180-179481-3	R-5877 T03	Leach	Solid	EPA 9040C	483173
180-179481-10	R-5878 T01	Leach	Solid	EPA 9040C	483164
180-179481-11	R-5878 T02	Leach	Solid	EPA 9040C	483172
180-179481-12	R-5878 T03	Leach	Solid	EPA 9040C	483173
180-179481-19	R-5879 T01	Leach	Solid	EPA 9040C	483164
180-179481-20	R-5879 T02	Leach	Solid	EPA 9040C	483172
180-179481-21	R-5879 T03	Leach	Solid	EPA 9040C	483173
LCS 180-483963/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
LCS 180-483963/24	Lab Control Sample	Total/NA	Solid	EPA 9040C	

General Chemistry

Analysis Batch: 484008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-1	R-5877 T01	Leach	Solid	5310C-2014	483164
180-179481-2	R-5877 T02	Leach	Solid	5310C-2014	483172
180-179481-3	R-5877 T03	Leach	Solid	5310C-2014	483173
180-179481-10	R-5878 T01	Leach	Solid	5310C-2014	483164
180-179481-11	R-5878 T02	Leach	Solid	5310C-2014	483172
180-179481-12	R-5878 T03	Leach	Solid	5310C-2014	483173
180-179481-19	R-5879 T01	Leach	Solid	5310C-2014	483164
180-179481-20	R-5879 T02	Leach	Solid	5310C-2014	483172
180-179481-21	R-5879 T03	Leach	Solid	5310C-2014	483173
MB 180-484008/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-484008/4	Lab Control Sample	Dissolved	Solid	5310C-2014	
180-179481-1 MS	R-5877 T01	Leach	Solid	5310C-2014	483164
180-179481-19 MS	R-5879 T01	Leach	Solid	5310C-2014	483164
180-179481-2 DU	R-5877 T02	Leach	Solid	5310C-2014	483172
180-179481-20 DU	R-5879 T02	Leach	Solid	5310C-2014	483172

Analysis Batch: 484015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-4	R-5877 T04	Leach	Solid	SM 2580B	483174
180-179481-13	R-5878 T04	Leach	Solid	SM 2580B	483174
180-179481-22	R-5879 T04	Leach	Solid	SM 2580B	483174
LCS 180-484015/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
LCS 180-484015/26	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-179481-13 DU	R-5878 T04	Leach	Solid	SM 2580B	483174

Analysis Batch: 484237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-4	R-5877 T04	Leach	Solid	5310C-2014	483174
180-179481-13	R-5878 T04	Leach	Solid	5310C-2014	483174
180-179481-22	R-5879 T04	Leach	Solid	5310C-2014	483174
MB 180-484237/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-484237/4	Lab Control Sample	Dissolved	Solid	5310C-2014	

Analysis Batch: 484286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-4	R-5877 T04	Leach	Solid	EPA 9040C	483174
180-179481-13	R-5878 T04	Leach	Solid	EPA 9040C	483174
180-179481-22	R-5879 T04	Leach	Solid	EPA 9040C	483174
LCS 180-484286/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-179481-4 DU	R-5877 T04	Leach	Solid	EPA 9040C	483174

Analysis Batch: 484289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-4	R-5877 T04	Leach	Solid	SM 2510B	483174
180-179481-13	R-5878 T04	Leach	Solid	SM 2510B	483174
180-179481-22	R-5879 T04	Leach	Solid	SM 2510B	483174
MB 180-484289/50	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-484289/49	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-179481-4 DU	R-5877 T04	Leach	Solid	SM 2510B	483174
180-179481-13 DU	R-5878 T04	Leach	Solid	SM 2510B	483174

General Chemistry

Analysis Batch: 484801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-5	R-5877 T05	Leach	Solid	SM 2510B	483175
180-179481-14	R-5878 T05	Leach	Solid	SM 2510B	483175
180-179481-23	R-5879 T05	Leach	Solid	SM 2510B	483175
MB 180-484801/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-484801/1	Lab Control Sample	Total/NA	Solid	SM 2510B	

Analysis Batch: 484973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-5	R-5877 T05	Leach	Solid	SM 2580B	483175
180-179481-14	R-5878 T05	Leach	Solid	SM 2580B	483175
180-179481-23	R-5879 T05	Leach	Solid	SM 2580B	483175
LCS 180-484973/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-179481-5 DU	R-5877 T05	Leach	Solid	SM 2580B	483175

Analysis Batch: 485167

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-5	R-5877 T05	Leach	Solid	EPA 9040C	483175
180-179481-14	R-5878 T05	Leach	Solid	EPA 9040C	483175
180-179481-23	R-5879 T05	Leach	Solid	EPA 9040C	483175
LCS 180-485167/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 485605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-5	R-5877 T05	Leach	Solid	5310C-2014	483175
180-179481-14	R-5878 T05	Leach	Solid	5310C-2014	483175
180-179481-23	R-5879 T05	Leach	Solid	5310C-2014	483175
MB 180-485605/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-485605/4	Lab Control Sample	Dissolved	Solid	5310C-2014	
180-179481-5 MS	R-5877 T05	Leach	Solid	5310C-2014	483175
180-179481-14 DU	R-5878 T05	Leach	Solid	5310C-2014	483175

Analysis Batch: 485741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-6	R-5877 T06	Leach	Solid	SM 2580B	483177
180-179481-15	R-5878 T06	Leach	Solid	SM 2580B	483177
180-179481-24	R-5879 T06	Leach	Solid	SM 2580B	483177
LCS 180-485741/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-179481-6 DU	R-5877 T06	Leach	Solid	SM 2580B	483177

Analysis Batch: 485905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-6	R-5877 T06	Leach	Solid	SM 2510B	483177
180-179481-15	R-5878 T06	Leach	Solid	SM 2510B	483177
180-179481-24	R-5879 T06	Leach	Solid	SM 2510B	483177
MB 180-485905/2	Method Blank	Total/NA	Solid	SM 2510B	
MB 180-485905/30	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-485905/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
LCS 180-485905/29	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-179481-6 DU	R-5877 T06	Leach	Solid	SM 2510B	483177

General Chemistry

Analysis Batch: 486040

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-6	R-5877 T06	Leach	Solid	5310C-2014	483177
180-179481-15	R-5878 T06	Leach	Solid	5310C-2014	483177
180-179481-24	R-5879 T06	Leach	Solid	5310C-2014	483177
MB 180-486040/35	Method Blank	Dissolved	Solid	5310C-2014	
MB 180-486040/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-486040/34	Lab Control Sample	Dissolved	Solid	5310C-2014	

Analysis Batch: 486092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-6	R-5877 T06	Leach	Solid	EPA 9040C	483177
180-179481-15	R-5878 T06	Leach	Solid	EPA 9040C	483177
180-179481-24	R-5879 T06	Leach	Solid	EPA 9040C	483177
LCS 180-486092/47	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 486788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-7	R-5877 T07	Leach	Solid	SM 2580B	483179
180-179481-16	R-5878 T07	Leach	Solid	SM 2580B	483179
180-179481-25	R-5879 T07	Leach	Solid	SM 2580B	483179
LCS 180-486788/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-179481-7 DU	R-5877 T07	Leach	Solid	SM 2580B	483179

Analysis Batch: 486916

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-7	R-5877 T07	Leach	Solid	EPA 9040C	483179
180-179481-16	R-5878 T07	Leach	Solid	EPA 9040C	483179
180-179481-25	R-5879 T07	Leach	Solid	EPA 9040C	483179
LCS 180-486916/24	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 487211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-8	R-5877 T08	Leach	Solid	EPA 9040C	483180
180-179481-17	R-5878 T08	Leach	Solid	EPA 9040C	483180
180-179481-26	R-5879 T08	Leach	Solid	EPA 9040C	483180
LCS 180-487211/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-179481-8 DU	R-5877 T08	Leach	Solid	EPA 9040C	483180

Analysis Batch: 487257

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-7	R-5877 T07	Leach	Solid	5310C-2014	483179
180-179481-8	R-5877 T08	Leach	Solid	5310C-2014	483180
180-179481-16	R-5878 T07	Leach	Solid	5310C-2014	483179
180-179481-17	R-5878 T08	Leach	Solid	5310C-2014	483180
180-179481-25	R-5879 T07	Leach	Solid	5310C-2014	483179
180-179481-26	R-5879 T08	Leach	Solid	5310C-2014	483180
MB 180-487257/35	Method Blank	Dissolved	Solid	5310C-2014	
MB 180-487257/5	Method Blank	Dissolved	Solid	5310C-2014	
MB 180-487257/67	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-487257/4	Lab Control Sample	Dissolved	Solid	5310C-2014	
LCS 180-487257/66	Lab Control Sample	Dissolved	Solid	5310C-2014	
180-179481-7 MS	R-5877 T07	Leach	Solid	5310C-2014	483179

General Chemistry (Continued)

Analysis Batch: 487257 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-8 MS	R-5877 T08	Leach	Solid	5310C-2014	483180
180-179481-26 MS	R-5879 T08	Leach	Solid	5310C-2014	483180
180-179481-16 DU	R-5878 T07	Leach	Solid	5310C-2014	483179
180-179481-17 DU	R-5878 T08	Leach	Solid	5310C-2014	483180

Analysis Batch: 487398

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-7	R-5877 T07	Leach	Solid	SM 2510B	483179
180-179481-8	R-5877 T08	Leach	Solid	SM 2510B	483180
180-179481-16	R-5878 T07	Leach	Solid	SM 2510B	483179
180-179481-17	R-5878 T08	Leach	Solid	SM 2510B	483180
180-179481-25	R-5879 T07	Leach	Solid	SM 2510B	483179
180-179481-26	R-5879 T08	Leach	Solid	SM 2510B	483180
MB 180-487398/2	Method Blank	Total/NA	Solid	SM 2510B	
MB 180-487398/28	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-487398/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
LCS 180-487398/27	Lab Control Sample	Total/NA	Solid	SM 2510B	

Analysis Batch: 487533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-8	R-5877 T08	Leach	Solid	SM 2580B	483180
180-179481-17	R-5878 T08	Leach	Solid	SM 2580B	483180
180-179481-26	R-5879 T08	Leach	Solid	SM 2580B	483180
LCS 180-487533/26	Lab Control Sample	Total/NA	Solid	SM 2580B	

Leach Batch: 487734

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 180-487734/1-A	Method Blank	Leach	Solid	D3987-85	

Analysis Batch: 487837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-9	R-5877 T09	Leach	Solid	SM 2580B	483181
180-179481-18	R-5878 T09	Leach	Solid	SM 2580B	483181
180-179481-27	R-5879 T09	Leach	Solid	SM 2580B	483181
LCS 180-487837/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-179481-9 DU	R-5877 T09	Leach	Solid	SM 2580B	483181

Analysis Batch: 487866

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-9	R-5877 T09	Leach	Solid	SM 2510B	483181
180-179481-18	R-5878 T09	Leach	Solid	SM 2510B	483181
180-179481-27	R-5879 T09	Leach	Solid	SM 2510B	483181
MB 180-487866/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-487866/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-179481-18 DU	R-5878 T09	Leach	Solid	SM 2510B	483181

Analysis Batch: 487928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-9	R-5877 T09	Leach	Solid	EPA 9040C	483181
180-179481-18	R-5878 T09	Leach	Solid	EPA 9040C	483181
180-179481-27	R-5879 T09	Leach	Solid	EPA 9040C	483181

General Chemistry (Continued)

Analysis Batch: 487928 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 180-487734/1-A	Method Blank	Leach	Solid	EPA 9040C	487734
LCS 180-487928/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-179481-9 DU	R-5877 T09	Leach	Solid	EPA 9040C	483181

Analysis Batch: 488181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179481-9	R-5877 T09	Leach	Solid	5310C-2014	483181
180-179481-18	R-5878 T09	Leach	Solid	5310C-2014	483181
180-179481-27	R-5879 T09	Leach	Solid	5310C-2014	483181
MB 180-488181/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-488181/4	Lab Control Sample	Dissolved	Solid	5310C-2014	
180-179481-9 MS	R-5877 T09	Leach	Solid	5310C-2014	483181
180-179481-18 DU	R-5878 T09	Leach	Solid	5310C-2014	483181

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-2442

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler:	Lab PM: Matko, Larry	Carrier Tracking No(s):	COC No:
Client Contact: Mike Ruela	Phone:	E-Mail:		Page: Page 1 of 1
Company: Mike Ruela				Job #:

Address: 935 Bethlehem Drive	Due Date Requested:
City: Bethlehem	TAT Requested (days):
State, Zip: PA, 18017	
Phone: 610-882-2611	PO #: Purchase Order not required
Email: mruela@bethapp.com	WO #:
Project Name: Blender 7	Project #:
Site:	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Lead Method 1315	TCLP Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
R-5877	8/27/24	1500	G	S			x			
R-5878	8/28/24	1500	G	S			x			
R-5879	8/29/24	1100	G	S			x			
R-5880	8/29/24	1500	G	S			x			
R-5881	8/30/24	1100	G	S			x			
R-5882	8/30/24	1500	G	S			x			

180-179481 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by:	Date/Time: 9/3/24 / 0800	Company: Bethlehem Apparatus	Received by:	Date/Time: 9/6/24 / 1000	Company:
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver 08/04/2016

Page 12 of 13
8/29/2025

CR20C

TODD RIZZUTO
(610) 838-7034
BETHLEHEM APPARATUS CO. INC.
890 FRONT STREET
HELLERTOWN PA 18055

7 LBS

1 OF 1

DWT: 17,9,10

SHIP TO:
LARRY MATKO
TESTAMERICA PITTSBURGH
301 ALPHA DRIVE RIDC PARK
PITTSBURGH PA 15238

PA 152 9-22

UPS GROUND
TRACKING #: 1Z 182 425 03 5336 2865

Temp

BILLING: P/P
HAZARDOUS MATERIALS – GROUND ONLY
HAZ#: UN2025

WS 27.0 32.7shrs ZP 450 35 DA 08/2024

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TEST AMERICA ...

180-179481 Waybill

19.5
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19.1

#26

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-531148.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179481-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 1/16/2025			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5877 T09 (180-179481-36)	1/6/25	09:35 Eastern	G	Water			X	X	X	3	
R-5878 T09 (180-179481-45)	1/6/25	09:35 Eastern	G	Water			X	X	X	3	
R-5879 T09 (180-179481-54)	1/6/25	09:35 Eastern	G	Water			X	X	X	3	
LCS T09 (180-179481-82)	1/6/25	09:35 Eastern	G	Water				X		2	
LCSD T09 (180-179481-91)	1/6/25	09:35 Eastern	G	Water				X		2	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	1-6-25 1700	EUTNF			
2						
3				[signature]	1/7/25 1020	EUTNF

Custody Seals Intact: ☒ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.2/1.1

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-527422.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 2
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179481-1
Address: 2425 New Holland Pike,	Due Date Requested: 11/14/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, Including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5877 T01 (180-179481-28)	11/4/24	11:35 Eastern	G	Water			X	X	X	3	
R-5877 T02 (180-179481-29)	11/5/24	09:35 Eastern	G	Water			X	X	X	3	
R-5877 T03 (180-179481-30)	11/6/24	09:35 Eastern	G	Water			X	X	X	3	
R-5878 T01 (180-179481-37)	11/4/24	11:35 Eastern	G	Water			X	X	X	3	
R-5878 T02 (180-179481-38)	11/5/24	09:35 Eastern	G	Water			X	X	X	3	
R-5878 T03 (180-179481-39)	11/6/24	09:35 Eastern	G	Water			X	X	X	3	
R-5879 T01 (180-179481-46)	11/4/24	11:35 Eastern	G	Water			X	X	X	3	
R-5879 T02 (180-179481-47)	11/5/24	09:35 Eastern	G	Water			X	X	X	3	
R-5879 T03 (180-179481-48)	11/6/24	09:35 Eastern	G	Water			X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		11/6/24 1700	ETTAS			
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: WV 24 09:50	Company ELLET

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 24.1-C3.7 20.7-CO.3

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-527422.2
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 2 of 2
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179481-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 11/14/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, Including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
LCS T01 (180-179481-74)	11/4/24	11:35 Eastern	G	Water				X		2	
LCS T02 (180-179481-75)	11/5/24	09:35 Eastern	G	Water				X		2	
LCS T03 (180-179481-76)	11/6/24	09:35 Eastern	G	Water				X		2	
LCSD T01 (180-179481-83)	11/4/24	11:35 Eastern	G	Water				X		2	
LCSD T02 (180-179481-84)	11/5/24	09:35 Eastern	G	Water				X		2	
LCSD T03 (180-179481-85)	11/6/24	09:35 Eastern	G	Water				X		2	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	11/16/24 1700	ETNB			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				W 7/24 09:50	ELLET

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		R4.1- C3.7 R0.7- C0.3

Ver: 10/10/2024

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-527819.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179481-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 11/14/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5877 T04 (180-179481-31)	11/11/24	09:35 Eastern	G	Water			X	X	X	3	
R-5878 T04 (180-179481-40)	11/11/24	09:35 Eastern	G	Water			X	X	X	3	
R-5879 T04 (180-179481-49)	11/11/24	09:35 Eastern	G	Water			X	X	X	3	
LCS T04 (180-179481-77)	11/11/24	09:35 Eastern	G	Water				X		2	
LCSD T04 (180-179481-86)	11/11/24	09:35 Eastern	G	Water				X		2	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 11/12/24 1700	Company: BTINE	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 11/13/24 1000	Company

Custody Seals Intact: X Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.3/1.7 4.3/4.0 4.5/0.9

Ver: 10/10/2024

1/29/2025

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-528226.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179481-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 11/28/2024			
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			

Analysis Requested

Preservation Codes: -

Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5877 T05 (180-179481-32)	11/18/24	09:35 Eastern	G	Water			X	X	X	1	
R-5878 T05 (180-179481-41)	11/18/24	09:35 Eastern	G	Water			X	X	X	1	
R-5879 T05 (180-179481-50)	11/18/24	09:35 Eastern	G	Water			X	X	X	1	
LCS T05 (180-179481-78)	11/18/24	09:35 Eastern	G	Water				X		2	
LCSD T05 (180-179481-87)	11/18/24	09:35 Eastern	G	Water				X		2	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 11-18-24 1700	Company: ELPMZ	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 11/19/24 1013	Company: ELPT

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.3 - 0.4

Ver: 10/10/2024

Eurofins Pittsburgh 12
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-529058.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179481-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 12/12/2024			
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, Including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5877 T06 (180-179481-33)	12/2/24	09:35 Eastern	G	Water			X	X	X	3	
R-5878 T06 (180-179481-42)	12/2/24	09:35 Eastern	G	Water			X	X	X	3	
R-5879 T06 (180-179481-51)	12/2/24	09:35 Eastern	G	Water			X	X	X	3	
LCS T06 (180-179481-79)	12/2/24	09:35 Eastern	G	Water				X		2	
LCSD T06 (180-179481-88)	12/2/24	09:35 Eastern	G	Water				X		2	

Preservation Codes: -

Other: N/A

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	12-2-24 1200	ELLE		12/2/24 1400	ELLE
Relinquished by:	12/2/24 1835	ELLE	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	12/2/24 1835	ELLE

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: ROW: 4.8-4.9 COW: 4.5-4.6

Ver: 10/10/2024

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-530032.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179481-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 12/26/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5877 T07 (180-179481-34)	12/16/24	09:35 Eastern	G	Water			X	X	X	3	
R-5878 T07 (180-179481-43)	12/16/24	09:35 Eastern	G	Water			X	X	X	3	
R-5879 T07 (180-179481-52)	12/16/24	09:35 Eastern	G	Water			X	X	X	3	
LCS T07 (180-179481-80)	12/16/24	09:35 Eastern	G	Water				X		2	
LCSD T07 (180-179481-89)	12/16/24	09:35 Eastern	G	Water				X		2	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	12-16-24 1300	ELLE	++	16DEC24 1400	ELLE
2	++	16DEC24	ELLE			
3				[signature]	17DEC24 1830	ELLE

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: R4 & C4

Ver: 10/10/2024

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-530566.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179481-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 1/2/2025			Preservation Codes:
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, Including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5877 T08 (180-179481-35)	12/23/24	09:35 Eastern	G	Water			X	X	X	3	
R-5878 T08 (180-179481-44)	12/23/24	09:35 Eastern	G	Water			X	X	X	3	
R-5879 T08 (180-179481-53)	12/23/24	09:35 Eastern	G	Water			X	X	X	3	
LCS T08 (180-179481-81)	12/23/24	09:35 Eastern	G	Water				X		2	
LCSD T08 (180-179481-90)	12/23/24	09:35 Eastern	G	Water				X		2	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	12-23-24 1430	ET HAN	Clarence Williams	12/23/24 1430	EHE
Relinquished by: Clarence Williams	Date/Time: 12/23/24 2050	Company EHE	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 12/23/24 2050	Company

Custody Seals Intact: ☑ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: None of the bottles said is Rinse 4.4 Corr 4.3

Ver: 10/10/2024

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179481-1

Login Number: 179481
List Number: 1
Creator: Kovitch, Christina M

List Source: Eurofins Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice per client request.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179481-1

Login Number: 179481
List Number: 2
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 11/07/24 10:40 AM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179481-1

Login Number: 179481
List Number: 3
Creator: McCaskey, Jonathan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 11/13/24 04:46 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179481-1

Login Number: 179481
List Number: 4
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 11/19/24 04:14 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179481-1

Login Number: 179481
List Number: 5
Creator: Metzger, Katherine A

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 12/02/24 08:34 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	Not present.
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179481-1

Login Number: 179481
List Number: 6
Creator: Burkholder, Conrad

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 12/17/24 03:56 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179481-1

Login Number: 179481
List Number: 7
Creator: Burkholder, Conrad

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 12/24/24 01:47 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179481-1

Login Number: 179481
List Number: 8
Creator: McCaskey, Jonathan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 01/07/25 12:17 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

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ANALYTICAL REPORT

PREPARED FOR

Attn: Paul Canevaro
Republic Services Inc
106130 W. Sam Houston Parkway N
Suite 300
Houston, Texas 77064

Generated 1/29/2025 1:01:37 PM

JOB DESCRIPTION

Republic Services Mercury Project REVISE

JOB NUMBER

180-179483-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.

my EOL

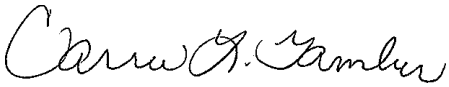
Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

Authorization



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1/29/2025 1:01:37 PM

Authorized for release by
Carrie Gamber, Senior Project Manager
Carrie.Gamber@et.eurofinsus.com
(412)963-2428

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CASE NARRATIVE

Client: Republic Services Inc

Project: Republic Services Mercury Project REVISE

Report Number: 180-179483-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 09/06/2024; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 19.1 C.

METALS
The following sample was analyzed outside of analytical holding time due to a laboratory error: MB T05 (180-179483-68).

Several samples were re-analyzed outside of analytical holding time both results were reported.

Sodium was detected in method blank MB 410-574859/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

GENERAL CHEMSITRY
The batch for DOC is dated to start in 2010, this was caused by an instrument malfunction that did not affect the samples in any form. The following samples were analyzed from 1/3/25 at 15:45 to 1/4/25 at 13:22. R-5882 T08 (180-179483-26), MB T08 (180-179483-62), (ICB 180-487755/3) and (ICV 180-487755/2)

The raw data for the following samples show the analysis preformed in 2010 for DOC. This is due to an error that has no affect on the samples. The time in the run log shows the correct time of analysis. R-5880 T09 (180-179483-9), R-5881 T09 (180-179483-18) and R-5882 T09 (180-179483-27)

Definitions/Glossary

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
B	Analyte was found in the blank.
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
!	Laboratory is not accredited for this parameter.
cn	Refer to Case Narrative for further detail
H3	Sample was received and analyzed past holding time. This does not meet regulatory requirements.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	02-00416	04-30-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
5310C-2014		Solid	Dissolved Organic Carbon - Quad
SM 2510B		Solid	Specific Conductance
SM 2580B		Solid	Oxidation Reduction Potential

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-26
A2LA	Dept. of Energy	0001.01	11-30-26
A2LA	ISO/IEC 17025	0001.01	11-30-26
Alabama	State	43200	01-31-25
Alaska	State	PA00009	06-30-25
Alaska (UST)	State	17-027	02-28-25
Arizona	State	AZ0780	03-12-25
Arkansas DEQ	State	88-00660	08-09-25
California	State	2792	01-31-25
Colorado	State	PA00009	06-30-25
Connecticut	State	PH-0746	06-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-25
Delaware (DW)	State	N/A	01-31-26
Florida	NELAP	E87997	06-30-25
Georgia (DW)	State	C048	01-31-25
Hawaii	State	N/A	01-31-25
Illinois	NELAP	200027	01-31-26
Iowa	State	361	03-01-26
Kansas	NELAP	E-10151	10-31-25
Kentucky (DW)	State	KY90088	12-31-25
Kentucky (UST)	State	0001.01	11-30-26
Kentucky (WW)	State	KY90088	12-31-25
Louisiana (All)	NELAP	02055	06-30-25
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-25
Massachusetts	State	M-PA009	06-30-25
Michigan	State	9930	01-31-25
Minnesota	NELAP	042-999-487	12-31-25
Mississippi	State	023	01-31-25
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-26
Nebraska	State	NE-OS-32-17	01-31-25
New Hampshire	NELAP	2730	01-10-26
New Jersey	NELAP	PA011	06-30-25
New York	NELAP	10670	04-01-25
North Carolina (DW)	State	42705	07-31-25
North Carolina (WW/SW)	State	521	12-31-25
North Dakota	State	R-205	01-31-24 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Oklahoma	NELAP	9804	08-31-25
Oregon	NELAP	PA200001	09-11-25
Pennsylvania	NELAP	36-00037	01-31-26
Quebec Ministry of Environment and Fight against Climate Change	PALA	507	09-16-29
Rhode Island	State	LAO00338	12-30-25
South Carolina	State	89002	01-31-25
Tennessee	State	02838	01-31-25
Texas	NELAP	T104704194-23-46	08-31-25
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-25
Virginia	NELAP	460182	06-14-25
Washington	State	C457	04-11-25
West Virginia (DW)	State	9906 C	01-31-25
West Virginia DEP	State	055	07-31-25
Wyoming	State	8TMS-L	01-31-25
Wyoming (UST)	A2LA	0001.01	11-30-26

Sample Summary

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-179483-1	R-5880 T01	Solid	08/29/24 15:00	09/06/24 10:00
180-179483-2	R-5880 T02	Solid	08/29/24 15:00	09/06/24 10:00
180-179483-3	R-5880 T03	Solid	08/29/24 15:00	09/06/24 10:00
180-179483-4	R-5880 T04	Solid	08/29/24 15:00	09/06/24 10:00
180-179483-5	R-5880 T05	Solid	08/29/24 15:00	09/06/24 10:00
180-179483-6	R-5880 T06	Solid	08/29/24 15:00	09/06/24 10:00
180-179483-7	R-5880 T07	Solid	08/29/24 15:00	09/06/24 10:00
180-179483-8	R-5880 T08	Solid	08/29/24 15:00	09/06/24 10:00
180-179483-9	R-5880 T09	Solid	08/29/24 15:00	09/06/24 10:00
180-179483-10	R-5881 T01	Solid	08/30/24 11:00	09/06/24 10:00
180-179483-11	R-5881 T02	Solid	08/30/24 11:00	09/06/24 10:00
180-179483-12	R-5881 T03	Solid	08/30/24 11:00	09/06/24 10:00
180-179483-13	R-5881 T04	Solid	08/30/24 11:00	09/06/24 10:00
180-179483-14	R-5881 T05	Solid	08/30/24 11:00	09/06/24 10:00
180-179483-15	R-5881 T06	Solid	08/30/24 11:00	09/06/24 10:00
180-179483-16	R-5881 T07	Solid	08/30/24 11:00	09/06/24 10:00
180-179483-17	R-5881 T08	Solid	08/30/24 11:00	09/06/24 10:00
180-179483-18	R-5881 T09	Solid	08/30/24 11:00	09/06/24 10:00
180-179483-19	R-5882 T01	Solid	08/30/24 15:00	09/06/24 10:00
180-179483-20	R-5882 T02	Solid	08/30/24 15:00	09/06/24 10:00
180-179483-21	R-5882 T03	Solid	08/30/24 15:00	09/06/24 10:00
180-179483-22	R-5882 T04	Solid	08/30/24 15:00	09/06/24 10:00
180-179483-23	R-5882 T05	Solid	08/30/24 15:00	09/06/24 10:00
180-179483-24	R-5882 T06	Solid	08/30/24 15:00	09/06/24 10:00
180-179483-25	R-5882 T07	Solid	08/30/24 15:00	09/06/24 10:00
180-179483-26	R-5882 T08	Solid	08/30/24 15:00	09/06/24 10:00
180-179483-27	R-5882 T09	Solid	08/30/24 15:00	09/06/24 10:00
180-179483-28	R-5880 T01	Water	11/04/24 11:35	09/06/24 10:00
180-179483-29	R-5880 T02	Water	11/05/24 09:35	09/06/24 10:00
180-179483-30	R-5880 T03	Water	11/06/24 09:35	09/06/24 10:00
180-179483-31	R-5880 T04	Water	11/11/24 09:35	09/06/24 10:00
180-179483-32	R-5880 T05	Water	11/18/24 09:35	09/06/24 10:00
180-179483-33	R-5880 T06	Water	12/02/24 09:35	09/06/24 10:00
180-179483-34	R-5880 T07	Water	12/16/24 09:35	09/06/24 10:00
180-179483-35	R-5880 T08	Water	12/23/24 09:35	09/06/24 10:00
180-179483-36	R-5880 T09	Water	01/06/25 09:35	09/06/24 10:00
180-179483-37	R-5881 T01	Water	11/04/24 11:35	09/06/24 10:00
180-179483-38	R-5881 T02	Water	11/05/24 09:35	09/06/24 10:00
180-179483-39	R-5881 T03	Water	11/06/24 09:35	09/06/24 10:00
180-179483-40	R-5881 T04	Water	11/11/24 09:35	09/06/24 10:00
180-179483-41	R-5881 T05	Water	11/18/24 09:35	09/06/24 10:00
180-179483-42	R-5881 T06	Water	12/02/24 09:35	09/06/24 10:00
180-179483-43	R-5881 T07	Water	12/16/24 09:35	09/06/24 10:00
180-179483-44	R-5881 T08	Water	12/23/24 09:35	09/06/24 10:00
180-179483-45	R-5881 T09	Water	01/06/25 09:35	09/06/24 10:00
180-179483-46	R-5882 T01	Water	11/04/24 11:35	09/06/24 10:00
180-179483-47	R-5882 T02	Water	11/05/24 09:35	09/06/24 10:00
180-179483-48	R-5882 T03	Water	11/06/24 09:35	09/06/24 10:00
180-179483-49	R-5882 T04	Water	11/11/24 09:35	09/06/24 10:00
180-179483-50	R-5882 T05	Water	11/18/24 09:35	09/06/24 10:00
180-179483-51	R-5882 T06	Water	12/02/24 09:35	09/06/24 10:00
180-179483-52	R-5882 T07	Water	12/16/24 09:35	09/06/24 10:00
180-179483-53	R-5882 T08	Water	12/23/24 09:35	09/06/24 10:00
180-179483-54	R-5882 T09	Water	01/06/25 09:35	09/06/24 10:00

Sample Summary

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-179483-55	MB T01	Solid	09/26/24 00:00	09/06/24 10:00
180-179483-56	MB T02	Solid	09/26/24 00:00	09/06/24 10:00
180-179483-57	MB T03	Solid	09/26/24 00:00	09/06/24 10:00
180-179483-58	MB T04	Solid	09/26/24 00:00	09/06/24 10:00
180-179483-59	MB T05	Solid	09/26/24 00:00	09/06/24 10:00
180-179483-60	MB T06	Solid	09/26/24 00:00	09/06/24 10:00
180-179483-61	MB T07	Solid	09/26/24 00:00	09/06/24 10:00
180-179483-62	MB T08	Solid	09/26/24 00:00	09/06/24 10:00
180-179483-63	MB T09	Solid	09/26/24 00:00	09/06/24 10:00
180-179483-64	MB T01	Water	11/04/24 11:35	09/06/24 10:00
180-179483-65	MB T02	Water	11/05/24 09:35	09/06/24 10:00
180-179483-66	MB T03	Water	11/06/24 09:35	09/06/24 10:00
180-179483-67	MB T04	Water	11/11/24 09:35	09/06/24 10:00
180-179483-68	MB T05	Water	11/18/24 09:35	09/06/24 10:00
180-179483-69	MB T06	Water	12/02/24 09:35	09/06/24 10:00
180-179483-70	MB T07	Water	12/16/24 09:35	09/06/24 10:00
180-179483-71	MB T08	Water	12/23/24 09:35	09/06/24 10:00
180-179483-72	MB T09	Water	01/06/25 09:35	09/06/24 10:00

Method Summary

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	ELLE
6020B	Metals (ICP/MS)	SW846	ELLE
7470A	Mercury (CVAA)	SW846	ELLE
5310C-2014	Dissolved Organic Carbon/Persulfate Oxidation	SM	EET PIT
EPA 9040C	pH	SW846	EET PIT
SM 2510B	Conductivity, Specific Conductance	SM	EET PIT
SM 2580B	Reduction-Oxidation (REDOX) Potential	SM	EET PIT
1315	Semi-Dynamic Tank Leaching Procedure	SW846	EET PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	ELLE
7470A	Preparation, Mercury	SW846	ELLE

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5880 T01
Lab Sample ID: 180-179483-1
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			263.8 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 22:55	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			263.8 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:05	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			263.8 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			263.8 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 13:34	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5880 T02
Lab Sample ID: 180-179483-2
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			265.4 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 23:18	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			265.4 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 10:08	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			265.4 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			265.4 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 14:22	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5880 T03
Lab Sample ID: 180-179483-3
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			265.6 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/07/24 23:41	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			265.6 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:35	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			265.6 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5880 T03
Lab Sample ID: 180-179483-3
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			265.6 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 15:03	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5880 T04
Lab Sample ID: 180-179483-4
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			265.8 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484237	11/12/24 22:15	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			265.8 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			484286	11/13/24 15:28	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			265.8 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484289	11/13/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			265.8 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484015	11/11/24 14:42	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5880 T05
Lab Sample ID: 180-179483-5
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			266.3 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	485605	11/27/24 23:04	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			266.3 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			485167	11/23/24 09:44	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			266.3 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484801	11/19/24 18:14	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			266.3 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484973	11/21/24 11:18	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5880 T06
Lab Sample ID: 180-179483-6
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			266.6 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	486040	12/05/24 12:34	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			266.6 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486092	12/06/24 14:30	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			266.6 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			485905	12/04/24 17:49	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			266.6 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			485741	12/03/24 16:05	CMC	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5880 T07
Lab Sample ID: 180-179483-7
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			267.2 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/23/24 19:19	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			267.2 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486916	12/18/24 17:10	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			267.2 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			267.2 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			486788	12/17/24 14:21	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5880 T08
Lab Sample ID: 180-179483-8
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			268.5 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/25/24 00:23	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			268.5 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487211	12/23/24 13:56	SNR	EET PIT
	Instrument ID: OZ									
Leach	Leach	1315			268.5 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 17:13	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5880 T08
Lab Sample ID: 180-179483-8
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			268.5 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487533	12/31/24 14:17	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5880 T09
Lab Sample ID: 180-179483-9
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			268.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	488181	01/10/25 06:24	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			268.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487928	01/08/25 08:25	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			268.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487866	01/07/25 16:30	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			268.5 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487837	01/07/25 11:37	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5881 T01
Lab Sample ID: 180-179483-10
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			258.5 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/08/24 00:06	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			258.5 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:12	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			258.5 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			258.5 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 13:40	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5881 T02
Lab Sample ID: 180-179483-11
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.3 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/08/24 00:29	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.3 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 10:11	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.3 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.3 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 14:28	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5881 T03
Lab Sample ID: 180-179483-12
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.4 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/08/24 01:43	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.4 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:38	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.4 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.4 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 15:09	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5881 T04
Lab Sample ID: 180-179483-13
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.6 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484237	11/12/24 22:39	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.6 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			484286	11/13/24 15:30	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.6 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484289	11/13/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5881 T04
Lab Sample ID: 180-179483-13
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.6 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484015	11/11/24 14:47	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5881 T05
Lab Sample ID: 180-179483-14
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.1 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	485605	11/27/24 23:28	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.1 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			485167	11/23/24 09:44	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.1 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484801	11/19/24 18:11	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.1 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484973	11/21/24 11:28	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5881 T06
Lab Sample ID: 180-179483-15
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			259.9 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	486040	12/05/24 12:58	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			259.9 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486092	12/06/24 14:32	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			259.9 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			485905	12/04/24 17:49	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			259.9 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			485741	12/03/24 16:10	CMC	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5881 T07
Lab Sample ID: 180-179483-16
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.3 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/23/24 19:42	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.3 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486916	12/18/24 17:10	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.3 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.3 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			486788	12/17/24 14:28	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5881 T08
Lab Sample ID: 180-179483-17
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.6 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/25/24 01:10	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.6 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487211	12/23/24 13:58	SNR	EET PIT
	Instrument ID: OZ									
Leach	Leach	1315			260.6 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.6 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487533	12/31/24 14:23	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5881 T09
Lab Sample ID: 180-179483-18
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.6 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	488181	01/10/25 07:42	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.6 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487928	01/08/25 08:29	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.6 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487866	01/07/25 16:30	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5881 T09
Lab Sample ID: 180-179483-18
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.6 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487837	01/07/25 11:45	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5882 T01
Lab Sample ID: 180-179483-19
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			260.3 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/08/24 02:06	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			260.3 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:18	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.3 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			260.3 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 13:46	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5882 T02
Lab Sample ID: 180-179483-20
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.4 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/08/24 02:30	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.4 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 10:14	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.4 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.4 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 14:34	ELS	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5882 T03
Lab Sample ID: 180-179483-21
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.4 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/08/24 02:54	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.4 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:41	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.4 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.4 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 15:21	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5882 T04
Lab Sample ID: 180-179483-22
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.3 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484237	11/12/24 23:51	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.3 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			484286	11/13/24 15:33	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.3 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484289	11/13/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.3 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484015	11/11/24 14:52	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5882 T05
Lab Sample ID: 180-179483-23
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.0 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	485605	11/27/24 23:52	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.0 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			485167	11/23/24 09:44	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.0 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484801	11/19/24 18:11	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5882 T05
Lab Sample ID: 180-179483-23
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.0 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484973	11/21/24 11:39	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5882 T06
Lab Sample ID: 180-179483-24
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.2 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	486040	12/05/24 13:22	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.2 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486092	12/06/24 14:33	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.2 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			485905	12/04/24 17:49	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.2 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			485741	12/03/24 16:15	CMC	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5882 T07
Lab Sample ID: 180-179483-25
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.6 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/23/24 20:07	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.6 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486916	12/18/24 17:10	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.6 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.6 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			486788	12/17/24 14:34	ELS	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5882 T08
Lab Sample ID: 180-179483-26
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487755	01/03/10 18:14	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.9 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Leach	1315			262.9 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487211	12/23/24 14:00	SNR	EET PIT
	Instrument ID: OZ									
Leach	Leach	1315			262.9 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 17:10	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.9 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487533	12/31/24 14:34	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5882 T09
Lab Sample ID: 180-179483-27
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			262.8 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	488181	01/10/25 09:01	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			262.8 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487928	01/08/25 08:33	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.8 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487866	01/07/25 16:30	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			262.8 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487837	01/07/25 11:53	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5880 T01
Lab Sample ID: 180-179483-28
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:20	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 04:17	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:37	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5880 T02
Lab Sample ID: 180-179483-29
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 05:46	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 04:14	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:35	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5880 T03
Lab Sample ID: 180-179483-30
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:26	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574859	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			576928	11/19/24 15:02	LHF4	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:32	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5880 T04
Lab Sample ID: 180-179483-31
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:35	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	575547	11/15/24 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			579341	11/25/24 12:21	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	3005A			50 mL	50 mL	575547	11/15/24 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			579881	11/26/24 11:12	F7JF	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	580616	12/02/24 04:26	UJL8	ELLE
Dissolved	Analysis	7470A		1			580938	12/02/24 10:59	X3ZX	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5880 T05
Lab Sample ID: 180-179483-32
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			578589	11/22/24 16:00	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6020B		1			579835	11/26/24 12:16	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	578435	11/24/24 03:11	UJL8	ELLE
Dissolved	Analysis	7470A		1			580313	11/27/24 12:56	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5880 T06
Lab Sample ID: 180-179483-33
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6010D		1			593965	01/09/25 15:44	T8CQ	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6020B		1			583073	12/06/24 09:35	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	582569	12/11/24 07:48	UJL8	ELLE
Dissolved	Analysis	7470A		1			585449	12/12/24 15:48	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5880 T07
Lab Sample ID: 180-179483-34
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6010D		1			589702	12/23/24 20:40	T8CQ	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6020B		1			589520	12/23/24 12:41	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	588453	12/19/24 23:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			589056	12/21/24 06:22	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:53	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5880 T08
Lab Sample ID: 180-179483-35
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6010D		1			591054	12/30/24 19:02	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6020B		1			591085	12/30/24 16:05	LHF4	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	590881	01/06/25 07:30	UJL8	ELLE
Dissolved	Analysis	7470A		1			592661	01/06/25 12:58	HNC4	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:36	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5880 T09
Lab Sample ID: 180-179483-36
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6010D		1			595310	01/14/25 12:29	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6020B		1			595032	01/13/25 16:49	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6020B		1			595507	01/14/25 14:47	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	593985	01/09/25 21:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			594253	01/10/25 11:35	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:58	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5881 T01
Lab Sample ID: 180-179483-37
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:57	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 04:12	F7JF	ELLE
	Instrument ID: E07 - 27813									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5881 T01
Lab Sample ID: 180-179483-37
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:58	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5881 T02
Lab Sample ID: 180-179483-38
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:04	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:54	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574584	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			576425	11/18/24 13:19	HNC4	ELLE
	Instrument ID: M09 - 65200									

Client Sample ID: R-5881 T03
Lab Sample ID: 180-179483-39
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:23	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:24	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:39	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5881 T04
Lab Sample ID: 180-179483-40
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:39	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	575547	11/15/24 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			579341	11/25/24 12:17	F7JF	ELLE
	Instrument ID: E07 - 27813									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5881 T04
Lab Sample ID: 180-179483-40
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	575547	11/15/24 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			579881	11/26/24 11:08	F7JF	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	580616	12/02/24 04:26	UJL8	ELLE
Dissolved	Analysis	7470A		1			580938	12/02/24 11:01	X3ZX	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5881 T05
Lab Sample ID: 180-179483-41
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			578589	11/22/24 15:57	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6020B		1			579835	11/26/24 12:14	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	578435	11/24/24 03:11	UJL8	ELLE
Dissolved	Analysis	7470A		1			580313	11/27/24 13:10	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5881 T06
Lab Sample ID: 180-179483-42
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6010D		1			583930	12/10/24 02:27	MT26	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6020B		1			583073	12/06/24 09:24	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	582569	12/11/24 07:48	UJL8	ELLE
Dissolved	Analysis	7470A		1			585449	12/12/24 15:42	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5881 T07
Lab Sample ID: 180-179483-43
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6010D		1			589702	12/23/24 20:34	T8CQ	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: R-5881 T07
Lab Sample ID: 180-179483-43
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6020B		1			589520	12/23/24 12:36	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	588453	12/19/24 23:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			589056	12/21/24 06:23	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:32	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5881 T08
Lab Sample ID: 180-179483-44
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6010D		1			591054	12/30/24 18:56	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6020B		1			591085	12/30/24 15:52	LHF4	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	590881	01/06/25 07:30	UJL8	ELLE
Dissolved	Analysis	7470A		1			592661	01/06/25 13:06	HNC4	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:34	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5881 T09
Lab Sample ID: 180-179483-45
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6010D		1			595310	01/14/25 12:23	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6020B		1			595032	01/13/25 16:45	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6020B		1			595507	01/14/25 14:43	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	593985	01/09/25 21:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			594253	01/10/25 11:29	X3ZX	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5881 T09
Lab Sample ID: 180-179483-45
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:12	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5882 T01
Lab Sample ID: 180-179483-46
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:17	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:22	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:41	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5882 T02
Lab Sample ID: 180-179483-47
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:54	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:31	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:56	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5882 T03
Lab Sample ID: 180-179483-48
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:42	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:05	F7JF	ELLE
	Instrument ID: E07 - 27813									

Client Sample ID: R-5882 T03
Lab Sample ID: 180-179483-48
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:51	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5882 T04
Lab Sample ID: 180-179483-49
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:32	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	575547	11/15/24 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			579341	11/25/24 12:19	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	3005A			50 mL	50 mL	575547	11/15/24 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			579881	11/26/24 11:20	F7JF	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	580616	12/02/24 04:26	UJL8	ELLE
Dissolved	Analysis	7470A		1			580938	12/02/24 10:55	X3ZX	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5882 T05
Lab Sample ID: 180-179483-50
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			578589	11/22/24 15:23	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	578204	11/22/24 06:42	UJL8	ELLE
Dissolved	Analysis	6020B		1			579835	11/26/24 11:58	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	578435	11/24/24 03:11	UJL8	ELLE
Dissolved	Analysis	7470A		1			580313	11/27/24 12:58	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5882 T06
Lab Sample ID: 180-179483-51
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6010D		1			583930	12/10/24 02:42	MT26	ELLE
	Instrument ID: T74 - 23745									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5882 T06
Lab Sample ID: 180-179483-51
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6020B		1			583073	12/06/24 09:41	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	582569	12/11/24 07:48	UJL8	ELLE
Dissolved	Analysis	7470A		1			585449	12/12/24 15:54	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5882 T07
Lab Sample ID: 180-179483-52
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6010D		1			589702	12/23/24 20:31	T8CQ	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6020B		1			589520	12/23/24 12:34	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	588453	12/19/24 23:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			589056	12/21/24 06:29	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:51	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: R-5882 T08
Lab Sample ID: 180-179483-53
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6010D		1			591054	12/30/24 18:53	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6020B		1			591085	12/30/24 15:50	LHF4	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	590881	01/06/25 07:30	UJL8	ELLE
Dissolved	Analysis	7470A		1			592661	01/06/25 13:17	HNC4	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:39	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5882 T09
Date Collected: 01/06/25 09:35
Date Received: 09/06/24 10:00

Lab Sample ID: 180-179483-54
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	593968	01/09/25 21:00	UAMX	ELLE
Dissolved	Analysis	6010D		1			594197	01/10/25 08:22	MT26	ELLE
	Instrument ID: T73 - 18255									
Dissolved	Prep	3005A			50 mL	50 mL	593968	01/09/25 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			594469	01/10/25 19:20	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	593985	01/09/25 21:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			594253	01/10/25 11:28	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:38	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: MB T01
Date Collected: 09/26/24 00:00
Date Received: 09/06/24 10:00

Lab Sample ID: 180-179483-55
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/08/24 03:17	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			1.0 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:22	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:34	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483164	11/04/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 13:52	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MB T02
Date Collected: 09/26/24 00:00
Date Received: 09/06/24 10:00

Lab Sample ID: 180-179483-56
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/08/24 03:40	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			1.0 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 10:18	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: MB T02
Lab Sample ID: 180-179483-56
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483172	11/04/24 10:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 14:40	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MB T03
Lab Sample ID: 180-179483-57
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484008	11/08/24 04:53	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			1.0 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			483963	11/09/24 09:51	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			483750	11/06/24 17:17	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483173	11/05/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			483740	11/06/24 15:39	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MB T04
Lab Sample ID: 180-179483-58
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	484237	11/13/24 00:14	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			1.0 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			484286	11/13/24 15:35	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484289	11/13/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483174	11/06/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484015	11/11/24 14:57	ELS	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: MB T05
Lab Sample ID: 180-179483-59
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	485605	11/28/24 01:06	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			1.0 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			485167	11/23/24 09:44	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			484801	11/19/24 18:09	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483175	11/11/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			484973	11/21/24 11:49	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MB T06
Lab Sample ID: 180-179483-60
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	486040	12/05/24 14:35	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			1.0 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486092	12/06/24 13:59	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			485905	12/04/24 17:49	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483177	11/18/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			485741	12/03/24 16:21	CMC	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MB T07
Lab Sample ID: 180-179483-61
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487257	12/23/24 21:20	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			1.0 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			486916	12/18/24 17:10	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 16:55	RAO	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: MB T07
Lab Sample ID: 180-179483-61
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483179	12/02/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			486788	12/17/24 14:41	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MB T08
Lab Sample ID: 180-179483-62
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Analysis	5310C-2014		1	40 mL	40 mL	487755	01/03/10 18:38	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			1.0 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Leach	1315			1.0 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487211	12/23/24 14:02	SNR	EET PIT
	Instrument ID: OZ									
Leach	Leach	1315			1.0 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487398	12/28/24 17:10	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483180	12/16/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487533	12/31/24 14:50	ELS	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MB T09
Lab Sample ID: 180-179483-63
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1315			1.0 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	5310C-2014		1	40 mL	40 mL	488184	01/10/25 20:30	ELS	EET PIT
	Instrument ID: SAM									
Leach	Leach	1315			1.0 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	EPA 9040C		1			487928	01/08/25 08:36	BAB	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2510B		1			487866	01/07/25 16:30	RAO	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1315			1.0 g	1800 mL	483181	12/23/24 08:00	TCS	EET PIT
Leach	Analysis	SM 2580B		1			487837	01/07/25 12:01	ELS	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: MB T01
Lab Sample ID: 180-179483-64
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 07:00	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:51	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:26	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: MB T02
Lab Sample ID: 180-179483-65
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595066	01/14/25 06:55	UJL8	ELLE
Dissolved	Analysis	6010D		1			595493	01/14/25 17:20	T8CQ	ELLE
	Instrument ID: T73 - 18255									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:33	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:20	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: MB T03
Lab Sample ID: 180-179483-66
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	596526	01/16/25 22:00	UAMX	ELLE
Dissolved	Analysis	6010D		1			596751	01/17/25 07:36	MT26	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	574857	11/13/24 23:30	UAMX	ELLE
Dissolved	Analysis	6020B		1			579551	11/26/24 03:28	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	574582	11/14/24 07:20	UJL8	ELLE
Dissolved	Analysis	7470A		1			575280	11/14/24 15:30	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: MB T04
Lab Sample ID: 180-179483-67
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	595767	01/16/25 06:42	UJL8	ELLE
Dissolved	Analysis	6010D		1			596770	01/17/25 06:29	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	575547	11/15/24 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			579341	11/25/24 12:09	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	3005A			50 mL	50 mL	575547	11/15/24 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			579881	11/26/24 11:06	F7JF	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	7470A			20 mL	20 mL	580616	12/02/24 04:26	UJL8	ELLE
Dissolved	Analysis	7470A		1			580938	12/02/24 10:57	X3ZX	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: MB T05
Lab Sample ID: 180-179483-68
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	578822	11/24/24 21:00	UAMX	ELLE
Dissolved	Analysis	6010D		1			579485	11/25/24 17:24	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	578822	11/24/24 21:00	UAMX	ELLE
Dissolved	Analysis	6020B		1			579835	11/26/24 13:18	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	588453	12/19/24 23:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			589056	12/21/24 06:33	X3ZX	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: MB T06
Lab Sample ID: 180-179483-69
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6010D		1			583930	12/10/24 02:30	MT26	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	582769	12/05/24 22:40	UAMX	ELLE
Dissolved	Analysis	6020B		1			583073	12/06/24 09:26	F7JF	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	582569	12/11/24 07:48	UJL8	ELLE
Dissolved	Analysis	7470A		1			585449	12/12/24 15:39	HNC4	ELLE
	Instrument ID: M10 – 31820									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: MB T07
Lab Sample ID: 180-179483-70
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6010D		1			589702	12/23/24 20:37	T8CQ	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	588785	12/23/24 06:52	UJL8	ELLE
Dissolved	Analysis	6020B		1			589520	12/23/24 12:38	F7JF	ELLE
	Instrument ID: E09 - 30921									
Dissolved	Prep	7470A			20 mL	20 mL	588453	12/19/24 23:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			589056	12/21/24 06:31	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:10	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: MB T08
Lab Sample ID: 180-179483-71
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6010D		1			591054	12/30/24 18:59	T8CQ	ELLE
	Instrument ID: T74 - 23745									
Dissolved	Prep	3005A			50 mL	50 mL	590566	12/30/24 06:37	UJL8	ELLE
Dissolved	Analysis	6020B		1			591085	12/30/24 16:03	LHF4	ELLE
	Instrument ID: E07 - 27813									
Dissolved	Prep	7470A			20 mL	20 mL	590881	01/06/25 07:30	UJL8	ELLE
Dissolved	Analysis	7470A		1			592661	01/06/25 13:19	HNC4	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:30	HNC4	ELLE
	Instrument ID: M10 – 31820									

Client Sample ID: MB T09
Lab Sample ID: 180-179483-72
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6010D		1			595310	01/14/25 12:20	MT26	ELLE
	Instrument ID: T75 - 27278									
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6020B		1			595032	01/13/25 16:41	LHF4	ELLE
	Instrument ID: E08 - 30647									
Dissolved	Prep	3005A			50 mL	50 mL	593724	01/13/25 06:46	UJL8	ELLE
Dissolved	Analysis	6020B		1			595507	01/14/25 14:38	LHF4	ELLE
	Instrument ID: E08 - 30647									

Lab Chronicle

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: MB T09
Date Collected: 01/06/25 09:35
Date Received: 09/06/24 10:00

Lab Sample ID: 180-179483-72
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			20 mL	20 mL	593985	01/09/25 21:10	UAMX	ELLE
Dissolved	Analysis	7470A		1			594253	01/10/25 11:31	X3ZX	ELLE
	Instrument ID: M10 – 31820									
Dissolved	Prep	7470A			20 mL	20 mL	594829	01/13/25 23:45	UAMX	ELLE
Dissolved	Analysis	7470A		1			595456	01/14/25 16:41	HNC4	ELLE
	Instrument ID: M10 – 31820									

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Analyst References:

Lab: EET PIT

Batch Type: Leach

TCS = Thomas Say

Batch Type: Analysis

BAB = Brooke Batyi
CMC = Candace California
ELS = Edwin Shireman
RAO = Rachel Oster
SNR = Sabra Richart

Lab: ELLE

Batch Type: Prep

UAMX = Annamaria Kuhns
UJL8 = James Mertz

Batch Type: Analysis

F7JF = Dennis Dick
HNC4 = Mindy Schantzenbach
LHF4 = Diamond Boyer
MT26 = Jason Knight
T8CQ = Sera Bargo
X3ZX = Skyler Ruf

Client Sample ID: R-5880 T01
Lab Sample ID: 180-179483-1
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 22:55	1
pH (SW846 EPA 9040C)	**6.1**	**H3**	0.1	0.1	SU			11/09/24 09:05	1
Specific Conductance (SM 2510B)	**1.1**	**!**	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**260**	**!**	10	10	millivolts			11/06/24 13:34	1

Client Sample ID: R-5880 T02
Lab Sample ID: 180-179483-2
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 23:18	1
pH (SW846 EPA 9040C)	**5.7**	**H3**	0.1	0.1	SU			11/09/24 10:08	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**290**	**!**	10	10	millivolts			11/06/24 14:22	1

Client Sample ID: R-5880 T03
Lab Sample ID: 180-179483-3
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/07/24 23:41	1
pH (SW846 EPA 9040C)	**5.8**	**H3**	0.1	0.1	SU			11/09/24 09:35	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**300**	**!**	10	10	millivolts			11/06/24 15:03	1

Client Sample ID: R-5880 T04
Lab Sample ID: 180-179483-4
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/12/24 22:15	1
pH (SW846 EPA 9040C)	**5.7**	**H3**	0.1	0.1	SU			11/13/24 15:28	1
Specific Conductance (SM 2510B)	**1.2**	**!**	1.0	1.0	umhos/cm			11/13/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	**310**	**!**	10	10	millivolts			11/11/24 14:42	1

Client Sample ID: R-5880 T05
Lab Sample ID: 180-179483-5
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/27/24 23:04	1

Client Sample ID: R-5880 T05
Lab Sample ID: 180-179483-5
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.8	H3	0.1	0.1	SU			11/23/24 09:44	1
Specific Conductance (SM 2510B)	1.2	!	1.0	1.0	umhos/cm			11/19/24 18:14	1
Oxidation Reduction Potential (SM 2580B)	320	!	10	10	millivolts			11/21/24 11:18	1

Client Sample ID: R-5880 T06
Lab Sample ID: 180-179483-6
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND		1.0	0.51	mg/L			12/05/24 12:34	1
pH (SW846 EPA 9040C)	5.3	H3	0.1	0.1	SU			12/06/24 14:30	1
Specific Conductance (SM 2510B)	1.7	!	1.0	1.0	umhos/cm			12/04/24 17:49	1
Oxidation Reduction Potential (SM 2580B)	340	!	10	10	millivolts			12/03/24 16:05	1

Client Sample ID: R-5880 T07
Lab Sample ID: 180-179483-7
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/23/24 19:19	1
pH (SW846 EPA 9040C)	5.7	H3	0.1	0.1	SU			12/18/24 17:10	1
Specific Conductance (SM 2510B)	4.3	!	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	300	!	10	10	millivolts			12/17/24 14:21	1

Client Sample ID: R-5880 T08
Lab Sample ID: 180-179483-8
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/25/24 00:23	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			12/23/24 13:56	1
Specific Conductance (SM 2510B)	1.4	!	1.0	1.0	umhos/cm			12/28/24 17:13	1
Oxidation Reduction Potential (SM 2580B)	290	!	10	10	millivolts			12/31/24 14:17	1

Client Sample ID: R-5880 T09
Lab Sample ID: 180-179483-9
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			01/10/25 06:24	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			01/08/25 08:25	1

Client Sample ID: R-5880 T09
Lab Sample ID: 180-179483-9
Date Collected: 08/29/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance (SM 2510B)	**1.5**	**!**	1.0	1.0	umhos/cm			01/07/25 16:30	1
Oxidation Reduction Potential (SM 2580B)	**320**	**!**	10	10	millivolts			01/07/25 11:37	1

Client Sample ID: R-5881 T01
Lab Sample ID: 180-179483-10
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/08/24 00:06	1
pH (SW846 EPA 9040C)	**6.0**	**H3**	0.1	0.1	SU			11/09/24 09:12	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**270**	**!**	10	10	millivolts			11/06/24 13:40	1

Client Sample ID: R-5881 T02
Lab Sample ID: 180-179483-11
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/08/24 00:29	1
pH (SW846 EPA 9040C)	**6.0**	**H3**	0.1	0.1	SU			11/09/24 10:11	1
Specific Conductance (SM 2510B)	**1.3**	**!**	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**250**	**!**	10	10	millivolts			11/06/24 14:28	1

Client Sample ID: R-5881 T03
Lab Sample ID: 180-179483-12
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/08/24 01:43	1
pH (SW846 EPA 9040C)	**6.0**	**H3**	0.1	0.1	SU			11/09/24 09:38	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**270**	**!**	10	10	millivolts			11/06/24 15:09	1

Client Sample ID: R-5881 T04
Lab Sample ID: 180-179483-13
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/12/24 22:39	1
pH (SW846 EPA 9040C)	**5.8**	**H3**	0.1	0.1	SU			11/13/24 15:30	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/13/24 16:55	1

Client Sample ID: R-5881 T04
Lab Sample ID: 180-179483-13
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential (SM 2580B)	270	!	10	10	millivolts			11/11/24 14:47	1

Client Sample ID: R-5881 T05
Lab Sample ID: 180-179483-14
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/27/24 23:28	1
pH (SW846 EPA 9040C)	5.8	H3	0.1	0.1	SU			11/23/24 09:44	1
Specific Conductance (SM 2510B)	1.1	!	1.0	1.0	umhos/cm			11/19/24 18:11	1
Oxidation Reduction Potential (SM 2580B)	280	!	10	10	millivolts			11/21/24 11:28	1

Client Sample ID: R-5881 T06
Lab Sample ID: 180-179483-15
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND		1.0	0.51	mg/L			12/05/24 12:58	1
pH (SW846 EPA 9040C)	5.3	H3	0.1	0.1	SU			12/06/24 14:32	1
Specific Conductance (SM 2510B)	1.6	!	1.0	1.0	umhos/cm			12/04/24 17:49	1
Oxidation Reduction Potential (SM 2580B)	330	!	10	10	millivolts			12/03/24 16:10	1

Client Sample ID: R-5881 T07
Lab Sample ID: 180-179483-16
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/23/24 19:42	1
pH (SW846 EPA 9040C)	5.7	H3	0.1	0.1	SU			12/18/24 17:10	1
Specific Conductance (SM 2510B)	1.6	!	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	340	!	10	10	millivolts			12/17/24 14:28	1

Client Sample ID: R-5881 T08
Lab Sample ID: 180-179483-17
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/25/24 01:10	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			12/23/24 13:58	1
Specific Conductance (SM 2510B)	1.2	!	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	310	!	10	10	millivolts			12/31/24 14:23	1

Client Sample ID: R-5881 T09
Lab Sample ID: 180-179483-18
Date Collected: 08/30/24 11:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			01/10/25 07:42	1
pH (SW846 EPA 9040C)	**5.5**	**H3**	0.1	0.1	SU			01/08/25 08:29	1
Specific Conductance (SM 2510B)	**1.3**	**!**	1.0	1.0	umhos/cm			01/07/25 16:30	1
Oxidation Reduction Potential (SM 2580B)	**330**	**!**	10	10	millivolts			01/07/25 11:45	1

Client Sample ID: R-5882 T01
Lab Sample ID: 180-179483-19
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/08/24 02:06	1
pH (SW846 EPA 9040C)	**6.1**	**H3**	0.1	0.1	SU			11/09/24 09:18	1
Specific Conductance (SM 2510B)	**1.1**	**!**	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**280**	**!**	10	10	millivolts			11/06/24 13:46	1

Client Sample ID: R-5882 T02
Lab Sample ID: 180-179483-20
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/08/24 02:30	1
pH (SW846 EPA 9040C)	**5.9**	**H3**	0.1	0.1	SU			11/09/24 10:14	1
Specific Conductance (SM 2510B)	**1.6**	**!**	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**300**	**!**	10	10	millivolts			11/06/24 14:34	1

Client Sample ID: R-5882 T03
Lab Sample ID: 180-179483-21
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/08/24 02:54	1
pH (SW846 EPA 9040C)	**5.8**	**H3**	0.1	0.1	SU			11/09/24 09:41	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**280**	**!**	10	10	millivolts			11/06/24 15:21	1

Client Sample ID: R-5882 T04
Lab Sample ID: 180-179483-22
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/12/24 23:51	1

Client Sample ID: R-5882 T04
Lab Sample ID: 180-179483-22
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.8	H3	0.1	0.1	SU			11/13/24 15:33	1
Specific Conductance (SM 2510B)	1.1	!	1.0	1.0	umhos/cm			11/13/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	310	!	10	10	millivolts			11/11/24 14:52	1

Client Sample ID: R-5882 T05
Lab Sample ID: 180-179483-23
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/27/24 23:52	1
pH (SW846 EPA 9040C)	5.7	H3	0.1	0.1	SU			11/23/24 09:44	1
Specific Conductance (SM 2510B)	1.2	!	1.0	1.0	umhos/cm			11/19/24 18:11	1
Oxidation Reduction Potential (SM 2580B)	310	!	10	10	millivolts			11/21/24 11:39	1

Client Sample ID: R-5882 T06
Lab Sample ID: 180-179483-24
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND		1.0	0.51	mg/L			12/05/24 13:22	1
pH (SW846 EPA 9040C)	5.3	H3	0.1	0.1	SU			12/06/24 14:33	1
Specific Conductance (SM 2510B)	1.8	!	1.0	1.0	umhos/cm			12/04/24 17:49	1
Oxidation Reduction Potential (SM 2580B)	330	!	10	10	millivolts			12/03/24 16:15	1

Client Sample ID: R-5882 T07
Lab Sample ID: 180-179483-25
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/23/24 20:07	1
pH (SW846 EPA 9040C)	5.6	H3	0.1	0.1	SU			12/18/24 17:10	1
Specific Conductance (SM 2510B)	1.7	!	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	310	!	10	10	millivolts			12/17/24 14:34	1

Client Sample ID: R-5882 T08
Lab Sample ID: 180-179483-26
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	cn	1.0	0.51	mg/L			01/03/10 18:14	1
pH (SW846 EPA 9040C)	5.5	H3	0.1	0.1	SU			12/23/24 14:00	1

Client Sample ID: R-5882 T08
Lab Sample ID: 180-179483-26
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance (SM 2510B)	1.3	!	1.0	1.0	umhos/cm			12/28/24 17:10	1
Oxidation Reduction Potential (SM 2580B)	270	!	10	10	millivolts			12/31/24 14:34	1

Client Sample ID: R-5882 T09
Lab Sample ID: 180-179483-27
Date Collected: 08/30/24 15:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	1.2	!	1.0	0.51	mg/L			01/10/25 09:01	1
pH (SW846 EPA 9040C)	5.4	H3	0.1	0.1	SU			01/08/25 08:33	1
Specific Conductance (SM 2510B)	1.6	!	1.0	1.0	umhos/cm			01/07/25 16:30	1
Oxidation Reduction Potential (SM 2580B)	330	!	10	10	millivolts			01/07/25 11:53	1

Client Sample ID: R-5880 T01
Lab Sample ID: 180-179483-28
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:20	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 04:17	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 04:17	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:37	1

Client Sample ID: R-5880 T02
Lab Sample ID: 180-179483-29
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 05:46	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 04:14	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 04:14	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:35	1

Client Sample ID: R-5880 T03
Lab Sample ID: 180-179483-30
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:26	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	79	J	200	65	ug/L		11/13/24 23:30	11/19/24 15:02	1
Sodium	96	J B	200	90	ug/L		11/13/24 23:30	11/19/24 15:02	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:32	1

Client Sample ID: R-5880 T04
Lab Sample ID: 180-179483-31
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:35	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/15/24 21:00	11/25/24 12:21	1
Sodium	ND		200	90	ug/L		11/15/24 21:00	11/26/24 11:12	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/02/24 04:26	12/02/24 10:59	1

Client Sample ID: R-5880 T05
Lab Sample ID: 180-179483-32
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/22/24 06:42	11/22/24 16:00	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/22/24 06:42	11/26/24 12:16	1
Sodium	ND		200	90	ug/L		11/22/24 06:42	11/26/24 12:16	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/24/24 03:11	11/27/24 12:56	1

Client Sample ID: R-5880 T06
Lab Sample ID: 180-179483-33
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/05/24 22:40	01/09/25 15:44	1

Client Sample ID: R-5880 T06
Lab Sample ID: 180-179483-33
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/05/24 22:40	12/06/24 09:35	1
Sodium	ND	^+	200	90	ug/L		12/05/24 22:40	12/06/24 09:35	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.25**		0.20	0.079	ug/L		12/11/24 07:48	12/12/24 15:48	1

Client Sample ID: R-5880 T07
Lab Sample ID: 180-179483-34
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/23/24 06:52	12/23/24 20:40	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/23/24 06:52	12/23/24 12:41	1
Sodium	ND		200	90	ug/L		12/23/24 06:52	12/23/24 12:41	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:22	1
Mercury	**0.084**	**J H**	0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:53	1

Client Sample ID: R-5880 T08
Lab Sample ID: 180-179483-35
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/30/24 06:37	12/30/24 19:02	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/30/24 06:37	12/30/24 16:05	1
Sodium	ND		200	90	ug/L		12/30/24 06:37	12/30/24 16:05	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/06/25 07:30	01/06/25 12:58	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:36	1

Client Sample ID: R-5880 T09
Lab Sample ID: 180-179483-36
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/13/25 06:46	01/14/25 12:29	1

Client Sample ID: R-5880 T09
Lab Sample ID: 180-179483-36
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/13/25 06:46	01/13/25 16:49	1
Sodium	ND		200	90	ug/L		01/13/25 06:46	01/14/25 14:47	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/09/25 21:10	01/10/25 11:35	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:58	1

Client Sample ID: R-5881 T01
Lab Sample ID: 180-179483-37
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:57	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 04:12	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 04:12	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:58	1

Client Sample ID: R-5881 T02
Lab Sample ID: 180-179483-38
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:04	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:54	1
Sodium	**210**		200	90	ug/L		11/13/24 23:30	11/26/24 03:54	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/18/24 13:19	1

Client Sample ID: R-5881 T03
Lab Sample ID: 180-179483-39
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:23	1

Client Sample ID: R-5881 T03
Lab Sample ID: 180-179483-39
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:24	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:24	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:39	1

Client Sample ID: R-5881 T04
Lab Sample ID: 180-179483-40
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:39	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/15/24 21:00	11/25/24 12:17	1
Sodium	ND		200	90	ug/L		11/15/24 21:00	11/26/24 11:08	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/02/24 04:26	12/02/24 11:01	1

Client Sample ID: R-5881 T05
Lab Sample ID: 180-179483-41
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/22/24 06:42	11/22/24 15:57	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/22/24 06:42	11/26/24 12:14	1
Sodium	ND		200	90	ug/L		11/22/24 06:42	11/26/24 12:14	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/24/24 03:11	11/27/24 13:10	1

Client Sample ID: R-5881 T06
Lab Sample ID: 180-179483-42
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/05/24 22:40	12/10/24 02:27	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/05/24 22:40	12/06/24 09:24	1

Client Sample ID: R-5881 T06
Lab Sample ID: 180-179483-42
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND		200	90	ug/L		12/05/24 22:40	12/06/24 09:24	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/11/24 07:48	12/12/24 15:42	1

Client Sample ID: R-5881 T07
Lab Sample ID: 180-179483-43
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/23/24 06:52	12/23/24 20:34	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/23/24 06:52	12/23/24 12:36	1
Sodium	ND		200	90	ug/L		12/23/24 06:52	12/23/24 12:36	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:23	1
Mercury	ND	H	0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:32	1

Client Sample ID: R-5881 T08
Lab Sample ID: 180-179483-44
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/30/24 06:37	12/30/24 18:56	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/30/24 06:37	12/30/24 15:52	1
Sodium	ND		200	90	ug/L		12/30/24 06:37	12/30/24 15:52	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/06/25 07:30	01/06/25 13:06	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:34	1

Client Sample ID: R-5881 T09
Lab Sample ID: 180-179483-45
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/13/25 06:46	01/14/25 12:23	1

Client Sample ID: R-5881 T09
Lab Sample ID: 180-179483-45
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/13/25 06:46	01/13/25 16:45	1
Sodium	ND		200	90	ug/L		01/13/25 06:46	01/14/25 14:43	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/09/25 21:10	01/10/25 11:29	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:12	1

Client Sample ID: R-5882 T01
Lab Sample ID: 180-179483-46
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:17	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:22	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:22	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:41	1

Client Sample ID: R-5882 T02
Lab Sample ID: 180-179483-47
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:54	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:31	1
Sodium	**140**	**J**	200	90	ug/L		11/13/24 23:30	11/26/24 03:31	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:56	1

Client Sample ID: R-5882 T03
Lab Sample ID: 180-179483-48
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:42	1

Client Sample ID: R-5882 T03
Lab Sample ID: 180-179483-48
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:05	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:05	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:51	1

Client Sample ID: R-5882 T04
Lab Sample ID: 180-179483-49
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:32	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/15/24 21:00	11/25/24 12:19	1
Sodium	ND		200	90	ug/L		11/15/24 21:00	11/26/24 11:20	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/02/24 04:26	12/02/24 10:55	1

Client Sample ID: R-5882 T05
Lab Sample ID: 180-179483-50
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/22/24 06:42	11/22/24 15:23	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/22/24 06:42	11/26/24 11:58	1
Sodium	ND		200	90	ug/L		11/22/24 06:42	11/26/24 11:58	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/24/24 03:11	11/27/24 12:58	1

Client Sample ID: R-5882 T06
Lab Sample ID: 180-179483-51
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/05/24 22:40	12/10/24 02:42	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/05/24 22:40	12/06/24 09:41	1

Client Sample ID: R-5882 T06
Lab Sample ID: 180-179483-51
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND	^+	200	90	ug/L		12/05/24 22:40	12/06/24 09:41	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/11/24 07:48	12/12/24 15:54	1

Client Sample ID: R-5882 T07
Lab Sample ID: 180-179483-52
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/23/24 06:52	12/23/24 20:31	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/23/24 06:52	12/23/24 12:34	1
Sodium	ND		200	90	ug/L		12/23/24 06:52	12/23/24 12:34	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:29	1
Mercury	ND	H	0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:51	1

Client Sample ID: R-5882 T08
Lab Sample ID: 180-179483-53
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/30/24 06:37	12/30/24 18:53	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/30/24 06:37	12/30/24 15:50	1
Sodium	ND		200	90	ug/L		12/30/24 06:37	12/30/24 15:50	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/06/25 07:30	01/06/25 13:17	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:39	1

Client Sample ID: R-5882 T09
Lab Sample ID: 180-179483-54
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/09/25 21:00	01/10/25 08:22	1

Client Sample ID: R-5882 T09
Lab Sample ID: 180-179483-54
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/09/25 21:00	01/10/25 19:20	1
Sodium	**590**		200	90	ug/L		01/09/25 21:00	01/10/25 19:20	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/09/25 21:10	01/10/25 11:28	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:38	1

Client Sample ID: MB T01
Lab Sample ID: 180-179483-55
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/08/24 03:17	1
pH (SW846 EPA 9040C)	**4.7**		0.1	0.1	SU			11/09/24 09:22	1
Specific Conductance (SM 2510B)	**9.7**	**!**	1.0	1.0	umhos/cm			11/06/24 17:34	1
Oxidation Reduction Potential (SM 2580B)	**330**	**!**	10	10	millivolts			11/06/24 13:52	1

Client Sample ID: MB T02
Lab Sample ID: 180-179483-56
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/08/24 03:40	1
pH (SW846 EPA 9040C)	**4.5**		0.1	0.1	SU			11/09/24 10:18	1
Specific Conductance (SM 2510B)	**19**	**!**	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**310**	**!**	10	10	millivolts			11/06/24 14:40	1

Client Sample ID: MB T03
Lab Sample ID: 180-179483-57
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/08/24 04:53	1
pH (SW846 EPA 9040C)	**5.7**		0.1	0.1	SU			11/09/24 09:51	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/06/24 17:17	1
Oxidation Reduction Potential (SM 2580B)	**330**	**!**	10	10	millivolts			11/06/24 15:39	1

Client Sample ID: MB T04
Lab Sample ID: 180-179483-58
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/13/24 00:14	1
pH (SW846 EPA 9040C)	**5.9**		0.1	0.1	SU			11/13/24 15:35	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			11/13/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	**300**	**!**	10	10	millivolts			11/11/24 14:57	1

Client Sample ID: MB T05
Lab Sample ID: 180-179483-59
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			11/28/24 01:06	1
pH (SW846 EPA 9040C)	**5.7**		0.1	0.1	SU			11/23/24 09:44	1
Specific Conductance (SM 2510B)	**1.2**	**!**	1.0	1.0	umhos/cm			11/19/24 18:09	1
Oxidation Reduction Potential (SM 2580B)	**300**	**!**	10	10	millivolts			11/21/24 11:49	1

Client Sample ID: MB T06
Lab Sample ID: 180-179483-60
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND		1.0	0.51	mg/L			12/05/24 14:35	1
pH (SW846 EPA 9040C)	**6.0**		0.1	0.1	SU			12/06/24 13:59	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			12/04/24 17:49	1
Oxidation Reduction Potential (SM 2580B)	**320**	**!**	10	10	millivolts			12/03/24 16:21	1

Client Sample ID: MB T07
Lab Sample ID: 180-179483-61
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			12/23/24 21:20	1
pH (SW846 EPA 9040C)	**5.6**		0.1	0.1	SU			12/18/24 17:10	1
Specific Conductance (SM 2510B)	**1.5**	**!**	1.0	1.0	umhos/cm			12/28/24 16:55	1
Oxidation Reduction Potential (SM 2580B)	**300**	**!**	10	10	millivolts			12/17/24 14:41	1

Client Sample ID: MB T08
Lab Sample ID: 180-179483-62
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	cn	1.0	0.51	mg/L			01/03/10 18:38	1

Client Sample ID: MB T08
Lab Sample ID: 180-179483-62
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.5**		0.1	0.1	SU			12/23/24 14:02	1
Specific Conductance (SM 2510B)	ND	!	1.0	1.0	umhos/cm			12/28/24 17:10	1
Oxidation Reduction Potential (SM 2580B)	**270**	**!**	10	10	millivolts			12/31/24 14:50	1

Client Sample ID: MB T09
Lab Sample ID: 180-179483-63
Date Collected: 09/26/24 00:00
Matrix: Solid
Date Received: 09/06/24 10:00

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad (SM 5310C-2014)	ND	!	1.0	0.51	mg/L			01/10/25 20:30	1
pH (SW846 EPA 9040C)	**5.6**		0.1	0.1	SU			01/08/25 08:36	1
Specific Conductance (SM 2510B)	**1.4**	**!**	1.0	1.0	umhos/cm			01/07/25 16:30	1
Oxidation Reduction Potential (SM 2580B)	**340**	**!**	10	10	millivolts			01/07/25 12:01	1

Client Sample ID: MB T01
Lab Sample ID: 180-179483-64
Date Collected: 11/04/24 11:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 07:00	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:51	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:51	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:26	1

Client Sample ID: MB T02
Lab Sample ID: 180-179483-65
Date Collected: 11/05/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/14/25 06:55	01/14/25 17:20	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:33	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:33	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:20	1

Client Sample ID: MB T03
Lab Sample ID: 180-179483-66
Date Collected: 11/06/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 22:00	01/17/25 07:36	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:28	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:28	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:30	1

Client Sample ID: MB T04
Lab Sample ID: 180-179483-67
Date Collected: 11/11/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 06:29	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/15/24 21:00	11/25/24 12:09	1
Sodium	ND		200	90	ug/L		11/15/24 21:00	11/26/24 11:06	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/02/24 04:26	12/02/24 10:57	1

Client Sample ID: MB T05
Lab Sample ID: 180-179483-68
Date Collected: 11/18/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/24/24 21:00	11/25/24 17:24	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/24/24 21:00	11/26/24 13:18	1
Sodium	ND		200	90	ug/L		11/24/24 21:00	11/26/24 13:18	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:33	1

Client Sample ID: MB T06
Lab Sample ID: 180-179483-69
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/05/24 22:40	12/10/24 02:30	1

Client Sample ID: MB T06
Lab Sample ID: 180-179483-69
Date Collected: 12/02/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/05/24 22:40	12/06/24 09:26	1
Sodium	ND		200	90	ug/L		12/05/24 22:40	12/06/24 09:26	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/11/24 07:48	12/12/24 15:39	1

Client Sample ID: MB T07
Lab Sample ID: 180-179483-70
Date Collected: 12/16/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/23/24 06:52	12/23/24 20:37	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/23/24 06:52	12/23/24 12:38	1
Sodium	ND		200	90	ug/L		12/23/24 06:52	12/23/24 12:38	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:31	1
Mercury	ND	H	0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:10	1

Client Sample ID: MB T08
Lab Sample ID: 180-179483-71
Date Collected: 12/23/24 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/30/24 06:37	12/30/24 18:59	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/30/24 06:37	12/30/24 16:03	1
Sodium	ND		200	90	ug/L		12/30/24 06:37	12/30/24 16:03	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/06/25 07:30	01/06/25 13:19	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:30	1

Client Sample ID: MB T09
Lab Sample ID: 180-179483-72
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/13/25 06:46	01/14/25 12:20	1

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: MB T09
Lab Sample ID: 180-179483-72
Date Collected: 01/06/25 09:35
Matrix: Water
Date Received: 09/06/24 10:00

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/13/25 06:46	01/13/25 16:41	1
Sodium	**100**	**J**	200	90	ug/L		01/13/25 06:46	01/14/25 14:38	1

Method: SW846 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/09/25 21:10	01/10/25 11:31	1
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:41	1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 410-578204/1-A
Matrix: Water
Analysis Batch: 578589

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/22/24 06:42	11/22/24 15:14	1

Lab Sample ID: LCS 410-578204/2-A
Matrix: Water
Analysis Batch: 578589

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.22		mg/L		104	90 - 114

Lab Sample ID: LCSD 410-578204/3-A
Matrix: Water
Analysis Batch: 578589

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfur	5.00	5.20		mg/L		104	90 - 114	0	20

Lab Sample ID: MB 410-578822/1-A
Matrix: Water
Analysis Batch: 579485

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 578822

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		11/24/24 21:00	11/25/24 16:50	1

Lab Sample ID: LCS 410-578822/2-A
Matrix: Water
Analysis Batch: 579485

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 578822

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.28		mg/L		106	90 - 114

Lab Sample ID: MB 410-582769/1-A
Matrix: Water
Analysis Batch: 583930

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 582769

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/05/24 22:40	12/10/24 01:47	1

Lab Sample ID: MB 410-582769/1-A
Matrix: Water
Analysis Batch: 593965

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 582769

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/05/24 22:40	01/09/25 15:38	1

Lab Sample ID: LCS 410-582769/2-A
Matrix: Water
Analysis Batch: 583930

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 582769

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.26		mg/L		105	90 - 114

Method: 6010D - Metals (ICP)

Lab Sample ID: LCS 410-582769/2-A
Matrix: Water
Analysis Batch: 593965

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 582769

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.07		mg/L		101	90 - 114

Lab Sample ID: MB 410-588785/1-A
Matrix: Water
Analysis Batch: 589702

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 588785

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/23/24 06:52	12/23/24 19:20	1

Lab Sample ID: LCS 410-588785/2-A
Matrix: Water
Analysis Batch: 589702

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 588785

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.01		mg/L		100	90 - 114

Lab Sample ID: MB 410-590566/1-A
Matrix: Water
Analysis Batch: 591054

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 590566

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		12/30/24 06:37	12/30/24 17:01	1

Lab Sample ID: LCS 410-590566/2-A
Matrix: Water
Analysis Batch: 591054

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 590566

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.04		mg/L		101	90 - 114

Lab Sample ID: MB 410-593724/1-A
Matrix: Water
Analysis Batch: 595310

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/13/25 06:46	01/14/25 10:45	1

Lab Sample ID: LCS 410-593724/2-A
Matrix: Water
Analysis Batch: 595310

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	4.98		mg/L		100	90 - 114

Lab Sample ID: MB 410-593968/1-A
Matrix: Water
Analysis Batch: 594197

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/09/25 21:00	01/10/25 07:41	1

Method: 6010D - Metals (ICP)

Lab Sample ID: LCS 410-593968/2-A
Matrix: Water
Analysis Batch: 594197

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfur			5.00	4.97		mg/L		99	90 - 114		

Lab Sample ID: LCSD 410-593968/3-A
Matrix: Water
Analysis Batch: 594197

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfur			5.00	4.93		mg/L		99	90 - 114	1	20

Lab Sample ID: MB 410-595066/1-A
Matrix: Water
Analysis Batch: 595493

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 595066

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/14/25 06:55	01/14/25 15:49	1

Lab Sample ID: LCS 410-595066/2-A
Matrix: Water
Analysis Batch: 595493

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 595066

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfur			5.00	5.17		mg/L		103	90 - 114		

Lab Sample ID: MB 410-595767/1-A
Matrix: Water
Analysis Batch: 596770

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 595767

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 06:42	01/17/25 05:40	1

Lab Sample ID: LCS 410-595767/2-A
Matrix: Water
Analysis Batch: 596770

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 595767

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfur			5.00	5.03		mg/L		101	90 - 114		

Lab Sample ID: MB 410-596526/1-A
Matrix: Water
Analysis Batch: 596751

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 596526

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		01/16/25 22:00	01/17/25 06:37	1

Lab Sample ID: LCS 410-596526/2-A
Matrix: Water
Analysis Batch: 596751

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 596526

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfur			5.00	5.06		mg/L		101	90 - 114		

Method: 6010D - Metals (ICP)

Lab Sample ID: 180-179483-50 MS
Matrix: Water
Analysis Batch: 578589

Client Sample ID: R-5882 T05
Prep Type: Dissolved
Prep Batch: 578204

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	ND		5.00	5.45		mg/L		109	75 - 125

Lab Sample ID: 180-179483-50 MSD
Matrix: Water
Analysis Batch: 578589

Client Sample ID: R-5882 T05
Prep Type: Dissolved
Prep Batch: 578204

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfur	ND		5.00	5.22		mg/L		104	75 - 125	4	20

Lab Sample ID: 180-179483-50 DU
Matrix: Water
Analysis Batch: 578589

Client Sample ID: R-5882 T05
Prep Type: Dissolved
Prep Batch: 578204

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfur	ND		ND		mg/L		NC	20

Lab Sample ID: 180-179483-29 MS
Matrix: Water
Analysis Batch: 596770

Client Sample ID: R-5880 T02
Prep Type: Dissolved
Prep Batch: 595767

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	ND		5.00	5.10		mg/L		102	75 - 125

Lab Sample ID: 180-179483-29 MSD
Matrix: Water
Analysis Batch: 596770

Client Sample ID: R-5880 T02
Prep Type: Dissolved
Prep Batch: 595767

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfur	ND		5.00	5.01		mg/L		100	75 - 125	2	20

Lab Sample ID: 180-179483-29 DU
Matrix: Water
Analysis Batch: 596770

Client Sample ID: R-5880 T02
Prep Type: Dissolved
Prep Batch: 595767

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfur	ND		ND		mg/L		NC	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 410-574857/1-A
Matrix: Water
Analysis Batch: 579551

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 574857

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/26/24 03:01	1
Sodium	ND		200	90	ug/L		11/13/24 23:30	11/26/24 03:01	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 410-574857/2-A
Matrix: Water
Analysis Batch: 579551

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 574857

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	5350		ug/L		107	90 - 110
Sodium	5000	5280		ug/L		106	89 - 114

Lab Sample ID: MB 410-574859/1-A
Matrix: Water
Analysis Batch: 576928

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 574859

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/13/24 23:30	11/19/24 14:07	1
Sodium	99.8	J B	200	90	ug/L		11/13/24 23:30	11/19/24 14:07	1

Lab Sample ID: LCS 410-574859/2-A
Matrix: Water
Analysis Batch: 576928

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 574859

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	5000		ug/L		100	90 - 110
Sodium	5000	5070		ug/L		101	89 - 114

Lab Sample ID: MB 410-575547/1-A
Matrix: Water
Analysis Batch: 579341

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 575547

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/15/24 21:00	11/25/24 11:22	1
Sodium	ND		200	90	ug/L		11/15/24 21:00	11/25/24 11:22	1

Lab Sample ID: LCS 410-575547/2-A
Matrix: Water
Analysis Batch: 579341

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 575547

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	5120		ug/L		102	90 - 110
Sodium	5000	4970		ug/L		99	89 - 114

Lab Sample ID: MB 410-578204/1-A
Matrix: Water
Analysis Batch: 579835

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/22/24 06:42	11/26/24 11:52	1
Sodium	ND		200	90	ug/L		11/22/24 06:42	11/26/24 11:52	1

Lab Sample ID: LCS 410-578204/2-A
Matrix: Water
Analysis Batch: 579835

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 578204

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4980		ug/L		100	90 - 110
Sodium	5000	5020		ug/L		100	89 - 114

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: LCSD 410-578204/3-A
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 579835
Prep Batch: 578204

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Potassium	5000	4990		ug/L		100	90 - 110	0	20
Sodium	5000	4940		ug/L		99	89 - 114	2	20

Lab Sample ID: MB 410-578822/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 579835
Prep Batch: 578822

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		11/24/24 21:00	11/26/24 13:00	1
Sodium	ND		200	90	ug/L		11/24/24 21:00	11/26/24 13:00	1

Lab Sample ID: LCS 410-578822/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 579835
Prep Batch: 578822

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	5050		ug/L		101	90 - 110
Sodium	5000	5130		ug/L		103	89 - 114

Lab Sample ID: MB 410-582769/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 583073
Prep Batch: 582769

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/05/24 22:40	12/06/24 09:07	1
Sodium	ND		200	90	ug/L		12/05/24 22:40	12/06/24 09:07	1

Lab Sample ID: LCS 410-582769/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 583073
Prep Batch: 582769

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4900		ug/L		98	90 - 110
Sodium	5000	4820		ug/L		96	89 - 114

Lab Sample ID: MB 410-588785/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 589520
Prep Batch: 588785

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/23/24 06:52	12/23/24 12:10	1
Sodium	ND		200	90	ug/L		12/23/24 06:52	12/23/24 12:10	1

Lab Sample ID: LCS 410-588785/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 589520
Prep Batch: 588785

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4790		ug/L		96	90 - 110
Sodium	5000	4810		ug/L		96	89 - 114

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 410-590566/1-A
Matrix: Water
Analysis Batch: 591085

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 590566

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		12/30/24 06:37	12/30/24 15:34	1
Sodium	ND		200	90	ug/L		12/30/24 06:37	12/30/24 15:34	1

Lab Sample ID: LCS 410-590566/2-A
Matrix: Water
Analysis Batch: 591085

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 590566

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4680		ug/L		94	90 - 110
Sodium	5000	4600		ug/L		92	89 - 114

Lab Sample ID: MB 410-593724/1-A
Matrix: Water
Analysis Batch: 595032

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/13/25 06:46	01/13/25 15:52	1

Lab Sample ID: MB 410-593724/1-A
Matrix: Water
Analysis Batch: 595507

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND		200	90	ug/L		01/13/25 06:46	01/14/25 14:34	1

Lab Sample ID: LCS 410-593724/2-A
Matrix: Water
Analysis Batch: 595032

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Potassium	5000	4550		ug/L		91	90 - 110

Lab Sample ID: LCS 410-593724/2-A
Matrix: Water
Analysis Batch: 595507

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593724

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sodium	5000	4810		ug/L		96	89 - 114

Lab Sample ID: MB 410-593968/1-A
Matrix: Water
Analysis Batch: 594469

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	ND		200	65	ug/L		01/09/25 21:00	01/10/25 18:07	1
Sodium	ND		200	90	ug/L		01/09/25 21:00	01/10/25 18:07	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 410-593968/2-A
Matrix: Water
Analysis Batch: 594469

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Potassium			5000	5160		ug/L		103	90 - 110		
Sodium			5000	5100		ug/L		102	89 - 114		

Lab Sample ID: LCSD 410-593968/3-A
Matrix: Water
Analysis Batch: 594469

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 593968

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Potassium			5000	5230		ug/L		105	90 - 110	1	20
Sodium			5000	5030		ug/L		101	89 - 114	1	20

Lab Sample ID: 180-179483-48 MS
Matrix: Water
Analysis Batch: 579551

Client Sample ID: R-5882 T03
Prep Type: Dissolved
Prep Batch: 574857

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Potassium	ND		5000	5430		ug/L		109	75 - 125		
Sodium	ND		5000	5320		ug/L		106	75 - 125		

Lab Sample ID: 180-179483-48 MSD
Matrix: Water
Analysis Batch: 579551

Client Sample ID: R-5882 T03
Prep Type: Dissolved
Prep Batch: 574857

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Potassium	ND		5000	5380		ug/L		108	75 - 125	1	20
Sodium	ND		5000	5400		ug/L		108	75 - 125	1	20

Lab Sample ID: 180-179483-48 DU
Matrix: Water
Analysis Batch: 579551

Client Sample ID: R-5882 T03
Prep Type: Dissolved
Prep Batch: 574857

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Potassium	ND			ND		ug/L				NC	20
Sodium	ND			ND		ug/L				NC	20

Lab Sample ID: 180-179483-50 MS
Matrix: Water
Analysis Batch: 579835

Client Sample ID: R-5882 T05
Prep Type: Dissolved
Prep Batch: 578204

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Potassium	ND		5000	4960		ug/L		99	75 - 125		
Sodium	ND		5000	5110		ug/L		102	75 - 125		

Lab Sample ID: 180-179483-50 MSD
Matrix: Water
Analysis Batch: 579835

Client Sample ID: R-5882 T05
Prep Type: Dissolved
Prep Batch: 578204

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Potassium	ND		5000	5050		ug/L		101	75 - 125	2	20
Sodium	ND		5000	5100		ug/L		102	75 - 125	0	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: 180-179483-50 DU
Matrix: Water
Analysis Batch: 579835

Client Sample ID: R-5882 T05
Prep Type: Dissolved
Prep Batch: 578204

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Potassium	ND		ND		ug/L		NC	20
Sodium	ND		ND		ug/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 410-574582/1-A
Matrix: Water
Analysis Batch: 575280

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 574582

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/14/24 15:07	1

Lab Sample ID: LCS 410-574582/2-A
Matrix: Water
Analysis Batch: 575280

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 574582

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.964		ug/L		96	80 - 118

Lab Sample ID: MB 410-574584/1-A
Matrix: Water
Analysis Batch: 576425

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 574584

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/14/24 07:20	11/18/24 12:50	1

Lab Sample ID: LCS 410-574584/2-A
Matrix: Water
Analysis Batch: 576425

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 574584

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.906		ug/L		91	80 - 118

Lab Sample ID: MB 410-578435/1-A
Matrix: Water
Analysis Batch: 580313

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 578435

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		11/24/24 03:11	11/27/24 12:30	1

Lab Sample ID: LCS 410-578435/2-A
Matrix: Water
Analysis Batch: 580313

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 578435

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.900		ug/L		90	80 - 118

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: MB 410-580616/1-A
Matrix: Water
Analysis Batch: 580938

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 580616

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/02/24 04:26	12/02/24 10:43	1

Lab Sample ID: LCS 410-580616/2-A
Matrix: Water
Analysis Batch: 580938

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 580616

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.961		ug/L		96	80 - 118

Lab Sample ID: MB 410-582569/1-A
Matrix: Water
Analysis Batch: 585449

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 582569

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/11/24 07:48	12/12/24 15:12	1

Lab Sample ID: LCS 410-582569/2-A
Matrix: Water
Analysis Batch: 585449

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 582569

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.988		ug/L		99	80 - 118

Lab Sample ID: MB 410-588453/1-A
Matrix: Water
Analysis Batch: 589056

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 588453

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		12/19/24 23:10	12/21/24 06:07	1

Lab Sample ID: LCS 410-588453/2-A
Matrix: Water
Analysis Batch: 589056

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 588453

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	1.03		ug/L		103	80 - 118

Lab Sample ID: MB 410-590881/1-A
Matrix: Water
Analysis Batch: 592661

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 590881

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/06/25 07:30	01/06/25 12:54	1

Lab Sample ID: LCS 410-590881/2-A
Matrix: Water
Analysis Batch: 592661

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 590881

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.991		ug/L		99	80 - 118

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 410-593985/1-A
Matrix: Water
Analysis Batch: 594253

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 593985

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/09/25 21:10	01/10/25 11:05	1

Lab Sample ID: LCS 410-593985/2-A
Matrix: Water
Analysis Batch: 594253

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 593985

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	1.09		ug/L		109	80 - 118

Lab Sample ID: LCSD 410-593985/3-A
Matrix: Water
Analysis Batch: 594253

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 593985

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	1.00	1.10		ug/L		110	80 - 118	1	20

Lab Sample ID: MB 410-594829/1-A
Matrix: Water
Analysis Batch: 595456

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 594829

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.079	ug/L		01/13/25 23:45	01/14/25 16:03	1

Lab Sample ID: LCS 410-594829/2-A
Matrix: Water
Analysis Batch: 595456

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 594829

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	1.01		ug/L		101	80 - 118

Lab Sample ID: LCSD 410-594829/3-A
Matrix: Water
Analysis Batch: 595456

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 594829

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	1.00	1.02		ug/L		102	80 - 118	1	20

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation

Lab Sample ID: MB 180-484008/35
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			11/08/24 04:30	1

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation (Continued)

Lab Sample ID: MB 180-484008/5
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			11/07/24 16:35	1

Lab Sample ID: LCS 180-484008/34
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	19.5		mg/L		97	85 - 115

Lab Sample ID: LCS 180-484008/4
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	19.8		mg/L		99	85 - 115

Lab Sample ID: MB 180-484237/5
Matrix: Solid
Analysis Batch: 484237

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			11/12/24 19:31	1

Lab Sample ID: LCS 180-484237/4
Matrix: Solid
Analysis Batch: 484237

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	20.3		mg/L		101	85 - 115

Lab Sample ID: MB 180-485605/5
Matrix: Solid
Analysis Batch: 485605

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			11/27/24 20:41	1

Lab Sample ID: LCS 180-485605/4
Matrix: Solid
Analysis Batch: 485605

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	21.0		mg/L		105	85 - 115

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation (Continued)

Lab Sample ID: MB 180-486040/35
Matrix: Solid
Analysis Batch: 486040

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/05/24 07:45	1

Lab Sample ID: MB 180-486040/5
Matrix: Solid
Analysis Batch: 486040

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/04/24 19:43	1

Lab Sample ID: LCS 180-486040/34
Matrix: Solid
Analysis Batch: 486040

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	20.3		mg/L		101	85 - 115

Lab Sample ID: MB 180-487257/35
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/24/24 04:59	1

Lab Sample ID: MB 180-487257/5
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/23/24 16:55	1

Lab Sample ID: MB 180-487257/67
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			12/24/24 18:20	1

Lab Sample ID: LCS 180-487257/4
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	21.1		mg/L		105	85 - 115

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation (Continued)

Lab Sample ID: LCS 180-487257/66
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	21.0		mg/L		105	85 - 115

Lab Sample ID: MB 180-487755/5
Matrix: Solid
Analysis Batch: 487755

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			01/03/10 17:50	1

Lab Sample ID: LCS 180-487755/4
Matrix: Solid
Analysis Batch: 487755

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	20.3		mg/L		102	85 - 115

Lab Sample ID: MB 180-488181/5
Matrix: Solid
Analysis Batch: 488181

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Quad	ND		1.0	0.51	mg/L			01/09/25 22:32	1

Lab Sample ID: LCS 180-488181/4
Matrix: Solid
Analysis Batch: 488181

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	20.0	20.7		mg/L		104	85 - 115

Lab Sample ID: 180-179483-57 MS
Matrix: Solid
Analysis Batch: 484008

Client Sample ID: MB T03
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	ND	!	10.0	8.71		mg/L		87	85 - 115

Lab Sample ID: 180-179483-59 MS
Matrix: Solid
Analysis Batch: 485605

Client Sample ID: MB T05
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	ND	!	10.0	10.5		mg/L		105	85 - 115

Method: 5310C-2014 - Dissolved Organic Carbon/Persulfate Oxidation (Continued)

Lab Sample ID: 180-179483-60 MS
Matrix: Solid
Analysis Batch: 486040

Client Sample ID: MB T06
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dissolved Organic Carbon - Quad	ND		10.0	10.5		mg/L		105	85 - 115

Lab Sample ID: 180-179483-8 DU
Matrix: Solid
Analysis Batch: 487257

Client Sample ID: R-5880 T08
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Dissolved Organic Carbon - Quad	ND	!	ND		mg/L		NC	15

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-483963/1
Matrix: Solid
Analysis Batch: 483963

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-483963/24
Matrix: Solid
Analysis Batch: 483963

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		101	99 - 101

Lab Sample ID: LCS 180-484286/1
Matrix: Solid
Analysis Batch: 484286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-485167/1
Matrix: Solid
Analysis Batch: 485167

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-486092/24
Matrix: Solid
Analysis Batch: 486092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Method: EPA 9040C - pH (Continued)

Lab Sample ID: LCS 180-486092/47
Matrix: Solid
Analysis Batch: 486092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-486916/24
Matrix: Solid
Analysis Batch: 486916

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		101	99 - 101

Lab Sample ID: LCS 180-487211/1
Matrix: Solid
Analysis Batch: 487211

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-487928/1
Matrix: Solid
Analysis Batch: 487928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: 180-179483-10 DU
Matrix: Solid
Analysis Batch: 483963

Client Sample ID: R-5881 T01
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	6.0	H3	6.0		SU		0	2

Lab Sample ID: 180-179483-57 DU
Matrix: Solid
Analysis Batch: 483963

Client Sample ID: MB T03
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	5.7		5.7		SU		0	2

Lab Sample ID: 180-179483-5 DU
Matrix: Solid
Analysis Batch: 485167

Client Sample ID: R-5880 T05
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	5.8	H3	5.7		SU		0.9	2

Lab Sample ID: 180-179483-7 DU
Matrix: Solid
Analysis Batch: 486916

Client Sample ID: R-5880 T07
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	5.7	H3	5.7		SU		0.5	2

Method: EPA 9040C - pH

Lab Sample ID: LB 180-487734/1-A
Matrix: Solid
Analysis Batch: 487928

Client Sample ID: Method Blank
Prep Type: Leach

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	4.8		0.1	0.1	SU			01/08/25 09:24	1

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 180-483750/50
Matrix: Solid
Analysis Batch: 483750

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			11/06/24 17:17	1

Lab Sample ID: MB 180-483750/74
Matrix: Solid
Analysis Batch: 483750

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			11/06/24 17:17	1

Lab Sample ID: LCS 180-483750/49
Matrix: Solid
Analysis Batch: 483750

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	88.4		umhos/cm		105	90 - 110

Lab Sample ID: LCS 180-483750/73
Matrix: Solid
Analysis Batch: 483750

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	88.4		umhos/cm		105	90 - 110

Lab Sample ID: MB 180-484289/50
Matrix: Solid
Analysis Batch: 484289

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			11/13/24 16:54	1

Lab Sample ID: LCS 180-484289/49
Matrix: Solid
Analysis Batch: 484289

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	84.2		umhos/cm		100	90 - 110

Method: SM 2510B - Conductivity, Specific Conductance (Continued)

Lab Sample ID: MB 180-484801/2
Matrix: Solid
Analysis Batch: 484801

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			11/19/24 18:01	1

Lab Sample ID: MB 180-484801/26
Matrix: Solid
Analysis Batch: 484801

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			11/19/24 18:13	1

Lab Sample ID: LCS 180-484801/1
Matrix: Solid
Analysis Batch: 484801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	86.5		umhos/cm		103	90 - 110

Lab Sample ID: LCS 180-484801/25
Matrix: Solid
Analysis Batch: 484801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	85.5		umhos/cm		102	90 - 110

Lab Sample ID: MB 180-485905/2
Matrix: Solid
Analysis Batch: 485905

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			12/04/24 17:48	1

Lab Sample ID: LCS 180-485905/1
Matrix: Solid
Analysis Batch: 485905

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	85.2		umhos/cm		101	90 - 110

Lab Sample ID: MB 180-487398/2
Matrix: Solid
Analysis Batch: 487398

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			12/28/24 16:55	1

Lab Sample ID: MB 180-487398/28
Matrix: Solid
Analysis Batch: 487398

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			12/28/24 16:55	1

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: LCS 180-487398/1
Matrix: Solid
Analysis Batch: 487398

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Specific Conductance			84.0	84.6		umhos/cm		101	90 - 110		

Lab Sample ID: LCS 180-487398/27
Matrix: Solid
Analysis Batch: 487398

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Specific Conductance			84.0	87.4		umhos/cm		104	90 - 110		

Lab Sample ID: MB 180-487866/2
Matrix: Solid
Analysis Batch: 487866

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			01/07/25 16:29	1

Lab Sample ID: LCS 180-487866/1
Matrix: Solid
Analysis Batch: 487866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Specific Conductance			84.0	86.8		umhos/cm		103	90 - 110		

Lab Sample ID: 180-179483-55 DU
Matrix: Solid
Analysis Batch: 483750

Client Sample ID: MB T01
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Conductance	9.7	!		9.53		umhos/cm				2	20

Lab Sample ID: 180-179483-5 DU
Matrix: Solid
Analysis Batch: 484801

Client Sample ID: R-5880 T05
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Conductance	1.2	!		1.21		umhos/cm				0.8	20

Lab Sample ID: 180-179483-17 DU
Matrix: Solid
Analysis Batch: 487398

Client Sample ID: R-5881 T08
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Conductance	1.2	!		1.21		umhos/cm				0.8	20

Lab Sample ID: 180-179483-25 DU
Matrix: Solid
Analysis Batch: 487398

Client Sample ID: R-5882 T07
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Conductance	1.7	!		1.67		umhos/cm				0.6	20

Method: SM 2580B - Reduction-Oxidation (REDOX) Potential

Lab Sample ID: LCS 180-483740/1
Matrix: Solid
Analysis Batch: 483740

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	481		millivolts		101	90 - 110

Lab Sample ID: LCS 180-483740/26
Matrix: Solid
Analysis Batch: 483740

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	458		millivolts		96	90 - 110

Lab Sample ID: LCS 180-484015/26
Matrix: Solid
Analysis Batch: 484015

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	480		millivolts		101	90 - 110

Lab Sample ID: LCS 180-484973/1
Matrix: Solid
Analysis Batch: 484973

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	465		millivolts		98	90 - 110

Lab Sample ID: LCS 180-485741/1
Matrix: Solid
Analysis Batch: 485741

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	469		millivolts		99	90 - 110

Lab Sample ID: LCS 180-486788/1
Matrix: Solid
Analysis Batch: 486788

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	466		millivolts		98	90 - 110

Lab Sample ID: LCS 180-487533/26
Matrix: Solid
Analysis Batch: 487533

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	462		millivolts		97	90 - 110

Lab Sample ID: LCS 180-487837/1
Matrix: Solid
Analysis Batch: 487837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	456		millivolts		96	90 - 110

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Method: SM 2580B - Reduction-Oxidation (REDOX) Potential

Lab Sample ID: 180-179483-57 DU
Client Sample ID: MB T03
Matrix: Solid
Prep Type: Leach
Analysis Batch: 483740

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Oxidation Reduction Potential	330	!		332		millivolts				1	20

Lab Sample ID: 180-179483-62 DU
Client Sample ID: MB T08
Matrix: Solid
Prep Type: Leach
Analysis Batch: 487533

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Oxidation Reduction Potential	270	!		275		millivolts				3	20

Metals

Prep Batch: 574582

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-28	R-5880 T01	Dissolved	Water	7470A	
180-179483-29	R-5880 T02	Dissolved	Water	7470A	
180-179483-30	R-5880 T03	Dissolved	Water	7470A	
180-179483-37	R-5881 T01	Dissolved	Water	7470A	
180-179483-39	R-5881 T03	Dissolved	Water	7470A	
180-179483-46	R-5882 T01	Dissolved	Water	7470A	
180-179483-47	R-5882 T02	Dissolved	Water	7470A	
180-179483-48	R-5882 T03	Dissolved	Water	7470A	
180-179483-64	MB T01	Dissolved	Water	7470A	
180-179483-65	MB T02	Dissolved	Water	7470A	
180-179483-66	MB T03	Dissolved	Water	7470A	
MB 410-574582/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-574582/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 574584

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-38	R-5881 T02	Dissolved	Water	7470A	
MB 410-574584/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-574584/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 574857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-28	R-5880 T01	Dissolved	Water	3005A	
180-179483-29	R-5880 T02	Dissolved	Water	3005A	
180-179483-37	R-5881 T01	Dissolved	Water	3005A	
180-179483-38	R-5881 T02	Dissolved	Water	3005A	
180-179483-39	R-5881 T03	Dissolved	Water	3005A	
180-179483-46	R-5882 T01	Dissolved	Water	3005A	
180-179483-47	R-5882 T02	Dissolved	Water	3005A	
180-179483-48	R-5882 T03	Dissolved	Water	3005A	
180-179483-64	MB T01	Dissolved	Water	3005A	
180-179483-65	MB T02	Dissolved	Water	3005A	
180-179483-66	MB T03	Dissolved	Water	3005A	
MB 410-574857/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-574857/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-179483-48 MS	R-5882 T03	Dissolved	Water	3005A	
180-179483-48 MSD	R-5882 T03	Dissolved	Water	3005A	
180-179483-48 DU	R-5882 T03	Dissolved	Water	3005A	

Prep Batch: 574859

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-30	R-5880 T03	Dissolved	Water	3005A	
MB 410-574859/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-574859/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 575280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-28	R-5880 T01	Dissolved	Water	7470A	574582
180-179483-29	R-5880 T02	Dissolved	Water	7470A	574582
180-179483-30	R-5880 T03	Dissolved	Water	7470A	574582
180-179483-37	R-5881 T01	Dissolved	Water	7470A	574582

Metals (Continued)

Analysis Batch: 575280 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-39	R-5881 T03	Dissolved	Water	7470A	574582
180-179483-46	R-5882 T01	Dissolved	Water	7470A	574582
180-179483-47	R-5882 T02	Dissolved	Water	7470A	574582
180-179483-48	R-5882 T03	Dissolved	Water	7470A	574582
180-179483-64	MB T01	Dissolved	Water	7470A	574582
180-179483-65	MB T02	Dissolved	Water	7470A	574582
180-179483-66	MB T03	Dissolved	Water	7470A	574582
MB 410-574582/1-A	Method Blank	Total/NA	Water	7470A	574582
LCS 410-574582/2-A	Lab Control Sample	Total/NA	Water	7470A	574582

Prep Batch: 575547

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-31	R-5880 T04	Dissolved	Water	3005A	
180-179483-40	R-5881 T04	Dissolved	Water	3005A	
180-179483-49	R-5882 T04	Dissolved	Water	3005A	
180-179483-67	MB T04	Dissolved	Water	3005A	
MB 410-575547/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-575547/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 576425

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-38	R-5881 T02	Dissolved	Water	7470A	574584
MB 410-574584/1-A	Method Blank	Total/NA	Water	7470A	574584
LCS 410-574584/2-A	Lab Control Sample	Total/NA	Water	7470A	574584

Analysis Batch: 576928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-30	R-5880 T03	Dissolved	Water	6020B	574859
MB 410-574859/1-A	Method Blank	Total Recoverable	Water	6020B	574859
LCS 410-574859/2-A	Lab Control Sample	Total Recoverable	Water	6020B	574859

Prep Batch: 578204

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-32	R-5880 T05	Dissolved	Water	3005A	
180-179483-41	R-5881 T05	Dissolved	Water	3005A	
180-179483-50	R-5882 T05	Dissolved	Water	3005A	
MB 410-578204/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-578204/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 410-578204/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
180-179483-50 MS	R-5882 T05	Dissolved	Water	3005A	
180-179483-50 MSD	R-5882 T05	Dissolved	Water	3005A	
180-179483-50 DU	R-5882 T05	Dissolved	Water	3005A	

Prep Batch: 578435

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-32	R-5880 T05	Dissolved	Water	7470A	
180-179483-41	R-5881 T05	Dissolved	Water	7470A	
180-179483-50	R-5882 T05	Dissolved	Water	7470A	
MB 410-578435/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-578435/2-A	Lab Control Sample	Total/NA	Water	7470A	

QC Association Summary

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

Metals

Analysis Batch: 578589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-32	R-5880 T05	Dissolved	Water	6010D	578204
180-179483-41	R-5881 T05	Dissolved	Water	6010D	578204
180-179483-50	R-5882 T05	Dissolved	Water	6010D	578204
MB 410-578204/1-A	Method Blank	Total Recoverable	Water	6010D	578204
LCS 410-578204/2-A	Lab Control Sample	Total Recoverable	Water	6010D	578204
LCSD 410-578204/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010D	578204
180-179483-50 MS	R-5882 T05	Dissolved	Water	6010D	578204
180-179483-50 MSD	R-5882 T05	Dissolved	Water	6010D	578204
180-179483-50 DU	R-5882 T05	Dissolved	Water	6010D	578204

Prep Batch: 578822

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-68	MB T05	Dissolved	Water	3005A	
MB 410-578822/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-578822/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 579341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-31	R-5880 T04	Dissolved	Water	6020B	575547
180-179483-40	R-5881 T04	Dissolved	Water	6020B	575547
180-179483-49	R-5882 T04	Dissolved	Water	6020B	575547
180-179483-67	MB T04	Dissolved	Water	6020B	575547
MB 410-575547/1-A	Method Blank	Total Recoverable	Water	6020B	575547
LCS 410-575547/2-A	Lab Control Sample	Total Recoverable	Water	6020B	575547

Analysis Batch: 579485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-68	MB T05	Dissolved	Water	6010D	578822
MB 410-578822/1-A	Method Blank	Total Recoverable	Water	6010D	578822
LCS 410-578822/2-A	Lab Control Sample	Total Recoverable	Water	6010D	578822

Analysis Batch: 579551

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-28	R-5880 T01	Dissolved	Water	6020B	574857
180-179483-29	R-5880 T02	Dissolved	Water	6020B	574857
180-179483-37	R-5881 T01	Dissolved	Water	6020B	574857
180-179483-38	R-5881 T02	Dissolved	Water	6020B	574857
180-179483-39	R-5881 T03	Dissolved	Water	6020B	574857
180-179483-46	R-5882 T01	Dissolved	Water	6020B	574857
180-179483-47	R-5882 T02	Dissolved	Water	6020B	574857
180-179483-48	R-5882 T03	Dissolved	Water	6020B	574857
180-179483-64	MB T01	Dissolved	Water	6020B	574857
180-179483-65	MB T02	Dissolved	Water	6020B	574857
180-179483-66	MB T03	Dissolved	Water	6020B	574857
MB 410-574857/1-A	Method Blank	Total Recoverable	Water	6020B	574857
LCS 410-574857/2-A	Lab Control Sample	Total Recoverable	Water	6020B	574857
180-179483-48 MS	R-5882 T03	Dissolved	Water	6020B	574857
180-179483-48 MSD	R-5882 T03	Dissolved	Water	6020B	574857
180-179483-48 DU	R-5882 T03	Dissolved	Water	6020B	574857

Metals

Analysis Batch: 579835

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-32	R-5880 T05	Dissolved	Water	6020B	578204
180-179483-41	R-5881 T05	Dissolved	Water	6020B	578204
180-179483-50	R-5882 T05	Dissolved	Water	6020B	578204
180-179483-68	MB T05	Dissolved	Water	6020B	578822
MB 410-578204/1-A	Method Blank	Total Recoverable	Water	6020B	578204
MB 410-578822/1-A	Method Blank	Total Recoverable	Water	6020B	578822
LCS 410-578204/2-A	Lab Control Sample	Total Recoverable	Water	6020B	578204
LCS 410-578822/2-A	Lab Control Sample	Total Recoverable	Water	6020B	578822
LCSD 410-578204/3-A	Lab Control Sample Dup	Total Recoverable	Water	6020B	578204
180-179483-50 MS	R-5882 T05	Dissolved	Water	6020B	578204
180-179483-50 MSD	R-5882 T05	Dissolved	Water	6020B	578204
180-179483-50 DU	R-5882 T05	Dissolved	Water	6020B	578204

Analysis Batch: 579881

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-31	R-5880 T04	Dissolved	Water	6020B	575547
180-179483-40	R-5881 T04	Dissolved	Water	6020B	575547
180-179483-49	R-5882 T04	Dissolved	Water	6020B	575547
180-179483-67	MB T04	Dissolved	Water	6020B	575547

Analysis Batch: 580313

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-32	R-5880 T05	Dissolved	Water	7470A	578435
180-179483-41	R-5881 T05	Dissolved	Water	7470A	578435
180-179483-50	R-5882 T05	Dissolved	Water	7470A	578435
MB 410-578435/1-A	Method Blank	Total/NA	Water	7470A	578435
LCS 410-578435/2-A	Lab Control Sample	Total/NA	Water	7470A	578435

Prep Batch: 580616

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-31	R-5880 T04	Dissolved	Water	7470A	
180-179483-40	R-5881 T04	Dissolved	Water	7470A	
180-179483-49	R-5882 T04	Dissolved	Water	7470A	
180-179483-67	MB T04	Dissolved	Water	7470A	
MB 410-580616/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-580616/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 580938

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-31	R-5880 T04	Dissolved	Water	7470A	580616
180-179483-40	R-5881 T04	Dissolved	Water	7470A	580616
180-179483-49	R-5882 T04	Dissolved	Water	7470A	580616
180-179483-67	MB T04	Dissolved	Water	7470A	580616
MB 410-580616/1-A	Method Blank	Total/NA	Water	7470A	580616
LCS 410-580616/2-A	Lab Control Sample	Total/NA	Water	7470A	580616

Prep Batch: 582569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-33	R-5880 T06	Dissolved	Water	7470A	
180-179483-42	R-5881 T06	Dissolved	Water	7470A	
180-179483-51	R-5882 T06	Dissolved	Water	7470A	

Metals (Continued)

Prep Batch: 582569 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-69	MB T06	Dissolved	Water	7470A	
MB 410-582569/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-582569/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 582769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-33	R-5880 T06	Dissolved	Water	3005A	
180-179483-42	R-5881 T06	Dissolved	Water	3005A	
180-179483-51	R-5882 T06	Dissolved	Water	3005A	
180-179483-69	MB T06	Dissolved	Water	3005A	
MB 410-582769/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-582769/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 583073

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-33	R-5880 T06	Dissolved	Water	6020B	582769
180-179483-42	R-5881 T06	Dissolved	Water	6020B	582769
180-179483-51	R-5882 T06	Dissolved	Water	6020B	582769
180-179483-69	MB T06	Dissolved	Water	6020B	582769
MB 410-582769/1-A	Method Blank	Total Recoverable	Water	6020B	582769
LCS 410-582769/2-A	Lab Control Sample	Total Recoverable	Water	6020B	582769

Analysis Batch: 583930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-42	R-5881 T06	Dissolved	Water	6010D	582769
180-179483-51	R-5882 T06	Dissolved	Water	6010D	582769
180-179483-69	MB T06	Dissolved	Water	6010D	582769
MB 410-582769/1-A	Method Blank	Total Recoverable	Water	6010D	582769
LCS 410-582769/2-A	Lab Control Sample	Total Recoverable	Water	6010D	582769

Analysis Batch: 585449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-33	R-5880 T06	Dissolved	Water	7470A	582569
180-179483-42	R-5881 T06	Dissolved	Water	7470A	582569
180-179483-51	R-5882 T06	Dissolved	Water	7470A	582569
180-179483-69	MB T06	Dissolved	Water	7470A	582569
MB 410-582569/1-A	Method Blank	Total/NA	Water	7470A	582569
LCS 410-582569/2-A	Lab Control Sample	Total/NA	Water	7470A	582569

Prep Batch: 588453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-34	R-5880 T07	Dissolved	Water	7470A	
180-179483-43	R-5881 T07	Dissolved	Water	7470A	
180-179483-52	R-5882 T07	Dissolved	Water	7470A	
180-179483-68	MB T05	Dissolved	Water	7470A	
180-179483-70	MB T07	Dissolved	Water	7470A	
MB 410-588453/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-588453/2-A	Lab Control Sample	Total/NA	Water	7470A	

Metals

Prep Batch: 588785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-34	R-5880 T07	Dissolved	Water	3005A	
180-179483-43	R-5881 T07	Dissolved	Water	3005A	
180-179483-52	R-5882 T07	Dissolved	Water	3005A	
180-179483-70	MB T07	Dissolved	Water	3005A	
MB 410-588785/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-588785/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 589056

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-34	R-5880 T07	Dissolved	Water	7470A	588453
180-179483-43	R-5881 T07	Dissolved	Water	7470A	588453
180-179483-52	R-5882 T07	Dissolved	Water	7470A	588453
180-179483-68	MB T05	Dissolved	Water	7470A	588453
180-179483-70	MB T07	Dissolved	Water	7470A	588453
MB 410-588453/1-A	Method Blank	Total/NA	Water	7470A	588453
LCS 410-588453/2-A	Lab Control Sample	Total/NA	Water	7470A	588453

Analysis Batch: 589520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-34	R-5880 T07	Dissolved	Water	6020B	588785
180-179483-43	R-5881 T07	Dissolved	Water	6020B	588785
180-179483-52	R-5882 T07	Dissolved	Water	6020B	588785
180-179483-70	MB T07	Dissolved	Water	6020B	588785
MB 410-588785/1-A	Method Blank	Total Recoverable	Water	6020B	588785
LCS 410-588785/2-A	Lab Control Sample	Total Recoverable	Water	6020B	588785

Analysis Batch: 589702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-34	R-5880 T07	Dissolved	Water	6010D	588785
180-179483-43	R-5881 T07	Dissolved	Water	6010D	588785
180-179483-52	R-5882 T07	Dissolved	Water	6010D	588785
180-179483-70	MB T07	Dissolved	Water	6010D	588785
MB 410-588785/1-A	Method Blank	Total Recoverable	Water	6010D	588785
LCS 410-588785/2-A	Lab Control Sample	Total Recoverable	Water	6010D	588785

Prep Batch: 590566

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-35	R-5880 T08	Dissolved	Water	3005A	
180-179483-44	R-5881 T08	Dissolved	Water	3005A	
180-179483-53	R-5882 T08	Dissolved	Water	3005A	
180-179483-71	MB T08	Dissolved	Water	3005A	
MB 410-590566/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-590566/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 590881

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-35	R-5880 T08	Dissolved	Water	7470A	
180-179483-44	R-5881 T08	Dissolved	Water	7470A	
180-179483-53	R-5882 T08	Dissolved	Water	7470A	
180-179483-71	MB T08	Dissolved	Water	7470A	
MB 410-590881/1-A	Method Blank	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 590881 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 410-590881/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 591054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-35	R-5880 T08	Dissolved	Water	6010D	590566
180-179483-44	R-5881 T08	Dissolved	Water	6010D	590566
180-179483-53	R-5882 T08	Dissolved	Water	6010D	590566
180-179483-71	MB T08	Dissolved	Water	6010D	590566
MB 410-590566/1-A	Method Blank	Total Recoverable	Water	6010D	590566
LCS 410-590566/2-A	Lab Control Sample	Total Recoverable	Water	6010D	590566

Analysis Batch: 591085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-35	R-5880 T08	Dissolved	Water	6020B	590566
180-179483-44	R-5881 T08	Dissolved	Water	6020B	590566
180-179483-53	R-5882 T08	Dissolved	Water	6020B	590566
180-179483-71	MB T08	Dissolved	Water	6020B	590566
MB 410-590566/1-A	Method Blank	Total Recoverable	Water	6020B	590566
LCS 410-590566/2-A	Lab Control Sample	Total Recoverable	Water	6020B	590566

Analysis Batch: 592661

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-35	R-5880 T08	Dissolved	Water	7470A	590881
180-179483-44	R-5881 T08	Dissolved	Water	7470A	590881
180-179483-53	R-5882 T08	Dissolved	Water	7470A	590881
180-179483-71	MB T08	Dissolved	Water	7470A	590881
MB 410-590881/1-A	Method Blank	Total/NA	Water	7470A	590881
LCS 410-590881/2-A	Lab Control Sample	Total/NA	Water	7470A	590881

Prep Batch: 593724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-36	R-5880 T09	Dissolved	Water	3005A	
180-179483-45	R-5881 T09	Dissolved	Water	3005A	
180-179483-72	MB T09	Dissolved	Water	3005A	
MB 410-593724/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-593724/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 593965

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-33	R-5880 T06	Dissolved	Water	6010D	582769
MB 410-582769/1-A	Method Blank	Total Recoverable	Water	6010D	582769
LCS 410-582769/2-A	Lab Control Sample	Total Recoverable	Water	6010D	582769

Prep Batch: 593968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-54	R-5882 T09	Dissolved	Water	3005A	
MB 410-593968/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-593968/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 410-593968/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	

Metals

Prep Batch: 593985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-36	R-5880 T09	Dissolved	Water	7470A	
180-179483-45	R-5881 T09	Dissolved	Water	7470A	
180-179483-54	R-5882 T09	Dissolved	Water	7470A	
180-179483-72	MB T09	Dissolved	Water	7470A	
MB 410-593985/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-593985/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 410-593985/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

Analysis Batch: 594197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-54	R-5882 T09	Dissolved	Water	6010D	593968
MB 410-593968/1-A	Method Blank	Total Recoverable	Water	6010D	593968
LCS 410-593968/2-A	Lab Control Sample	Total Recoverable	Water	6010D	593968
LCSD 410-593968/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010D	593968

Analysis Batch: 594253

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-36	R-5880 T09	Dissolved	Water	7470A	593985
180-179483-45	R-5881 T09	Dissolved	Water	7470A	593985
180-179483-54	R-5882 T09	Dissolved	Water	7470A	593985
180-179483-72	MB T09	Dissolved	Water	7470A	593985
MB 410-593985/1-A	Method Blank	Total/NA	Water	7470A	593985
LCS 410-593985/2-A	Lab Control Sample	Total/NA	Water	7470A	593985
LCSD 410-593985/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	593985

Analysis Batch: 594469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-54	R-5882 T09	Dissolved	Water	6020B	593968
MB 410-593968/1-A	Method Blank	Total Recoverable	Water	6020B	593968
LCS 410-593968/2-A	Lab Control Sample	Total Recoverable	Water	6020B	593968
LCSD 410-593968/3-A	Lab Control Sample Dup	Total Recoverable	Water	6020B	593968

Prep Batch: 594829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-34	R-5880 T07	Dissolved	Water	7470A	
180-179483-35	R-5880 T08	Dissolved	Water	7470A	
180-179483-36	R-5880 T09	Dissolved	Water	7470A	
180-179483-43	R-5881 T07	Dissolved	Water	7470A	
180-179483-44	R-5881 T08	Dissolved	Water	7470A	
180-179483-45	R-5881 T09	Dissolved	Water	7470A	
180-179483-52	R-5882 T07	Dissolved	Water	7470A	
180-179483-53	R-5882 T08	Dissolved	Water	7470A	
180-179483-54	R-5882 T09	Dissolved	Water	7470A	
180-179483-70	MB T07	Dissolved	Water	7470A	
180-179483-71	MB T08	Dissolved	Water	7470A	
180-179483-72	MB T09	Dissolved	Water	7470A	
MB 410-594829/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-594829/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 410-594829/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

Metals

Analysis Batch: 595032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-36	R-5880 T09	Dissolved	Water	6020B	593724
180-179483-45	R-5881 T09	Dissolved	Water	6020B	593724
180-179483-72	MB T09	Dissolved	Water	6020B	593724
MB 410-593724/1-A	Method Blank	Total Recoverable	Water	6020B	593724
LCS 410-593724/2-A	Lab Control Sample	Total Recoverable	Water	6020B	593724

Prep Batch: 595066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-65	MB T02	Dissolved	Water	3005A	
MB 410-595066/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-595066/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 595310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-36	R-5880 T09	Dissolved	Water	6010D	593724
180-179483-45	R-5881 T09	Dissolved	Water	6010D	593724
180-179483-72	MB T09	Dissolved	Water	6010D	593724
MB 410-593724/1-A	Method Blank	Total Recoverable	Water	6010D	593724
LCS 410-593724/2-A	Lab Control Sample	Total Recoverable	Water	6010D	593724

Analysis Batch: 595456

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-34	R-5880 T07	Dissolved	Water	7470A	594829
180-179483-35	R-5880 T08	Dissolved	Water	7470A	594829
180-179483-36	R-5880 T09	Dissolved	Water	7470A	594829
180-179483-43	R-5881 T07	Dissolved	Water	7470A	594829
180-179483-44	R-5881 T08	Dissolved	Water	7470A	594829
180-179483-45	R-5881 T09	Dissolved	Water	7470A	594829
180-179483-52	R-5882 T07	Dissolved	Water	7470A	594829
180-179483-53	R-5882 T08	Dissolved	Water	7470A	594829
180-179483-54	R-5882 T09	Dissolved	Water	7470A	594829
180-179483-70	MB T07	Dissolved	Water	7470A	594829
180-179483-71	MB T08	Dissolved	Water	7470A	594829
180-179483-72	MB T09	Dissolved	Water	7470A	594829
MB 410-594829/1-A	Method Blank	Total/NA	Water	7470A	594829
LCS 410-594829/2-A	Lab Control Sample	Total/NA	Water	7470A	594829
LCSD 410-594829/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	594829

Analysis Batch: 595493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-65	MB T02	Dissolved	Water	6010D	595066
MB 410-595066/1-A	Method Blank	Total Recoverable	Water	6010D	595066
LCS 410-595066/2-A	Lab Control Sample	Total Recoverable	Water	6010D	595066

Analysis Batch: 595507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-36	R-5880 T09	Dissolved	Water	6020B	593724
180-179483-45	R-5881 T09	Dissolved	Water	6020B	593724
180-179483-72	MB T09	Dissolved	Water	6020B	593724
MB 410-593724/1-A	Method Blank	Total Recoverable	Water	6020B	593724
LCS 410-593724/2-A	Lab Control Sample	Total Recoverable	Water	6020B	593724

Metals

Prep Batch: 595767

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-28	R-5880 T01	Dissolved	Water	3005A	
180-179483-29	R-5880 T02	Dissolved	Water	3005A	
180-179483-30	R-5880 T03	Dissolved	Water	3005A	
180-179483-31	R-5880 T04	Dissolved	Water	3005A	
180-179483-37	R-5881 T01	Dissolved	Water	3005A	
180-179483-38	R-5881 T02	Dissolved	Water	3005A	
180-179483-39	R-5881 T03	Dissolved	Water	3005A	
180-179483-40	R-5881 T04	Dissolved	Water	3005A	
180-179483-46	R-5882 T01	Dissolved	Water	3005A	
180-179483-47	R-5882 T02	Dissolved	Water	3005A	
180-179483-48	R-5882 T03	Dissolved	Water	3005A	
180-179483-49	R-5882 T04	Dissolved	Water	3005A	
180-179483-64	MB T01	Dissolved	Water	3005A	
180-179483-67	MB T04	Dissolved	Water	3005A	
MB 410-595767/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-595767/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-179483-29 MS	R-5880 T02	Dissolved	Water	3005A	
180-179483-29 MSD	R-5880 T02	Dissolved	Water	3005A	
180-179483-29 DU	R-5880 T02	Dissolved	Water	3005A	

Prep Batch: 596526

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-66	MB T03	Dissolved	Water	3005A	
MB 410-596526/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-596526/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 596751

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-66	MB T03	Dissolved	Water	6010D	596526
MB 410-596526/1-A	Method Blank	Total Recoverable	Water	6010D	596526
LCS 410-596526/2-A	Lab Control Sample	Total Recoverable	Water	6010D	596526

Analysis Batch: 596770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-28	R-5880 T01	Dissolved	Water	6010D	595767
180-179483-29	R-5880 T02	Dissolved	Water	6010D	595767
180-179483-30	R-5880 T03	Dissolved	Water	6010D	595767
180-179483-31	R-5880 T04	Dissolved	Water	6010D	595767
180-179483-37	R-5881 T01	Dissolved	Water	6010D	595767
180-179483-38	R-5881 T02	Dissolved	Water	6010D	595767
180-179483-39	R-5881 T03	Dissolved	Water	6010D	595767
180-179483-40	R-5881 T04	Dissolved	Water	6010D	595767
180-179483-46	R-5882 T01	Dissolved	Water	6010D	595767
180-179483-47	R-5882 T02	Dissolved	Water	6010D	595767
180-179483-48	R-5882 T03	Dissolved	Water	6010D	595767
180-179483-49	R-5882 T04	Dissolved	Water	6010D	595767
180-179483-64	MB T01	Dissolved	Water	6010D	595767
180-179483-67	MB T04	Dissolved	Water	6010D	595767
MB 410-595767/1-A	Method Blank	Total Recoverable	Water	6010D	595767
LCS 410-595767/2-A	Lab Control Sample	Total Recoverable	Water	6010D	595767
180-179483-29 MS	R-5880 T02	Dissolved	Water	6010D	595767

Metals (Continued)

Analysis Batch: 596770 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-29 MSD	R-5880 T02	Dissolved	Water	6010D	595767
180-179483-29 DU	R-5880 T02	Dissolved	Water	6010D	595767

General Chemistry

Leach Batch: 483164

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-1	R-5880 T01	Leach	Solid	1315	
180-179483-10	R-5881 T01	Leach	Solid	1315	
180-179483-19	R-5882 T01	Leach	Solid	1315	
180-179483-55	MB T01	Leach	Solid	1315	
180-179483-10 DU	R-5881 T01	Leach	Solid	1315	
180-179483-55 DU	MB T01	Leach	Solid	1315	

Leach Batch: 483172

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-2	R-5880 T02	Leach	Solid	1315	
180-179483-11	R-5881 T02	Leach	Solid	1315	
180-179483-20	R-5882 T02	Leach	Solid	1315	
180-179483-56	MB T02	Leach	Solid	1315	

Leach Batch: 483173

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-3	R-5880 T03	Leach	Solid	1315	
180-179483-12	R-5881 T03	Leach	Solid	1315	
180-179483-21	R-5882 T03	Leach	Solid	1315	
180-179483-57	MB T03	Leach	Solid	1315	
180-179483-57 MS	MB T03	Leach	Solid	1315	
180-179483-57 DU	MB T03	Leach	Solid	1315	

Leach Batch: 483174

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-4	R-5880 T04	Leach	Solid	1315	
180-179483-13	R-5881 T04	Leach	Solid	1315	
180-179483-22	R-5882 T04	Leach	Solid	1315	
180-179483-58	MB T04	Leach	Solid	1315	

Leach Batch: 483175

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-5	R-5880 T05	Leach	Solid	1315	
180-179483-14	R-5881 T05	Leach	Solid	1315	
180-179483-23	R-5882 T05	Leach	Solid	1315	
180-179483-59	MB T05	Leach	Solid	1315	
180-179483-59 MS	MB T05	Leach	Solid	1315	
180-179483-5 DU	R-5880 T05	Leach	Solid	1315	

Leach Batch: 483177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-6	R-5880 T06	Leach	Solid	1315	
180-179483-15	R-5881 T06	Leach	Solid	1315	
180-179483-24	R-5882 T06	Leach	Solid	1315	

General Chemistry (Continued)

Leach Batch: 483177 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-60	MB T06	Leach	Solid	1315	
180-179483-60 MS	MB T06	Leach	Solid	1315	

Leach Batch: 483179

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-7	R-5880 T07	Leach	Solid	1315	
180-179483-16	R-5881 T07	Leach	Solid	1315	
180-179483-25	R-5882 T07	Leach	Solid	1315	
180-179483-61	MB T07	Leach	Solid	1315	
180-179483-7 DU	R-5880 T07	Leach	Solid	1315	
180-179483-25 DU	R-5882 T07	Leach	Solid	1315	

Leach Batch: 483180

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-8	R-5880 T08	Leach	Solid	1315	
180-179483-17	R-5881 T08	Leach	Solid	1315	
180-179483-26	R-5882 T08	Leach	Solid	1315	
180-179483-62	MB T08	Leach	Solid	1315	
180-179483-8 DU	R-5880 T08	Leach	Solid	1315	
180-179483-17 DU	R-5881 T08	Leach	Solid	1315	
180-179483-62 DU	MB T08	Leach	Solid	1315	

Leach Batch: 483181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-9	R-5880 T09	Leach	Solid	1315	
180-179483-18	R-5881 T09	Leach	Solid	1315	
180-179483-27	R-5882 T09	Leach	Solid	1315	
180-179483-63	MB T09	Leach	Solid	1315	

Analysis Batch: 483740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-1	R-5880 T01	Leach	Solid	SM 2580B	483164
180-179483-2	R-5880 T02	Leach	Solid	SM 2580B	483172
180-179483-3	R-5880 T03	Leach	Solid	SM 2580B	483173
180-179483-10	R-5881 T01	Leach	Solid	SM 2580B	483164
180-179483-11	R-5881 T02	Leach	Solid	SM 2580B	483172
180-179483-12	R-5881 T03	Leach	Solid	SM 2580B	483173
180-179483-19	R-5882 T01	Leach	Solid	SM 2580B	483164
180-179483-20	R-5882 T02	Leach	Solid	SM 2580B	483172
180-179483-21	R-5882 T03	Leach	Solid	SM 2580B	483173
180-179483-55	MB T01	Leach	Solid	SM 2580B	483164
180-179483-56	MB T02	Leach	Solid	SM 2580B	483172
180-179483-57	MB T03	Leach	Solid	SM 2580B	483173
LCS 180-483740/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
LCS 180-483740/26	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-179483-57 DU	MB T03	Leach	Solid	SM 2580B	483173

Analysis Batch: 483750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-1	R-5880 T01	Leach	Solid	SM 2510B	483164
180-179483-2	R-5880 T02	Leach	Solid	SM 2510B	483172

General Chemistry (Continued)

Analysis Batch: 483750 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-3	R-5880 T03	Leach	Solid	SM 2510B	483173
180-179483-10	R-5881 T01	Leach	Solid	SM 2510B	483164
180-179483-11	R-5881 T02	Leach	Solid	SM 2510B	483172
180-179483-12	R-5881 T03	Leach	Solid	SM 2510B	483173
180-179483-19	R-5882 T01	Leach	Solid	SM 2510B	483164
180-179483-20	R-5882 T02	Leach	Solid	SM 2510B	483172
180-179483-21	R-5882 T03	Leach	Solid	SM 2510B	483173
180-179483-55	MB T01	Leach	Solid	SM 2510B	483164
180-179483-56	MB T02	Leach	Solid	SM 2510B	483172
180-179483-57	MB T03	Leach	Solid	SM 2510B	483173
MB 180-483750/50	Method Blank	Total/NA	Solid	SM 2510B	
MB 180-483750/74	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-483750/49	Lab Control Sample	Total/NA	Solid	SM 2510B	
LCS 180-483750/73	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-179483-55 DU	MB T01	Leach	Solid	SM 2510B	483164

Analysis Batch: 483963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-1	R-5880 T01	Leach	Solid	EPA 9040C	483164
180-179483-2	R-5880 T02	Leach	Solid	EPA 9040C	483172
180-179483-3	R-5880 T03	Leach	Solid	EPA 9040C	483173
180-179483-10	R-5881 T01	Leach	Solid	EPA 9040C	483164
180-179483-11	R-5881 T02	Leach	Solid	EPA 9040C	483172
180-179483-12	R-5881 T03	Leach	Solid	EPA 9040C	483173
180-179483-19	R-5882 T01	Leach	Solid	EPA 9040C	483164
180-179483-20	R-5882 T02	Leach	Solid	EPA 9040C	483172
180-179483-21	R-5882 T03	Leach	Solid	EPA 9040C	483173
180-179483-55	MB T01	Leach	Solid	EPA 9040C	483164
180-179483-56	MB T02	Leach	Solid	EPA 9040C	483172
180-179483-57	MB T03	Leach	Solid	EPA 9040C	483173
LCS 180-483963/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
LCS 180-483963/24	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-179483-10 DU	R-5881 T01	Leach	Solid	EPA 9040C	483164
180-179483-57 DU	MB T03	Leach	Solid	EPA 9040C	483173

Analysis Batch: 484008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-1	R-5880 T01	Leach	Solid	5310C-2014	483164
180-179483-2	R-5880 T02	Leach	Solid	5310C-2014	483172
180-179483-3	R-5880 T03	Leach	Solid	5310C-2014	483173
180-179483-10	R-5881 T01	Leach	Solid	5310C-2014	483164
180-179483-11	R-5881 T02	Leach	Solid	5310C-2014	483172
180-179483-12	R-5881 T03	Leach	Solid	5310C-2014	483173
180-179483-19	R-5882 T01	Leach	Solid	5310C-2014	483164
180-179483-20	R-5882 T02	Leach	Solid	5310C-2014	483172
180-179483-21	R-5882 T03	Leach	Solid	5310C-2014	483173
180-179483-55	MB T01	Leach	Solid	5310C-2014	483164
180-179483-56	MB T02	Leach	Solid	5310C-2014	483172
180-179483-57	MB T03	Leach	Solid	5310C-2014	483173
MB 180-484008/35	Method Blank	Dissolved	Solid	5310C-2014	
MB 180-484008/5	Method Blank	Dissolved	Solid	5310C-2014	

General Chemistry (Continued)

Analysis Batch: 484008 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-484008/34	Lab Control Sample	Dissolved	Solid	5310C-2014	
LCS 180-484008/4	Lab Control Sample	Dissolved	Solid	5310C-2014	
180-179483-57 MS	MB T03	Leach	Solid	5310C-2014	483173

Analysis Batch: 484015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-4	R-5880 T04	Leach	Solid	SM 2580B	483174
180-179483-13	R-5881 T04	Leach	Solid	SM 2580B	483174
180-179483-22	R-5882 T04	Leach	Solid	SM 2580B	483174
180-179483-58	MB T04	Leach	Solid	SM 2580B	483174
LCS 180-484015/26	Lab Control Sample	Total/NA	Solid	SM 2580B	

Analysis Batch: 484237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-4	R-5880 T04	Leach	Solid	5310C-2014	483174
180-179483-13	R-5881 T04	Leach	Solid	5310C-2014	483174
180-179483-22	R-5882 T04	Leach	Solid	5310C-2014	483174
180-179483-58	MB T04	Leach	Solid	5310C-2014	483174
MB 180-484237/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-484237/4	Lab Control Sample	Dissolved	Solid	5310C-2014	

Analysis Batch: 484286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-4	R-5880 T04	Leach	Solid	EPA 9040C	483174
180-179483-13	R-5881 T04	Leach	Solid	EPA 9040C	483174
180-179483-22	R-5882 T04	Leach	Solid	EPA 9040C	483174
180-179483-58	MB T04	Leach	Solid	EPA 9040C	483174
LCS 180-484286/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 484289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-4	R-5880 T04	Leach	Solid	SM 2510B	483174
180-179483-13	R-5881 T04	Leach	Solid	SM 2510B	483174
180-179483-22	R-5882 T04	Leach	Solid	SM 2510B	483174
180-179483-58	MB T04	Leach	Solid	SM 2510B	483174
MB 180-484289/50	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-484289/49	Lab Control Sample	Total/NA	Solid	SM 2510B	

Analysis Batch: 484801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-5	R-5880 T05	Leach	Solid	SM 2510B	483175
180-179483-14	R-5881 T05	Leach	Solid	SM 2510B	483175
180-179483-23	R-5882 T05	Leach	Solid	SM 2510B	483175
180-179483-59	MB T05	Leach	Solid	SM 2510B	483175
MB 180-484801/2	Method Blank	Total/NA	Solid	SM 2510B	
MB 180-484801/26	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-484801/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
LCS 180-484801/25	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-179483-5 DU	R-5880 T05	Leach	Solid	SM 2510B	483175

General Chemistry

Analysis Batch: 484973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-5	R-5880 T05	Leach	Solid	SM 2580B	483175
180-179483-14	R-5881 T05	Leach	Solid	SM 2580B	483175
180-179483-23	R-5882 T05	Leach	Solid	SM 2580B	483175
180-179483-59	MB T05	Leach	Solid	SM 2580B	483175
LCS 180-484973/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

Analysis Batch: 485167

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-5	R-5880 T05	Leach	Solid	EPA 9040C	483175
180-179483-14	R-5881 T05	Leach	Solid	EPA 9040C	483175
180-179483-23	R-5882 T05	Leach	Solid	EPA 9040C	483175
180-179483-59	MB T05	Leach	Solid	EPA 9040C	483175
LCS 180-485167/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-179483-5 DU	R-5880 T05	Leach	Solid	EPA 9040C	483175

Analysis Batch: 485605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-5	R-5880 T05	Leach	Solid	5310C-2014	483175
180-179483-14	R-5881 T05	Leach	Solid	5310C-2014	483175
180-179483-23	R-5882 T05	Leach	Solid	5310C-2014	483175
180-179483-59	MB T05	Leach	Solid	5310C-2014	483175
MB 180-485605/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-485605/4	Lab Control Sample	Dissolved	Solid	5310C-2014	
180-179483-59 MS	MB T05	Leach	Solid	5310C-2014	483175

Analysis Batch: 485741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-6	R-5880 T06	Leach	Solid	SM 2580B	483177
180-179483-15	R-5881 T06	Leach	Solid	SM 2580B	483177
180-179483-24	R-5882 T06	Leach	Solid	SM 2580B	483177
180-179483-60	MB T06	Leach	Solid	SM 2580B	483177
LCS 180-485741/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

Analysis Batch: 485905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-6	R-5880 T06	Leach	Solid	SM 2510B	483177
180-179483-15	R-5881 T06	Leach	Solid	SM 2510B	483177
180-179483-24	R-5882 T06	Leach	Solid	SM 2510B	483177
180-179483-60	MB T06	Leach	Solid	SM 2510B	483177
MB 180-485905/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-485905/1	Lab Control Sample	Total/NA	Solid	SM 2510B	

Analysis Batch: 486040

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-6	R-5880 T06	Leach	Solid	5310C-2014	483177
180-179483-15	R-5881 T06	Leach	Solid	5310C-2014	483177
180-179483-24	R-5882 T06	Leach	Solid	5310C-2014	483177
180-179483-60	MB T06	Leach	Solid	5310C-2014	483177
MB 180-486040/35	Method Blank	Dissolved	Solid	5310C-2014	
MB 180-486040/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-486040/34	Lab Control Sample	Dissolved	Solid	5310C-2014	

General Chemistry (Continued)

Analysis Batch: 486040 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-60 MS	MB T06	Leach	Solid	5310C-2014	483177

Analysis Batch: 486092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-6	R-5880 T06	Leach	Solid	EPA 9040C	483177
180-179483-15	R-5881 T06	Leach	Solid	EPA 9040C	483177
180-179483-24	R-5882 T06	Leach	Solid	EPA 9040C	483177
180-179483-60	MB T06	Leach	Solid	EPA 9040C	483177
LCS 180-486092/24	Lab Control Sample	Total/NA	Solid	EPA 9040C	
LCS 180-486092/47	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 486788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-7	R-5880 T07	Leach	Solid	SM 2580B	483179
180-179483-16	R-5881 T07	Leach	Solid	SM 2580B	483179
180-179483-25	R-5882 T07	Leach	Solid	SM 2580B	483179
180-179483-61	MB T07	Leach	Solid	SM 2580B	483179
LCS 180-486788/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

Analysis Batch: 486916

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-7	R-5880 T07	Leach	Solid	EPA 9040C	483179
180-179483-16	R-5881 T07	Leach	Solid	EPA 9040C	483179
180-179483-25	R-5882 T07	Leach	Solid	EPA 9040C	483179
180-179483-61	MB T07	Leach	Solid	EPA 9040C	483179
LCS 180-486916/24	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-179483-7 DU	R-5880 T07	Leach	Solid	EPA 9040C	483179

Analysis Batch: 487211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-8	R-5880 T08	Leach	Solid	EPA 9040C	483180
180-179483-17	R-5881 T08	Leach	Solid	EPA 9040C	483180
180-179483-26	R-5882 T08	Leach	Solid	EPA 9040C	483180
180-179483-62	MB T08	Leach	Solid	EPA 9040C	483180
LCS 180-487211/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 487257

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-7	R-5880 T07	Leach	Solid	5310C-2014	483179
180-179483-8	R-5880 T08	Leach	Solid	5310C-2014	483180
180-179483-16	R-5881 T07	Leach	Solid	5310C-2014	483179
180-179483-17	R-5881 T08	Leach	Solid	5310C-2014	483180
180-179483-25	R-5882 T07	Leach	Solid	5310C-2014	483179
180-179483-61	MB T07	Leach	Solid	5310C-2014	483179
MB 180-487257/35	Method Blank	Dissolved	Solid	5310C-2014	
MB 180-487257/5	Method Blank	Dissolved	Solid	5310C-2014	
MB 180-487257/67	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-487257/4	Lab Control Sample	Dissolved	Solid	5310C-2014	
LCS 180-487257/66	Lab Control Sample	Dissolved	Solid	5310C-2014	
180-179483-8 DU	R-5880 T08	Leach	Solid	5310C-2014	483180

General Chemistry

Analysis Batch: 487398

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-7	R-5880 T07	Leach	Solid	SM 2510B	483179
180-179483-8	R-5880 T08	Leach	Solid	SM 2510B	483180
180-179483-16	R-5881 T07	Leach	Solid	SM 2510B	483179
180-179483-17	R-5881 T08	Leach	Solid	SM 2510B	483180
180-179483-25	R-5882 T07	Leach	Solid	SM 2510B	483179
180-179483-26	R-5882 T08	Leach	Solid	SM 2510B	483180
180-179483-61	MB T07	Leach	Solid	SM 2510B	483179
180-179483-62	MB T08	Leach	Solid	SM 2510B	483180
MB 180-487398/2	Method Blank	Total/NA	Solid	SM 2510B	
MB 180-487398/28	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-487398/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
LCS 180-487398/27	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-179483-17 DU	R-5881 T08	Leach	Solid	SM 2510B	483180
180-179483-25 DU	R-5882 T07	Leach	Solid	SM 2510B	483179

Analysis Batch: 487533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-8	R-5880 T08	Leach	Solid	SM 2580B	483180
180-179483-17	R-5881 T08	Leach	Solid	SM 2580B	483180
180-179483-26	R-5882 T08	Leach	Solid	SM 2580B	483180
180-179483-62	MB T08	Leach	Solid	SM 2580B	483180
LCS 180-487533/26	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-179483-62 DU	MB T08	Leach	Solid	SM 2580B	483180

Leach Batch: 487734

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 180-487734/1-A	Method Blank	Leach	Solid	D3987-85	

Analysis Batch: 487755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-26	R-5882 T08	Leach	Solid	5310C-2014	483180
180-179483-62	MB T08	Leach	Solid	5310C-2014	483180
MB 180-487755/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-487755/4	Lab Control Sample	Dissolved	Solid	5310C-2014	

Analysis Batch: 487837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-9	R-5880 T09	Leach	Solid	SM 2580B	483181
180-179483-18	R-5881 T09	Leach	Solid	SM 2580B	483181
180-179483-27	R-5882 T09	Leach	Solid	SM 2580B	483181
180-179483-63	MB T09	Leach	Solid	SM 2580B	483181
LCS 180-487837/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

Analysis Batch: 487866

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-9	R-5880 T09	Leach	Solid	SM 2510B	483181
180-179483-18	R-5881 T09	Leach	Solid	SM 2510B	483181
180-179483-27	R-5882 T09	Leach	Solid	SM 2510B	483181
180-179483-63	MB T09	Leach	Solid	SM 2510B	483181
MB 180-487866/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-487866/1	Lab Control Sample	Total/NA	Solid	SM 2510B	

QC Association Summary

Client: Republic Services Inc
Job ID: 180-179483-1
Project/Site: Republic Services Mercury Project REVISE

General Chemistry

Analysis Batch: 487928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-9	R-5880 T09	Leach	Solid	EPA 9040C	483181
180-179483-18	R-5881 T09	Leach	Solid	EPA 9040C	483181
180-179483-27	R-5882 T09	Leach	Solid	EPA 9040C	483181
180-179483-63	MB T09	Leach	Solid	EPA 9040C	483181
LB 180-487734/1-A	Method Blank	Leach	Solid	EPA 9040C	487734
LCS 180-487928/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 488181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-9	R-5880 T09	Leach	Solid	5310C-2014	483181
180-179483-18	R-5881 T09	Leach	Solid	5310C-2014	483181
180-179483-27	R-5882 T09	Leach	Solid	5310C-2014	483181
MB 180-488181/5	Method Blank	Dissolved	Solid	5310C-2014	
LCS 180-488181/4	Lab Control Sample	Dissolved	Solid	5310C-2014	

Analysis Batch: 488184

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-179483-63	MB T09	Leach	Solid	5310C-2014	483181

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-2442

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler:	Lab PM: Matko, Larry	Carrier Tracking No(s):	COC No:
Client Contact: Mike Ruela	Phone:	E-Mail:		Page: Page 1 of 1
Company: Mike Ruela				Job #:
Address: 935 Bethlehem Drive	Due Date Requested:			
City: Bethlehem	TAT Requested (days):			
State, Zip: PA, 18017				
Phone: 610-882-2611	PO #: Purchase Order not required			
Email: mruela@bethapp.com	WO #:			
Project Name: Blender 7	Project #:			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Lead Method 1315	TCLP Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
R-5877	8/27/24	1500	G	S			x			
R-5878	8/28/24	1500	G	S			x			
R-5879	8/29/24	1100	G	S			x			
R-5880	8/29/24	1500	G	S			x			
R-5881	8/30/24	1100	G	S			x			
R-5882	8/30/24	1500	G	S			x			

180-179483 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For Months

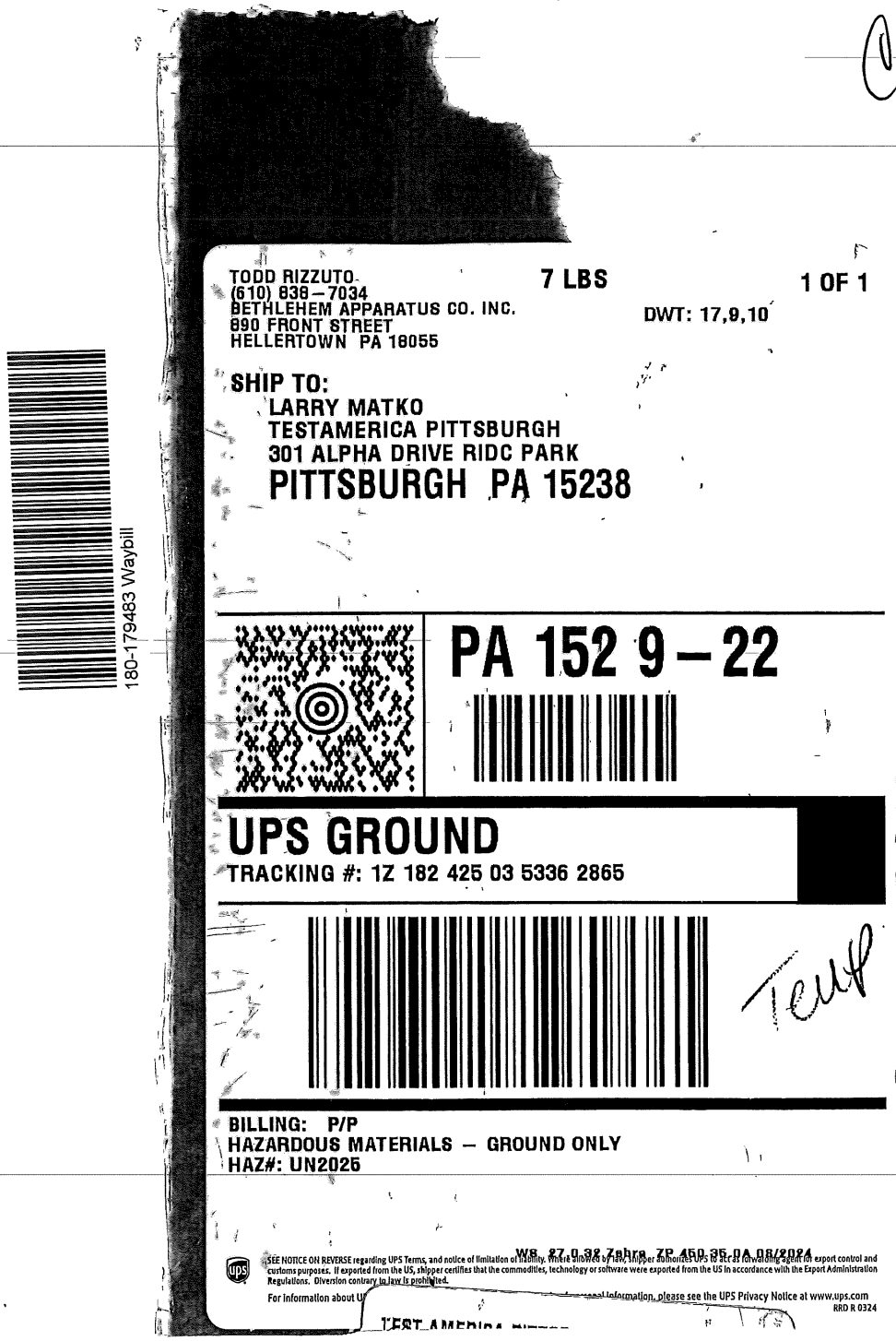
Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:			
Relinquished by:	Date/Time: 9/3/24 0800	Company: Bethlehem Apparatus	Received by:	Date/Time: 9/6/24 1000	Company	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:			

Ver: 08/04/2016

9/26/2025



TODD RIZZUTO
(610) 838-7034
BETHLEHEM APPARATUS CO. INC.
890 FRONT STREET
HELLERTOWN PA 18055

7 LBS

1 OF 1

DWT: 17,9,10

SHIP TO:
LARRY MATKO
TESTAMERICA PITTSBURGH
301 ALPHA DRIVE RIDC PARK
PITTSBURGH PA 15238

180-179483 Waybill

PA 152 9-22

UPS GROUND
TRACKING #: 1Z 182 425 03 5336 2865

BILLING: P/P
HAZARDOUS MATERIALS - GROUND ONLY
HAZ#: UN2025

WS, 27.0,32,7shrs, ZP 450,35,DA,08/2024

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Temp

19.5
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19.1

#26

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-531148.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179483-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 1/16/2025			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:									
R-5880 T09 (180-179483-36)	1/6/25	09:35 Eastern	G	Water			X	X	X	X	3	
R-5881 T09 (180-179483-45)	1/6/25	09:35 Eastern	G	Water			X	X	X	X	3	
R-5882 T09 (180-179483-54)	1/6/25	09:35 Eastern	G	Water			X	X	X	X	3	
MB T09 (180-179483-72)	1/6/25	09:35 Eastern	G	Water			X	X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	1-6-25 1700	EPTNE			
2				[signature]		
3				[signature]	1/7/25 1020	

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.2/1.1

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-527422.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 2
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179483-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 11/14/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5880 T01 (180-179483-28)	11/4/24	11:35 Eastern	G	Water			X	X	X	3	
R-5880 T02 (180-179483-29)	11/5/24	09:35 Eastern	G	Water			X	X	X	3	
R-5880 T03 (180-179483-30)	11/6/24	09:35 Eastern	G	Water			X	X	X	3	
R-5881 T01 (180-179483-37)	11/4/24	11:35 Eastern	G	Water			X	X	X	3	
R-5881 T02 (180-179483-38)	11/5/24	09:35 Eastern	G	Water			X	X	X	3	
R-5881 T03 (180-179483-39)	11/6/24	09:35 Eastern	G	Water			X	X	X	3	
R-5882 T01 (180-179483-46)	11/4/24	11:35 Eastern	G	Water			X	X	X	3	
R-5882 T02 (180-179483-47)	11/5/24	09:35 Eastern	G	Water			X	X	X	3	
R-5882 T03 (180-179483-48)	11/6/24	09:35 Eastern	G	Water			X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:			
Relinquished by:	Date/Time: 11/6/24 1700	Company EPITHB	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 11/7/24 0950	Company ELLET

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: R4.1-C3.7 R0.7-C0.3

Ver: 10/10/2024

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-527422.2
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 2 of 2
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179483-1
Address: 2425 New Holland Pike,	Due Date Requested: 11/14/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MB T01 (180-179483-64)	11/4/24	11:35 Eastern	G	Water			X	X	X	3	
MB T02 (180-179483-65)	11/5/24	09:35 Eastern	G	Water			X	X	X	3	
MB T03 (180-179483-66)	11/6/24	09:35 Eastern	G	Water			X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		11/6/24 1700	EHM			
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 11/7/24 0950	Company ECLSX

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 24.1 - C3.7 20.7 - C0.3

Ver: 10/10/2024

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Pittsburgh, PA 15238
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Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-527819.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179483-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 11/14/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, Including prep	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5880 T04 (180-179483-31)	11/11/24	09:35 Eastern	G	Water			X	X	X	3	
R-5881 T04 (180-179483-40)	11/11/24	09:35 Eastern	G	Water			X	X	X	3	
R-5882 T04 (180-179483-49)	11/11/24	09:35 Eastern	G	Water			X	X	X	3	
MB T04 (180-179483-67)	11/11/24	09:35 Eastern	G	Water			X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	11/12/24 1700	ETHNB			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				11/13/24 1000	ANA

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.3/0.7 1.0/0.4 4.3/4.0

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Pittsburgh, PA 15238
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Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-528226.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179483-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 11/28/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
R-5880 T05 (180-179483-32)	11/18/24	09:35 Eastern	G	Water			X	X	X	1	
R-5881 T05 (180-179483-41)	11/18/24	09:35 Eastern	G	Water			X	X	X	1	
R-5882 T05 (180-179483-50)	11/18/24	09:35 Eastern	G	Water			X	X	X	1	
MB T05 (180-179483-68)	11/18/24	09:35 Eastern	G	Water			X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	11-18-24 1720	FEDEX			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 11/19/24 10:30	Company BLGT

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 20.3 - 20.4

Ver: 10/10/2024

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Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-529058.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179483-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 12/12/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, Including prep	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, Including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:									
R-5880 T06 (180-179483-33)	12/2/24	09:35 Eastern	G	Water			X	X	X	X	3	
R-5881 T06 (180-179483-42)	12/2/24	09:35 Eastern	G	Water			X	X	X	X	3	
R-5882 T06 (180-179483-51)	12/2/24	09:35 Eastern	G	Water			X	X	X	X	3	
MB T06 (180-179483-69)	12/2/24	09:35 Eastern	G	Water			X	X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	12-2-24 1200	ELLE		12/2/24 1410	ELLE
Relinquished by:	Date/Time: 12/2/24 1835	Company ELLE	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 12/2/24 1835	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: RAW: 4.8-4.9 corr: 4.5-4.6

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Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-530032.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179483-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 12/26/2024			Preservation Codes: -
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:									
R-5880 T07 (180-179483-34)	12/16/24	09:35 Eastern	G	Water			X	X	X	X	3	
R-5881 T07 (180-179483-43)	12/16/24	09:35 Eastern	G	Water			X	X	X	X	3	
R-5882 T07 (180-179483-52)	12/16/24	09:35 Eastern	G	Water			X	X	X	X	3	
MB T07 (180-179483-70)	12/16/24	09:35 Eastern	G	Water			X	X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		12-16-24 1300	ELLE	H	16Dec24 1400	ELLE
2	H	16Dec24 1830	ELLE			
3					12/16/24 1830	ELLE

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: R 4.8 C 4.7

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Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Gamber, Carrie L	Carrier Tracking No(s): N/A	COC No: 180-530566.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-179483-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 1/2/2025			Preservation Codes:
City: Lancaster	TAT Requested (days): N/A			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site: N/A	SSOW#: N/A			Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	6020B/FIELD_FLTRD (MOD) Copy Analytes	7470A/FIELD_FLTRD Mercury	6010D/FIELD_FLTRD (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:									
R-5880 T08 (180-179483-35)	12/23/24	09:35 Eastern	G	Water			X	X	X	X	3	
R-5881 T08 (180-179483-44)	12/23/24	09:35 Eastern	G	Water			X	X	X	X	3	
R-5882 T08 (180-179483-53)	12/23/24	09:35 Eastern	G	Water			X	X	X	X	3	
MB T08 (180-179483-71)	12/23/24	09:35 Eastern	G	Water			X	X	X	X	3	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	12-23-24 1430	FEDEX	Clarence Williams	12/23/24 1430	FEDEX
Relinquished by: Clarence Williams	Date/Time: 12/23/24 1420	Company FEDEX	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 12/23/24 2050	Company Client

Custody Seals Intact: ☑ Yes ☐ No	Custody Seal No.: none of the bottles say dis	Cooler Temperature(s) °C and Other Remarks: RSW 4.4 COR 4.3

Ver: 10/10/2024

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179483-1

Login Number: 179483
List Number: 1
Creator: Kovitch, Christina M

List Source: Eurofins Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice per client request.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179483-1

Login Number: 179483
List Number: 2
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 11/07/24 10:40 AM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179483-1

Login Number: 179483
List Number: 3
Creator: McCaskey, Jonathan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 11/13/24 04:46 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179483-1

Login Number: 179483
List Number: 4
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 11/19/24 04:14 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179483-1

Login Number: 179483
List Number: 5
Creator: Metzger, Katherine A

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 12/02/24 08:34 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	Not present.
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179483-1

Login Number: 179483
List Number: 6
Creator: Burkholder, Conrad

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 12/17/24 03:56 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179483-1

Login Number: 179483
List Number: 7
Creator: Burkholder, Conrad

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 12/24/24 01:47 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 180-179483-1

Login Number: 179483
List Number: 8
Creator: McCaskey, Jonathan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 01/07/25 12:17 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Paul Canevaro
US Ecology Inc
101 S Capitol Boulevard Suite 1000
Boise, Idaho 83702

Generated 8/21/2023 4:03:42 PM Revision 1

JOB DESCRIPTION

Republic Services Mercury Project REVISE

JOB NUMBER

180-158886-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.

myEOL

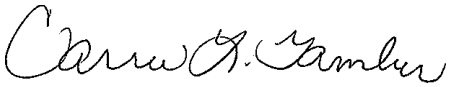
Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

Authorization



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Revision 1

Authorized for release by
Carrie Gamber, Senior Project Manager
Carrie.Gamber@et.eurofinsus.com
(412)963-2428

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Job ID: 180-158886-1

Laboratory: Eurofins Pittsburgh

Narrative

CASE NARRATIVE

Client: US Ecology Inc

Project: Republic Services Mercury Project

Report Number: 180-158886-1 REVISED

NOTE: This report was revised to remove the TCLP volatiles analyzed out of holding time. The TCLP Volatiles report is 180-160446.

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 07/06/2023; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was C.

SEMIVOLATILES
The laboratory control sample duplicate (LCSD) for preparation batch 180-440211 and analytical batch 180-440270 recovered outside control limits for the following analyte: Pyridine. This analyte was biased high in the LCSD and was not detected in the associated samples; therefore, the data have been reported.

PESTICIDES
The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 180-440212 and analytical batch 180-440250 recovered outside control limits for the following analytes: Endrin, gamma-BHC (Lindane), Heptachlor, Heptachlor epoxide and Methoxychlor.

The following PEM sample was used for breakdown only: (PEM 180-440250/1).

HERBICIDES
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS
The following samples were diluted to bring the concentration of Mercury to within the instrument's calibration range as shown on the raw data sheets: R-5473, BLENDER #3, BATCH 36 (180-158886-1), R-5475, BLENDER #4, BATCH 26 (180-158886-2), R-5476, BLENDER #2, BATCH 105 (180-158886-3) and SAMPLE DUPLICATE 07/09/2023 (180-158886-4). Elevated reporting limits (RLs) are provided.

PERCENT SOLIDS
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Pittsburgh

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	02-00416	08-01-23

Sample Summary

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-158886-1	R-5473, BLENDER #3, BATCH 36	Solid	07/06/23 09:25	07/06/23 19:15
180-158886-2	R-5475, BLENDER #4, BATCH 26	Solid	07/06/23 09:35	07/06/23 19:15
180-158886-3	R-5476, BLENDER #2, BATCH 105	Solid	07/06/23 09:40	07/06/23 19:15
180-158886-4	SAMPLE DUPLICATE 07/09/2023	Solid	07/06/23 09:45	07/06/23 19:15

Method Summary

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

Method	Method Description	Protocol	Laboratory
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	EET PIT
EPA 8081B	Organochlorine Pesticides (GC)	SW846	EET PIT
EPA 8151A	Herbicides (GC)	SW846	EET PIT
6010D	Metals (ICP)	SW846	EET PIT
EPA 7470A	Mercury (CVAA)	SW846	EET PIT
2540G	SM 2540G	SM22	EET PIT
1311	TCLP Extraction	SW846	EET PIT
3010A	Preparation, Total Metals	SW846	EET PIT
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET PIT
7470A	Preparation, Mercury	SW846	EET PIT
8151A	Extraction (Herbicides)	SW846	EET PIT
EPA 1311	TCLP Extraction	SW846	EET PIT

Protocol References:

SM22 = Standard Methods For The Examination Of Water And Wastewater, 22nd Edition

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5473, BLENDER #3, BATCH 36
Lab Sample ID: 180-158886-1
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	EPA 1311			100.37 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3510C			200 mL	10.0 mL	440211	07/13/23 02:30	CBY	EET PIT
TCLP	Analysis	8270E		1	1 mL	1 mL	440270	07/13/23 17:56	VVP	EET PIT
	Instrument ID: CH733									
TCLP	Leach	EPA 1311			100.37 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3510C			100 mL	40.0 mL	440212	07/13/23 02:30	CBY	EET PIT
TCLP	Analysis	EPA 8081B		1	1 mL	1 mL	440250	07/13/23 13:27	SMW	EET PIT
	Instrument ID: CHGC15									
TCLP	Leach	EPA 1311			100.37 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	8151A			100 mL	10.0 mL	440214	07/13/23 03:40	CBY	EET PIT
TCLP	Analysis	EPA 8151A		20	1 mL	1 mL	440743	07/19/23 09:45	JMO	EET PIT
	Instrument ID: CGC1									
TCLP	Leach	EPA 1311			100.37 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3010A			5 mL	50 mL	440282	07/13/23 10:00	S1Z	EET PIT
TCLP	Analysis	6010D		1			440639	07/17/23 17:53	AAS	EET PIT
	Instrument ID: Q									
TCLP	Leach	EPA 1311			100.37 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	7470A			25 mL	25 mL	440303	07/13/23 12:53	RJR	EET PIT
TCLP	Analysis	EPA 7470A		10			440437	07/14/23 14:16	RJR	EET PIT
	Instrument ID: HGY									
Total/NA	Analysis	2540G		1			441366	07/25/23 14:47	SNR	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5475, BLENDER #4, BATCH 26
Lab Sample ID: 180-158886-2
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	EPA 1311			100.00 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3510C			200 mL	10.0 mL	440211	07/13/23 02:30	CBY	EET PIT
TCLP	Analysis	8270E		1	1 mL	1 mL	440270	07/13/23 18:17	VVP	EET PIT
	Instrument ID: CH733									
TCLP	Leach	EPA 1311			100.00 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3510C			100 mL	40.0 mL	440212	07/13/23 02:30	CBY	EET PIT
TCLP	Analysis	EPA 8081B		1	1 mL	1 mL	440250	07/13/23 13:43	SMW	EET PIT
	Instrument ID: CHGC15									
TCLP	Leach	EPA 1311			100.00 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	8151A			100 mL	10.0 mL	440214	07/13/23 03:40	CBY	EET PIT
TCLP	Analysis	EPA 8151A		20	1 mL	1 mL	440743	07/19/23 10:05	JMO	EET PIT
	Instrument ID: CGC1									
TCLP	Leach	EPA 1311			100.00 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3010A			5 mL	50 mL	440282	07/13/23 10:00	S1Z	EET PIT
TCLP	Analysis	6010D		1			440639	07/17/23 17:59	AAS	EET PIT
	Instrument ID: Q									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5475, BLENDER #4, BATCH 26
Lab Sample ID: 180-158886-2
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	EPA 1311			100.00 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	7470A			25 mL	25 mL	440303	07/13/23 12:53	RJR	EET PIT
TCLP	Analysis	EPA 7470A		10			440437	07/14/23 14:17	RJR	EET PIT
	Instrument ID: HGY									
Total/NA	Analysis	2540G		1			441366	07/25/23 14:47	SNR	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: R-5476, BLENDER #2, BATCH 105
Lab Sample ID: 180-158886-3
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	EPA 1311			100.06 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3510C			200 mL	10.0 mL	440211	07/13/23 02:30	CBY	EET PIT
TCLP	Analysis	8270E		1	1 mL	1 mL	440270	07/13/23 18:37	VVP	EET PIT
	Instrument ID: CH733									
TCLP	Leach	EPA 1311			100.06 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3510C			100 mL	40.0 mL	440212	07/13/23 02:30	CBY	EET PIT
TCLP	Analysis	EPA 8081B		1	1 mL	1 mL	440250	07/13/23 13:59	SMW	EET PIT
	Instrument ID: CHGC15									
TCLP	Leach	EPA 1311			100.06 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	8151A			100 mL	10.0 mL	440214	07/13/23 03:40	CBY	EET PIT
TCLP	Analysis	EPA 8151A		20	1 mL	1 mL	440743	07/19/23 10:24	JMO	EET PIT
	Instrument ID: CGC1									
TCLP	Leach	EPA 1311			100.06 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3010A			5 mL	50 mL	440282	07/13/23 10:00	S1Z	EET PIT
TCLP	Analysis	6010D		1			440639	07/17/23 18:04	AAS	EET PIT
	Instrument ID: Q									
TCLP	Leach	EPA 1311			100.06 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	7470A			25 mL	25 mL	440303	07/13/23 12:53	RJR	EET PIT
TCLP	Analysis	EPA 7470A		10			440437	07/14/23 14:18	RJR	EET PIT
	Instrument ID: HGY									
Total/NA	Analysis	2540G		1			441366	07/25/23 14:47	SNR	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: SAMPLE DUPLICATE 07/09/2023
Lab Sample ID: 180-158886-4
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	EPA 1311			100.01 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3510C			200 mL	10.0 mL	440211	07/13/23 02:30	CBY	EET PIT
TCLP	Analysis	8270E		1	1 mL	1 mL	440270	07/13/23 18:57	VVP	EET PIT
	Instrument ID: CH733									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: SAMPLE DUPLICATE 07/09/2023
Lab Sample ID: 180-158886-4

Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	EPA 1311			100.01 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3510C			100 mL	40.0 mL	440212	07/13/23 02:30	CBY	EET PIT
TCLP	Analysis	EPA 8081B		1	1 mL	1 mL	440250	07/13/23 14:15	SMW	EET PIT
	Instrument ID: CHGC15									
TCLP	Leach	EPA 1311			100.01 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	8151A			100 mL	10.0 mL	440214	07/13/23 03:40	CBY	EET PIT
TCLP	Analysis	EPA 8151A		20	1 mL	1 mL	440743	07/19/23 10:43	JMO	EET PIT
	Instrument ID: CGC1									
TCLP	Leach	EPA 1311			100.01 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	3010A			5 mL	50 mL	440282	07/13/23 10:00	S1Z	EET PIT
TCLP	Analysis	6010D		1			440639	07/17/23 18:20	AAS	EET PIT
	Instrument ID: Q									
TCLP	Leach	EPA 1311			100.01 g	2000 mL	440064	07/11/23 13:00	DMM	EET PIT
TCLP	Prep	7470A			25 mL	25 mL	440303	07/13/23 12:53	RJR	EET PIT
TCLP	Analysis	EPA 7470A		10			440437	07/14/23 14:19	RJR	EET PIT
	Instrument ID: HGY									
Total/NA	Analysis	2540G		1			441366	07/25/23 14:47	SNR	EET PIT
	Instrument ID: NOEQUIP									

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: EET PIT

Batch Type: Leach

DMM = Dominic Mancino

Batch Type: Prep

CBY = Charles Yushinski
RJR = Ron Rosenbaum
S1Z = Sage Ziviello

Batch Type: Analysis

AAS = Ariana Swick
JMO = John Oravec
RJR = Ron Rosenbaum
SMW = Shelby Walters
SNR = Sabra Richart
VVP = Vincent Piccolino

Client Sample ID: R-5473, BLENDER #3, BATCH 36
Lab Sample ID: 180-158886-1

Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0045	mg/L		07/13/23 02:30	07/13/23 17:56	1
2,4,5-Trichlorophenol	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 17:56	1
2,4,6-Trichlorophenol	ND		0.050	0.0095	mg/L		07/13/23 02:30	07/13/23 17:56	1
2,4-Dinitrotoluene	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 17:56	1
2-Methylphenol	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 17:56	1
Methylphenol, 3 & 4	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 17:56	1
Hexachlorobenzene	ND		0.050	0.0055	mg/L		07/13/23 02:30	07/13/23 17:56	1
Hexachlorobutadiene	ND		0.050	0.0084	mg/L		07/13/23 02:30	07/13/23 17:56	1
Hexachloroethane	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 17:56	1
Nitrobenzene	ND		0.050	0.012	mg/L		07/13/23 02:30	07/13/23 17:56	1
Pentachlorophenol	ND		0.25	0.0075	mg/L		07/13/23 02:30	07/13/23 17:56	1
Pyridine	ND	*+	0.10	0.0082	mg/L		07/13/23 02:30	07/13/23 17:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*79*		*55 - 105*	*07/13/23 02:30*	*07/13/23 17:56*	*1*
2-Fluorophenol (Surr)	*91*		*55 - 105*	*07/13/23 02:30*	*07/13/23 17:56*	*1*
2,4,6-Tribromophenol (Surr)	*72*		*32 - 115*	*07/13/23 02:30*	*07/13/23 17:56*	*1*
Nitrobenzene-d5 (Surr)	*89*		*55 - 109*	*07/13/23 02:30*	*07/13/23 17:56*	*1*
Phenol-d5 (Surr)	*86*		*48 - 105*	*07/13/23 02:30*	*07/13/23 17:56*	*1*
Terphenyl-d14 (Surr)	*81*		*37 - 107*	*07/13/23 02:30*	*07/13/23 17:56*	*1*

Method: SW846 EPA 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.0050	0.0029	mg/L		07/13/23 02:30	07/13/23 13:27	1
Endrin	ND	*1	0.00050	0.000091	mg/L		07/13/23 02:30	07/13/23 13:27	1
gamma-BHC (Lindane)	ND	*1	0.00050	0.00012	mg/L		07/13/23 02:30	07/13/23 13:27	1
Heptachlor	ND	*1	0.00050	0.00018	mg/L		07/13/23 02:30	07/13/23 13:27	1
Heptachlor epoxide	ND	*1	0.00050	0.00014	mg/L		07/13/23 02:30	07/13/23 13:27	1
Methoxychlor	ND	*1	0.00050	0.00031	mg/L		07/13/23 02:30	07/13/23 13:27	1
Toxaphene	ND		0.040	0.020	mg/L		07/13/23 02:30	07/13/23 13:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*106*		*48 - 137*	*07/13/23 02:30*	*07/13/23 13:27*	*1*
DCB Decachlorobiphenyl (Surr)	*111*		*48 - 137*	*07/13/23 02:30*	*07/13/23 13:27*	*1*
Tetrachloro-m-xylene	*101*		*56 - 137*	*07/13/23 02:30*	*07/13/23 13:27*	*1*
Tetrachloro-m-xylene	*100*		*56 - 137*	*07/13/23 02:30*	*07/13/23 13:27*	*1*

Method: SW846 EPA 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		07/13/23 03:40	07/19/23 09:45	20
Silvex (2,4,5-TP)	ND		0.010	0.0064	mg/L		07/13/23 03:40	07/19/23 09:45	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*69*		*48 - 127*	*07/13/23 03:40*	*07/19/23 09:45*	*20*
2,4-Dichlorophenylacetic acid	*75*		*48 - 127*	*07/13/23 03:40*	*07/19/23 09:45*	*20*

Method: SW846 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.50	0.0091	mg/L		07/13/23 10:00	07/17/23 17:53	1
Arsenic	ND		0.50	0.083	mg/L		07/13/23 10:00	07/17/23 17:53	1
Barium	ND		2.0	0.063	mg/L		07/13/23 10:00	07/17/23 17:53	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36
Lab Sample ID: 180-158886-1
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Method: SW846 6010D - Metals (ICP) - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.50	0.0030	mg/L		07/13/23 10:00	07/17/23 17:53	1
Chromium	ND		0.50	0.016	mg/L		07/13/23 10:00	07/17/23 17:53	1
Lead	ND		0.50	0.044	mg/L		07/13/23 10:00	07/17/23 17:53	1
Selenium	ND		0.50	0.037	mg/L		07/13/23 10:00	07/17/23 17:53	1

Method: SW846 EPA 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.029**		0.0020	0.0013	mg/L		07/13/23 12:53	07/14/23 14:16	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (SM22 2540G)	**0.8**		0.1	0.1	%			07/25/23 14:47	1
Percent Solids (SM22 2540G)	**99.2**		0.1	0.1	%			07/25/23 14:47	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26
Lab Sample ID: 180-158886-2
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0045	mg/L		07/13/23 02:30	07/13/23 18:17	1
2,4,5-Trichlorophenol	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 18:17	1
2,4,6-Trichlorophenol	ND		0.050	0.0095	mg/L		07/13/23 02:30	07/13/23 18:17	1
2,4-Dinitrotoluene	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 18:17	1
2-Methylphenol	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 18:17	1
Methylphenol, 3 & 4	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 18:17	1
Hexachlorobenzene	ND		0.050	0.0055	mg/L		07/13/23 02:30	07/13/23 18:17	1
Hexachlorobutadiene	ND		0.050	0.0084	mg/L		07/13/23 02:30	07/13/23 18:17	1
Hexachloroethane	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 18:17	1
Nitrobenzene	ND		0.050	0.012	mg/L		07/13/23 02:30	07/13/23 18:17	1
Pentachlorophenol	ND		0.25	0.0075	mg/L		07/13/23 02:30	07/13/23 18:17	1
Pyridine	ND	*+	0.10	0.0082	mg/L		07/13/23 02:30	07/13/23 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*76*		*55 - 105*	*07/13/23 02:30*	*07/13/23 18:17*	*1*
2-Fluorophenol (Surr)	*90*		*55 - 105*	*07/13/23 02:30*	*07/13/23 18:17*	*1*
2,4,6-Tribromophenol (Surr)	*68*		*32 - 115*	*07/13/23 02:30*	*07/13/23 18:17*	*1*
Nitrobenzene-d5 (Surr)	*87*		*55 - 109*	*07/13/23 02:30*	*07/13/23 18:17*	*1*
Phenol-d5 (Surr)	*84*		*48 - 105*	*07/13/23 02:30*	*07/13/23 18:17*	*1*
Terphenyl-d14 (Surr)	*80*		*37 - 107*	*07/13/23 02:30*	*07/13/23 18:17*	*1*

Method: SW846 EPA 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.0050	0.0029	mg/L		07/13/23 02:30	07/13/23 13:43	1
Endrin	ND	*1	0.00050	0.000091	mg/L		07/13/23 02:30	07/13/23 13:43	1
gamma-BHC (Lindane)	ND	*1	0.00050	0.00012	mg/L		07/13/23 02:30	07/13/23 13:43	1
Heptachlor	ND	*1	0.00050	0.00018	mg/L		07/13/23 02:30	07/13/23 13:43	1
Heptachlor epoxide	ND	*1	0.00050	0.00014	mg/L		07/13/23 02:30	07/13/23 13:43	1
Methoxychlor	ND	*1	0.00050	0.00031	mg/L		07/13/23 02:30	07/13/23 13:43	1
Toxaphene	ND		0.040	0.020	mg/L		07/13/23 02:30	07/13/23 13:43	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26
Lab Sample ID: 180-158886-2
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*106*		*48 - 137*	*07/13/23 02:30*	*07/13/23 13:43*	*1*
DCB Decachlorobiphenyl (Surr)	*107*		*48 - 137*	*07/13/23 02:30*	*07/13/23 13:43*	*1*
Tetrachloro-m-xylene	*97*		*56 - 137*	*07/13/23 02:30*	*07/13/23 13:43*	*1*
Tetrachloro-m-xylene	*101*		*56 - 137*	*07/13/23 02:30*	*07/13/23 13:43*	*1*

Method: SW846 EPA 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		07/13/23 03:40	07/19/23 10:05	20
Silvex (2,4,5-TP)	ND		0.010	0.0064	mg/L		07/13/23 03:40	07/19/23 10:05	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*64*		*48 - 127*	*07/13/23 03:40*	*07/19/23 10:05*	*20*
2,4-Dichlorophenylacetic acid	*70*		*48 - 127*	*07/13/23 03:40*	*07/19/23 10:05*	*20*

Method: SW846 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.50	0.0091	mg/L		07/13/23 10:00	07/17/23 17:59	1
Arsenic	ND		0.50	0.083	mg/L		07/13/23 10:00	07/17/23 17:59	1
Barium	ND		2.0	0.063	mg/L		07/13/23 10:00	07/17/23 17:59	1
Cadmium	ND		0.50	0.0030	mg/L		07/13/23 10:00	07/17/23 17:59	1
Chromium	ND		0.50	0.016	mg/L		07/13/23 10:00	07/17/23 17:59	1
Lead	ND		0.50	0.044	mg/L		07/13/23 10:00	07/17/23 17:59	1
Selenium	ND		0.50	0.037	mg/L		07/13/23 10:00	07/17/23 17:59	1

Method: SW846 EPA 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.018**		0.0020	0.0013	mg/L		07/13/23 12:53	07/14/23 14:17	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (SM22 2540G)	**1.6**		0.1	0.1	%			07/25/23 14:47	1
Percent Solids (SM22 2540G)	**98.4**		0.1	0.1	%			07/25/23 14:47	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105
Lab Sample ID: 180-158886-3
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0045	mg/L		07/13/23 02:30	07/13/23 18:37	1
2,4,5-Trichlorophenol	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 18:37	1
2,4,6-Trichlorophenol	ND		0.050	0.0095	mg/L		07/13/23 02:30	07/13/23 18:37	1
2,4-Dinitrotoluene	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 18:37	1
2-Methylphenol	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 18:37	1
Methylphenol, 3 & 4	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 18:37	1
Hexachlorobenzene	ND		0.050	0.0055	mg/L		07/13/23 02:30	07/13/23 18:37	1
Hexachlorobutadiene	ND		0.050	0.0084	mg/L		07/13/23 02:30	07/13/23 18:37	1
Hexachloroethane	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 18:37	1
Nitrobenzene	ND		0.050	0.012	mg/L		07/13/23 02:30	07/13/23 18:37	1
Pentachlorophenol	ND		0.25	0.0075	mg/L		07/13/23 02:30	07/13/23 18:37	1
Pyridine	ND	*+	0.10	0.0082	mg/L		07/13/23 02:30	07/13/23 18:37	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105
Lab Sample ID: 180-158886-3
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*77*		*55 - 105*	*07/13/23 02:30*	*07/13/23 18:37*	*1*
2-Fluorophenol (Surr)	*89*		*55 - 105*	*07/13/23 02:30*	*07/13/23 18:37*	*1*
2,4,6-Tribromophenol (Surr)	*62*		*32 - 115*	*07/13/23 02:30*	*07/13/23 18:37*	*1*
Nitrobenzene-d5 (Surr)	*86*		*55 - 109*	*07/13/23 02:30*	*07/13/23 18:37*	*1*
Phenol-d5 (Surr)	*79*		*48 - 105*	*07/13/23 02:30*	*07/13/23 18:37*	*1*
Terphenyl-d14 (Surr)	*80*		*37 - 107*	*07/13/23 02:30*	*07/13/23 18:37*	*1*

Method: SW846 EPA 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.0050	0.0029	mg/L		07/13/23 02:30	07/13/23 13:59	1
Endrin	ND	*1	0.00050	0.000091	mg/L		07/13/23 02:30	07/13/23 13:59	1
gamma-BHC (Lindane)	ND	*1	0.00050	0.00012	mg/L		07/13/23 02:30	07/13/23 13:59	1
Heptachlor	ND	*1	0.00050	0.00018	mg/L		07/13/23 02:30	07/13/23 13:59	1
Heptachlor epoxide	ND	*1	0.00050	0.00014	mg/L		07/13/23 02:30	07/13/23 13:59	1
Methoxychlor	ND	*1	0.00050	0.00031	mg/L		07/13/23 02:30	07/13/23 13:59	1
Toxaphene	ND		0.040	0.020	mg/L		07/13/23 02:30	07/13/23 13:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*115*		*48 - 137*	*07/13/23 02:30*	*07/13/23 13:59*	*1*
DCB Decachlorobiphenyl (Surr)	*116*		*48 - 137*	*07/13/23 02:30*	*07/13/23 13:59*	*1*
Tetrachloro-m-xylene	*104*		*56 - 137*	*07/13/23 02:30*	*07/13/23 13:59*	*1*
Tetrachloro-m-xylene	*107*		*56 - 137*	*07/13/23 02:30*	*07/13/23 13:59*	*1*

Method: SW846 EPA 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		07/13/23 03:40	07/19/23 10:24	20
Silvex (2,4,5-TP)	ND		0.010	0.0064	mg/L		07/13/23 03:40	07/19/23 10:24	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*71*		*48 - 127*	*07/13/23 03:40*	*07/19/23 10:24*	*20*
2,4-Dichlorophenylacetic acid	*78*		*48 - 127*	*07/13/23 03:40*	*07/19/23 10:24*	*20*

Method: SW846 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.50	0.0091	mg/L		07/13/23 10:00	07/17/23 18:04	1
Arsenic	ND		0.50	0.083	mg/L		07/13/23 10:00	07/17/23 18:04	1
Barium	ND		2.0	0.063	mg/L		07/13/23 10:00	07/17/23 18:04	1
Cadmium	ND		0.50	0.0030	mg/L		07/13/23 10:00	07/17/23 18:04	1
Chromium	ND		0.50	0.016	mg/L		07/13/23 10:00	07/17/23 18:04	1
Lead	ND		0.50	0.044	mg/L		07/13/23 10:00	07/17/23 18:04	1
Selenium	ND		0.50	0.037	mg/L		07/13/23 10:00	07/17/23 18:04	1

Method: SW846 EPA 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.045**		0.0020	0.0013	mg/L		07/13/23 12:53	07/14/23 14:18	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (SM22 2540G)	**1.1**		0.1	0.1	%			07/25/23 14:47	1
Percent Solids (SM22 2540G)	**98.9**		0.1	0.1	%			07/25/23 14:47	1

Client Sample ID: SAMPLE DUPLICATE 07/09/2023
Lab Sample ID: 180-158886-4

Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0045	mg/L		07/13/23 02:30	07/13/23 18:57	1
2,4,5-Trichlorophenol	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 18:57	1
2,4,6-Trichlorophenol	ND		0.050	0.0095	mg/L		07/13/23 02:30	07/13/23 18:57	1
2,4-Dinitrotoluene	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 18:57	1
2-Methylphenol	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 18:57	1
Methylphenol, 3 & 4	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 18:57	1
Hexachlorobenzene	ND		0.050	0.0055	mg/L		07/13/23 02:30	07/13/23 18:57	1
Hexachlorobutadiene	ND		0.050	0.0084	mg/L		07/13/23 02:30	07/13/23 18:57	1
Hexachloroethane	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 18:57	1
Nitrobenzene	ND		0.050	0.012	mg/L		07/13/23 02:30	07/13/23 18:57	1
Pentachlorophenol	ND		0.25	0.0075	mg/L		07/13/23 02:30	07/13/23 18:57	1
Pyridine	ND	*+	0.10	0.0082	mg/L		07/13/23 02:30	07/13/23 18:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*76*		*55 - 105*	*07/13/23 02:30*	*07/13/23 18:57*	*1*
2-Fluorophenol (Surr)	*89*		*55 - 105*	*07/13/23 02:30*	*07/13/23 18:57*	*1*
2,4,6-Tribromophenol (Surr)	*57*		*32 - 115*	*07/13/23 02:30*	*07/13/23 18:57*	*1*
Nitrobenzene-d5 (Surr)	*88*		*55 - 109*	*07/13/23 02:30*	*07/13/23 18:57*	*1*
Phenol-d5 (Surr)	*76*		*48 - 105*	*07/13/23 02:30*	*07/13/23 18:57*	*1*
Terphenyl-d14 (Surr)	*81*		*37 - 107*	*07/13/23 02:30*	*07/13/23 18:57*	*1*

Method: SW846 EPA 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.0050	0.0029	mg/L		07/13/23 02:30	07/13/23 14:15	1
Endrin	ND	*1	0.00050	0.000091	mg/L		07/13/23 02:30	07/13/23 14:15	1
gamma-BHC (Lindane)	ND	*1	0.00050	0.00012	mg/L		07/13/23 02:30	07/13/23 14:15	1
Heptachlor	ND	*1	0.00050	0.00018	mg/L		07/13/23 02:30	07/13/23 14:15	1
Heptachlor epoxide	ND	*1	0.00050	0.00014	mg/L		07/13/23 02:30	07/13/23 14:15	1
Methoxychlor	ND	*1	0.00050	0.00031	mg/L		07/13/23 02:30	07/13/23 14:15	1
Toxaphene	ND		0.040	0.020	mg/L		07/13/23 02:30	07/13/23 14:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*104*		*48 - 137*	*07/13/23 02:30*	*07/13/23 14:15*	*1*
DCB Decachlorobiphenyl (Surr)	*108*		*48 - 137*	*07/13/23 02:30*	*07/13/23 14:15*	*1*
Tetrachloro-m-xylene	*98*		*56 - 137*	*07/13/23 02:30*	*07/13/23 14:15*	*1*
Tetrachloro-m-xylene	*100*		*56 - 137*	*07/13/23 02:30*	*07/13/23 14:15*	*1*

Method: SW846 EPA 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		07/13/23 03:40	07/19/23 10:43	20
Silvex (2,4,5-TP)	ND		0.010	0.0064	mg/L		07/13/23 03:40	07/19/23 10:43	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*76*		*48 - 127*	*07/13/23 03:40*	*07/19/23 10:43*	*20*
2,4-Dichlorophenylacetic acid	*84*		*48 - 127*	*07/13/23 03:40*	*07/19/23 10:43*	*20*

Method: SW846 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.50	0.0091	mg/L		07/13/23 10:00	07/17/23 18:20	1
Arsenic	ND		0.50	0.083	mg/L		07/13/23 10:00	07/17/23 18:20	1
Barium	ND		2.0	0.063	mg/L		07/13/23 10:00	07/17/23 18:20	1

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: SAMPLE DUPLICATE 07/09/2023
Lab Sample ID: 180-158886-4
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Method: SW846 6010D - Metals (ICP) - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.50	0.0030	mg/L		07/13/23 10:00	07/17/23 18:20	1
Chromium	ND		0.50	0.016	mg/L		07/13/23 10:00	07/17/23 18:20	1
Lead	ND		0.50	0.044	mg/L		07/13/23 10:00	07/17/23 18:20	1
Selenium	ND		0.50	0.037	mg/L		07/13/23 10:00	07/17/23 18:20	1

Method: SW846 EPA 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.024**		0.0020	0.0013	mg/L		07/13/23 12:53	07/14/23 14:19	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (SM22 2540G)	**1.0**		0.1	0.1	%			07/25/23 14:47	1
Percent Solids (SM22 2540G)	**99.0**		0.1	0.1	%			07/25/23 14:47	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 180-440211/1-A
Matrix: Solid
Analysis Batch: 440270

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 440211

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0045	mg/L		07/13/23 02:30	07/13/23 14:17	1
2,4,5-Trichlorophenol	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 14:17	1
2,4,6-Trichlorophenol	ND		0.050	0.0095	mg/L		07/13/23 02:30	07/13/23 14:17	1
2,4-Dinitrotoluene	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 14:17	1
2-Methylphenol	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 14:17	1
Methylphenol, 3 & 4	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 14:17	1
Hexachlorobenzene	ND		0.050	0.0055	mg/L		07/13/23 02:30	07/13/23 14:17	1
Hexachlorobutadiene	ND		0.050	0.0084	mg/L		07/13/23 02:30	07/13/23 14:17	1
Hexachloroethane	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 14:17	1
Nitrobenzene	ND		0.050	0.012	mg/L		07/13/23 02:30	07/13/23 14:17	1
Pentachlorophenol	ND		0.25	0.0075	mg/L		07/13/23 02:30	07/13/23 14:17	1
Pyridine	ND		0.10	0.0082	mg/L		07/13/23 02:30	07/13/23 14:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*75*		*55 - 105*	*07/13/23 02:30*	*07/13/23 14:17*	*1*
2-Fluorophenol (Surr)	*85*		*55 - 105*	*07/13/23 02:30*	*07/13/23 14:17*	*1*
2,4,6-Tribromophenol (Surr)	*67*		*32 - 115*	*07/13/23 02:30*	*07/13/23 14:17*	*1*
Nitrobenzene-d5 (Surr)	*83*		*55 - 109*	*07/13/23 02:30*	*07/13/23 14:17*	*1*
Phenol-d5 (Surr)	*83*		*48 - 105*	*07/13/23 02:30*	*07/13/23 14:17*	*1*
Terphenyl-d14 (Surr)	*78*		*37 - 107*	*07/13/23 02:30*	*07/13/23 14:17*	*1*

Lab Sample ID: LCS 180-440211/2-A
Matrix: Solid
Analysis Batch: 440270

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 440211

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.250	0.184		mg/L		74	61 - 100
2,4,5-Trichlorophenol	0.250	0.186		mg/L		74	53 - 104
2,4,6-Trichlorophenol	0.250	0.193		mg/L		77	53 - 103
2,4-Dinitrotoluene	0.250	0.155		mg/L		62	43 - 100
2-Methylphenol	0.250	0.198		mg/L		79	56 - 100
Methylphenol, 3 & 4	0.500	0.389		mg/L		78	59 - 100
Hexachlorobenzene	0.250	0.154		mg/L		62	34 - 100
Hexachlorobutadiene	0.250	0.155		mg/L		62	52 - 110
Hexachloroethane	0.250	0.185		mg/L		74	56 - 100
Nitrobenzene	0.250	0.206		mg/L		82	60 - 100
Pentachlorophenol	0.250	0.166	J	mg/L		66	14 - 112
Pyridine	0.250	0.255		mg/L		102	54 - 107

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl	*76*		*55 - 105*
2-Fluorophenol (Surr)	*89*		*55 - 105*
2,4,6-Tribromophenol (Surr)	*68*		*32 - 115*
Nitrobenzene-d5 (Surr)	*84*		*55 - 109*
Phenol-d5 (Surr)	*84*		*48 - 105*
Terphenyl-d14 (Surr)	*77*		*37 - 107*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 180-440211/3-A
Matrix: Solid
Analysis Batch: 440270

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 440211

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,4-Dichlorobenzene			0.250	0.191		mg/L		76	61 - 100	4	15
2,4,5-Trichlorophenol			0.250	0.192		mg/L		77	53 - 104	3	15
2,4,6-Trichlorophenol			0.250	0.189		mg/L		76	53 - 103	2	15
2,4-Dinitrotoluene			0.250	0.148		mg/L		59	43 - 100	5	15
2-Methylphenol			0.250	0.206		mg/L		82	56 - 100	4	15
Methylphenol, 3 & 4			0.500	0.420		mg/L		84	59 - 100	8	15
Hexachlorobenzene			0.250	0.159		mg/L		63	34 - 100	3	15
Hexachlorobutadiene			0.250	0.152		mg/L		61	52 - 110	1	15
Hexachloroethane			0.250	0.198		mg/L		79	56 - 100	7	15
Nitrobenzene			0.250	0.217		mg/L		87	60 - 100	5	15
Pentachlorophenol			0.250	0.162	J	mg/L		65	14 - 112	3	18
Pyridine			0.250	0.270	*+	mg/L		108	54 - 107	6	15

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl	*77*		*55 - 105*
2-Fluorophenol (Surr)	*93*		*55 - 105*
2,4,6-Tribromophenol (Surr)	*71*		*32 - 115*
Nitrobenzene-d5 (Surr)	*87*		*55 - 109*
Phenol-d5 (Surr)	*90*		*48 - 105*
Terphenyl-d14 (Surr)	*79*		*37 - 107*

Lab Sample ID: LB 180-440064/1-B
Matrix: Solid
Analysis Batch: 440270

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 440211

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0045	mg/L		07/13/23 02:30	07/13/23 16:29	1
2,4,5-Trichlorophenol	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 16:29	1
2,4,6-Trichlorophenol	ND		0.050	0.0095	mg/L		07/13/23 02:30	07/13/23 16:29	1
2,4-Dinitrotoluene	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 16:29	1
2-Methylphenol	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 16:29	1
Methylphenol, 3 & 4	ND		0.050	0.0079	mg/L		07/13/23 02:30	07/13/23 16:29	1
Hexachlorobenzene	ND		0.050	0.0055	mg/L		07/13/23 02:30	07/13/23 16:29	1
Hexachlorobutadiene	ND		0.050	0.0084	mg/L		07/13/23 02:30	07/13/23 16:29	1
Hexachloroethane	ND		0.050	0.0040	mg/L		07/13/23 02:30	07/13/23 16:29	1
Nitrobenzene	ND		0.050	0.012	mg/L		07/13/23 02:30	07/13/23 16:29	1
Pentachlorophenol	ND		0.25	0.0075	mg/L		07/13/23 02:30	07/13/23 16:29	1
Pyridine	ND		0.10	0.0082	mg/L		07/13/23 02:30	07/13/23 16:29	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*67*		*55 - 105*	*07/13/23 02:30*	*07/13/23 16:29*	*1*
2-Fluorophenol (Surr)	*81*		*55 - 105*	*07/13/23 02:30*	*07/13/23 16:29*	*1*
2,4,6-Tribromophenol (Surr)	*62*		*32 - 115*	*07/13/23 02:30*	*07/13/23 16:29*	*1*
Nitrobenzene-d5 (Surr)	*76*		*55 - 109*	*07/13/23 02:30*	*07/13/23 16:29*	*1*
Phenol-d5 (Surr)	*77*		*48 - 105*	*07/13/23 02:30*	*07/13/23 16:29*	*1*
Terphenyl-d14 (Surr)	*70*		*37 - 107*	*07/13/23 02:30*	*07/13/23 16:29*	*1*

Method: EPA 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 180-440212/1-A
Matrix: Solid
Analysis Batch: 440250

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 440212

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.0050	0.0029	mg/L		07/13/23 02:30	07/13/23 12:24	1
Endrin	ND		0.00050	0.000091	mg/L		07/13/23 02:30	07/13/23 12:24	1
gamma-BHC (Lindane)	ND		0.00050	0.00012	mg/L		07/13/23 02:30	07/13/23 12:24	1
Heptachlor	ND		0.00050	0.00018	mg/L		07/13/23 02:30	07/13/23 12:24	1
Heptachlor epoxide	ND		0.00050	0.00014	mg/L		07/13/23 02:30	07/13/23 12:24	1
Methoxychlor	ND		0.00050	0.00031	mg/L		07/13/23 02:30	07/13/23 12:24	1
Toxaphene	ND		0.040	0.020	mg/L		07/13/23 02:30	07/13/23 12:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*101*		*48 - 137*	*07/13/23 02:30*	*07/13/23 12:24*	*1*
DCB Decachlorobiphenyl (Surr)	*108*		*48 - 137*	*07/13/23 02:30*	*07/13/23 12:24*	*1*
Tetrachloro-m-xylene	*96*		*56 - 137*	*07/13/23 02:30*	*07/13/23 12:24*	*1*
Tetrachloro-m-xylene	*97*		*56 - 137*	*07/13/23 02:30*	*07/13/23 12:24*	*1*

Lab Sample ID: LCS 180-440212/2-A
Matrix: Solid
Analysis Batch: 440250

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 440212

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Endrin			0.0100	0.0114		mg/L		114	72 - 115		
gamma-BHC (Lindane)			0.0100	0.0104		mg/L		104	67 - 120		
Heptachlor			0.0100	0.00963		mg/L		96	71 - 125		
Heptachlor epoxide			0.0100	0.0102		mg/L		102	67 - 123		
Methoxychlor			0.0100	0.0107		mg/L		107	59 - 109		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*125*		*48 - 137*
DCB Decachlorobiphenyl (Surr)	*129*		*48 - 137*
Tetrachloro-m-xylene	*119*		*56 - 137*
Tetrachloro-m-xylene	*119*		*56 - 137*

Lab Sample ID: LCSD 180-440212/3-A
Matrix: Solid
Analysis Batch: 440250

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 440212

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Endrin			0.0100	0.00922	*1	mg/L		92	72 - 115	21	15
gamma-BHC (Lindane)			0.0100	0.00803	*1	mg/L		80	67 - 120	25	18
Heptachlor			0.0100	0.00788	*1	mg/L		79	71 - 125	20	16
Heptachlor epoxide			0.0100	0.00830	*1	mg/L		83	67 - 123	21	15
Methoxychlor			0.0100	0.00897	*1	mg/L		90	59 - 109	21	15

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*101*		*48 - 137*
DCB Decachlorobiphenyl (Surr)	*102*		*48 - 137*
Tetrachloro-m-xylene	*93*		*56 - 137*
Tetrachloro-m-xylene	*96*		*56 - 137*

Method: EPA 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LB 180-440064/1-C
Matrix: Solid
Analysis Batch: 440250

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 440212

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	ND		0.0050	0.0029	mg/L		07/13/23 02:30	07/13/23 13:12	1
Endrin	ND		0.00050	0.000091	mg/L		07/13/23 02:30	07/13/23 13:12	1
gamma-BHC (Lindane)	ND		0.00050	0.00012	mg/L		07/13/23 02:30	07/13/23 13:12	1
Heptachlor	ND		0.00050	0.00018	mg/L		07/13/23 02:30	07/13/23 13:12	1
Heptachlor epoxide	ND		0.00050	0.00014	mg/L		07/13/23 02:30	07/13/23 13:12	1
Methoxychlor	ND		0.00050	0.00031	mg/L		07/13/23 02:30	07/13/23 13:12	1
Toxaphene	ND		0.040	0.020	mg/L		07/13/23 02:30	07/13/23 13:12	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*109*		*48 - 137*	*07/13/23 02:30*	*07/13/23 13:12*	*1*
DCB Decachlorobiphenyl (Surr)	*105*		*48 - 137*	*07/13/23 02:30*	*07/13/23 13:12*	*1*
Tetrachloro-m-xylene	*96*		*56 - 137*	*07/13/23 02:30*	*07/13/23 13:12*	*1*
Tetrachloro-m-xylene	*98*		*56 - 137*	*07/13/23 02:30*	*07/13/23 13:12*	*1*

Method: EPA 8151A - Herbicides (GC)

Lab Sample ID: MB 180-440214/1-A
Matrix: Solid
Analysis Batch: 440743

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 440214

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		07/13/23 03:40	07/19/23 09:26	20
Silvex (2,4,5-TP)	ND		0.010	0.0064	mg/L		07/13/23 03:40	07/19/23 09:26	20

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*80*		*48 - 127*	*07/13/23 03:40*	*07/19/23 09:26*	*20*
2,4-Dichlorophenylacetic acid	*90*		*48 - 127*	*07/13/23 03:40*	*07/19/23 09:26*	*20*

Lab Sample ID: LCS 180-440214/2-A
Matrix: Solid
Analysis Batch: 440743

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 440214

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
2,4-D			0.200	0.218		mg/L		109	23 - 139		
Silvex (2,4,5-TP)			0.0500	0.0477	p	mg/L		95	33 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*89*		*48 - 127*
2,4-Dichlorophenylacetic acid	*100*		*48 - 127*

Lab Sample ID: LCSD 180-440214/3-A
Matrix: Solid
Analysis Batch: 440743

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 440214

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,4-D			0.200	0.188		mg/L		94	23 - 139	15	35
Silvex (2,4,5-TP)			0.0500	0.0424	p	mg/L		85	33 - 140	12	35

Method: EPA 8151A - Herbicides (GC) (Continued)

Lab Sample ID: LCSD 180-440214/3-A
Matrix: Solid
Analysis Batch: 440743

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 440214

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*79*		*48 - 127*
2,4-Dichlorophenylacetic acid	*86*		*48 - 127*

Lab Sample ID: LB 180-440064/1-D
Matrix: Solid
Analysis Batch: 440743

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 440214

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		07/13/23 03:40	07/19/23 11:40	20
Silvex (2,4,5-TP)	ND		0.010	0.0064	mg/L		07/13/23 03:40	07/19/23 11:40	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*84*		*48 - 127*	*07/13/23 03:40*	*07/19/23 11:40*	*20*
2,4-Dichlorophenylacetic acid	*90*		*48 - 127*	*07/13/23 03:40*	*07/19/23 11:40*	*20*

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 180-440282/1-A
Matrix: Solid
Analysis Batch: 440639

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 440282

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.050	0.00091	mg/L		07/13/23 10:00	07/17/23 16:31	1
Arsenic	ND		0.050	0.0083	mg/L		07/13/23 10:00	07/17/23 16:31	1
Barium	ND		0.20	0.0063	mg/L		07/13/23 10:00	07/17/23 16:31	1
Cadmium	ND		0.050	0.00030	mg/L		07/13/23 10:00	07/17/23 16:31	1
Chromium	ND		0.050	0.0016	mg/L		07/13/23 10:00	07/17/23 16:31	1
Lead	ND		0.050	0.0044	mg/L		07/13/23 10:00	07/17/23 16:31	1
Selenium	ND		0.050	0.0037	mg/L		07/13/23 10:00	07/17/23 16:31	1

Lab Sample ID: LCS 180-440282/2-A
Matrix: Solid
Analysis Batch: 440639

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 440282

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Silver	0.250	0.243		mg/L		97	80 - 120
Arsenic	1.00	1.06		mg/L		106	80 - 120
Barium	1.00	1.03		mg/L		103	80 - 120
Cadmium	0.500	0.512		mg/L		102	80 - 120
Chromium	0.500	0.510		mg/L		102	80 - 120
Lead	0.500	0.482		mg/L		96	80 - 120
Selenium	1.00	1.05		mg/L		105	80 - 120

Lab Sample ID: LB 180-440064/1-F
Matrix: Solid
Analysis Batch: 440639

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 440282

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.50	0.0091	mg/L		07/13/23 10:00	07/17/23 16:41	1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LB 180-440064/1-F
Matrix: Solid
Analysis Batch: 440639

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 440282

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.083	mg/L		07/13/23 10:00	07/17/23 16:41	1
Barium	ND		2.0	0.063	mg/L		07/13/23 10:00	07/17/23 16:41	1
Cadmium	ND		0.50	0.0030	mg/L		07/13/23 10:00	07/17/23 16:41	1
Chromium	ND		0.50	0.016	mg/L		07/13/23 10:00	07/17/23 16:41	1
Lead	ND		0.50	0.044	mg/L		07/13/23 10:00	07/17/23 16:41	1
Selenium	ND		0.50	0.037	mg/L		07/13/23 10:00	07/17/23 16:41	1

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-440303/1-A
Matrix: Solid
Analysis Batch: 440437

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 440303

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		07/13/23 12:53	07/14/23 12:57	1

Lab Sample ID: LCS 180-440303/2-A
Matrix: Solid
Analysis Batch: 440437

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 440303

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury			0.00250	0.00265		mg/L		106	80 - 120		

Lab Sample ID: LB 180-440064/1-G
Matrix: Solid
Analysis Batch: 440437

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 440303

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		07/13/23 12:53	07/14/23 12:59	1

Method: 2540G - SM 2540G

Lab Sample ID: 180-158886-1 DU
Matrix: Solid
Analysis Batch: 441366

Client Sample ID: R-5473, BLENDER #3, BATCH 36
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	0.8			0.8		%				9	10
Percent Solids	99.2			99.2		%				0.07	10

QC Association Summary

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

GC/MS Semi VOA

Leach Batch: 440064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	EPA 1311	
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	EPA 1311	
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	EPA 1311	
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	EPA 1311	
LB 180-440064/1-B	Method Blank	TCLP	Solid	EPA 1311	

Prep Batch: 440211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	3510C	440064
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	3510C	440064
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	3510C	440064
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	3510C	440064
LB 180-440064/1-B	Method Blank	TCLP	Solid	3510C	440064
MB 180-440211/1-A	Method Blank	Total/NA	Solid	3510C	
LCS 180-440211/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 180-440211/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

Analysis Batch: 440270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	8270E	440211
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	8270E	440211
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	8270E	440211
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	8270E	440211
LB 180-440064/1-B	Method Blank	TCLP	Solid	8270E	440211
MB 180-440211/1-A	Method Blank	Total/NA	Solid	8270E	440211
LCS 180-440211/2-A	Lab Control Sample	Total/NA	Solid	8270E	440211
LCSD 180-440211/3-A	Lab Control Sample Dup	Total/NA	Solid	8270E	440211

GC Semi VOA

Leach Batch: 440064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	EPA 1311	
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	EPA 1311	
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	EPA 1311	
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	EPA 1311	
LB 180-440064/1-C	Method Blank	TCLP	Solid	EPA 1311	
LB 180-440064/1-D	Method Blank	TCLP	Solid	EPA 1311	

Prep Batch: 440212

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	3510C	440064
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	3510C	440064
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	3510C	440064
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	3510C	440064
LB 180-440064/1-C	Method Blank	TCLP	Solid	3510C	440064
MB 180-440212/1-A	Method Blank	Total/NA	Solid	3510C	
LCS 180-440212/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 180-440212/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

GC Semi VOA

Prep Batch: 440214

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	8151A	440064
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	8151A	440064
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	8151A	440064
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	8151A	440064
LB 180-440064/1-D	Method Blank	TCLP	Solid	8151A	440064
MB 180-440214/1-A	Method Blank	Total/NA	Solid	8151A	
LCS 180-440214/2-A	Lab Control Sample	Total/NA	Solid	8151A	
LCSD 180-440214/3-A	Lab Control Sample Dup	Total/NA	Solid	8151A	

Analysis Batch: 440250

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	EPA 8081B	440212
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	EPA 8081B	440212
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	EPA 8081B	440212
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	EPA 8081B	440212
LB 180-440064/1-C	Method Blank	TCLP	Solid	EPA 8081B	440212
MB 180-440212/1-A	Method Blank	Total/NA	Solid	EPA 8081B	440212
LCS 180-440212/2-A	Lab Control Sample	Total/NA	Solid	EPA 8081B	440212
LCSD 180-440212/3-A	Lab Control Sample Dup	Total/NA	Solid	EPA 8081B	440212

Analysis Batch: 440743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	EPA 8151A	440214
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	EPA 8151A	440214
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	EPA 8151A	440214
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	EPA 8151A	440214
LB 180-440064/1-D	Method Blank	TCLP	Solid	EPA 8151A	440214
MB 180-440214/1-A	Method Blank	Total/NA	Solid	EPA 8151A	440214
LCS 180-440214/2-A	Lab Control Sample	Total/NA	Solid	EPA 8151A	440214
LCSD 180-440214/3-A	Lab Control Sample Dup	Total/NA	Solid	EPA 8151A	440214

Metals

Leach Batch: 440064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	EPA 1311	
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	EPA 1311	
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	EPA 1311	
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	EPA 1311	
LB 180-440064/1-F	Method Blank	TCLP	Solid	EPA 1311	
LB 180-440064/1-G	Method Blank	TCLP	Solid	EPA 1311	

Prep Batch: 440282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	3010A	440064
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	3010A	440064
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	3010A	440064
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	3010A	440064
LB 180-440064/1-F	Method Blank	TCLP	Solid	3010A	440064
MB 180-440282/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 180-440282/2-A	Lab Control Sample	Total/NA	Solid	3010A	

QC Association Summary

Client: US Ecology Inc
Job ID: 180-158886-1
Project/Site: Republic Services Mercury Project REVISE

Metals

Prep Batch: 440303

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	7470A	440064
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	7470A	440064
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	7470A	440064
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	7470A	440064
LB 180-440064/1-G	Method Blank	TCLP	Solid	7470A	440064
MB 180-440303/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-440303/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Analysis Batch: 440437

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	EPA 7470A	440303
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	EPA 7470A	440303
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	EPA 7470A	440303
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	EPA 7470A	440303
LB 180-440064/1-G	Method Blank	TCLP	Solid	EPA 7470A	440303
MB 180-440303/1-A	Method Blank	Total/NA	Solid	EPA 7470A	440303
LCS 180-440303/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	440303

Analysis Batch: 440639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	6010D	440282
180-158886-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	6010D	440282
180-158886-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	6010D	440282
180-158886-4	SAMPLE DUPLICATE 07/09/2023	TCLP	Solid	6010D	440282
LB 180-440064/1-F	Method Blank	TCLP	Solid	6010D	440282
MB 180-440282/1-A	Method Blank	Total/NA	Solid	6010D	440282
LCS 180-440282/2-A	Lab Control Sample	Total/NA	Solid	6010D	440282

General Chemistry

Analysis Batch: 441366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158886-1	R-5473, BLENDER #3, BATCH 36	Total/NA	Solid	2540G	
180-158886-2	R-5475, BLENDER #4, BATCH 26	Total/NA	Solid	2540G	
180-158886-3	R-5476, BLENDER #2, BATCH 105	Total/NA	Solid	2540G	
180-158886-4	SAMPLE DUPLICATE 07/09/2023	Total/NA	Solid	2540G	
180-158886-1 DU	R-5473, BLENDER #3, BATCH 36	Total/NA	Solid	2540G	

Chain of Custody Record

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238-2907
phone 412.963.7058 fax 412.963.2468

eurofins | Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

Eurofins Environment Testing America

COC No: _____ of _____ COCs

TALS Project #:

Sampler:

For Lab Use Only:
Walk-in Client:
Lab Sampling:

Job / SDG No.:

Client Contact	Project Manager: Paul Canevaro	Site Contact: A. Dugan	Date: 07/06/2023
US Ecology	Email: paul.canevaro@usecology.com	Lab Contact: A. Dugan	Carrier: Eurofins
Address	Tel/Fax: (346) 314-9769		
City/State/Zip	**Analysis Turnaround Time**		
(346) 314-9769 Phone	☐ CALENDAR DAYS ☐ WORKING DAYS		
FAX	TAT if different from Below _____		
Project Name: **Cinnabar (HgS)**	☐ 2 weeks		
Site:	☐ 1 week		
P O #	☐ 2 days		
	☐ 1 day		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TCLP 6010/7470	TCLP 8270	TCLP 8260	TCLP 8081	TCLP 8151	1314 7470B	Sample Specific Notes:
R-5473, Blender #3, Batch 36	7/6/2023	9:25 AM	G	S	1			X	X	X	X	X	X	
R-5475, Blender #4, Batch 26	7/6/2023	9:35 AM	G	S	1			X	X	X	X	X	X	
R-5476, Blender #2, Batch 105	7/6/2023	9:40 AM	G	S	1			X	X	X	X	X	X	
Sample Duplicate 07/06/2023	7/6/2023	9:45 AM	G	S	1			X	X	X	X	X	X	
								6	6	6	6	6	6	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other None

180-158886 Chain of Custody

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if sam

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: The US Ecology Quality Assurance Project Plan, petition for site-specific determination of equivalent treatment for elemental mercury waste (D009 and U151) under the land disposal restrictions. Please coordinate with Larry Matko.

Custody Seals Intact: ☑ Yes ☐ No | Custody Seal No.: 1805553 | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

Relinquished by:	Company: USE	Date/Time: 10:55 AM	Received by:	Company: USEQ	Date/Time: 7-6-23 10:55
Relinquished by:	Company: USEQ	Date/Time: 7-6-23	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: ETPITTSB	Date/Time: 7-6-23 19:15

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-158886-1

Login Number: 158886
List Number: 1
Creator: Matko, Larry

List Source: Eurofins Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	thermal preservation not required
Cooler Temperature is acceptable.	N/A	thermal preservation not required
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Paul Canevaro
US Ecology Inc
101 S Capitol Boulevard Suite 1000
Boise, Idaho 83702

Generated 8/29/2023 7:38:48 AM

JOB DESCRIPTION

Republic Services Mercury Project REVISE

JOB NUMBER

180-158914-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.

myEOL

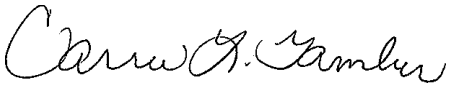
Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

Authorization



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8/29/2023 7:38:48 AM

Authorized for release by
Carrie Gamber, Senior Project Manager
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(412)963-2428

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Job ID: 180-158914-1

Laboratory: Eurofins Pittsburgh

Narrative

CASE NARRATIVE

Client: US Ecology Inc

Project: Republic Services Mercury Project

Report Number: 180-158914-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 07/06/2023; the samples arrived in good condition. Thermal preservation not required.

MERCURY
The following samples were diluted to bring the concentration of Mercury to within the instrument's calibration range: R-5473, BLENDER #3, BATCH 36 T01 (180-158914-1), R-5473, BLENDER #3, BATCH 36 T02 (180-158914-2), R-5473, BLENDER #3, BATCH 36 T03 (180-158914-3), R-5473, BLENDER #3, BATCH 36 T04 (180-158914-4), R-5473, BLENDER #3, BATCH 36 T05 (180-158914-5), R-5473, BLENDER #3, BATCH 36 T06 (180-158914-6), R-5473, BLENDER #3, BATCH 36 T07 (180-158914-7), R-5473, BLENDER #3, BATCH 36 T09 (180-158914-9), R-5476, BLENDER #2, BATCH 105 T01 (180-158914-19), SAMPLE DUPLICATE 07/06/23 T01 (180-158914-28), SAMPLE DUPLICATE 07/06/23 T06 (180-158914-33), SAMPLE DUPLICATE 07/06/23 T07 (180-158914-34), (180-158914-A-1-C MS ^10) and (180-158914-A-1-D MSD ^10). Elevated reporting limits (RLs) are provided.

Mercury was detected in method blank MB 180-443455/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Mercury was detected in method blank MB 180-443456/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Mercury was detected in method blank MB 180-443459/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Mercury failed the recovery criteria low for the MS of sample R-5473, BLENDER #3, BATCH 36 T01MS (180-158914-1) in batch 180-443708. Mercury failed the recovery criteria low for the MSD of sample R-5473, BLENDER #3, BATCH 36 T01MSD (180-158914-1) in batch 180-443708. Mercury exceeded the RPD limit. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Mercury failed the recovery criteria low for the MS of sample R-5476, BLENDER #2, BATCH 105 T03MS (180-158914-21) in batch 180-443708. Mercury failed the recovery criteria low for the MSD of sample R-5476, BLENDER #2, BATCH 105 T03MSD (180-158914-21) in batch 180-443708. Mercury exceeded the RPD limit. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Job ID: 180-158914-1 (Continued)

Laboratory: Eurofins Pittsburgh (Continued)

Mercury failed the recovery criteria low for the MS of sample SAMPLE DUPLICATE 07/06/23 T04MS (180-158914-31) in batch 180-443708. Mercury failed the recovery criteria high for the MSD of sample SAMPLE DUPLICATE 07/06/23 T04MSD (180-158914-31) in batch 180-443708. Mercury exceeded the RPD limit.

Definitions/Glossary

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Qualifiers

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Analyte was found in the blank.
F2	MS/MSD RPD exceeds control limits
FH	MS and/or MSD recovery above control limits.
FL	MS and/or MSD recovery below control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Pittsburgh

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	02-00416	04-30-24

Sample Summary

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-158914-1	R-5473, BLENDER #3, BATCH 36 T01	Solid	07/06/23 09:25	07/06/23 19:15
180-158914-2	R-5473, BLENDER #3, BATCH 36 T02	Solid	07/06/23 09:25	07/06/23 19:15
180-158914-3	R-5473, BLENDER #3, BATCH 36 T03	Solid	07/06/23 09:25	07/06/23 19:15
180-158914-4	R-5473, BLENDER #3, BATCH 36 T04	Solid	07/06/23 09:25	07/06/23 19:15
180-158914-5	R-5473, BLENDER #3, BATCH 36 T05	Solid	07/06/23 09:25	07/06/23 19:15
180-158914-6	R-5473, BLENDER #3, BATCH 36 T06	Solid	07/06/23 09:25	07/06/23 19:15
180-158914-7	R-5473, BLENDER #3, BATCH 36 T07	Solid	07/06/23 09:25	07/06/23 19:15
180-158914-8	R-5473, BLENDER #3, BATCH 36 T08	Solid	07/06/23 09:25	07/06/23 19:15
180-158914-9	R-5473, BLENDER #3, BATCH 36 T09	Solid	07/06/23 09:25	07/06/23 19:15
180-158914-10	R-5475, BLENDER #4, BATCH 26 T01	Solid	07/06/23 09:35	07/06/23 19:15
180-158914-11	R-5475, BLENDER #4, BATCH 26 T02	Solid	07/06/23 09:35	07/06/23 19:15
180-158914-12	R-5475, BLENDER #4, BATCH 26 T03	Solid	07/06/23 09:35	07/06/23 19:15
180-158914-13	R-5475, BLENDER #4, BATCH 26 T04	Solid	07/06/23 09:35	07/06/23 19:15
180-158914-14	R-5475, BLENDER #4, BATCH 26 T05	Solid	07/06/23 09:35	07/06/23 19:15
180-158914-15	R-5475, BLENDER #4, BATCH 26 T06	Solid	07/06/23 09:35	07/06/23 19:15
180-158914-16	R-5475, BLENDER #4, BATCH 26 T07	Solid	07/06/23 09:35	07/06/23 19:15
180-158914-17	R-5475, BLENDER #4, BATCH 26 T08	Solid	07/06/23 09:35	07/06/23 19:15
180-158914-18	R-5475, BLENDER #4, BATCH 26 T09	Solid	07/06/23 09:35	07/06/23 19:15
180-158914-19	R-5476, BLENDER #2, BATCH 105 T01	Solid	07/06/23 09:40	07/06/23 19:15
180-158914-20	R-5476, BLENDER #2, BATCH 105 T02	Solid	07/06/23 09:40	07/06/23 19:15
180-158914-21	R-5476, BLENDER #2, BATCH 105 T03	Solid	07/06/23 09:40	07/06/23 19:15
180-158914-22	R-5476, BLENDER #2, BATCH 105 T04	Solid	07/06/23 09:40	07/06/23 19:15
180-158914-23	R-5476, BLENDER #2, BATCH 105 T05	Solid	07/06/23 09:40	07/06/23 19:15
180-158914-24	R-5476, BLENDER #2, BATCH 105 T06	Solid	07/06/23 09:40	07/06/23 19:15
180-158914-25	R-5476, BLENDER #2, BATCH 105 T07	Solid	07/06/23 09:40	07/06/23 19:15
180-158914-26	R-5476, BLENDER #2, BATCH 105 T08	Solid	07/06/23 09:40	07/06/23 19:15
180-158914-27	R-5476, BLENDER #2, BATCH 105 T09	Solid	07/06/23 09:40	07/06/23 19:15
180-158914-28	SAMPLE DUPLICATE 07/06/23 T01	Solid	07/06/23 09:45	07/06/23 19:15
180-158914-29	SAMPLE DUPLICATE 07/06/23 T02	Solid	07/06/23 09:45	07/06/23 19:15
180-158914-30	SAMPLE DUPLICATE 07/06/23 T03	Solid	07/06/23 09:45	07/06/23 19:15
180-158914-31	SAMPLE DUPLICATE 07/06/23 T04	Solid	07/06/23 09:45	07/06/23 19:15
180-158914-32	SAMPLE DUPLICATE 07/06/23 T055	Solid	07/06/23 09:45	07/06/23 19:15
180-158914-33	SAMPLE DUPLICATE 07/06/23 T06	Solid	07/06/23 09:45	07/06/23 19:15
180-158914-34	SAMPLE DUPLICATE 07/06/23 T07	Solid	07/06/23 09:45	07/06/23 19:15
180-158914-35	SAMPLE DUPLICATE 07/06/23 T08	Solid	07/06/23 09:45	07/06/23 19:15
180-158914-36	SAMPLE DUPLICATE 07/06/23 T09	Solid	07/06/23 09:45	07/06/23 19:15
180-158914-38	R-5473, BLENDER #3, BATCH 36 T01	Water	08/09/23 11:11	07/06/23 19:15
180-158914-39	R-5473, BLENDER #3, BATCH 36 T02	Water	08/09/23 18:23	07/06/23 19:15
180-158914-40	R-5473, BLENDER #3, BATCH 36 T03	Water	08/10/23 06:23	07/06/23 19:15
180-158914-41	R-5473, BLENDER #3, BATCH 36 T04	Water	08/10/23 18:23	07/06/23 19:15
180-158914-42	R-5473, BLENDER #3, BATCH 36 T05	Water	08/11/23 06:23	07/06/23 19:15
180-158914-43	R-5473, BLENDER #3, BATCH 36 T06	Water	08/13/23 18:23	07/06/23 19:15
180-158914-44	R-5473, BLENDER #3, BATCH 36 T07	Water	08/14/23 06:23	07/06/23 19:15
180-158914-45	R-5473, BLENDER #3, BATCH 36 T08	Water	08/18/23 18:23	07/06/23 19:15
180-158914-46	R-5473, BLENDER #3, BATCH 36 T09	Water	08/19/23 06:23	07/06/23 19:15
180-158914-47	R-5475, BLENDER #4, BATCH 26 T01	Water	08/09/23 11:11	07/06/23 19:15
180-158914-48	R-5475, BLENDER #4, BATCH 26 T02	Water	08/09/23 18:23	07/06/23 19:15
180-158914-49	R-5475, BLENDER #4, BATCH 26 T03	Water	08/10/23 06:23	07/06/23 19:15
180-158914-50	R-5475, BLENDER #4, BATCH 26 T04	Water	08/10/23 18:23	07/06/23 19:15
180-158914-51	R-5475, BLENDER #4, BATCH 26 T05	Water	08/11/23 06:23	07/06/23 19:15
180-158914-52	R-5475, BLENDER #4, BATCH 26 T06	Water	08/13/23 18:23	07/06/23 19:15
180-158914-53	R-5475, BLENDER #4, BATCH 26 T07	Water	08/14/23 06:23	07/06/23 19:15
180-158914-54	R-5475, BLENDER #4, BATCH 26 T08	Water	08/18/23 18:23	07/06/23 19:15
180-158914-55	R-5475, BLENDER #4, BATCH 26 T09	Water	08/19/23 06:23	07/06/23 19:15

Sample Summary

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-158914-56	R-5476, BLENDER #2, BATCH 105 T01	Water	08/09/23 11:11	07/06/23 19:15
180-158914-57	R-5476, BLENDER #2, BATCH 105 T02	Water	08/09/23 18:23	07/06/23 19:15
180-158914-58	R-5476, BLENDER #2, BATCH 105 T03	Water	08/10/23 06:23	07/06/23 19:15
180-158914-59	R-5476, BLENDER #2, BATCH 105 T04	Water	08/10/23 18:23	07/06/23 19:15
180-158914-60	R-5476, BLENDER #2, BATCH 105 T05	Water	08/11/23 06:23	07/06/23 19:15
180-158914-61	R-5476, BLENDER #2, BATCH 105 T06	Water	08/13/23 18:23	07/06/23 19:15
180-158914-62	R-5476, BLENDER #2, BATCH 105 T07	Water	08/14/23 06:23	07/06/23 19:15
180-158914-63	R-5476, BLENDER #2, BATCH 105 T08	Water	08/18/23 18:23	07/06/23 19:15
180-158914-64	R-5476, BLENDER #2, BATCH 105 T09	Water	08/19/23 06:23	07/06/23 19:15
180-158914-65	SAMPLE DUPLICATE 07/06/23 T01	Water	08/09/23 11:11	07/06/23 19:15
180-158914-66	SAMPLE DUPLICATE 07/06/23 T02	Water	08/09/23 18:23	07/06/23 19:15
180-158914-67	SAMPLE DUPLICATE 07/06/23 T03	Water	08/10/23 06:23	07/06/23 19:15
180-158914-68	SAMPLE DUPLICATE 07/06/23 T04	Water	08/10/23 18:23	07/06/23 19:15
180-158914-69	SAMPLE DUPLICATE 07/06/23 T05	Water	08/11/23 06:23	07/06/23 19:15
180-158914-70	SAMPLE DUPLICATE 07/06/23 T06	Water	08/13/23 18:23	07/06/23 19:15
180-158914-71	SAMPLE DUPLICATE 07/06/23 T07	Water	08/14/23 06:23	07/06/23 19:15
180-158914-72	SAMPLE DUPLICATE 07/06/23 T08	Water	08/18/23 18:23	07/06/23 19:15
180-158914-73	SAMPLE DUPLICATE 07/06/23 T09	Water	08/19/23 06:23	07/06/23 19:15

Method Summary

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Method	Method Description	Protocol	Laboratory
EPA 7470A	Mercury (CVAA)	SW846	EET PIT
1314	Up-Flow Percolation Column Leach Procedure	SW846	EET PIT
7470A	Preparation, Mercury	SW846	EET PIT

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T01
Lab Sample ID: 180-158914-1
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			1783.1 g	344.5 mL	442647	08/09/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443455	08/15/23 07:45	RJR	EET PIT
Leach	Analysis	EPA 7470A		10			443708	08/16/23 12:30	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T02
Lab Sample ID: 180-158914-2
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			1783.1 g	597.5 mL	442954	08/09/23 11:11	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443456	08/15/23 07:47	RJR	EET PIT
Leach	Analysis	EPA 7470A		10			443708	08/16/23 12:51	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T03
Lab Sample ID: 180-158914-3
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			1783.1 g	876.5 mL	442956	08/09/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443457	08/15/23 07:49	RJR	EET PIT
Leach	Analysis	EPA 7470A		2			443708	08/16/23 16:25	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T04
Lab Sample ID: 180-158914-4
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			1783.1 g	873 mL	442963	08/10/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443458	08/15/23 07:50	RJR	EET PIT
Leach	Analysis	EPA 7470A		5			443708	08/16/23 16:30	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T05
Lab Sample ID: 180-158914-5
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			1783.1 g	872.6 mL	442964	08/10/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443459	08/15/23 07:53	RJR	EET PIT
Leach	Analysis	EPA 7470A		10			443708	08/16/23 16:31	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T06
Lab Sample ID: 180-158914-6
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			1783.1 g	4352.3 mL	442966	08/11/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443468	08/15/23 07:58	RJR	EET PIT
Leach	Analysis	EPA 7470A		10			443708	08/16/23 16:35	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T07
Lab Sample ID: 180-158914-7
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			1783.1 g	850.8 mL	442967	08/13/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443470	08/15/23 07:59	RJR	EET PIT
Leach	Analysis	EPA 7470A		10			443708	08/16/23 16:40	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T08
Lab Sample ID: 180-158914-8
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			1783.1 g	8195 mL	442968	08/14/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	444264	08/22/23 10:22	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			444307	08/22/23 15:30	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T09
Lab Sample ID: 180-158914-9
Date Collected: 07/06/23 09:25
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			1783.1 g	880.5 mL	442969	08/18/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	444265	08/22/23 10:25	RJR	EET PIT
Leach	Analysis	EPA 7470A		2			444307	08/22/23 16:41	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T01
Lab Sample ID: 180-158914-10
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.8 g	348.4 mL	442647	08/09/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443455	08/15/23 07:45	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 12:34	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T02
Lab Sample ID: 180-158914-11
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.8 g	557.4 mL	442954	08/09/23 11:11	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443456	08/15/23 07:47	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 13:31	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T03
Lab Sample ID: 180-158914-12
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.8 g	981.7 mL	442956	08/09/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443457	08/15/23 07:49	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 13:41	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T04
Lab Sample ID: 180-158914-13
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.8 g	989.4 mL	442963	08/10/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443458	08/15/23 07:50	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 14:17	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T05
Lab Sample ID: 180-158914-14
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.8 g	1021.9 mL	442964	08/10/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443459	08/15/23 07:53	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 14:46	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T06
Lab Sample ID: 180-158914-15
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.8 g	5084.9 mL	442966	08/11/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443468	08/15/23 07:58	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 15:18	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T07
Lab Sample ID: 180-158914-16
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.8 g	987.7 mL	442967	08/13/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443470	08/15/23 07:59	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 15:53	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T08
Lab Sample ID: 180-158914-17
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.8 g	9366 mL	442968	08/14/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	444264	08/22/23 10:22	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			444307	08/22/23 15:32	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T09
Lab Sample ID: 180-158914-18
Date Collected: 07/06/23 09:35
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.8 g	1028.7 mL	442969	08/18/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	444265	08/22/23 10:25	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			444307	08/22/23 16:01	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T01
Lab Sample ID: 180-158914-19
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.5 g	352.2 mL	442647	08/09/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443455	08/15/23 07:45	RJR	EET PIT
Leach	Analysis	EPA 7470A		5			443708	08/16/23 12:35	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T02
Lab Sample ID: 180-158914-20
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.5 g	580.1 mL	442954	08/09/23 11:11	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443456	08/15/23 07:47	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 12:59	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T03
Lab Sample ID: 180-158914-21
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.5 g	1036.6 mL	442956	08/09/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443457	08/15/23 07:49	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 13:47	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T04
Lab Sample ID: 180-158914-22
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.5 g	1033 mL	442963	08/10/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443458	08/15/23 07:50	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 14:19	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T05
Lab Sample ID: 180-158914-23
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.5 g	1033.1 mL	442964	08/10/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443459	08/15/23 07:53	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 14:47	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T06
Lab Sample ID: 180-158914-24
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.5 g	5239.7 mL	442966	08/11/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443468	08/15/23 07:58	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 15:19	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T07
Lab Sample ID: 180-158914-25
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.5 g	998.7 mL	442967	08/13/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443470	08/15/23 07:59	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 15:55	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T08
Lab Sample ID: 180-158914-26
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.5 g	9171 mL	442968	08/14/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	444264	08/22/23 10:22	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			444307	08/22/23 15:34	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T09
Lab Sample ID: 180-158914-27
Date Collected: 07/06/23 09:40
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.5 g	1029.1 mL	442969	08/18/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	444265	08/22/23 10:25	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			444307	08/22/23 16:02	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T01
Lab Sample ID: 180-158914-28
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.1 g	307.5 mL	442647	08/09/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443455	08/15/23 07:45	RJR	EET PIT
Leach	Analysis	EPA 7470A		5			443708	08/16/23 12:36	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T02
Lab Sample ID: 180-158914-29
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.1 g	542 mL	442954	08/09/23 11:11	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443456	08/15/23 07:47	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 13:34	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T03
Lab Sample ID: 180-158914-30
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.1 g	1026.7 mL	442956	08/09/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443457	08/15/23 07:49	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 13:56	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T04
Lab Sample ID: 180-158914-31
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.1 g	1034.1 mL	442963	08/10/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443458	08/15/23 07:50	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 14:20	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T055
Lab Sample ID: 180-158914-32
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.1 g	1031 mL	442964	08/10/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443459	08/15/23 07:53	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			443708	08/16/23 14:50	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T06
Lab Sample ID: 180-158914-33
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.1 g	5380.4 mL	442966	08/11/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443468	08/15/23 07:58	RJR	EET PIT
Leach	Analysis	EPA 7470A		5			443708	08/16/23 16:36	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T07
Lab Sample ID: 180-158914-34
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.1 g	1010.2 mL	442967	08/13/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	443470	08/15/23 07:59	RJR	EET PIT
Leach	Analysis	EPA 7470A		5			443708	08/16/23 16:41	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T08
Lab Sample ID: 180-158914-35
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.1 g	9171 mL	442968	08/14/23 06:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	444264	08/22/23 10:22	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			444307	08/22/23 15:35	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T09
Lab Sample ID: 180-158914-36
Date Collected: 07/06/23 09:45
Matrix: Solid
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			2064.1 g	1041.6 mL	442969	08/18/23 18:23	LWM	EET PIT
Leach	Prep	7470A			25 mL	25 mL	444265	08/22/23 10:25	RJR	EET PIT
Leach	Analysis	EPA 7470A		1			444307	08/22/23 16:03	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T01
Lab Sample ID: 180-158914-38
Date Collected: 08/09/23 11:11
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:06	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T02
Lab Sample ID: 180-158914-39
Date Collected: 08/09/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:07	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T03
Lab Sample ID: 180-158914-40
Date Collected: 08/10/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:08	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T04
Lab Sample ID: 180-158914-41
Date Collected: 08/10/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:11	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T05
Lab Sample ID: 180-158914-42
Date Collected: 08/11/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:12	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T06
Lab Sample ID: 180-158914-43
Date Collected: 08/13/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:13	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T07
Lab Sample ID: 180-158914-44
Date Collected: 08/14/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:14	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T08
Lab Sample ID: 180-158914-45
Date Collected: 08/18/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	444384	08/23/23 08:37	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			444485	08/23/23 14:39	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T09
Lab Sample ID: 180-158914-46
Date Collected: 08/19/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	444384	08/23/23 08:37	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			444485	08/23/23 14:40	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Project/Site: Republic Services Mercury Project REVISE

Job ID: 180-158914-1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T01

Lab Sample ID: 180-158914-47
Matrix: Water
Date Collected: 08/09/23 11:11
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:15	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T02

Lab Sample ID: 180-158914-48
Matrix: Water
Date Collected: 08/09/23 18:23
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:16	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T03

Lab Sample ID: 180-158914-49
Matrix: Water
Date Collected: 08/10/23 06:23
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443525	08/15/23 13:42	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:17	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T04

Lab Sample ID: 180-158914-50
Matrix: Water
Date Collected: 08/10/23 18:23
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:36	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T05

Lab Sample ID: 180-158914-51
Matrix: Water
Date Collected: 08/11/23 06:23
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:37	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T06
Lab Sample ID: 180-158914-52
Date Collected: 08/13/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:38	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T07
Lab Sample ID: 180-158914-53
Date Collected: 08/14/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:39	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T08
Lab Sample ID: 180-158914-54
Date Collected: 08/18/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	444384	08/23/23 08:37	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			444485	08/23/23 14:41	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T09
Lab Sample ID: 180-158914-55
Date Collected: 08/19/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	444384	08/23/23 08:37	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			444485	08/23/23 14:42	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T01
Lab Sample ID: 180-158914-56
Date Collected: 08/09/23 11:11
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:40	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T02
Lab Sample ID: 180-158914-57
Date Collected: 08/09/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:41	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T03
Lab Sample ID: 180-158914-58
Date Collected: 08/10/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:42	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T04
Lab Sample ID: 180-158914-59
Date Collected: 08/10/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:43	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T05
Lab Sample ID: 180-158914-60
Date Collected: 08/11/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:44	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T06
Lab Sample ID: 180-158914-61
Date Collected: 08/13/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:45	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T07
Lab Sample ID: 180-158914-62
Date Collected: 08/14/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:48	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T08
Lab Sample ID: 180-158914-63
Date Collected: 08/18/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	444384	08/23/23 08:37	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			444485	08/23/23 14:43	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T09
Lab Sample ID: 180-158914-64
Date Collected: 08/19/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	444384	08/23/23 08:37	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			444485	08/23/23 14:44	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T01
Lab Sample ID: 180-158914-65
Date Collected: 08/09/23 11:11
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:49	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T02
Lab Sample ID: 180-158914-66
Date Collected: 08/09/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:50	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T03
Lab Sample ID: 180-158914-67
Date Collected: 08/10/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:51	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T04
Lab Sample ID: 180-158914-68
Date Collected: 08/10/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:52	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T05
Lab Sample ID: 180-158914-69
Date Collected: 08/11/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:54	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T06
Lab Sample ID: 180-158914-70
Date Collected: 08/13/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:56	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T07
Lab Sample ID: 180-158914-71
Date Collected: 08/14/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	443527	08/15/23 13:47	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			443657	08/16/23 09:58	RJR	EET PIT
	Instrument ID: HGY									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T08
Lab Sample ID: 180-158914-72
Date Collected: 08/18/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	444384	08/23/23 08:37	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			444485	08/23/23 14:49	RJR	EET PIT
	Instrument ID: HGY									

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T09
Lab Sample ID: 180-158914-73
Date Collected: 08/19/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			25 mL	25 mL	444384	08/23/23 08:41	RJR	EET PIT
Total/NA	Analysis	EPA 7470A		1			444485	08/23/23 14:50	RJR	EET PIT
	Instrument ID: HGY									

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: EET PIT

Batch Type: Leach

LWM = Larry Matko

Batch Type: Prep

RJR = Ron Rosenbaum

Batch Type: Analysis

RJR = Ron Rosenbaum

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T01 — **Lab Sample ID: 180-158914-1**
Date Collected: 07/06/23 09:25 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	57	B 4 F2	2.0	1.3	ug/L		08/15/23 07:45	08/16/23 12:30	10

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T02 — **Lab Sample ID: 180-158914-2**
Date Collected: 07/06/23 09:25 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	26	B	2.0	1.3	ug/L		08/15/23 07:47	08/16/23 12:51	10

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T03 — **Lab Sample ID: 180-158914-3**
Date Collected: 07/06/23 09:25 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	14		0.40	0.26	ug/L		08/15/23 07:49	08/16/23 16:25	2

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T04 — **Lab Sample ID: 180-158914-4**
Date Collected: 07/06/23 09:25 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	23		1.0	0.65	ug/L		08/15/23 07:50	08/16/23 16:30	5

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T05 — **Lab Sample ID: 180-158914-5**
Date Collected: 07/06/23 09:25 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	84	B	2.0	1.3	ug/L		08/15/23 07:53	08/16/23 16:31	10

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T06 — **Lab Sample ID: 180-158914-6**
Date Collected: 07/06/23 09:25 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	40		2.0	1.3	ug/L		08/15/23 07:58	08/16/23 16:35	10

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T07 — **Lab Sample ID: 180-158914-7**
Date Collected: 07/06/23 09:25 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	39		2.0	1.3	ug/L		08/15/23 07:59	08/16/23 16:40	10

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T08 — **Lab Sample ID: 180-158914-8**
Date Collected: 07/06/23 09:25 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	9.2		0.20	0.13	ug/L		08/22/23 10:22	08/22/23 15:30	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T09 — **Lab Sample ID: 180-158914-9**
Date Collected: 07/06/23 09:25 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	12		0.40	0.26	ug/L		08/22/23 10:25	08/22/23 16:41	2

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T01 — **Lab Sample ID: 180-158914-10**
Date Collected: 07/06/23 09:35 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.31	B	0.20	0.13	ug/L		08/15/23 07:45	08/16/23 12:34	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T02 — **Lab Sample ID: 180-158914-11**
Date Collected: 07/06/23 09:35 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.15	J B	0.20	0.13	ug/L		08/15/23 07:47	08/16/23 13:31	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T03 — **Lab Sample ID: 180-158914-12**
Date Collected: 07/06/23 09:35 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 07:49	08/16/23 13:41	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T04 — **Lab Sample ID: 180-158914-13**
Date Collected: 07/06/23 09:35 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13	J	0.20	0.13	ug/L		08/15/23 07:50	08/16/23 14:17	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T05 — **Lab Sample ID: 180-158914-14**
Date Collected: 07/06/23 09:35 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.28	B	0.20	0.13	ug/L		08/15/23 07:53	08/16/23 14:46	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T06 — **Lab Sample ID: 180-158914-15**
Date Collected: 07/06/23 09:35 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.63		0.20	0.13	ug/L		08/15/23 07:58	08/16/23 15:18	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T07 — **Lab Sample ID: 180-158914-16**
Date Collected: 07/06/23 09:35 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.69		0.20	0.13	ug/L		08/15/23 07:59	08/16/23 15:53	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T08 — **Lab Sample ID: 180-158914-17**
Date Collected: 07/06/23 09:35 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20		0.20	0.13	ug/L		08/22/23 10:22	08/22/23 15:32	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T09 — **Lab Sample ID: 180-158914-18**
Date Collected: 07/06/23 09:35 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.8		0.20	0.13	ug/L		08/22/23 10:25	08/22/23 16:01	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T01 — **Lab Sample ID: 180-158914-19**
Date Collected: 07/06/23 09:40 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	15	B	1.0	0.65	ug/L		08/15/23 07:45	08/16/23 12:35	5

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T02 — **Lab Sample ID: 180-158914-20**
Date Collected: 07/06/23 09:40 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.39	B	0.20	0.13	ug/L		08/15/23 07:47	08/16/23 12:59	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T03 — **Lab Sample ID: 180-158914-21**
Date Collected: 07/06/23 09:40 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	7.8	4 F2	0.20	0.13	ug/L		08/15/23 07:49	08/16/23 13:47	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T04 — **Lab Sample ID: 180-158914-22**
Date Collected: 07/06/23 09:40 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	4.4		0.20	0.13	ug/L		08/15/23 07:50	08/16/23 14:19	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T05 — **Lab Sample ID: 180-158914-23**
Date Collected: 07/06/23 09:40 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	8.8	B	0.20	0.13	ug/L		08/15/23 07:53	08/16/23 14:47	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T06 — **Lab Sample ID: 180-158914-24**
Date Collected: 07/06/23 09:40 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	9.4		0.20	0.13	ug/L		08/15/23 07:58	08/16/23 15:19	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T07 — **Lab Sample ID: 180-158914-25**
Date Collected: 07/06/23 09:40 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	9.8		0.20	0.13	ug/L		08/15/23 07:59	08/16/23 15:55	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T08 — **Lab Sample ID: 180-158914-26**
Date Collected: 07/06/23 09:40 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	3.8		0.20	0.13	ug/L		08/22/23 10:22	08/22/23 15:34	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T09 — **Lab Sample ID: 180-158914-27**
Date Collected: 07/06/23 09:40 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	4.7		0.20	0.13	ug/L		08/22/23 10:25	08/22/23 16:02	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T01 — **Lab Sample ID: 180-158914-28**
Date Collected: 07/06/23 09:45 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	11	B	1.0	0.65	ug/L		08/15/23 07:45	08/16/23 12:36	5

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T02 — **Lab Sample ID: 180-158914-29**
Date Collected: 07/06/23 09:45 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	3.3	B	0.20	0.13	ug/L		08/15/23 07:47	08/16/23 13:34	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T03 — **Lab Sample ID: 180-158914-30**
Date Collected: 07/06/23 09:45 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	2.2		0.20	0.13	ug/L		08/15/23 07:49	08/16/23 13:56	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T04 — **Lab Sample ID: 180-158914-31**
Date Collected: 07/06/23 09:45 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.5	FL FH F2	0.20	0.13	ug/L		08/15/23 07:50	08/16/23 14:20	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T055 — **Lab Sample ID: 180-158914-32**
Date Collected: 07/06/23 09:45 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	7.1	B	0.20	0.13	ug/L		08/15/23 07:53	08/16/23 14:50	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T06 — **Lab Sample ID: 180-158914-33**
Date Collected: 07/06/23 09:45 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	26		1.0	0.65	ug/L		08/15/23 07:58	08/16/23 16:36	5

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T07 — **Lab Sample ID: 180-158914-34**
Date Collected: 07/06/23 09:45 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	14		1.0	0.65	ug/L		08/15/23 07:59	08/16/23 16:41	5

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T08 — **Lab Sample ID: 180-158914-35**
Date Collected: 07/06/23 09:45 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	2.9		0.20	0.13	ug/L		08/22/23 10:22	08/22/23 15:35	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T09 — **Lab Sample ID: 180-158914-36**
Date Collected: 07/06/23 09:45 — **Matrix: Solid**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA) - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.1		0.20	0.13	ug/L		08/22/23 10:25	08/22/23 16:03	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T01 — **Lab Sample ID: 180-158914-38**
Date Collected: 08/09/23 11:11 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.18	J	0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:06	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T02 — **Lab Sample ID: 180-158914-39**
Date Collected: 08/09/23 18:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.63		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:07	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T03 — **Lab Sample ID: 180-158914-40**
Date Collected: 08/10/23 06:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:08	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T04 — **Lab Sample ID: 180-158914-41**
Date Collected: 08/10/23 18:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.45		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:11	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T05 — **Lab Sample ID: 180-158914-42**
Date Collected: 08/11/23 06:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.6		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:12	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T06 — **Lab Sample ID: 180-158914-43**
Date Collected: 08/13/23 18:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.0		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:13	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T07 — **Lab Sample ID: 180-158914-44**
Date Collected: 08/14/23 06:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:14	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T08 — **Lab Sample ID: 180-158914-45**
Date Collected: 08/18/23 18:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.30**		0.20	0.13	ug/L		08/23/23 08:37	08/23/23 14:39	1

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T09 — **Lab Sample ID: 180-158914-46**
Date Collected: 08/19/23 06:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.37**		0.20	0.13	ug/L		08/23/23 08:37	08/23/23 14:40	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T01 — **Lab Sample ID: 180-158914-47**
Date Collected: 08/09/23 11:11 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**1.8**		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:15	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T02 — **Lab Sample ID: 180-158914-48**
Date Collected: 08/09/23 18:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:16	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T03 — **Lab Sample ID: 180-158914-49**
Date Collected: 08/10/23 06:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.23**		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 09:17	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T04 — **Lab Sample ID: 180-158914-50**
Date Collected: 08/10/23 18:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:36	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T05
Lab Sample ID: 180-158914-51
Date Collected: 08/11/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.3		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:37	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T06
Lab Sample ID: 180-158914-52
Date Collected: 08/13/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.42		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:38	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T07
Lab Sample ID: 180-158914-53
Date Collected: 08/14/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:39	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T08
Lab Sample ID: 180-158914-54
Date Collected: 08/18/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/23/23 08:37	08/23/23 14:41	1

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T09
Lab Sample ID: 180-158914-55
Date Collected: 08/19/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.33		0.20	0.13	ug/L		08/23/23 08:37	08/23/23 14:42	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T01
Lab Sample ID: 180-158914-56
Date Collected: 08/09/23 11:11
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.24		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:40	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T02
Lab Sample ID: 180-158914-57
Date Collected: 08/09/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.26		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:41	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T03
Lab Sample ID: 180-158914-58
Date Collected: 08/10/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:42	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T04
Lab Sample ID: 180-158914-59
Date Collected: 08/10/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.18**	**J**	0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:43	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T05
Lab Sample ID: 180-158914-60
Date Collected: 08/11/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:44	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T06
Lab Sample ID: 180-158914-61
Date Collected: 08/13/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.45**		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:45	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T07
Lab Sample ID: 180-158914-62
Date Collected: 08/14/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.50**		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:48	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T08
Lab Sample ID: 180-158914-63
Date Collected: 08/18/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/23/23 08:37	08/23/23 14:43	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T09
Lab Sample ID: 180-158914-64
Date Collected: 08/19/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.28**		0.20	0.13	ug/L		08/23/23 08:37	08/23/23 14:44	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T01 — **Lab Sample ID: 180-158914-65**
Date Collected: 08/09/23 11:11 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:49	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T02 — **Lab Sample ID: 180-158914-66**
Date Collected: 08/09/23 18:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:50	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T03 — **Lab Sample ID: 180-158914-67**
Date Collected: 08/10/23 06:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13	J	0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:51	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T04 — **Lab Sample ID: 180-158914-68**
Date Collected: 08/10/23 18:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.27		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:52	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T05 — **Lab Sample ID: 180-158914-69**
Date Collected: 08/11/23 06:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	7.8		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:54	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T06 — **Lab Sample ID: 180-158914-70**
Date Collected: 08/13/23 18:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	7.0		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:56	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T07 — **Lab Sample ID: 180-158914-71**
Date Collected: 08/14/23 06:23 — **Matrix: Water**
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.75		0.20	0.13	ug/L		08/15/23 13:47	08/16/23 09:58	1

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T08
Lab Sample ID: 180-158914-72
Date Collected: 08/18/23 18:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.85		0.20	0.13	ug/L		08/23/23 08:37	08/23/23 14:49	1

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T09
Lab Sample ID: 180-158914-73
Date Collected: 08/19/23 06:23
Matrix: Water
Date Received: 07/06/23 19:15

Method: SW846 EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.36		0.20	0.13	ug/L		08/23/23 08:41	08/23/23 14:50	1

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-443455/1-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443455

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.149	J B	0.20	0.13	ug/L		08/15/23 07:45	08/16/23 11:26	1

Lab Sample ID: LCS 180-443455/2-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443455

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.74		ug/L		109	80 - 120

Lab Sample ID: MB 180-443456/1-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443456

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.142	J B	0.20	0.13	ug/L		08/15/23 07:47	08/16/23 11:50	1

Lab Sample ID: LCS 180-443456/2-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443456

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.70		ug/L		108	80 - 120

Lab Sample ID: MB 180-443457/1-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443457

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 07:49	08/16/23 13:35	1

Lab Sample ID: LCS 180-443457/2-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443457

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.62		ug/L		105	80 - 120

Lab Sample ID: MB 180-443458/1-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443458

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 07:50	08/16/23 14:11	1

Lab Sample ID: LCS 180-443458/2-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443458

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.56		ug/L		102	80 - 120

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-443459/1-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443459

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.131	J B	0.20	0.13	ug/L		08/15/23 07:53	08/16/23 14:39	1

Lab Sample ID: LCS 180-443459/2-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443459

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.56		ug/L		102	80 - 120

Lab Sample ID: MB 180-443468/1-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443468

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 07:58	08/16/23 15:11	1

Lab Sample ID: LCS 180-443468/2-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443468

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.49		ug/L		100	80 - 120

Lab Sample ID: MB 180-443470/1-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443470

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 07:59	08/16/23 15:46	1

Lab Sample ID: LCS 180-443470/2-A
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443470

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.50		ug/L		100	80 - 120

Lab Sample ID: MB 180-443525/1-A
Matrix: Water
Analysis Batch: 443657

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443525

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:42	08/16/23 08:58	1

Lab Sample ID: LCS 180-443525/2-A
Matrix: Water
Analysis Batch: 443657

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443525

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.54		ug/L		102	80 - 120

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-443527/1-A
Matrix: Water
Analysis Batch: 443657

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443527

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/15/23 13:46	08/16/23 09:27	1

Lab Sample ID: LCS 180-443527/2-A
Matrix: Water
Analysis Batch: 443657

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443527

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.48		ug/L		99	80 - 120

Lab Sample ID: MB 180-444264/1-A
Matrix: Solid
Analysis Batch: 444307

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444264

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/22/23 10:22	08/22/23 15:28	1

Lab Sample ID: LCS 180-444264/2-A
Matrix: Solid
Analysis Batch: 444307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444264

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.05		ug/L		82	80 - 120

Lab Sample ID: MB 180-444265/1-A
Matrix: Solid
Analysis Batch: 444307

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444265

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/22/23 10:25	08/22/23 15:55	1

Lab Sample ID: LCS 180-444265/2-A
Matrix: Solid
Analysis Batch: 444307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444265

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.04		ug/L		82	80 - 120

Lab Sample ID: MB 180-444384/1-A
Matrix: Water
Analysis Batch: 444485

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444384

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		08/23/23 08:37	08/23/23 14:21	1

Lab Sample ID: LCS 180-444384/2-A
Matrix: Water
Analysis Batch: 444485

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444384

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.28		ug/L		91	80 - 120

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: LCSD 180-444384/3-A
Matrix: Water
Analysis Batch: 444485

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 444384

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury			2.50	2.32		ug/L		93	80 - 120	2	20

Lab Sample ID: 180-158914-1 MS
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T01
Prep Type: Leach
Prep Batch: 443455

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	57	B 4 F2	1.00	16.5	4	ug/L		-4012	75 - 125		

Lab Sample ID: 180-158914-1 MSD
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: R-5473, BLENDER #3, BATCH 36 T01
Prep Type: Leach
Prep Batch: 443455

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	57	B 4 F2	1.00	36.3	4 F2	ug/L		-2031	75 - 125	75	20

Lab Sample ID: 180-158914-11 MS
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T02
Prep Type: Leach
Prep Batch: 443456

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	0.15	J B	1.00	1.08		ug/L		93	75 - 125		

Lab Sample ID: 180-158914-11 MSD
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: R-5475, BLENDER #4, BATCH 26 T02
Prep Type: Leach
Prep Batch: 443456

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.15	J B	1.00	1.02		ug/L		87	75 - 125	5	20

Lab Sample ID: 180-158914-21 MS
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T03
Prep Type: Leach
Prep Batch: 443457

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	7.8	4 F2	1.00	1.36	4	ug/L		-642	75 - 125		

Lab Sample ID: 180-158914-21 MSD
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: R-5476, BLENDER #2, BATCH 105 T03
Prep Type: Leach
Prep Batch: 443457

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	7.8	4 F2	1.00	1.80	4 F2	ug/L		-598	75 - 125	28	20

Lab Sample ID: 180-158914-31 MS
Matrix: Solid
Analysis Batch: 443708

Client Sample ID: SAMPLE DUPLICATE 07/06/23 T04
Prep Type: Leach
Prep Batch: 443458

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	1.5	FL FH F2	1.00	1.49	FL	ug/L		-5	75 - 125		

Client: US Ecology Inc
Job ID: 180-158914-1
Project/Site: Republic Services Mercury Project REVISE

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: 180-158914-31 MSD
Client Sample ID: SAMPLE DUPLICATE 07/06/23 T04
Matrix: Solid
Prep Type: Leach
Analysis Batch: 443708
Prep Batch: 443458

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	1.5	FL FH F2	1.00	3.53	FH F2	ug/L		199	75 - 125	81	20

Metals

Leach Batch: 442647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-1	R-5473, BLENDER #3, BATCH 36 T01	Leach	Solid	1314	
180-158914-10	R-5475, BLENDER #4, BATCH 26 T01	Leach	Solid	1314	
180-158914-19	R-5476, BLENDER #2, BATCH 105 T01	Leach	Solid	1314	
180-158914-28	SAMPLE DUPLICATE 07/06/23 T01	Leach	Solid	1314	
180-158914-1 MS	R-5473, BLENDER #3, BATCH 36 T01	Leach	Solid	1314	
180-158914-1 MSD	R-5473, BLENDER #3, BATCH 36 T01	Leach	Solid	1314	

Leach Batch: 442954

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-2	R-5473, BLENDER #3, BATCH 36 T02	Leach	Solid	1314	
180-158914-11	R-5475, BLENDER #4, BATCH 26 T02	Leach	Solid	1314	
180-158914-20	R-5476, BLENDER #2, BATCH 105 T02	Leach	Solid	1314	
180-158914-29	SAMPLE DUPLICATE 07/06/23 T02	Leach	Solid	1314	
180-158914-11 MS	R-5475, BLENDER #4, BATCH 26 T02	Leach	Solid	1314	
180-158914-11 MSD	R-5475, BLENDER #4, BATCH 26 T02	Leach	Solid	1314	

Leach Batch: 442956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-3	R-5473, BLENDER #3, BATCH 36 T03	Leach	Solid	1314	
180-158914-12	R-5475, BLENDER #4, BATCH 26 T03	Leach	Solid	1314	
180-158914-21	R-5476, BLENDER #2, BATCH 105 T03	Leach	Solid	1314	
180-158914-30	SAMPLE DUPLICATE 07/06/23 T03	Leach	Solid	1314	
180-158914-21 MS	R-5476, BLENDER #2, BATCH 105 T03	Leach	Solid	1314	
180-158914-21 MSD	R-5476, BLENDER #2, BATCH 105 T03	Leach	Solid	1314	

Leach Batch: 442963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-4	R-5473, BLENDER #3, BATCH 36 T04	Leach	Solid	1314	
180-158914-13	R-5475, BLENDER #4, BATCH 26 T04	Leach	Solid	1314	
180-158914-22	R-5476, BLENDER #2, BATCH 105 T04	Leach	Solid	1314	
180-158914-31	SAMPLE DUPLICATE 07/06/23 T04	Leach	Solid	1314	
180-158914-31 MS	SAMPLE DUPLICATE 07/06/23 T04	Leach	Solid	1314	
180-158914-31 MSD	SAMPLE DUPLICATE 07/06/23 T04	Leach	Solid	1314	

Leach Batch: 442964

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-5	R-5473, BLENDER #3, BATCH 36 T05	Leach	Solid	1314	
180-158914-14	R-5475, BLENDER #4, BATCH 26 T05	Leach	Solid	1314	
180-158914-23	R-5476, BLENDER #2, BATCH 105 T05	Leach	Solid	1314	
180-158914-32	SAMPLE DUPLICATE 07/06/23 T055	Leach	Solid	1314	

Leach Batch: 442966

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-6	R-5473, BLENDER #3, BATCH 36 T06	Leach	Solid	1314	
180-158914-15	R-5475, BLENDER #4, BATCH 26 T06	Leach	Solid	1314	
180-158914-24	R-5476, BLENDER #2, BATCH 105 T06	Leach	Solid	1314	
180-158914-33	SAMPLE DUPLICATE 07/06/23 T06	Leach	Solid	1314	

Leach Batch: 442967

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-7	R-5473, BLENDER #3, BATCH 36 T07	Leach	Solid	1314	

Metals (Continued)

Leach Batch: 442967 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-16	R-5475, BLENDER #4, BATCH 26 T07	Leach	Solid	1314	
180-158914-25	R-5476, BLENDER #2, BATCH 105 T07	Leach	Solid	1314	
180-158914-34	SAMPLE DUPLICATE 07/06/23 T07	Leach	Solid	1314	

Leach Batch: 442968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-8	R-5473, BLENDER #3, BATCH 36 T08	Leach	Solid	1314	
180-158914-17	R-5475, BLENDER #4, BATCH 26 T08	Leach	Solid	1314	
180-158914-26	R-5476, BLENDER #2, BATCH 105 T08	Leach	Solid	1314	
180-158914-35	SAMPLE DUPLICATE 07/06/23 T08	Leach	Solid	1314	

Leach Batch: 442969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-9	R-5473, BLENDER #3, BATCH 36 T09	Leach	Solid	1314	
180-158914-18	R-5475, BLENDER #4, BATCH 26 T09	Leach	Solid	1314	
180-158914-27	R-5476, BLENDER #2, BATCH 105 T09	Leach	Solid	1314	
180-158914-36	SAMPLE DUPLICATE 07/06/23 T09	Leach	Solid	1314	

Prep Batch: 443455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-1	R-5473, BLENDER #3, BATCH 36 T01	Leach	Solid	7470A	442647
180-158914-10	R-5475, BLENDER #4, BATCH 26 T01	Leach	Solid	7470A	442647
180-158914-19	R-5476, BLENDER #2, BATCH 105 T01	Leach	Solid	7470A	442647
180-158914-28	SAMPLE DUPLICATE 07/06/23 T01	Leach	Solid	7470A	442647
MB 180-443455/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-443455/2-A	Lab Control Sample	Total/NA	Solid	7470A	
180-158914-1 MS	R-5473, BLENDER #3, BATCH 36 T01	Leach	Solid	7470A	442647
180-158914-1 MSD	R-5473, BLENDER #3, BATCH 36 T01	Leach	Solid	7470A	442647

Prep Batch: 443456

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-2	R-5473, BLENDER #3, BATCH 36 T02	Leach	Solid	7470A	442954
180-158914-11	R-5475, BLENDER #4, BATCH 26 T02	Leach	Solid	7470A	442954
180-158914-20	R-5476, BLENDER #2, BATCH 105 T02	Leach	Solid	7470A	442954
180-158914-29	SAMPLE DUPLICATE 07/06/23 T02	Leach	Solid	7470A	442954
MB 180-443456/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-443456/2-A	Lab Control Sample	Total/NA	Solid	7470A	
180-158914-11 MS	R-5475, BLENDER #4, BATCH 26 T02	Leach	Solid	7470A	442954
180-158914-11 MSD	R-5475, BLENDER #4, BATCH 26 T02	Leach	Solid	7470A	442954

Prep Batch: 443457

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-3	R-5473, BLENDER #3, BATCH 36 T03	Leach	Solid	7470A	442956
180-158914-12	R-5475, BLENDER #4, BATCH 26 T03	Leach	Solid	7470A	442956
180-158914-21	R-5476, BLENDER #2, BATCH 105 T03	Leach	Solid	7470A	442956
180-158914-30	SAMPLE DUPLICATE 07/06/23 T03	Leach	Solid	7470A	442956
MB 180-443457/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-443457/2-A	Lab Control Sample	Total/NA	Solid	7470A	
180-158914-21 MS	R-5476, BLENDER #2, BATCH 105 T03	Leach	Solid	7470A	442956
180-158914-21 MSD	R-5476, BLENDER #2, BATCH 105 T03	Leach	Solid	7470A	442956

Metals

Prep Batch: 443458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-4	R-5473, BLENDER #3, BATCH 36 T04	Leach	Solid	7470A	442963
180-158914-13	R-5475, BLENDER #4, BATCH 26 T04	Leach	Solid	7470A	442963
180-158914-22	R-5476, BLENDER #2, BATCH 105 T04	Leach	Solid	7470A	442963
180-158914-31	SAMPLE DUPLICATE 07/06/23 T04	Leach	Solid	7470A	442963
MB 180-443458/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-443458/2-A	Lab Control Sample	Total/NA	Solid	7470A	
180-158914-31 MS	SAMPLE DUPLICATE 07/06/23 T04	Leach	Solid	7470A	442963
180-158914-31 MSD	SAMPLE DUPLICATE 07/06/23 T04	Leach	Solid	7470A	442963

Prep Batch: 443459

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-5	R-5473, BLENDER #3, BATCH 36 T05	Leach	Solid	7470A	442964
180-158914-14	R-5475, BLENDER #4, BATCH 26 T05	Leach	Solid	7470A	442964
180-158914-23	R-5476, BLENDER #2, BATCH 105 T05	Leach	Solid	7470A	442964
180-158914-32	SAMPLE DUPLICATE 07/06/23 T055	Leach	Solid	7470A	442964
MB 180-443459/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-443459/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Prep Batch: 443468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-6	R-5473, BLENDER #3, BATCH 36 T06	Leach	Solid	7470A	442966
180-158914-15	R-5475, BLENDER #4, BATCH 26 T06	Leach	Solid	7470A	442966
180-158914-24	R-5476, BLENDER #2, BATCH 105 T06	Leach	Solid	7470A	442966
180-158914-33	SAMPLE DUPLICATE 07/06/23 T06	Leach	Solid	7470A	442966
MB 180-443468/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-443468/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Prep Batch: 443470

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-7	R-5473, BLENDER #3, BATCH 36 T07	Leach	Solid	7470A	442967
180-158914-16	R-5475, BLENDER #4, BATCH 26 T07	Leach	Solid	7470A	442967
180-158914-25	R-5476, BLENDER #2, BATCH 105 T07	Leach	Solid	7470A	442967
180-158914-34	SAMPLE DUPLICATE 07/06/23 T07	Leach	Solid	7470A	442967
MB 180-443470/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-443470/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Prep Batch: 443525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-38	R-5473, BLENDER #3, BATCH 36 T01	Total/NA	Water	7470A	
180-158914-39	R-5473, BLENDER #3, BATCH 36 T02	Total/NA	Water	7470A	
180-158914-40	R-5473, BLENDER #3, BATCH 36 T03	Total/NA	Water	7470A	
180-158914-41	R-5473, BLENDER #3, BATCH 36 T04	Total/NA	Water	7470A	
180-158914-42	R-5473, BLENDER #3, BATCH 36 T05	Total/NA	Water	7470A	
180-158914-43	R-5473, BLENDER #3, BATCH 36 T06	Total/NA	Water	7470A	
180-158914-44	R-5473, BLENDER #3, BATCH 36 T07	Total/NA	Water	7470A	
180-158914-47	R-5475, BLENDER #4, BATCH 26 T01	Total/NA	Water	7470A	
180-158914-48	R-5475, BLENDER #4, BATCH 26 T02	Total/NA	Water	7470A	
180-158914-49	R-5475, BLENDER #4, BATCH 26 T03	Total/NA	Water	7470A	
MB 180-443525/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-443525/2-A	Lab Control Sample	Total/NA	Water	7470A	

Metals

Prep Batch: 443527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-50	R-5475, BLENDER #4, BATCH 26 T04	Total/NA	Water	7470A	
180-158914-51	R-5475, BLENDER #4, BATCH 26 T05	Total/NA	Water	7470A	
180-158914-52	R-5475, BLENDER #4, BATCH 26 T06	Total/NA	Water	7470A	
180-158914-53	R-5475, BLENDER #4, BATCH 26 T07	Total/NA	Water	7470A	
180-158914-56	R-5476, BLENDER #2, BATCH 105 T01	Total/NA	Water	7470A	
180-158914-57	R-5476, BLENDER #2, BATCH 105 T02	Total/NA	Water	7470A	
180-158914-58	R-5476, BLENDER #2, BATCH 105 T03	Total/NA	Water	7470A	
180-158914-59	R-5476, BLENDER #2, BATCH 105 T04	Total/NA	Water	7470A	
180-158914-60	R-5476, BLENDER #2, BATCH 105 T05	Total/NA	Water	7470A	
180-158914-61	R-5476, BLENDER #2, BATCH 105 T06	Total/NA	Water	7470A	
180-158914-62	R-5476, BLENDER #2, BATCH 105 T07	Total/NA	Water	7470A	
180-158914-65	SAMPLE DUPLICATE 07/06/23 T01	Total/NA	Water	7470A	
180-158914-66	SAMPLE DUPLICATE 07/06/23 T02	Total/NA	Water	7470A	
180-158914-67	SAMPLE DUPLICATE 07/06/23 T03	Total/NA	Water	7470A	
180-158914-68	SAMPLE DUPLICATE 07/06/23 T04	Total/NA	Water	7470A	
180-158914-69	SAMPLE DUPLICATE 07/06/23 T05	Total/NA	Water	7470A	
180-158914-70	SAMPLE DUPLICATE 07/06/23 T06	Total/NA	Water	7470A	
180-158914-71	SAMPLE DUPLICATE 07/06/23 T07	Total/NA	Water	7470A	
MB 180-443527/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-443527/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 443657

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-38	R-5473, BLENDER #3, BATCH 36 T01	Total/NA	Water	EPA 7470A	443525
180-158914-39	R-5473, BLENDER #3, BATCH 36 T02	Total/NA	Water	EPA 7470A	443525
180-158914-40	R-5473, BLENDER #3, BATCH 36 T03	Total/NA	Water	EPA 7470A	443525
180-158914-41	R-5473, BLENDER #3, BATCH 36 T04	Total/NA	Water	EPA 7470A	443525
180-158914-42	R-5473, BLENDER #3, BATCH 36 T05	Total/NA	Water	EPA 7470A	443525
180-158914-43	R-5473, BLENDER #3, BATCH 36 T06	Total/NA	Water	EPA 7470A	443525
180-158914-44	R-5473, BLENDER #3, BATCH 36 T07	Total/NA	Water	EPA 7470A	443525
180-158914-47	R-5475, BLENDER #4, BATCH 26 T01	Total/NA	Water	EPA 7470A	443525
180-158914-48	R-5475, BLENDER #4, BATCH 26 T02	Total/NA	Water	EPA 7470A	443525
180-158914-49	R-5475, BLENDER #4, BATCH 26 T03	Total/NA	Water	EPA 7470A	443525
180-158914-50	R-5475, BLENDER #4, BATCH 26 T04	Total/NA	Water	EPA 7470A	443527
180-158914-51	R-5475, BLENDER #4, BATCH 26 T05	Total/NA	Water	EPA 7470A	443527
180-158914-52	R-5475, BLENDER #4, BATCH 26 T06	Total/NA	Water	EPA 7470A	443527
180-158914-53	R-5475, BLENDER #4, BATCH 26 T07	Total/NA	Water	EPA 7470A	443527
180-158914-56	R-5476, BLENDER #2, BATCH 105 T01	Total/NA	Water	EPA 7470A	443527
180-158914-57	R-5476, BLENDER #2, BATCH 105 T02	Total/NA	Water	EPA 7470A	443527
180-158914-58	R-5476, BLENDER #2, BATCH 105 T03	Total/NA	Water	EPA 7470A	443527
180-158914-59	R-5476, BLENDER #2, BATCH 105 T04	Total/NA	Water	EPA 7470A	443527
180-158914-60	R-5476, BLENDER #2, BATCH 105 T05	Total/NA	Water	EPA 7470A	443527
180-158914-61	R-5476, BLENDER #2, BATCH 105 T06	Total/NA	Water	EPA 7470A	443527
180-158914-62	R-5476, BLENDER #2, BATCH 105 T07	Total/NA	Water	EPA 7470A	443527
180-158914-65	SAMPLE DUPLICATE 07/06/23 T01	Total/NA	Water	EPA 7470A	443527
180-158914-66	SAMPLE DUPLICATE 07/06/23 T02	Total/NA	Water	EPA 7470A	443527
180-158914-67	SAMPLE DUPLICATE 07/06/23 T03	Total/NA	Water	EPA 7470A	443527
180-158914-68	SAMPLE DUPLICATE 07/06/23 T04	Total/NA	Water	EPA 7470A	443527
180-158914-69	SAMPLE DUPLICATE 07/06/23 T05	Total/NA	Water	EPA 7470A	443527
180-158914-70	SAMPLE DUPLICATE 07/06/23 T06	Total/NA	Water	EPA 7470A	443527
180-158914-71	SAMPLE DUPLICATE 07/06/23 T07	Total/NA	Water	EPA 7470A	443527

Metals (Continued)

Analysis Batch: 443657 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-443525/1-A	Method Blank	Total/NA	Water	EPA 7470A	443525
MB 180-443527/1-A	Method Blank	Total/NA	Water	EPA 7470A	443527
LCS 180-443525/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	443525
LCS 180-443527/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	443527

Analysis Batch: 443708

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-1	R-5473, BLENDER #3, BATCH 36 T01	Leach	Solid	EPA 7470A	443455
180-158914-2	R-5473, BLENDER #3, BATCH 36 T02	Leach	Solid	EPA 7470A	443456
180-158914-3	R-5473, BLENDER #3, BATCH 36 T03	Leach	Solid	EPA 7470A	443457
180-158914-4	R-5473, BLENDER #3, BATCH 36 T04	Leach	Solid	EPA 7470A	443458
180-158914-5	R-5473, BLENDER #3, BATCH 36 T05	Leach	Solid	EPA 7470A	443459
180-158914-6	R-5473, BLENDER #3, BATCH 36 T06	Leach	Solid	EPA 7470A	443468
180-158914-7	R-5473, BLENDER #3, BATCH 36 T07	Leach	Solid	EPA 7470A	443470
180-158914-10	R-5475, BLENDER #4, BATCH 26 T01	Leach	Solid	EPA 7470A	443455
180-158914-11	R-5475, BLENDER #4, BATCH 26 T02	Leach	Solid	EPA 7470A	443456
180-158914-12	R-5475, BLENDER #4, BATCH 26 T03	Leach	Solid	EPA 7470A	443457
180-158914-13	R-5475, BLENDER #4, BATCH 26 T04	Leach	Solid	EPA 7470A	443458
180-158914-14	R-5475, BLENDER #4, BATCH 26 T05	Leach	Solid	EPA 7470A	443459
180-158914-15	R-5475, BLENDER #4, BATCH 26 T06	Leach	Solid	EPA 7470A	443468
180-158914-16	R-5475, BLENDER #4, BATCH 26 T07	Leach	Solid	EPA 7470A	443470
180-158914-19	R-5476, BLENDER #2, BATCH 105 T01	Leach	Solid	EPA 7470A	443455
180-158914-20	R-5476, BLENDER #2, BATCH 105 T02	Leach	Solid	EPA 7470A	443456
180-158914-21	R-5476, BLENDER #2, BATCH 105 T03	Leach	Solid	EPA 7470A	443457
180-158914-22	R-5476, BLENDER #2, BATCH 105 T04	Leach	Solid	EPA 7470A	443458
180-158914-23	R-5476, BLENDER #2, BATCH 105 T05	Leach	Solid	EPA 7470A	443459
180-158914-24	R-5476, BLENDER #2, BATCH 105 T06	Leach	Solid	EPA 7470A	443468
180-158914-25	R-5476, BLENDER #2, BATCH 105 T07	Leach	Solid	EPA 7470A	443470
180-158914-28	SAMPLE DUPLICATE 07/06/23 T01	Leach	Solid	EPA 7470A	443455
180-158914-29	SAMPLE DUPLICATE 07/06/23 T02	Leach	Solid	EPA 7470A	443456
180-158914-30	SAMPLE DUPLICATE 07/06/23 T03	Leach	Solid	EPA 7470A	443457
180-158914-31	SAMPLE DUPLICATE 07/06/23 T04	Leach	Solid	EPA 7470A	443458
180-158914-32	SAMPLE DUPLICATE 07/06/23 T055	Leach	Solid	EPA 7470A	443459
180-158914-33	SAMPLE DUPLICATE 07/06/23 T06	Leach	Solid	EPA 7470A	443468
180-158914-34	SAMPLE DUPLICATE 07/06/23 T07	Leach	Solid	EPA 7470A	443470
MB 180-443455/1-A	Method Blank	Total/NA	Solid	EPA 7470A	443455
MB 180-443456/1-A	Method Blank	Total/NA	Solid	EPA 7470A	443456
MB 180-443457/1-A	Method Blank	Total/NA	Solid	EPA 7470A	443457
MB 180-443458/1-A	Method Blank	Total/NA	Solid	EPA 7470A	443458
MB 180-443459/1-A	Method Blank	Total/NA	Solid	EPA 7470A	443459
MB 180-443468/1-A	Method Blank	Total/NA	Solid	EPA 7470A	443468
MB 180-443470/1-A	Method Blank	Total/NA	Solid	EPA 7470A	443470
LCS 180-443455/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	443455
LCS 180-443456/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	443456
LCS 180-443457/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	443457
LCS 180-443458/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	443458
LCS 180-443459/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	443459
LCS 180-443468/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	443468
LCS 180-443470/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	443470
180-158914-1 MS	R-5473, BLENDER #3, BATCH 36 T01	Leach	Solid	EPA 7470A	443455
180-158914-1 MSD	R-5473, BLENDER #3, BATCH 36 T01	Leach	Solid	EPA 7470A	443455

Metals (Continued)

Analysis Batch: 443708 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-11 MS	R-5475, BLENDER #4, BATCH 26 T02	Leach	Solid	EPA 7470A	443456
180-158914-11 MSD	R-5475, BLENDER #4, BATCH 26 T02	Leach	Solid	EPA 7470A	443456
180-158914-21 MS	R-5476, BLENDER #2, BATCH 105 T03	Leach	Solid	EPA 7470A	443457
180-158914-21 MSD	R-5476, BLENDER #2, BATCH 105 T03	Leach	Solid	EPA 7470A	443457
180-158914-31 MS	SAMPLE DUPLICATE 07/06/23 T04	Leach	Solid	EPA 7470A	443458
180-158914-31 MSD	SAMPLE DUPLICATE 07/06/23 T04	Leach	Solid	EPA 7470A	443458

Prep Batch: 444264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-8	R-5473, BLENDER #3, BATCH 36 T08	Leach	Solid	7470A	442968
180-158914-17	R-5475, BLENDER #4, BATCH 26 T08	Leach	Solid	7470A	442968
180-158914-26	R-5476, BLENDER #2, BATCH 105 T08	Leach	Solid	7470A	442968
180-158914-35	SAMPLE DUPLICATE 07/06/23 T08	Leach	Solid	7470A	442968
MB 180-444264/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-444264/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Prep Batch: 444265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-9	R-5473, BLENDER #3, BATCH 36 T09	Leach	Solid	7470A	442969
180-158914-18	R-5475, BLENDER #4, BATCH 26 T09	Leach	Solid	7470A	442969
180-158914-27	R-5476, BLENDER #2, BATCH 105 T09	Leach	Solid	7470A	442969
180-158914-36	SAMPLE DUPLICATE 07/06/23 T09	Leach	Solid	7470A	442969
MB 180-444265/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-444265/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Analysis Batch: 444307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-8	R-5473, BLENDER #3, BATCH 36 T08	Leach	Solid	EPA 7470A	444264
180-158914-9	R-5473, BLENDER #3, BATCH 36 T09	Leach	Solid	EPA 7470A	444265
180-158914-17	R-5475, BLENDER #4, BATCH 26 T08	Leach	Solid	EPA 7470A	444264
180-158914-18	R-5475, BLENDER #4, BATCH 26 T09	Leach	Solid	EPA 7470A	444265
180-158914-26	R-5476, BLENDER #2, BATCH 105 T08	Leach	Solid	EPA 7470A	444264
180-158914-27	R-5476, BLENDER #2, BATCH 105 T09	Leach	Solid	EPA 7470A	444265
180-158914-35	SAMPLE DUPLICATE 07/06/23 T08	Leach	Solid	EPA 7470A	444264
180-158914-36	SAMPLE DUPLICATE 07/06/23 T09	Leach	Solid	EPA 7470A	444265
MB 180-444264/1-A	Method Blank	Total/NA	Solid	EPA 7470A	444264
MB 180-444265/1-A	Method Blank	Total/NA	Solid	EPA 7470A	444265
LCS 180-444264/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	444264
LCS 180-444265/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	444265

Prep Batch: 444384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-45	R-5473, BLENDER #3, BATCH 36 T08	Total/NA	Water	7470A	
180-158914-46	R-5473, BLENDER #3, BATCH 36 T09	Total/NA	Water	7470A	
180-158914-54	R-5475, BLENDER #4, BATCH 26 T08	Total/NA	Water	7470A	
180-158914-55	R-5475, BLENDER #4, BATCH 26 T09	Total/NA	Water	7470A	
180-158914-63	R-5476, BLENDER #2, BATCH 105 T08	Total/NA	Water	7470A	
180-158914-64	R-5476, BLENDER #2, BATCH 105 T09	Total/NA	Water	7470A	
180-158914-72	SAMPLE DUPLICATE 07/06/23 T08	Total/NA	Water	7470A	
180-158914-73	SAMPLE DUPLICATE 07/06/23 T09	Total/NA	Water	7470A	
MB 180-444384/1-A	Method Blank	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 444384 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-444384/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 180-444384/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

Analysis Batch: 444485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-158914-45	R-5473, BLENDER #3, BATCH 36 T08	Total/NA	Water	EPA 7470A	444384
180-158914-46	R-5473, BLENDER #3, BATCH 36 T09	Total/NA	Water	EPA 7470A	444384
180-158914-54	R-5475, BLENDER #4, BATCH 26 T08	Total/NA	Water	EPA 7470A	444384
180-158914-55	R-5475, BLENDER #4, BATCH 26 T09	Total/NA	Water	EPA 7470A	444384
180-158914-63	R-5476, BLENDER #2, BATCH 105 T08	Total/NA	Water	EPA 7470A	444384
180-158914-64	R-5476, BLENDER #2, BATCH 105 T09	Total/NA	Water	EPA 7470A	444384
180-158914-72	SAMPLE DUPLICATE 07/06/23 T08	Total/NA	Water	EPA 7470A	444384
180-158914-73	SAMPLE DUPLICATE 07/06/23 T09	Total/NA	Water	EPA 7470A	444384
MB 180-444384/1-A	Method Blank	Total/NA	Water	EPA 7470A	444384
LCS 180-444384/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	444384
LCSD 180-444384/3-A	Lab Control Sample Dup	Total/NA	Water	EPA 7470A	444384

Chain of Custody Record

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238-2907
phone 412.963.7058 fax 412.963.2468

eurofins | Environment Testing America

8/29/2023

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

Eurofins Environment Testing America

COC No: _____ of _____ COCs

TALS Project #:

Sampler:

For Lab Use Only:
Walk-in Client:
Lab Sampling:

Job / SDG No.:

Client Contact	Project Manager: Paul Canevaro	Site Contact: A. Dugan	Date: 07/06/2023
US Ecology	Email: paul.canevaro@usecology.com	Lab Contact: A. Dugan	Carrier: Eurofins
Address	Tel/Fax: (346) 314-9769		
City/State/Zip	**Analysis Turnaround Time**		
(346) 314-9769 Phone	☐ CALENDAR DAYS ☐ WORKING DAYS		
FAX	TAT if different from Below _____		
Project Name: **Cinnabar (HgS)**	☐ 2 weeks		
Site:	☐ 1 week		
P O #	☐ 2 days		
	☐ 1 day		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TCLP 6010/7470	TCLP 8270	TCLP 8260	TCLP 8081	TCLP 8151	1314 7470B	Sample Specific Notes:
R-5473, Blender #3, Batch 36	7/6/2023	9:25 AM	G	S	1			X	X	X	X	X	X	
R-5475, Blender #4, Batch 26	7/6/2023	9:35 AM	G	S	1			X	X	X	X	X	X	
R-5476, Blender #2, Batch 105	7/6/2023	9:40 AM	G	S	1			X	X	X	X	X	X	
Sample Duplicate 07/06/2023	7/6/2023	9:45 AM	G	S	1			X	X	X	X	X	X	
								6	6	6	6	6	6	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other None

180-158886 Chain of Custody

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if sam

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: The US Ecology Quality Assurance Project Plan, petition for site-specific determination of equivalent treatment for elemental mercury waste (D009 and U151) under the land disposal restrictions. Please coordinate with Larry Matko.

Custody Seals Intact: ☑ Yes ☐ No | Custody Seal No.: 1805553 | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

Relinquished by:	Company: USE	Date/Time: 10:55 AM	Received by:	Company: USEQ	Date/Time: 7-6-23 10:55
Relinquished by:	Company: USEQ	Date/Time: 7-6-23	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: ETTMS	Date/Time: 7-6-23 19:15

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-158914-1

Login Number: 158914
List Number: 1
Creator: Matko, Larry

List Source: Eurofins Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	thermal preservation not required
Cooler Temperature is acceptable.	N/A	thermal preservation not required
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Paul Canevaro
US Ecology Inc
101 S Capitol Boulevard Suite 1000
Boise, Idaho 83702

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JOB DESCRIPTION

Republic Services Mercury Project REVISE

JOB NUMBER

180-159655-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.

my EOL

Eurofins Pittsburgh

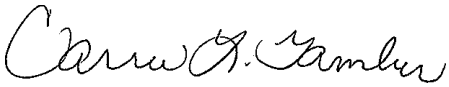
Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

Authorization



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Revision 2

Authorized for release by
Carrie Gamber, Senior Project Manager
Carrie.Gamber@et.eurofinsus.com
(412)963-2428

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Job ID: 180-159655-1

Laboratory: Eurofins Pittsburgh

Narrative

CASE NARRATIVE

Client: US Ecology Inc

Project: Republic Services Mercury Project REVISE

Report Number: 180-159655-2

NOTE: This report has been revised to update the second part of the sample IDs on samples 180-159655 samples 64-72.

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 07/21/2023; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was C.

IC
Total Organic Carbon - Quad failed the recovery criteria low for the MS of sample B620-1 THRU B620-5 T06MS (180-159655-24) in batch 180-445262.

METALS
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GENERAL CHEMISTRY
Methods 9060A TOC, 2510B Specific Conductance and 2580B Oxidation reduction Potential are flagged as not certified for Pennsylvania, Eurofins Northeast Pittsburgh's NELAC state; however, certification flags are based on the initial sample matrix. These samples were logged in as solids for leaching. Eurofins Northeast Pittsburgh is NELAC certified for these analyses in waters for Pennsylvania.

The matrix spike (MS) recovery for preparation batch 180-444371 and analytical batch 180-445262 was outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. B620-1 THRU B620-5 T06 (180-159655-24)

Definitions/Glossary

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
!	Laboratory is not accredited for this parameter.
FL	MS and/or MSD recovery below control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	02-00416	04-30-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
EPA 9060A		Solid	Total Organic Carbon - Quad
SM 2510B		Solid	Specific Conductance
SM 2580B		Solid	Oxidation Reduction Potential

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24
A2LA	ISO/IEC 17025	0001.01	11-30-24
Alabama	State	43200	01-31-24
Alaska	State	PA00009	06-30-24
Alaska (UST)	State	17-027	02-28-24
Arizona	State	AZ0780	03-12-24
Arkansas DEQ	State	88-00660	08-09-24
California	State	2792	11-30-23
Colorado	State	PA00009	06-30-24
Connecticut	State	PH-0746	06-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-24
Delaware (DW)	State	N/A	01-31-24
Florida	NELAP	E87997	06-30-24
Georgia (DW)	State	C048	01-31-24
Hawaii	State	N/A	01-31-24
Illinois	NELAP	200027	01-31-24
Iowa	State	361	03-01-24
Kansas	NELAP	E-10151	10-31-23
Kentucky (DW)	State	KY90088	12-31-23
Kentucky (UST)	State	0001.01	11-30-24
Kentucky (WW)	State	KY90088	12-31-23
Louisiana (All)	NELAP	02055	06-30-24
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-24
Massachusetts	State	M-PA009	06-30-24
Michigan	State	9930	01-31-24
Minnesota	NELAP	042-999-487	12-31-23
Mississippi	State	023	01-31-24
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-24
Nebraska	State	NE-OS-32-17	01-31-24
New Hampshire	NELAP	2730	01-10-24
New Jersey	NELAP	PA011	09-17-23
New York	NELAP	10670	04-01-24
North Carolina (DW)	State	42705	07-31-24
North Carolina (WW/SW)	State	521	12-31-23
North Dakota	State	R-205	01-31-24
Oklahoma	NELAP	9804	08-31-23 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	PA200001	09-11-24
PALA	Canada	1978	09-16-24
Pennsylvania	NELAP	36-00037	01-31-24
Rhode Island	State	LAO00338	12-31-23
South Carolina	State	89002	01-31-24
Tennessee	State	02838	01-31-24
Texas	NELAP	T104704194-23-46	08-31-24
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-23
Virginia	NELAP	460182	06-14-25
Washington	State	C457	04-11-24
West Virginia (DW)	State	9906 C	12-31-23
West Virginia DEP	State	055	07-31-24
Wyoming	State	8TMS-L	01-31-24
Wyoming (UST)	A2LA	0001.01	11-30-24

Sample Summary

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-159655-1	B615-1 THRU B615-5 T01	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-2	B615-1 THRU B615-5 T02	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-3	B615-1 THRU B615-5 T03	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-4	B615-1 THRU B615-5 T04	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-5	B615-1 THRU B615-5 T05	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-6	B615-1 THRU B615-5 T06	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-7	B615-1 THRU B615-5 T07	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-8	B615-1 THRU B615-5 T08	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-9	B615-1 THRU B615-5 T09	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-10	B615-1 THRU B615-5 DUP T01	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-11	B615-1 THRU B615-5 DUP T02	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-12	B615-1 THRU B615-5 DUP T03	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-13	B615-1 THRU B615-5 DUP T04	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-14	B615-1 THRU B615-5 DUP T05	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-15	B615-1 THRU B615-5 DUP T06	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-16	B615-1 THRU B615-5 DUP T07	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-17	B615-1 THRU B615-5 DUP T08	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-18	B615-1 THRU B615-5 DUP T09	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-19	B620-1 THRU B620-5 T01	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-20	B620-1 THRU B620-5 T02	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-21	B620-1 THRU B620-5 T03	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-22	B620-1 THRU B620-5 T04	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-23	B620-1 THRU B620-5 T05	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-24	B620-1 THRU B620-5 T06	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-25	B620-1 THRU B620-5 T07	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-26	B620-1 THRU B620-5 T08	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-27	B620-1 THRU B620-5 T09	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-28	B620-1 THRU B620-5 DUP T01	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-29	B620-1 THRU B620-5 DUP T02	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-30	B620-1 THRU B620-5 DUP T03	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-31	B620-1 THRU B620-5 DUP T04	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-32	B620-1 THRU B620-5 DUP T05	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-33	B620-1 THRU B620-5 DUP T06	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-34	B620-1 THRU B620-5 DUP T07	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-35	B620-1 THRU B620-5 DUP T08	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-36	B620-1 THRU B620-5 DUP T09	Solid	07/11/23 09:00	07/21/23 10:02
180-159655-37	B615-1 THRU B615-5 T01	Water	08/23/23 11:18	07/21/23 10:02
180-159655-38	B615-1 THRU B615-5 T02	Water	08/23/23 18:30	07/21/23 10:02
180-159655-39	B615-1 THRU B615-5 T03	Water	08/24/23 06:30	07/21/23 10:02
180-159655-40	B615-1 THRU B615-5 T04	Water	08/24/23 18:30	07/21/23 10:02
180-159655-41	B615-1 THRU B615-5 T05	Water	08/25/23 06:30	07/21/23 10:02
180-159655-42	B615-1 THRU B615-5 T06	Water	08/27/23 18:30	07/21/23 10:02
180-159655-43	B615-1 THRU B615-5 T07	Water	08/28/23 06:30	07/21/23 10:02
180-159655-44	B615-1 THRU B615-5 T08	Water	09/01/23 18:30	07/21/23 10:02
180-159655-45	B615-1 THRU B615-5 T09	Water	09/02/23 06:30	07/21/23 10:02
180-159655-46	B615-1 THRU B615-5 DUP T01	Water	08/23/23 11:18	07/21/23 10:02
180-159655-47	B615-1 THRU B615-5 DUP T02	Water	08/23/23 18:30	07/21/23 10:02
180-159655-48	B615-1 THRU B615-5 DUP T03	Water	08/24/23 06:30	07/21/23 10:02
180-159655-49	B615-1 THRU B615-5 DUP T04	Water	08/24/23 18:30	07/21/23 10:02
180-159655-50	B615-1 THRU B615-5 DUP T05	Water	08/25/23 06:30	07/21/23 10:02
180-159655-51	B615-1 THRU B615-5 DUP T06	Water	08/27/23 18:30	07/21/23 10:02
180-159655-52	B615-1 THRU B615-5 DUP T07	Water	08/28/23 06:30	07/21/23 10:02
180-159655-53	B615-1 THRU B615-5 DUP T08	Water	09/01/23 18:30	07/21/23 10:02
180-159655-54	B615-1 THRU B615-5 DUP T09	Water	09/02/23 06:30	07/21/23 10:02

Sample Summary

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-159655-55	B620-1 THRU B620-5 T01	Water	08/23/23 11:18	07/21/23 10:02
180-159655-56	B620-1 THRU B620-5 T02	Water	08/23/23 18:30	07/21/23 10:02
180-159655-57	B620-1 THRU B620-5 T03	Water	08/24/23 06:30	07/21/23 10:02
180-159655-58	B620-1 THRU B620-5 T04	Water	08/24/23 18:30	07/21/23 10:02
180-159655-59	B620-1 THRU B620-5 T05	Water	08/25/23 06:30	07/21/23 10:02
180-159655-60	B620-1 THRU B620-5 T06	Water	08/27/23 18:30	07/21/23 10:02
180-159655-61	B620-1 THRU B620-5 T07	Water	08/28/23 06:30	07/21/23 10:02
180-159655-62	B620-1 THRU B620-5 T08	Water	09/01/23 18:30	07/21/23 10:02
180-159655-63	B620-1 THRU B620-5 T09	Water	09/02/23 06:30	07/21/23 10:02
180-159655-64	B620-1 THRU B620-5 DUP T01	Water	08/23/23 11:18	07/21/23 10:02
180-159655-65	B620-1 THRU B620-5 DUP T02	Water	08/23/23 18:30	07/21/23 10:02
180-159655-66	B620-1 THRU B620-5 DUP T03	Water	08/24/23 06:30	07/21/23 10:02
180-159655-67	B620-1 THRU B620-5 DUP T04	Water	08/24/23 18:30	07/21/23 10:02
180-159655-68	B620-1 THRU B620-5 DUP T05	Water	08/25/23 06:30	07/21/23 10:02
180-159655-69	B620-1 THRU B620-5 DUP T06	Water	08/27/23 18:30	07/21/23 10:02
180-159655-70	B620-1 THRU B620-5 DUP T07	Water	08/28/23 06:30	07/21/23 10:02
180-159655-71	B620-1 THRU B620-5 DUP T08	Water	09/01/23 18:30	07/21/23 10:02
180-159655-72	B620-1 THRU B620-5 DUP T09	Water	09/02/23 06:30	07/21/23 10:02

Method Summary

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	EET PIT
6010D	Metals (ICP)	SW846	ELLE
EPA 9040C	pH	SW846	EET PIT
EPA 9060A	Organic Carbon, Total (TOC)	SW846	EET PIT
SM 2510B	Conductivity, Specific Conductance	SM	EET PIT
SM 2580B	Reduction-Oxidation (REDOX) Potential	SM	EET PIT
1314	Up-Flow Percolation Column Leach Procedure	SW846	EET PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	ELLE

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B615-1 THRU B615-5 T01
Lab Sample ID: 180-159655-1
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	106.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444414	08/23/23 18:00	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.1 g	106.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445960	08/23/23 12:22	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	106.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446114	09/01/23 23:40	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.1 g	106.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445962	08/23/23 12:23	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	106.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445961	08/23/23 12:22	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 T02
Lab Sample ID: 180-159655-2
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	157.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444665	08/25/23 21:26	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.1 g	157.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:00	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	157.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446114	09/02/23 00:04	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.1 g	157.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 10:59	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	157.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 10:58	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 T03
Lab Sample ID: 180-159655-3
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	242 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 17:26	M1D	EET PIT
	Instrument ID: CHICS2100B									

Client Sample ID: B615-1 THRU B615-5 T03
Lab Sample ID: 180-159655-3

Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	242 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:47	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	242 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446114	09/02/23 00:29	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.1 g	242 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:37	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	242 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:38	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 T04
Lab Sample ID: 180-159655-4

Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	249.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 21:07	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.1 g	249.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:13	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	249.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 00:28	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.1 g	249.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:14	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	249.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:13	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 T05
Lab Sample ID: 180-159655-5

Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	238.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 20:56	M1D	EET PIT
	Instrument ID: CHIC2100A									
Leach	Leach	1314			495.1 g	238.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:53	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B615-1 THRU B615-5 T05
Lab Sample ID: 180-159655-5
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	238.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 00:51	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.1 g	238.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:52	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	238.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:53	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 T06
Lab Sample ID: 180-159655-6
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	1213.5 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/29/23 20:45	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.1 g	1213.5 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:14	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	1213.5 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 01:15	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.1 g	1213.5 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:14	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	1213.5 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:14	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 T07
Lab Sample ID: 180-159655-7
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	279.7 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/29/23 19:31	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.1 g	279.7 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:52	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	279.7 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 01:39	LWM	EET PIT
	Instrument ID: SAM									

Client Sample ID: B615-1 THRU B615-5 T07
Lab Sample ID: 180-159655-7
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	279.7 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:52	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	279.7 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:52	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 T08
Lab Sample ID: 180-159655-8
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	2811.4 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 20:09	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.1 g	2811.4 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 14:36	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	2811.4 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 02:27	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.1 g	2811.4 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 14:36	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	2811.4 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 14:36	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 T09
Lab Sample ID: 180-159655-9
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	293.4 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/15/23 00:06	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.1 g	293.4 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 15:18	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.1 g	293.4 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 03:14	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.1 g	293.4 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 15:18	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B615-1 THRU B615-5 T09
Lab Sample ID: 180-159655-9
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.1 g	293.4 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 15:18	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 DUP T01
Lab Sample ID: 180-159655-10
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	120.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444414	08/23/23 18:18	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			496.4 g	120.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445960	08/23/23 12:28	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	120.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 03:38	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			496.4 g	120.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445962	08/23/23 12:28	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	120.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445961	08/23/23 12:28	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 DUP T02
Lab Sample ID: 180-159655-11
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	152.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444665	08/25/23 21:45	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			496.4 g	152.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:04	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	152.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 04:54	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			496.4 g	152.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	152.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:01	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 DUP T03
Lab Sample ID: 180-159655-12
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	252.1 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 17:41	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			496.4 g	252.1 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:51	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	252.1 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 05:18	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			496.4 g	252.1 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:40	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	252.1 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:41	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 DUP T04
Lab Sample ID: 180-159655-13
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	253.6 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 21:22	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			496.4 g	253.6 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:16	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	253.6 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 05:42	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			496.4 g	253.6 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:17	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	253.6 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:16	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 DUP T05
Lab Sample ID: 180-159655-14
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	253.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 21:11	M1D	EET PIT
	Instrument ID: CHIC2100A									

Client Sample ID: B615-1 THRU B615-5 DUP T05
Lab Sample ID: 180-159655-14
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	253.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:56	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	253.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 06:06	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			496.4 g	253.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:55	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	253.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:56	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 DUP T06
Lab Sample ID: 180-159655-15
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	1272.6 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444942	08/29/23 16:37	AM	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			496.4 g	1272.6 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:17	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	1272.6 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 06:30	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			496.4 g	1272.6 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:17	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	1272.6 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:17	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 DUP T07
Lab Sample ID: 180-159655-16
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	247 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/29/23 17:59	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			496.4 g	247 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:55	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B615-1 THRU B615-5 DUP T07
Lab Sample ID: 180-159655-16
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	247 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 06:53	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			496.4 g	247 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:55	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	247 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:55	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 DUP T08
Lab Sample ID: 180-159655-17
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	2278.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 20:24	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			496.4 g	2278.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 14:39	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	2278.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 08:09	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			496.4 g	2278.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 14:39	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	2278.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 14:39	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 DUP T09
Lab Sample ID: 180-159655-18
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	246.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 23:51	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			496.4 g	246.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 15:21	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	246.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 09:49	LWM	EET PIT
	Instrument ID: SAM									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B615-1 THRU B615-5 DUP T09
Lab Sample ID: 180-159655-18
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			496.4 g	246.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 15:21	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			496.4 g	246.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 15:21	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 T01
Lab Sample ID: 180-159655-19
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	89.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444414	08/23/23 18:37	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			493.8 g	89.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445960	08/23/23 12:33	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	89.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 07:41	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			493.8 g	89.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445962	08/23/23 12:33	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	89.5 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445961	08/23/23 12:33	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 T02
Lab Sample ID: 180-159655-20
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	148.7 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444665	08/25/23 22:03	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			493.8 g	148.7 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:08	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	148.7 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 08:05	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			493.8 g	148.7 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:05	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B620-1 THRU B620-5 T02
Lab Sample ID: 180-159655-20
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	148.7 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:05	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 T03
Lab Sample ID: 180-159655-21
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	246.9 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 17:55	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			493.8 g	246.9 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:54	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	246.9 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 11:49	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			493.8 g	246.9 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:43	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	246.9 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:45	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 T04
Lab Sample ID: 180-159655-22
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	242.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 23:20	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			493.8 g	242.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:20	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	242.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 12:13	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			493.8 g	242.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:20	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	242.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:20	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 T05
Lab Sample ID: 180-159655-23
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	247.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 21:26	M1D	EET PIT
	Instrument ID: CHIC2100A									
Leach	Leach	1314			493.8 g	247.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 12:00	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	247.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 12:37	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			493.8 g	247.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:58	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	247.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 12:00	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 T06
Lab Sample ID: 180-159655-24
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	1111.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444942	08/29/23 16:52	AM	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			493.8 g	1111.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:20	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	1111.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/30/23 20:29	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			493.8 g	1111.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:20	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	1111.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:20	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 T07
Lab Sample ID: 180-159655-25
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	246.9 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444942	08/29/23 17:07	AM	EET PIT
	Instrument ID: CHICS2100B									

Client Sample ID: B620-1 THRU B620-5 T07
Lab Sample ID: 180-159655-25
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	246.9 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:58	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	246.9 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/30/23 21:17	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			493.8 g	246.9 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:58	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	246.9 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:58	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 T08
Lab Sample ID: 180-159655-26
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	1954.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 20:39	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			493.8 g	1954.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 14:42	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	1954.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 10:37	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			493.8 g	1954.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 14:42	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	1954.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 14:42	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 T09
Lab Sample ID: 180-159655-27
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	216.3 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 23:36	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			493.8 g	216.3 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 15:24	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B620-1 THRU B620-5 T09
Lab Sample ID: 180-159655-27
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			493.8 g	216.3 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 11:01	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			493.8 g	216.3 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 15:24	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			493.8 g	216.3 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 15:24	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 DUP T01
Lab Sample ID: 180-159655-28
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	103.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444414	08/23/23 19:51	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.8 g	103.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445960	08/23/23 12:39	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	103.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/30/23 22:04	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.8 g	103.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445962	08/23/23 12:37	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	103.3 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445961	08/23/23 12:39	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 DUP T02
Lab Sample ID: 180-159655-29
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	153.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444665	08/26/23 00:31	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.8 g	153.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:12	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	153.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/30/23 22:28	LWM	EET PIT
	Instrument ID: SAM									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B620-1 THRU B620-5 DUP T02
Lab Sample ID: 180-159655-29
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	153.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:08	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	153.1 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:08	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 DUP T03
Lab Sample ID: 180-159655-30
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	238 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 18:54	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.8 g	238 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:58	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	238 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/30/23 22:52	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.8 g	238 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:45	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	238 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:48	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 DUP T04
Lab Sample ID: 180-159655-31
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	242.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 23:35	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.8 g	242.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:23	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	242.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/30/23 23:15	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.8 g	242.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:23	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B620-1 THRU B620-5 DUP T04
Lab Sample ID: 180-159655-31
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	242.4 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:23	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 DUP T05
Lab Sample ID: 180-159655-32
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	239.7 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 21:40	M1D	EET PIT
	Instrument ID: CHIC2100A									
Leach	Leach	1314			495.8 g	239.7 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 12:03	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	239.7 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 00:31	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.8 g	239.7 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 12:00	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	239.7 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 12:03	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 DUP T06
Lab Sample ID: 180-159655-33
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	1093.8 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/29/23 21:41	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.8 g	1093.8 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:23	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	1093.8 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 00:55	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.8 g	1093.8 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:23	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	1093.8 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:23	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 DUP T07
Lab Sample ID: 180-159655-34
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	224.6 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/30/23 01:23	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.8 g	224.6 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 12:00	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	224.6 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 01:18	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.8 g	224.6 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 12:00	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	224.6 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 12:00	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 DUP T08
Lab Sample ID: 180-159655-35
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	1761.9 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/15/23 00:35	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.8 g	1761.9 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 14:45	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	1761.9 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 11:25	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.8 g	1761.9 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 14:45	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	1761.9 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 14:45	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B620-1 THRU B620-5 DUP T09
Lab Sample ID: 180-159655-36
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	208.9 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/15/23 00:21	M1D	EET PIT
	Instrument ID: CHICS2100B									

Client Sample ID: B620-1 THRU B620-5 DUP T09
Lab Sample ID: 180-159655-36
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.8 g	208.9 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 15:27	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	208.9 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 11:48	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.8 g	208.9 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 15:27	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.8 g	208.9 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 15:27	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B615-1 THRU B615-5 T01
Lab Sample ID: 180-159655-37
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	412316	08/24/23 22:35	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			412799	08/25/23 19:43	T8CQ	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 T02
Lab Sample ID: 180-159655-38
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:32	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B615-1 THRU B615-5 T03
Lab Sample ID: 180-159655-39
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 07:43	MT26	ELLE
	Instrument ID: T75 - 27278									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B615-1 THRU B615-5 T04
Lab Sample ID: 180-159655-40
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413211	08/28/23 10:11	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413881	08/29/23 11:17	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 T05
Lab Sample ID: 180-159655-41
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 08:13	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B615-1 THRU B615-5 T06
Lab Sample ID: 180-159655-42
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:20	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 T07
Lab Sample ID: 180-159655-43
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:23	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 T08
Lab Sample ID: 180-159655-44
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:49	MT26	ELLE
	Instrument ID: T73 - 18255									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B615-1 THRU B615-5 T09
Lab Sample ID: 180-159655-45
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:56	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 DUP T01
Lab Sample ID: 180-159655-46
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	412316	08/24/23 22:35	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			412799	08/25/23 20:06	T8CQ	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 DUP T02
Lab Sample ID: 180-159655-47
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413042	08/27/23 21:09	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413359	08/28/23 13:24	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 DUP T03
Lab Sample ID: 180-159655-48
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:35	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B615-1 THRU B615-5 DUP T04
Lab Sample ID: 180-159655-49
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 08:20	MT26	ELLE
	Instrument ID: T75 - 27278									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B615-1 THRU B615-5 DUP T05
Lab Sample ID: 180-159655-50
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 08:17	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B615-1 THRU B615-5 DUP T06
Lab Sample ID: 180-159655-51
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:55	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 DUP T07
Lab Sample ID: 180-159655-52
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:01	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 DUP T08
Lab Sample ID: 180-159655-53
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 01:02	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B615-1 THRU B615-5 DUP T09
Lab Sample ID: 180-159655-54
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:15	MT26	ELLE
	Instrument ID: T73 - 18255									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B620-1 THRU B620-5 T01
Lab Sample ID: 180-159655-55
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	412316	08/24/23 22:35	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			412799	08/25/23 19:40	T8CQ	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B620-1 THRU B620-5 T02
Lab Sample ID: 180-159655-56
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 07:58	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B620-1 THRU B620-5 T03
Lab Sample ID: 180-159655-57
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:23	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B620-1 THRU B620-5 T04
Lab Sample ID: 180-159655-58
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 08:26	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B620-1 THRU B620-5 T05
Lab Sample ID: 180-159655-59
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 08:39	MT26	ELLE
	Instrument ID: T75 - 27278									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B620-1 THRU B620-5 T06
Lab Sample ID: 180-159655-60
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:36	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B620-1 THRU B620-5 T07
Lab Sample ID: 180-159655-61
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:33	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B620-1 THRU B620-5 T08
Lab Sample ID: 180-159655-62
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:21	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B620-1 THRU B620-5 T09
Lab Sample ID: 180-159655-63
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:43	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B620-1 THRU B620-5 DUP T01
Lab Sample ID: 180-159655-64
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	412316	08/24/23 22:35	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			412799	08/25/23 19:50	T8CQ	ELLE
	Instrument ID: T73 - 18255									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B620-1 THRU B620-5 DUP T02
Lab Sample ID: 180-159655-65
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 07:52	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B620-1 THRU B620-5 DUP T03
Lab Sample ID: 180-159655-66
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:38	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B620-1 THRU B620-5 DUP T04
Lab Sample ID: 180-159655-67
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 07:49	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B620-1 THRU B620-5 DUP T05
Lab Sample ID: 180-159655-68
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 08:23	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B620-1 THRU B620-5 DUP T06
Lab Sample ID: 180-159655-69
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:17	MT26	ELLE
	Instrument ID: T73 - 18255									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B620-1 THRU B620-5 DUP T07
Lab Sample ID: 180-159655-70
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414869	08/31/23 11:19	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			415819	09/04/23 21:48	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B620-1 THRU B620-5 DUP T08
Lab Sample ID: 180-159655-71
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/11/23 23:37	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B620-1 THRU B620-5 DUP T09
Lab Sample ID: 180-159655-72
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:46	MT26	ELLE
	Instrument ID: T73 - 18255									

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Analyst References:

Lab: EET PIT

Batch Type: Leach

LWM = Larry Matko

Batch Type: Analysis

AM = Adzuira Musule

LWM = Leslie McIntire

M1D = Maureen Donlin

Lab: ELLE

Batch Type: Prep

HUH3 = Emily Dickens

UAMX = Annamaria Kuhns

Batch Type: Analysis

MT26 = Jason Knight

T8CQ = Sera Bargo

Client Sample ID: B615-1 THRU B615-5 T01
Lab Sample ID: 180-159655-1
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 18:00	1
Chloride	ND		1.00	0.713	mg/L			08/23/23 18:00	1
Sulfate	**0.787**	**J**	1.00	0.756	mg/L			08/23/23 18:00	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.0**		0.1	0.1	SU			08/23/23 12:22	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**2.6**	**!**	1.0	0.51	mg/L			09/01/23 23:40	1
Specific Conductance (SM 2510B)	**13**	**!**	1.0	1.0	umhos/cm			08/23/23 12:23	1
Oxidation Reduction Potential (SM 2580B)	**390**	**!**	10	10	millivolts			08/23/23 12:22	1

Client Sample ID: B615-1 THRU B615-5 T02
Lab Sample ID: 180-159655-2
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 21:26	1
Chloride	**0.974**	**J**	1.00	0.713	mg/L			08/25/23 21:26	1
Sulfate	**0.794**	**J**	1.00	0.756	mg/L			08/25/23 21:26	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.0**		0.1	0.1	SU			08/24/23 11:00	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.0**	**!**	1.0	0.51	mg/L			09/02/23 00:04	1
Specific Conductance (SM 2510B)	**14**	**!**	1.0	1.0	umhos/cm			08/24/23 10:59	1
Oxidation Reduction Potential (SM 2580B)	**350**	**!**	10	10	millivolts			08/24/23 10:58	1

Client Sample ID: B615-1 THRU B615-5 T03
Lab Sample ID: 180-159655-3
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 17:26	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 17:26	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 17:26	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.8**		0.1	0.1	SU			08/24/23 11:47	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.73**	**J !**	1.0	0.51	mg/L			09/02/23 00:29	1
Specific Conductance (SM 2510B)	**7.8**	**!**	1.0	1.0	umhos/cm			08/24/23 11:37	1
Oxidation Reduction Potential (SM 2580B)	**370**	**!**	10	10	millivolts			08/24/23 11:38	1

Client Sample ID: B615-1 THRU B615-5 T04
Lab Sample ID: 180-159655-4
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 21:07	1
Chloride	**2.78**		1.00	0.713	mg/L			08/25/23 21:07	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 21:07	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.7**		0.1	0.1	SU			08/25/23 11:13	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.65**	**J !**	1.0	0.51	mg/L			09/12/23 00:28	1
Specific Conductance (SM 2510B)	**4.9**	**!**	1.0	1.0	umhos/cm			08/25/23 11:14	1
Oxidation Reduction Potential (SM 2580B)	**330**	**!**	10	10	millivolts			08/25/23 11:13	1

Client Sample ID: B615-1 THRU B615-5 T05
Lab Sample ID: 180-159655-5
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 20:56	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 20:56	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 20:56	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.5**		0.1	0.1	SU			08/25/23 11:53	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.65**	**J !**	1.0	0.51	mg/L			09/12/23 00:51	1
Specific Conductance (SM 2510B)	**3.5**	**!**	1.0	1.0	umhos/cm			08/25/23 11:52	1
Oxidation Reduction Potential (SM 2580B)	**330**	**!**	10	10	millivolts			08/25/23 11:53	1

Client Sample ID: B615-1 THRU B615-5 T06
Lab Sample ID: 180-159655-6
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 20:45	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 20:45	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 20:45	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.3**		0.1	0.1	SU			08/29/23 11:14	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.62**	**J !**	1.0	0.51	mg/L			09/12/23 01:15	1
Specific Conductance (SM 2510B)	**2.4**		1.0	1.0	umhos/cm			08/29/23 11:14	1
Oxidation Reduction Potential (SM 2580B)	**370**		10	10	millivolts			08/29/23 11:14	1

Client Sample ID: B615-1 THRU B615-5 T07
Lab Sample ID: 180-159655-7
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 19:31	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 19:31	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 19:31	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.0**		0.1	0.1	SU			08/29/23 11:52	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	ND	!	1.0	0.51	mg/L			09/12/23 01:39	1
Specific Conductance (SM 2510B)	**1.9**		1.0	1.0	umhos/cm			08/29/23 11:52	1
Oxidation Reduction Potential (SM 2580B)	**420**		10	10	millivolts			08/29/23 11:52	1

Client Sample ID: B615-1 THRU B615-5 T08
Lab Sample ID: 180-159655-8
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 20:09	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 20:09	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 20:09	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.9**		0.1	0.1	SU			09/06/23 14:36	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	ND	!	1.0	0.51	mg/L			09/12/23 02:27	1
Specific Conductance (SM 2510B)	**1.4**	**!**	1.0	1.0	umhos/cm			09/06/23 14:36	1
Oxidation Reduction Potential (SM 2580B)	**390**	**!**	10	10	millivolts			09/06/23 14:36	1

Client Sample ID: B615-1 THRU B615-5 T09
Lab Sample ID: 180-159655-9
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/15/23 00:06	1
Chloride	**1.09**		1.00	0.713	mg/L			09/15/23 00:06	1
Sulfate	ND		1.00	0.756	mg/L			09/15/23 00:06	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.8**		0.1	0.1	SU			09/06/23 15:18	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.53**	**J !**	1.0	0.51	mg/L			09/12/23 03:14	1
Specific Conductance (SM 2510B)	**1.7**	**!**	1.0	1.0	umhos/cm			09/06/23 15:18	1
Oxidation Reduction Potential (SM 2580B)	**380**	**!**	10	10	millivolts			09/06/23 15:18	1

Client Sample ID: B615-1 THRU B615-5 DUP T01
Lab Sample ID: 180-159655-10
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 18:18	1
Chloride	**14.8**		1.00	0.713	mg/L			08/23/23 18:18	1
Sulfate	ND		1.00	0.756	mg/L			08/23/23 18:18	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.0**		0.1	0.1	SU			08/23/23 12:28	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.1**	**!**	1.0	0.51	mg/L			09/12/23 03:38	1
Specific Conductance (SM 2510B)	**2.8**	**!**	1.0	1.0	umhos/cm			08/23/23 12:28	1
Oxidation Reduction Potential (SM 2580B)	**450**	**!**	10	10	millivolts			08/23/23 12:28	1

Client Sample ID: B615-1 THRU B615-5 DUP T02
Lab Sample ID: 180-159655-11
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 21:45	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 21:45	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 21:45	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.0**		0.1	0.1	SU			08/24/23 11:04	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.93**	**J !**	1.0	0.51	mg/L			09/12/23 04:54	1
Specific Conductance (SM 2510B)	**10**	**!**	1.0	1.0	umhos/cm			08/24/23 11:02	1
Oxidation Reduction Potential (SM 2580B)	**350**	**!**	10	10	millivolts			08/24/23 11:01	1

Client Sample ID: B615-1 THRU B615-5 DUP T03
Lab Sample ID: 180-159655-12
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 17:41	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 17:41	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 17:41	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.0**		0.1	0.1	SU			08/24/23 11:51	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.72**	**J !**	1.0	0.51	mg/L			09/12/23 05:18	1
Specific Conductance (SM 2510B)	**6.1**	**!**	1.0	1.0	umhos/cm			08/24/23 11:40	1
Oxidation Reduction Potential (SM 2580B)	**370**	**!**	10	10	millivolts			08/24/23 11:41	1

Client Sample ID: B615-1 THRU B615-5 DUP T04
Lab Sample ID: 180-159655-13
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 21:22	1
Chloride	**4.04**		1.00	0.713	mg/L			08/25/23 21:22	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 21:22	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.7**		0.1	0.1	SU			08/25/23 11:16	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.65**	**J !**	1.0	0.51	mg/L			09/12/23 05:42	1
Specific Conductance (SM 2510B)	**4.1**	**!**	1.0	1.0	umhos/cm			08/25/23 11:17	1
Oxidation Reduction Potential (SM 2580B)	**320**	**!**	10	10	millivolts			08/25/23 11:16	1

Client Sample ID: B615-1 THRU B615-5 DUP T05
Lab Sample ID: 180-159655-14
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 21:11	1
Chloride	**1.34**		1.00	0.713	mg/L			08/25/23 21:11	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 21:11	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.6**		0.1	0.1	SU			08/25/23 11:56	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.65**	**J !**	1.0	0.51	mg/L			09/12/23 06:06	1
Specific Conductance (SM 2510B)	**3.1**	**!**	1.0	1.0	umhos/cm			08/25/23 11:55	1
Oxidation Reduction Potential (SM 2580B)	**320**	**!**	10	10	millivolts			08/25/23 11:56	1

Client Sample ID: B615-1 THRU B615-5 DUP T06
Lab Sample ID: 180-159655-15
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 16:37	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 16:37	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 16:37	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.3**		0.1	0.1	SU			08/29/23 11:17	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.61**	**J !**	1.0	0.51	mg/L			09/12/23 06:30	1
Specific Conductance (SM 2510B)	**2.1**		1.0	1.0	umhos/cm			08/29/23 11:17	1
Oxidation Reduction Potential (SM 2580B)	**370**		10	10	millivolts			08/29/23 11:17	1

Client Sample ID: B615-1 THRU B615-5 DUP T07
Lab Sample ID: 180-159655-16
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 17:59	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 17:59	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 17:59	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.0**		0.1	0.1	SU			08/29/23 11:55	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.54**	**J !**	1.0	0.51	mg/L			09/12/23 06:53	1
Specific Conductance (SM 2510B)	**1.8**		1.0	1.0	umhos/cm			08/29/23 11:55	1
Oxidation Reduction Potential (SM 2580B)	**420**		10	10	millivolts			08/29/23 11:55	1

Client Sample ID: B615-1 THRU B615-5 DUP T08
Lab Sample ID: 180-159655-17
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 20:24	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 20:24	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 20:24	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.9**		0.1	0.1	SU			09/06/23 14:39	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	ND	!	1.0	0.51	mg/L			09/12/23 08:09	1
Specific Conductance (SM 2510B)	**1.4**	**!**	1.0	1.0	umhos/cm			09/06/23 14:39	1
Oxidation Reduction Potential (SM 2580B)	**390**	**!**	10	10	millivolts			09/06/23 14:39	1

Client Sample ID: B615-1 THRU B615-5 DUP T09
Lab Sample ID: 180-159655-18
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 23:51	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 23:51	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 23:51	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.8**		0.1	0.1	SU			09/06/23 15:21	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.59**	**J !**	1.0	0.51	mg/L			09/12/23 09:49	1
Specific Conductance (SM 2510B)	**1.6**	**!**	1.0	1.0	umhos/cm			09/06/23 15:21	1
Oxidation Reduction Potential (SM 2580B)	**370**	**!**	10	10	millivolts			09/06/23 15:21	1

Client Sample ID: B620-1 THRU B620-5 T01
Lab Sample ID: 180-159655-19
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 18:37	1
Chloride	**3.79**		1.00	0.713	mg/L			08/23/23 18:37	1
Sulfate	ND		1.00	0.756	mg/L			08/23/23 18:37	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.9**		0.1	0.1	SU			08/23/23 12:33	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.6**		1.0	0.51	mg/L			08/29/23 07:41	1
Specific Conductance (SM 2510B)	**2.6**	!	1.0	1.0	umhos/cm			08/23/23 12:33	1
Oxidation Reduction Potential (SM 2580B)	**450**	!	10	10	millivolts			08/23/23 12:33	1

Client Sample ID: B620-1 THRU B620-5 T02
Lab Sample ID: 180-159655-20
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 22:03	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 22:03	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 22:03	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.9**		0.1	0.1	SU			08/24/23 11:08	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.4**		1.0	0.51	mg/L			08/29/23 08:05	1
Specific Conductance (SM 2510B)	**7.4**	!	1.0	1.0	umhos/cm			08/24/23 11:05	1
Oxidation Reduction Potential (SM 2580B)	**350**	!	10	10	millivolts			08/24/23 11:05	1

Client Sample ID: B620-1 THRU B620-5 T03
Lab Sample ID: 180-159655-21
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 17:55	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 17:55	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 17:55	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.1**		0.1	0.1	SU			08/24/23 11:54	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.1**		1.0	0.51	mg/L			08/29/23 11:49	1
Specific Conductance (SM 2510B)	**5.9**	!	1.0	1.0	umhos/cm			08/24/23 11:43	1
Oxidation Reduction Potential (SM 2580B)	**360**	!	10	10	millivolts			08/24/23 11:45	1

Client Sample ID: B620-1 THRU B620-5 T04
Lab Sample ID: 180-159655-22
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 23:20	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 23:20	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 23:20	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.7		0.1	0.1	SU			08/25/23 11:20	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.85	J	1.0	0.51	mg/L			08/29/23 12:13	1
Specific Conductance (SM 2510B)	3.8	!	1.0	1.0	umhos/cm			08/25/23 11:20	1
Oxidation Reduction Potential (SM 2580B)	360	!	10	10	millivolts			08/25/23 11:20	1

Client Sample ID: B620-1 THRU B620-5 T05
Lab Sample ID: 180-159655-23
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 21:26	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 21:26	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 21:26	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.6		0.1	0.1	SU			08/25/23 12:00	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	1.0		1.0	0.51	mg/L			08/29/23 12:37	1
Specific Conductance (SM 2510B)	3.2	!	1.0	1.0	umhos/cm			08/25/23 11:58	1
Oxidation Reduction Potential (SM 2580B)	320	!	10	10	millivolts			08/25/23 12:00	1

Client Sample ID: B620-1 THRU B620-5 T06
Lab Sample ID: 180-159655-24
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 16:52	1
Chloride	2.25		1.00	0.713	mg/L			08/29/23 16:52	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 16:52	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.1		0.1	0.1	SU			08/29/23 11:20	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	2.2	! FL	1.0	0.51	mg/L			08/30/23 20:29	1
Specific Conductance (SM 2510B)	2.6		1.0	1.0	umhos/cm			08/29/23 11:20	1
Oxidation Reduction Potential (SM 2580B)	370		10	10	millivolts			08/29/23 11:20	1

Client Sample ID: B620-1 THRU B620-5 T07
Lab Sample ID: 180-159655-25
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 17:07	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 17:07	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 17:07	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.5		0.1	0.1	SU			08/29/23 11:58	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	1.0	!	1.0	0.51	mg/L			08/30/23 21:17	1
Specific Conductance (SM 2510B)	3.1		1.0	1.0	umhos/cm			08/29/23 11:58	1
Oxidation Reduction Potential (SM 2580B)	430		10	10	millivolts			08/29/23 11:58	1

Client Sample ID: B620-1 THRU B620-5 T08
Lab Sample ID: 180-159655-26
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 20:39	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 20:39	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 20:39	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.2		0.1	0.1	SU			09/06/23 14:42	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.93	J !	1.0	0.51	mg/L			09/12/23 10:37	1
Specific Conductance (SM 2510B)	3.5	!	1.0	1.0	umhos/cm			09/06/23 14:42	1
Oxidation Reduction Potential (SM 2580B)	400	!	10	10	millivolts			09/06/23 14:42	1

Client Sample ID: B620-1 THRU B620-5 T09
Lab Sample ID: 180-159655-27
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 23:36	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 23:36	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 23:36	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.3		0.1	0.1	SU			09/06/23 15:24	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	1.2	!	1.0	0.51	mg/L			09/12/23 11:01	1
Specific Conductance (SM 2510B)	3.9	!	1.0	1.0	umhos/cm			09/06/23 15:24	1
Oxidation Reduction Potential (SM 2580B)	380	!	10	10	millivolts			09/06/23 15:24	1

Client Sample ID: B620-1 THRU B620-5 DUP T01
Lab Sample ID: 180-159655-28
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 19:51	1
Chloride	**1.69**		1.00	0.713	mg/L			08/23/23 19:51	1
Sulfate	ND		1.00	0.756	mg/L			08/23/23 19:51	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.5**		0.1	0.1	SU			08/23/23 12:39	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.4**	!	1.0	0.51	mg/L			08/30/23 22:04	1
Specific Conductance (SM 2510B)	**6.1**	!	1.0	1.0	umhos/cm			08/23/23 12:37	1
Oxidation Reduction Potential (SM 2580B)	**440**	!	10	10	millivolts			08/23/23 12:39	1

Client Sample ID: B620-1 THRU B620-5 DUP T02
Lab Sample ID: 180-159655-29
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/26/23 00:31	1
Chloride	ND		1.00	0.713	mg/L			08/26/23 00:31	1
Sulfate	ND		1.00	0.756	mg/L			08/26/23 00:31	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.9**		0.1	0.1	SU			08/24/23 11:12	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.6**	!	1.0	0.51	mg/L			08/30/23 22:28	1
Specific Conductance (SM 2510B)	**7.9**	!	1.0	1.0	umhos/cm			08/24/23 11:08	1
Oxidation Reduction Potential (SM 2580B)	**350**	!	10	10	millivolts			08/24/23 11:08	1

Client Sample ID: B620-1 THRU B620-5 DUP T03
Lab Sample ID: 180-159655-30
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 18:54	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 18:54	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 18:54	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.0**		0.1	0.1	SU			08/24/23 11:58	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.1**	!	1.0	0.51	mg/L			08/30/23 22:52	1
Specific Conductance (SM 2510B)	**5.4**	!	1.0	1.0	umhos/cm			08/24/23 11:45	1
Oxidation Reduction Potential (SM 2580B)	**370**	!	10	10	millivolts			08/24/23 11:48	1

Client Sample ID: B620-1 THRU B620-5 DUP T04
Lab Sample ID: 180-159655-31
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 23:35	1
Chloride	**5.51**		1.00	0.713	mg/L			08/25/23 23:35	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 23:35	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.7**		0.1	0.1	SU			08/25/23 11:23	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.89**	**J !**	1.0	0.51	mg/L			08/30/23 23:15	1
Specific Conductance (SM 2510B)	**3.3**	**!**	1.0	1.0	umhos/cm			08/25/23 11:23	1
Oxidation Reduction Potential (SM 2580B)	**370**	**!**	10	10	millivolts			08/25/23 11:23	1

Client Sample ID: B620-1 THRU B620-5 DUP T05
Lab Sample ID: 180-159655-32
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 21:40	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 21:40	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 21:40	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.1**		0.1	0.1	SU			08/25/23 12:03	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.99**	**J !**	1.0	0.51	mg/L			08/31/23 00:31	1
Specific Conductance (SM 2510B)	**2.7**	**!**	1.0	1.0	umhos/cm			08/25/23 12:00	1
Oxidation Reduction Potential (SM 2580B)	**320**	**!**	10	10	millivolts			08/25/23 12:03	1

Client Sample ID: B620-1 THRU B620-5 DUP T06
Lab Sample ID: 180-159655-33
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 21:41	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 21:41	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 21:41	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.2**		0.1	0.1	SU			08/29/23 11:23	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.2**	**!**	1.0	0.51	mg/L			08/31/23 00:55	1
Specific Conductance (SM 2510B)	**1.9**		1.0	1.0	umhos/cm			08/29/23 11:23	1
Oxidation Reduction Potential (SM 2580B)	**370**		10	10	millivolts			08/29/23 11:23	1

Client Sample ID: B620-1 THRU B620-5 DUP T07
Lab Sample ID: 180-159655-34
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/30/23 01:23	1
Chloride	ND		1.00	0.713	mg/L			08/30/23 01:23	1
Sulfate	ND		1.00	0.756	mg/L			08/30/23 01:23	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.8		0.1	0.1	SU			08/29/23 12:00	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	1.3	!	1.0	0.51	mg/L			08/31/23 01:18	1
Specific Conductance (SM 2510B)	1.8		1.0	1.0	umhos/cm			08/29/23 12:00	1
Oxidation Reduction Potential (SM 2580B)	420		10	10	millivolts			08/29/23 12:00	1

Client Sample ID: B620-1 THRU B620-5 DUP T08
Lab Sample ID: 180-159655-35
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/15/23 00:35	1
Chloride	ND		1.00	0.713	mg/L			09/15/23 00:35	1
Sulfate	ND		1.00	0.756	mg/L			09/15/23 00:35	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.9		0.1	0.1	SU			09/06/23 14:45	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	1.0	!	1.0	0.51	mg/L			09/12/23 11:25	1
Specific Conductance (SM 2510B)	1.5	!	1.0	1.0	umhos/cm			09/06/23 14:45	1
Oxidation Reduction Potential (SM 2580B)	400	!	10	10	millivolts			09/06/23 14:45	1

Client Sample ID: B620-1 THRU B620-5 DUP T09
Lab Sample ID: 180-159655-36
Date Collected: 07/11/23 09:00
Matrix: Solid
Date Received: 07/21/23 10:02

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/15/23 00:21	1
Chloride	ND		1.00	0.713	mg/L			09/15/23 00:21	1
Sulfate	ND		1.00	0.756	mg/L			09/15/23 00:21	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.8		0.1	0.1	SU			09/06/23 15:27	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	1.3	!	1.0	0.51	mg/L			09/12/23 11:48	1
Specific Conductance (SM 2510B)	1.8	!	1.0	1.0	umhos/cm			09/06/23 15:27	1
Oxidation Reduction Potential (SM 2580B)	360	!	10	10	millivolts			09/06/23 15:27	1

Client Sample ID: B615-1 THRU B615-5 T01
Lab Sample ID: 180-159655-37
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.21	J	0.50	0.083	mg/L		08/24/23 22:35	08/25/23 19:43	1

Client Sample ID: B615-1 THRU B615-5 T02
Lab Sample ID: 180-159655-38
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.17	J	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:32	1

Client Sample ID: B615-1 THRU B615-5 T03
Lab Sample ID: 180-159655-39
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	2.1		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 07:43	1

Client Sample ID: B615-1 THRU B615-5 T04
Lab Sample ID: 180-159655-40
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.15	J	0.50	0.083	mg/L		08/28/23 10:11	08/29/23 11:17	1

Client Sample ID: B615-1 THRU B615-5 T05
Lab Sample ID: 180-159655-41
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.10	J	0.50	0.083	mg/L		08/28/23 10:16	08/29/23 08:13	1

Client Sample ID: B615-1 THRU B615-5 T06
Lab Sample ID: 180-159655-42
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.13	J	0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:20	1

Client Sample ID: B615-1 THRU B615-5 T07
Lab Sample ID: 180-159655-43
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.097	J	0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:23	1

Client Sample ID: B615-1 THRU B615-5 T08
Lab Sample ID: 180-159655-44
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:49	1

Client Sample ID: B615-1 THRU B615-5 T09
Lab Sample ID: 180-159655-45
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:56	1

Client Sample ID: B615-1 THRU B615-5 DUP T01
Lab Sample ID: 180-159655-46
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	**0.11**	**J**	0.50	0.083	mg/L		08/24/23 22:35	08/25/23 20:06	1

Client Sample ID: B615-1 THRU B615-5 DUP T02
Lab Sample ID: 180-159655-47
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	**0.14**	**J**	0.50	0.083	mg/L		08/27/23 21:09	08/28/23 13:24	1

Client Sample ID: B615-1 THRU B615-5 DUP T03
Lab Sample ID: 180-159655-48
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	**0.096**	**J**	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:35	1

Client Sample ID: B615-1 THRU B615-5 DUP T04
Lab Sample ID: 180-159655-49
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 08:20	1

Client Sample ID: B615-1 THRU B615-5 DUP T05
Lab Sample ID: 180-159655-50
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 08:17	1

Client Sample ID: B615-1 THRU B615-5 DUP T06
Lab Sample ID: 180-159655-51
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.74		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:55	1

Client Sample ID: B615-1 THRU B615-5 DUP T07
Lab Sample ID: 180-159655-52
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.39	J	0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:01	1

Client Sample ID: B615-1 THRU B615-5 DUP T08
Lab Sample ID: 180-159655-53
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		09/10/23 20:53	09/12/23 01:02	1

Client Sample ID: B615-1 THRU B615-5 DUP T09
Lab Sample ID: 180-159655-54
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.13	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:15	1

Client Sample ID: B620-1 THRU B620-5 T01
Lab Sample ID: 180-159655-55
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.46	J	0.50	0.083	mg/L		08/24/23 22:35	08/25/23 19:40	1

Client Sample ID: B620-1 THRU B620-5 T02
Lab Sample ID: 180-159655-56
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		08/28/23 10:16	08/29/23 07:58	1

Client Sample ID: B620-1 THRU B620-5 T03
Lab Sample ID: 180-159655-57
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:23	1

Client Sample ID: B620-1 THRU B620-5 T04
Lab Sample ID: 180-159655-58
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.096	J	0.50	0.083	mg/L		08/28/23 10:16	08/29/23 08:26	1

Client Sample ID: B620-1 THRU B620-5 T05
Lab Sample ID: 180-159655-59
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.096	J	0.50	0.083	mg/L		08/28/23 10:16	08/29/23 08:39	1

Client Sample ID: B620-1 THRU B620-5 T06
Lab Sample ID: 180-159655-60
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:36	1

Client Sample ID: B620-1 THRU B620-5 T07
Lab Sample ID: 180-159655-61
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.17	J	0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:33	1

Client Sample ID: B620-1 THRU B620-5 T08
Lab Sample ID: 180-159655-62
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.23	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:21	1

Client Sample ID: B620-1 THRU B620-5 T09
Lab Sample ID: 180-159655-63
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.23	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:43	1

Client Sample ID: B620-1 THRU B620-5 DUP T01
Lab Sample ID: 180-159655-64
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.15	J	0.50	0.083	mg/L		08/24/23 22:35	08/25/23 19:50	1

Client Sample ID: B620-1 THRU B620-5 DUP T02
Lab Sample ID: 180-159655-65
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		08/28/23 10:16	08/29/23 07:52	1

Client Sample ID: B620-1 THRU B620-5 DUP T03
Lab Sample ID: 180-159655-66
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.14	J	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:38	1

Client Sample ID: B620-1 THRU B620-5 DUP T04
Lab Sample ID: 180-159655-67
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 07:49	1

Client Sample ID: B620-1 THRU B620-5 DUP T05
Lab Sample ID: 180-159655-68
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 08:23	1

Client Sample ID: B620-1 THRU B620-5 DUP T06
Lab Sample ID: 180-159655-69
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:17	1

Client Sample ID: B620-1 THRU B620-5 DUP T07
Lab Sample ID: 180-159655-70
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		08/31/23 11:19	09/04/23 21:48	1

Client Sample ID: B620-1 THRU B620-5 DUP T08
Lab Sample ID: 180-159655-71
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.088	J	0.50	0.083	mg/L		09/10/23 20:53	09/11/23 23:37	1

Client Sample Results

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B620-1 THRU B620-5 DUP T09
Lab Sample ID: 180-159655-72
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/21/23 10:02

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.11	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:46	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-444414/6
Matrix: Solid
Analysis Batch: 444414

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 12:43	1
Chloride	ND		1.00	0.713	mg/L			08/23/23 12:43	1
Sulfate	ND		1.00	0.756	mg/L			08/23/23 12:43	1

Lab Sample ID: LCS 180-444414/7
Matrix: Solid
Analysis Batch: 444414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.854		mg/L		99	80 - 120
Chloride	50.0	49.70		mg/L		99	80 - 120
Sulfate	50.0	47.77		mg/L		96	80 - 120

Lab Sample ID: MB 180-444656/36
Matrix: Solid
Analysis Batch: 444656

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 21:37	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 21:37	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 21:37	1

Lab Sample ID: MB 180-444656/6
Matrix: Solid
Analysis Batch: 444656

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 11:01	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 11:01	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 11:01	1

Lab Sample ID: LCS 180-444656/37
Matrix: Solid
Analysis Batch: 444656

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	10.49		mg/L		105	80 - 120
Chloride	50.0	50.69		mg/L		101	80 - 120
Sulfate	50.0	50.64		mg/L		101	80 - 120

Lab Sample ID: LCS 180-444656/7
Matrix: Solid
Analysis Batch: 444656

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	10.13		mg/L		101	80 - 120
Chloride	50.0	48.74		mg/L		97	80 - 120
Sulfate	50.0	48.33		mg/L		97	80 - 120

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 180-444665/36
Matrix: Solid
Analysis Batch: 444665

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 22:21	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 22:21	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 22:21	1

Lab Sample ID: MB 180-444665/6
Matrix: Solid
Analysis Batch: 444665

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 12:27	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 12:27	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 12:27	1

Lab Sample ID: LCS 180-444665/37
Matrix: Solid
Analysis Batch: 444665

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.624		mg/L		96	80 - 120
Chloride	50.0	50.33		mg/L		101	80 - 120
Sulfate	50.0	52.34		mg/L		105	80 - 120

Lab Sample ID: LCS 180-444665/7
Matrix: Solid
Analysis Batch: 444665

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.542		mg/L		95	80 - 120
Chloride	50.0	49.87		mg/L		100	80 - 120
Sulfate	50.0	51.87		mg/L		104	80 - 120

Lab Sample ID: MB 180-444670/6
Matrix: Solid
Analysis Batch: 444670

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 12:04	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 12:04	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 12:04	1

Lab Sample ID: LCS 180-444670/7
Matrix: Solid
Analysis Batch: 444670

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.498		mg/L		95	80 - 120
Chloride	50.0	49.34		mg/L		99	80 - 120
Sulfate	50.0	49.91		mg/L		100	80 - 120

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 180-444942/8
Matrix: Solid
Analysis Batch: 444942

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 11:49	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 11:49	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 11:49	1

Lab Sample ID: LCS 180-444942/9
Matrix: Solid
Analysis Batch: 444942

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	10.50		mg/L		105	80 - 120
Chloride	50.0	50.13		mg/L		100	80 - 120
Sulfate	50.0	49.93		mg/L		100	80 - 120

Lab Sample ID: MB 180-444962/36
Matrix: Solid
Analysis Batch: 444962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 22:36	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 22:36	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 22:36	1

Lab Sample ID: MB 180-444962/6
Matrix: Solid
Analysis Batch: 444962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 13:21	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 13:21	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 13:21	1

Lab Sample ID: LCS 180-444962/37
Matrix: Solid
Analysis Batch: 444962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.608		mg/L		96	80 - 120
Chloride	50.0	49.93		mg/L		100	80 - 120
Sulfate	50.0	51.95		mg/L		104	80 - 120

Lab Sample ID: LCS 180-444962/7
Matrix: Solid
Analysis Batch: 444962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.580		mg/L		96	80 - 120
Chloride	50.0	49.49		mg/L		99	80 - 120
Sulfate	50.0	51.15		mg/L		102	80 - 120

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 180-446523/38
Matrix: Solid
Analysis Batch: 446523

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 20:54	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 20:54	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 20:54	1

Lab Sample ID: MB 180-446523/8
Matrix: Solid
Analysis Batch: 446523

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 12:41	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 12:41	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 12:41	1

Lab Sample ID: LCS 180-446523/39
Matrix: Solid
Analysis Batch: 446523

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	10.71		mg/L		107	80 - 120
Chloride	50.0	51.30		mg/L		103	80 - 120
Sulfate	50.0	50.67		mg/L		101	80 - 120

Lab Sample ID: LCS 180-446523/9
Matrix: Solid
Analysis Batch: 446523

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	10.80		mg/L		108	80 - 120
Chloride	50.0	51.99		mg/L		104	80 - 120
Sulfate	50.0	51.14		mg/L		102	80 - 120

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 410-412316/1-A
Matrix: Water
Analysis Batch: 412799

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 412316

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/24/23 22:35	08/25/23 18:50	1

Lab Sample ID: LCS 410-412316/2-A
Matrix: Water
Analysis Batch: 412799

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 412316

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.06		mg/L		101	80 - 120

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: MB 410-413042/1-A
Matrix: Water
Analysis Batch: 413359

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 413042

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/27/23 21:09	08/28/23 12:53	1

Lab Sample ID: LCS 410-413042/2-A
Matrix: Water
Analysis Batch: 413359

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 413042

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.16		mg/L		103	80 - 120

Lab Sample ID: MB 410-413043/1-A
Matrix: Water
Analysis Batch: 413362

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 413043

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/27/23 21:13	08/28/23 12:26	1

Lab Sample ID: LCS 410-413043/2-A
Matrix: Water
Analysis Batch: 413362

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 413043

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.11		mg/L		102	80 - 120

Lab Sample ID: MB 410-413211/1-A
Matrix: Water
Analysis Batch: 413881

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 413211

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:11	08/29/23 09:35	1

Lab Sample ID: LCS 410-413211/2-A
Matrix: Water
Analysis Batch: 413881

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 413211

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.28		mg/L		106	80 - 120

Lab Sample ID: MB 410-413213/1-A
Matrix: Water
Analysis Batch: 413825

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 413213

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 07:08	1

Lab Sample ID: LCS 410-413213/2-A
Matrix: Water
Analysis Batch: 413825

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 413213

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.11		mg/L		102	80 - 120

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 410-414855/1-A
Matrix: Water
Analysis Batch: 416737

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 414855

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 16:24	1

Lab Sample ID: LCS 410-414855/2-A
Matrix: Water
Analysis Batch: 416737

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 414855

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.05		mg/L		101	80 - 120

Lab Sample ID: MB 410-414869/1-A
Matrix: Water
Analysis Batch: 415819

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 414869

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/31/23 11:19	09/04/23 21:14	1

Lab Sample ID: LCS 410-414869/2-A
Matrix: Water
Analysis Batch: 415819

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 414869

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.36		mg/L		107	80 - 120

Lab Sample ID: MB 410-417838/1-A
Matrix: Water
Analysis Batch: 418354

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 417838

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		09/10/23 20:53	09/11/23 23:31	1

Lab Sample ID: LCS 410-417838/2-A
Matrix: Water
Analysis Batch: 418354

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 417838

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	4.90		mg/L		98	80 - 120

Lab Sample ID: 180-159655-71 MS
Matrix: Water
Analysis Batch: 418354

Client Sample ID: B620-1 THRU B620-5 DUP T08
Prep Type: Total Recoverable
Prep Batch: 417838

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	0.088	J	5.00	4.97		mg/L		98	75 - 125

Lab Sample ID: 180-159655-71 MSD
Matrix: Water
Analysis Batch: 418354

Client Sample ID: B620-1 THRU B620-5 DUP T08
Prep Type: Total Recoverable
Prep Batch: 417838

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfur	0.088	J	5.00	4.91		mg/L		96	75 - 125	1	20

Method: 6010D - Metals (ICP)

Lab Sample ID: 180-159655-71 DU
Matrix: Water
Analysis Batch: 418354

Client Sample ID: B620-1 THRU B620-5 DUP T08
Prep Type: Total Recoverable
Prep Batch: 417838

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Sulfur	0.088	J		0.106	J	mg/L				19	20

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-445960/1
Matrix: Solid
Analysis Batch: 445960

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: LCS 180-445969/1
Matrix: Solid
Analysis Batch: 445969

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: LCS 180-445992/1
Matrix: Solid
Analysis Batch: 445992

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: LCS 180-446000/1
Matrix: Solid
Analysis Batch: 446000

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: LCS 180-446003/1
Matrix: Solid
Analysis Batch: 446003

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Method: EPA 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 180-445128/35
Matrix: Solid
Analysis Batch: 445128

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			08/29/23 08:55	1

Method: EPA 9060A - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: MB 180-445128/5
Matrix: Solid
Analysis Batch: 445128

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			08/28/23 20:50	1

Lab Sample ID: LCS 180-445128/34
Matrix: Solid
Analysis Batch: 445128

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	20.8		mg/L		104	85 - 115

Lab Sample ID: LCS 180-445128/4
Matrix: Solid
Analysis Batch: 445128

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	20.9		mg/L		105	85 - 115

Lab Sample ID: MB 180-445262/5
Matrix: Solid
Analysis Batch: 445262

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			08/30/23 20:01	1

Lab Sample ID: LCS 180-445262/4
Matrix: Solid
Analysis Batch: 445262

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	20.6		mg/L		103	85 - 115

Lab Sample ID: MB 180-446114/35
Matrix: Solid
Analysis Batch: 446114

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			09/01/23 05:48	1

Lab Sample ID: MB 180-446114/67
Matrix: Solid
Analysis Batch: 446114

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			09/01/23 18:47	1

Lab Sample ID: LCS 180-446114/66
Matrix: Solid
Analysis Batch: 446114

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	21.4		mg/L		107	85 - 115

Method: EPA 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 180-446407/35
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			09/12/23 07:43	1

Lab Sample ID: MB 180-446407/5
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			09/11/23 19:35	1

Lab Sample ID: MB 180-446407/67
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			09/12/23 20:45	1

Lab Sample ID: LCS 180-446407/34
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	20.9		mg/L		104	85 - 115

Lab Sample ID: LCS 180-446407/4
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	21.1		mg/L		106	85 - 115

Lab Sample ID: LCS 180-446407/66
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	21.3		mg/L		106	85 - 115

Lab Sample ID: 180-159655-24 MS
Matrix: Solid
Analysis Batch: 445262

Client Sample ID: B620-1 THRU B620-5 T06
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	2.2	! FL	10.0	7.73	FL	mg/L		55	85 - 115

Lab Sample ID: 180-159655-25 DU
Matrix: Solid
Analysis Batch: 445262

Client Sample ID: B620-1 THRU B620-5 T07
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon - Quad	1.0	!	1.07		mg/L		3	15

Method: EPA 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: 180-159655-7 MS
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: B615-1 THRU B615-5 T07
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	ND	!	10.0	9.08		mg/L		91	85 - 115

Lab Sample ID: 180-159655-17 MS
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: B615-1 THRU B615-5 DUP T08
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	ND	!	10.0	10.4		mg/L		104	85 - 115

Lab Sample ID: 180-159655-8 DU
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: B615-1 THRU B615-5 T08
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon - Quad	ND	!	ND		mg/L		NC	15

Lab Sample ID: 180-159655-18 DU
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: B615-1 THRU B615-5 DUP T09
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon - Quad	0.59	J !	0.598	J	mg/L		2	15

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 180-445962/2
Matrix: Solid
Analysis Batch: 445962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			08/23/23 12:04	1

Lab Sample ID: LCS 180-445962/1
Matrix: Solid
Analysis Batch: 445962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	85.9		umhos/cm		102	90 - 110

Lab Sample ID: MB 180-445986/2
Matrix: Solid
Analysis Batch: 445986

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			08/24/23 10:47	1

Method: SM 2510B - Conductivity, Specific Conductance (Continued)

Lab Sample ID: LCS 180-445986/1
Matrix: Solid
Analysis Batch: 445986

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	85.9		umhos/cm		102	90 - 110

Lab Sample ID: MB 180-445987/2
Matrix: Solid
Analysis Batch: 445987

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			08/25/23 11:02	1

Lab Sample ID: LCS 180-445987/1
Matrix: Solid
Analysis Batch: 445987

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	86.1		umhos/cm		103	90 - 110

Lab Sample ID: MB 180-445996/2
Matrix: Solid
Analysis Batch: 445996

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			08/29/23 11:02	1

Lab Sample ID: LCS 180-445996/1
Matrix: Solid
Analysis Batch: 445996

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	86.3		umhos/cm		103	90 - 110

Lab Sample ID: MB 180-446001/2
Matrix: Solid
Analysis Batch: 446001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			09/06/23 14:23	1

Lab Sample ID: LCS 180-446001/1
Matrix: Solid
Analysis Batch: 446001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	87.6		umhos/cm		104	90 - 110

HPLC/IC

Leach Batch: 444238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-1	B615-1 THRU B615-5 T01	Leach	Solid	1314	
180-159655-10	B615-1 THRU B615-5 DUP T01	Leach	Solid	1314	
180-159655-19	B620-1 THRU B620-5 T01	Leach	Solid	1314	
180-159655-28	B620-1 THRU B620-5 DUP T01	Leach	Solid	1314	

Leach Batch: 444360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-2	B615-1 THRU B615-5 T02	Leach	Solid	1314	
180-159655-11	B615-1 THRU B615-5 DUP T02	Leach	Solid	1314	
180-159655-20	B620-1 THRU B620-5 T02	Leach	Solid	1314	
180-159655-29	B620-1 THRU B620-5 DUP T02	Leach	Solid	1314	

Leach Batch: 444363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-3	B615-1 THRU B615-5 T03	Leach	Solid	1314	
180-159655-12	B615-1 THRU B615-5 DUP T03	Leach	Solid	1314	
180-159655-21	B620-1 THRU B620-5 T03	Leach	Solid	1314	
180-159655-30	B620-1 THRU B620-5 DUP T03	Leach	Solid	1314	

Leach Batch: 444365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-4	B615-1 THRU B615-5 T04	Leach	Solid	1314	
180-159655-13	B615-1 THRU B615-5 DUP T04	Leach	Solid	1314	
180-159655-22	B620-1 THRU B620-5 T04	Leach	Solid	1314	
180-159655-31	B620-1 THRU B620-5 DUP T04	Leach	Solid	1314	

Leach Batch: 444366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-5	B615-1 THRU B615-5 T05	Leach	Solid	1314	
180-159655-14	B615-1 THRU B615-5 DUP T05	Leach	Solid	1314	
180-159655-23	B620-1 THRU B620-5 T05	Leach	Solid	1314	
180-159655-32	B620-1 THRU B620-5 DUP T05	Leach	Solid	1314	

Leach Batch: 444371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-6	B615-1 THRU B615-5 T06	Leach	Solid	1314	
180-159655-15	B615-1 THRU B615-5 DUP T06	Leach	Solid	1314	
180-159655-24	B620-1 THRU B620-5 T06	Leach	Solid	1314	
180-159655-33	B620-1 THRU B620-5 DUP T06	Leach	Solid	1314	

Leach Batch: 444374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-7	B615-1 THRU B615-5 T07	Leach	Solid	1314	
180-159655-16	B615-1 THRU B615-5 DUP T07	Leach	Solid	1314	
180-159655-25	B620-1 THRU B620-5 T07	Leach	Solid	1314	
180-159655-34	B620-1 THRU B620-5 DUP T07	Leach	Solid	1314	

Leach Batch: 444377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-8	B615-1 THRU B615-5 T08	Leach	Solid	1314	
180-159655-17	B615-1 THRU B615-5 DUP T08	Leach	Solid	1314	

HPLC/IC (Continued)

Leach Batch: 444377 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-26	B620-1 THRU B620-5 T08	Leach	Solid	1314	
180-159655-35	B620-1 THRU B620-5 DUP T08	Leach	Solid	1314	

Leach Batch: 444380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-9	B615-1 THRU B615-5 T09	Leach	Solid	1314	
180-159655-18	B615-1 THRU B615-5 DUP T09	Leach	Solid	1314	
180-159655-27	B620-1 THRU B620-5 T09	Leach	Solid	1314	
180-159655-36	B620-1 THRU B620-5 DUP T09	Leach	Solid	1314	

Analysis Batch: 444414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-1	B615-1 THRU B615-5 T01	Leach	Solid	EPA 9056A	444238
180-159655-10	B615-1 THRU B615-5 DUP T01	Leach	Solid	EPA 9056A	444238
180-159655-19	B620-1 THRU B620-5 T01	Leach	Solid	EPA 9056A	444238
180-159655-28	B620-1 THRU B620-5 DUP T01	Leach	Solid	EPA 9056A	444238
MB 180-444414/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444414/7	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 444656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-3	B615-1 THRU B615-5 T03	Leach	Solid	EPA 9056A	444363
180-159655-4	B615-1 THRU B615-5 T04	Leach	Solid	EPA 9056A	444365
180-159655-12	B615-1 THRU B615-5 DUP T03	Leach	Solid	EPA 9056A	444363
180-159655-13	B615-1 THRU B615-5 DUP T04	Leach	Solid	EPA 9056A	444365
180-159655-21	B620-1 THRU B620-5 T03	Leach	Solid	EPA 9056A	444363
180-159655-22	B620-1 THRU B620-5 T04	Leach	Solid	EPA 9056A	444365
180-159655-30	B620-1 THRU B620-5 DUP T03	Leach	Solid	EPA 9056A	444363
180-159655-31	B620-1 THRU B620-5 DUP T04	Leach	Solid	EPA 9056A	444365
MB 180-444656/36	Method Blank	Total/NA	Solid	EPA 9056A	
MB 180-444656/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444656/37	Lab Control Sample	Total/NA	Solid	EPA 9056A	
LCS 180-444656/7	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 444665

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-2	B615-1 THRU B615-5 T02	Leach	Solid	EPA 9056A	444360
180-159655-11	B615-1 THRU B615-5 DUP T02	Leach	Solid	EPA 9056A	444360
180-159655-20	B620-1 THRU B620-5 T02	Leach	Solid	EPA 9056A	444360
180-159655-29	B620-1 THRU B620-5 DUP T02	Leach	Solid	EPA 9056A	444360
MB 180-444665/36	Method Blank	Total/NA	Solid	EPA 9056A	
MB 180-444665/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444665/37	Lab Control Sample	Total/NA	Solid	EPA 9056A	
LCS 180-444665/7	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 444670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-5	B615-1 THRU B615-5 T05	Leach	Solid	EPA 9056A	444366
180-159655-14	B615-1 THRU B615-5 DUP T05	Leach	Solid	EPA 9056A	444366
180-159655-23	B620-1 THRU B620-5 T05	Leach	Solid	EPA 9056A	444366
180-159655-32	B620-1 THRU B620-5 DUP T05	Leach	Solid	EPA 9056A	444366

HPLC/IC (Continued)

Analysis Batch: 444670 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-444670/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444670/7	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 444942

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-15	B615-1 THRU B615-5 DUP T06	Leach	Solid	EPA 9056A	444371
180-159655-24	B620-1 THRU B620-5 T06	Leach	Solid	EPA 9056A	444371
180-159655-25	B620-1 THRU B620-5 T07	Leach	Solid	EPA 9056A	444374
MB 180-444942/8	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444942/9	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 444962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-6	B615-1 THRU B615-5 T06	Leach	Solid	EPA 9056A	444371
180-159655-7	B615-1 THRU B615-5 T07	Leach	Solid	EPA 9056A	444374
180-159655-16	B615-1 THRU B615-5 DUP T07	Leach	Solid	EPA 9056A	444374
180-159655-33	B620-1 THRU B620-5 DUP T06	Leach	Solid	EPA 9056A	444371
180-159655-34	B620-1 THRU B620-5 DUP T07	Leach	Solid	EPA 9056A	444374
MB 180-444962/36	Method Blank	Total/NA	Solid	EPA 9056A	
MB 180-444962/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444962/37	Lab Control Sample	Total/NA	Solid	EPA 9056A	
LCS 180-444962/7	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 446523

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-8	B615-1 THRU B615-5 T08	Leach	Solid	EPA 9056A	444377
180-159655-9	B615-1 THRU B615-5 T09	Leach	Solid	EPA 9056A	444380
180-159655-17	B615-1 THRU B615-5 DUP T08	Leach	Solid	EPA 9056A	444377
180-159655-18	B615-1 THRU B615-5 DUP T09	Leach	Solid	EPA 9056A	444380
180-159655-26	B620-1 THRU B620-5 T08	Leach	Solid	EPA 9056A	444377
180-159655-27	B620-1 THRU B620-5 T09	Leach	Solid	EPA 9056A	444380
180-159655-35	B620-1 THRU B620-5 DUP T08	Leach	Solid	EPA 9056A	444377
180-159655-36	B620-1 THRU B620-5 DUP T09	Leach	Solid	EPA 9056A	444380
MB 180-446523/38	Method Blank	Total/NA	Solid	EPA 9056A	
MB 180-446523/8	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-446523/39	Lab Control Sample	Total/NA	Solid	EPA 9056A	
LCS 180-446523/9	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Metals

Prep Batch: 412316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-37	B615-1 THRU B615-5 T01	Total Recoverable	Water	3005A	
180-159655-46	B615-1 THRU B615-5 DUP T01	Total Recoverable	Water	3005A	
180-159655-55	B620-1 THRU B620-5 T01	Total Recoverable	Water	3005A	
180-159655-64	B620-1 THRU B620-5 DUP T01	Total Recoverable	Water	3005A	
MB 410-412316/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-412316/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Metals

Analysis Batch: 412799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-37	B615-1 THRU B615-5 T01	Total Recoverable	Water	6010D	412316
180-159655-46	B615-1 THRU B615-5 DUP T01	Total Recoverable	Water	6010D	412316
180-159655-55	B620-1 THRU B620-5 T01	Total Recoverable	Water	6010D	412316
180-159655-64	B620-1 THRU B620-5 DUP T01	Total Recoverable	Water	6010D	412316
MB 410-412316/1-A	Method Blank	Total Recoverable	Water	6010D	412316
LCS 410-412316/2-A	Lab Control Sample	Total Recoverable	Water	6010D	412316

Prep Batch: 413042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-47	B615-1 THRU B615-5 DUP T02	Total Recoverable	Water	3005A	
MB 410-413042/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-413042/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 413043

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-38	B615-1 THRU B615-5 T02	Total Recoverable	Water	3005A	
180-159655-48	B615-1 THRU B615-5 DUP T03	Total Recoverable	Water	3005A	
180-159655-57	B620-1 THRU B620-5 T03	Total Recoverable	Water	3005A	
180-159655-66	B620-1 THRU B620-5 DUP T03	Total Recoverable	Water	3005A	
MB 410-413043/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-413043/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 413211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-40	B615-1 THRU B615-5 T04	Total Recoverable	Water	3005A	
MB 410-413211/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-413211/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 413213

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-39	B615-1 THRU B615-5 T03	Total Recoverable	Water	3005A	
180-159655-41	B615-1 THRU B615-5 T05	Total Recoverable	Water	3005A	
180-159655-49	B615-1 THRU B615-5 DUP T04	Total Recoverable	Water	3005A	
180-159655-50	B615-1 THRU B615-5 DUP T05	Total Recoverable	Water	3005A	
180-159655-56	B620-1 THRU B620-5 T02	Total Recoverable	Water	3005A	
180-159655-58	B620-1 THRU B620-5 T04	Total Recoverable	Water	3005A	
180-159655-59	B620-1 THRU B620-5 T05	Total Recoverable	Water	3005A	
180-159655-65	B620-1 THRU B620-5 DUP T02	Total Recoverable	Water	3005A	
180-159655-67	B620-1 THRU B620-5 DUP T04	Total Recoverable	Water	3005A	
180-159655-68	B620-1 THRU B620-5 DUP T05	Total Recoverable	Water	3005A	
MB 410-413213/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-413213/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 413359

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-47	B615-1 THRU B615-5 DUP T02	Total Recoverable	Water	6010D	413042
MB 410-413042/1-A	Method Blank	Total Recoverable	Water	6010D	413042
LCS 410-413042/2-A	Lab Control Sample	Total Recoverable	Water	6010D	413042

Metals

Analysis Batch: 413362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-38	B615-1 THRU B615-5 T02	Total Recoverable	Water	6010D	413043
180-159655-48	B615-1 THRU B615-5 DUP T03	Total Recoverable	Water	6010D	413043
180-159655-57	B620-1 THRU B620-5 T03	Total Recoverable	Water	6010D	413043
180-159655-66	B620-1 THRU B620-5 DUP T03	Total Recoverable	Water	6010D	413043
MB 410-413043/1-A	Method Blank	Total Recoverable	Water	6010D	413043
LCS 410-413043/2-A	Lab Control Sample	Total Recoverable	Water	6010D	413043

Analysis Batch: 413825

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-39	B615-1 THRU B615-5 T03	Total Recoverable	Water	6010D	413213
180-159655-41	B615-1 THRU B615-5 T05	Total Recoverable	Water	6010D	413213
180-159655-49	B615-1 THRU B615-5 DUP T04	Total Recoverable	Water	6010D	413213
180-159655-50	B615-1 THRU B615-5 DUP T05	Total Recoverable	Water	6010D	413213
180-159655-56	B620-1 THRU B620-5 T02	Total Recoverable	Water	6010D	413213
180-159655-58	B620-1 THRU B620-5 T04	Total Recoverable	Water	6010D	413213
180-159655-59	B620-1 THRU B620-5 T05	Total Recoverable	Water	6010D	413213
180-159655-65	B620-1 THRU B620-5 DUP T02	Total Recoverable	Water	6010D	413213
180-159655-67	B620-1 THRU B620-5 DUP T04	Total Recoverable	Water	6010D	413213
180-159655-68	B620-1 THRU B620-5 DUP T05	Total Recoverable	Water	6010D	413213
MB 410-413213/1-A	Method Blank	Total Recoverable	Water	6010D	413213
LCS 410-413213/2-A	Lab Control Sample	Total Recoverable	Water	6010D	413213

Analysis Batch: 413881

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-40	B615-1 THRU B615-5 T04	Total Recoverable	Water	6010D	413211
MB 410-413211/1-A	Method Blank	Total Recoverable	Water	6010D	413211
LCS 410-413211/2-A	Lab Control Sample	Total Recoverable	Water	6010D	413211

Prep Batch: 414855

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-42	B615-1 THRU B615-5 T06	Total Recoverable	Water	3005A	
180-159655-43	B615-1 THRU B615-5 T07	Total Recoverable	Water	3005A	
180-159655-51	B615-1 THRU B615-5 DUP T06	Total Recoverable	Water	3005A	
180-159655-52	B615-1 THRU B615-5 DUP T07	Total Recoverable	Water	3005A	
180-159655-60	B620-1 THRU B620-5 T06	Total Recoverable	Water	3005A	
180-159655-61	B620-1 THRU B620-5 T07	Total Recoverable	Water	3005A	
180-159655-69	B620-1 THRU B620-5 DUP T06	Total Recoverable	Water	3005A	
MB 410-414855/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-414855/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 414869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-70	B620-1 THRU B620-5 DUP T07	Total Recoverable	Water	3005A	
MB 410-414869/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-414869/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 415819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-70	B620-1 THRU B620-5 DUP T07	Total Recoverable	Water	6010D	414869
MB 410-414869/1-A	Method Blank	Total Recoverable	Water	6010D	414869
LCS 410-414869/2-A	Lab Control Sample	Total Recoverable	Water	6010D	414869

QC Association Summary

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

Metals

Analysis Batch: 416737

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-42	B615-1 THRU B615-5 T06	Total Recoverable	Water	6010D	414855
180-159655-43	B615-1 THRU B615-5 T07	Total Recoverable	Water	6010D	414855
180-159655-51	B615-1 THRU B615-5 DUP T06	Total Recoverable	Water	6010D	414855
180-159655-52	B615-1 THRU B615-5 DUP T07	Total Recoverable	Water	6010D	414855
180-159655-60	B620-1 THRU B620-5 T06	Total Recoverable	Water	6010D	414855
180-159655-61	B620-1 THRU B620-5 T07	Total Recoverable	Water	6010D	414855
180-159655-69	B620-1 THRU B620-5 DUP T06	Total Recoverable	Water	6010D	414855
MB 410-414855/1-A	Method Blank	Total Recoverable	Water	6010D	414855
LCS 410-414855/2-A	Lab Control Sample	Total Recoverable	Water	6010D	414855

Prep Batch: 417838

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-44	B615-1 THRU B615-5 T08	Total Recoverable	Water	3005A	
180-159655-45	B615-1 THRU B615-5 T09	Total Recoverable	Water	3005A	
180-159655-53	B615-1 THRU B615-5 DUP T08	Total Recoverable	Water	3005A	
180-159655-54	B615-1 THRU B615-5 DUP T09	Total Recoverable	Water	3005A	
180-159655-62	B620-1 THRU B620-5 T08	Total Recoverable	Water	3005A	
180-159655-63	B620-1 THRU B620-5 T09	Total Recoverable	Water	3005A	
180-159655-71	B620-1 THRU B620-5 DUP T08	Total Recoverable	Water	3005A	
180-159655-72	B620-1 THRU B620-5 DUP T09	Total Recoverable	Water	3005A	
MB 410-417838/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-417838/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-159655-71 MS	B620-1 THRU B620-5 DUP T08	Total Recoverable	Water	3005A	
180-159655-71 MSD	B620-1 THRU B620-5 DUP T08	Total Recoverable	Water	3005A	
180-159655-71 DU	B620-1 THRU B620-5 DUP T08	Total Recoverable	Water	3005A	

Analysis Batch: 418354

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-44	B615-1 THRU B615-5 T08	Total Recoverable	Water	6010D	417838
180-159655-45	B615-1 THRU B615-5 T09	Total Recoverable	Water	6010D	417838
180-159655-53	B615-1 THRU B615-5 DUP T08	Total Recoverable	Water	6010D	417838
180-159655-54	B615-1 THRU B615-5 DUP T09	Total Recoverable	Water	6010D	417838
180-159655-62	B620-1 THRU B620-5 T08	Total Recoverable	Water	6010D	417838
180-159655-63	B620-1 THRU B620-5 T09	Total Recoverable	Water	6010D	417838
180-159655-71	B620-1 THRU B620-5 DUP T08	Total Recoverable	Water	6010D	417838
180-159655-72	B620-1 THRU B620-5 DUP T09	Total Recoverable	Water	6010D	417838
MB 410-417838/1-A	Method Blank	Total Recoverable	Water	6010D	417838
LCS 410-417838/2-A	Lab Control Sample	Total Recoverable	Water	6010D	417838
180-159655-71 MS	B620-1 THRU B620-5 DUP T08	Total Recoverable	Water	6010D	417838
180-159655-71 MSD	B620-1 THRU B620-5 DUP T08	Total Recoverable	Water	6010D	417838
180-159655-71 DU	B620-1 THRU B620-5 DUP T08	Total Recoverable	Water	6010D	417838

General Chemistry

Leach Batch: 444238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-1	B615-1 THRU B615-5 T01	Leach	Solid	1314	
180-159655-10	B615-1 THRU B615-5 DUP T01	Leach	Solid	1314	
180-159655-19	B620-1 THRU B620-5 T01	Leach	Solid	1314	
180-159655-28	B620-1 THRU B620-5 DUP T01	Leach	Solid	1314	

General Chemistry

Leach Batch: 444360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-2	B615-1 THRU B615-5 T02	Leach	Solid	1314	
180-159655-11	B615-1 THRU B615-5 DUP T02	Leach	Solid	1314	
180-159655-20	B620-1 THRU B620-5 T02	Leach	Solid	1314	
180-159655-29	B620-1 THRU B620-5 DUP T02	Leach	Solid	1314	

Leach Batch: 444363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-3	B615-1 THRU B615-5 T03	Leach	Solid	1314	
180-159655-12	B615-1 THRU B615-5 DUP T03	Leach	Solid	1314	
180-159655-21	B620-1 THRU B620-5 T03	Leach	Solid	1314	
180-159655-30	B620-1 THRU B620-5 DUP T03	Leach	Solid	1314	

Leach Batch: 444365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-4	B615-1 THRU B615-5 T04	Leach	Solid	1314	
180-159655-13	B615-1 THRU B615-5 DUP T04	Leach	Solid	1314	
180-159655-22	B620-1 THRU B620-5 T04	Leach	Solid	1314	
180-159655-31	B620-1 THRU B620-5 DUP T04	Leach	Solid	1314	

Leach Batch: 444366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-5	B615-1 THRU B615-5 T05	Leach	Solid	1314	
180-159655-14	B615-1 THRU B615-5 DUP T05	Leach	Solid	1314	
180-159655-23	B620-1 THRU B620-5 T05	Leach	Solid	1314	
180-159655-32	B620-1 THRU B620-5 DUP T05	Leach	Solid	1314	

Leach Batch: 444371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-6	B615-1 THRU B615-5 T06	Leach	Solid	1314	
180-159655-15	B615-1 THRU B615-5 DUP T06	Leach	Solid	1314	
180-159655-24	B620-1 THRU B620-5 T06	Leach	Solid	1314	
180-159655-33	B620-1 THRU B620-5 DUP T06	Leach	Solid	1314	
180-159655-24 MS	B620-1 THRU B620-5 T06	Leach	Solid	1314	

Leach Batch: 444374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-7	B615-1 THRU B615-5 T07	Leach	Solid	1314	
180-159655-16	B615-1 THRU B615-5 DUP T07	Leach	Solid	1314	
180-159655-25	B620-1 THRU B620-5 T07	Leach	Solid	1314	
180-159655-34	B620-1 THRU B620-5 DUP T07	Leach	Solid	1314	
180-159655-7 MS	B615-1 THRU B615-5 T07	Leach	Solid	1314	
180-159655-25 DU	B620-1 THRU B620-5 T07	Leach	Solid	1314	

Leach Batch: 444377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-8	B615-1 THRU B615-5 T08	Leach	Solid	1314	
180-159655-17	B615-1 THRU B615-5 DUP T08	Leach	Solid	1314	
180-159655-26	B620-1 THRU B620-5 T08	Leach	Solid	1314	
180-159655-35	B620-1 THRU B620-5 DUP T08	Leach	Solid	1314	
180-159655-17 MS	B615-1 THRU B615-5 DUP T08	Leach	Solid	1314	
180-159655-8 DU	B615-1 THRU B615-5 T08	Leach	Solid	1314	

QC Association Summary

Client: US Ecology Inc
Job ID: 180-159655-1
Project/Site: Republic Services Mercury Project REVISE

General Chemistry

Leach Batch: 444380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-9	B615-1 THRU B615-5 T09	Leach	Solid	1314	
180-159655-18	B615-1 THRU B615-5 DUP T09	Leach	Solid	1314	
180-159655-27	B620-1 THRU B620-5 T09	Leach	Solid	1314	
180-159655-36	B620-1 THRU B620-5 DUP T09	Leach	Solid	1314	
180-159655-18 DU	B615-1 THRU B615-5 DUP T09	Leach	Solid	1314	

Analysis Batch: 445128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-19	B620-1 THRU B620-5 T01	Leach	Solid	EPA 9060A	444238
180-159655-20	B620-1 THRU B620-5 T02	Leach	Solid	EPA 9060A	444360
180-159655-21	B620-1 THRU B620-5 T03	Leach	Solid	EPA 9060A	444363
180-159655-22	B620-1 THRU B620-5 T04	Leach	Solid	EPA 9060A	444365
180-159655-23	B620-1 THRU B620-5 T05	Leach	Solid	EPA 9060A	444366
MB 180-445128/35	Method Blank	Total/NA	Solid	EPA 9060A	
MB 180-445128/5	Method Blank	Total/NA	Solid	EPA 9060A	
LCS 180-445128/34	Lab Control Sample	Total/NA	Solid	EPA 9060A	
LCS 180-445128/4	Lab Control Sample	Total/NA	Solid	EPA 9060A	

Analysis Batch: 445262

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-24	B620-1 THRU B620-5 T06	Leach	Solid	EPA 9060A	444371
180-159655-25	B620-1 THRU B620-5 T07	Leach	Solid	EPA 9060A	444374
180-159655-28	B620-1 THRU B620-5 DUP T01	Leach	Solid	EPA 9060A	444238
180-159655-29	B620-1 THRU B620-5 DUP T02	Leach	Solid	EPA 9060A	444360
180-159655-30	B620-1 THRU B620-5 DUP T03	Leach	Solid	EPA 9060A	444363
180-159655-31	B620-1 THRU B620-5 DUP T04	Leach	Solid	EPA 9060A	444365
180-159655-32	B620-1 THRU B620-5 DUP T05	Leach	Solid	EPA 9060A	444366
180-159655-33	B620-1 THRU B620-5 DUP T06	Leach	Solid	EPA 9060A	444371
180-159655-34	B620-1 THRU B620-5 DUP T07	Leach	Solid	EPA 9060A	444374
MB 180-445262/5	Method Blank	Total/NA	Solid	EPA 9060A	
LCS 180-445262/4	Lab Control Sample	Total/NA	Solid	EPA 9060A	
180-159655-24 MS	B620-1 THRU B620-5 T06	Leach	Solid	EPA 9060A	444371
180-159655-25 DU	B620-1 THRU B620-5 T07	Leach	Solid	EPA 9060A	444374

Analysis Batch: 445960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-1	B615-1 THRU B615-5 T01	Leach	Solid	EPA 9040C	444238
180-159655-10	B615-1 THRU B615-5 DUP T01	Leach	Solid	EPA 9040C	444238
180-159655-19	B620-1 THRU B620-5 T01	Leach	Solid	EPA 9040C	444238
180-159655-28	B620-1 THRU B620-5 DUP T01	Leach	Solid	EPA 9040C	444238
LCS 180-445960/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 445961

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-1	B615-1 THRU B615-5 T01	Leach	Solid	SM 2580B	444238
180-159655-10	B615-1 THRU B615-5 DUP T01	Leach	Solid	SM 2580B	444238
180-159655-19	B620-1 THRU B620-5 T01	Leach	Solid	SM 2580B	444238
180-159655-28	B620-1 THRU B620-5 DUP T01	Leach	Solid	SM 2580B	444238
LCS 180-445961/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

General Chemistry

Analysis Batch: 445962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-1	B615-1 THRU B615-5 T01	Leach	Solid	SM 2510B	444238
180-159655-10	B615-1 THRU B615-5 DUP T01	Leach	Solid	SM 2510B	444238
180-159655-19	B620-1 THRU B620-5 T01	Leach	Solid	SM 2510B	444238
180-159655-28	B620-1 THRU B620-5 DUP T01	Leach	Solid	SM 2510B	444238
MB 180-445962/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-445962/1	Lab Control Sample	Total/NA	Solid	SM 2510B	

Analysis Batch: 445969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-2	B615-1 THRU B615-5 T02	Leach	Solid	EPA 9040C	444360
180-159655-3	B615-1 THRU B615-5 T03	Leach	Solid	EPA 9040C	444363
180-159655-11	B615-1 THRU B615-5 DUP T02	Leach	Solid	EPA 9040C	444360
180-159655-12	B615-1 THRU B615-5 DUP T03	Leach	Solid	EPA 9040C	444363
180-159655-20	B620-1 THRU B620-5 T02	Leach	Solid	EPA 9040C	444360
180-159655-21	B620-1 THRU B620-5 T03	Leach	Solid	EPA 9040C	444363
180-159655-29	B620-1 THRU B620-5 DUP T02	Leach	Solid	EPA 9040C	444360
180-159655-30	B620-1 THRU B620-5 DUP T03	Leach	Solid	EPA 9040C	444363
LCS 180-445969/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 445985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-2	B615-1 THRU B615-5 T02	Leach	Solid	SM 2580B	444360
180-159655-3	B615-1 THRU B615-5 T03	Leach	Solid	SM 2580B	444363
180-159655-11	B615-1 THRU B615-5 DUP T02	Leach	Solid	SM 2580B	444360
180-159655-12	B615-1 THRU B615-5 DUP T03	Leach	Solid	SM 2580B	444363
180-159655-20	B620-1 THRU B620-5 T02	Leach	Solid	SM 2580B	444360
180-159655-21	B620-1 THRU B620-5 T03	Leach	Solid	SM 2580B	444363
180-159655-29	B620-1 THRU B620-5 DUP T02	Leach	Solid	SM 2580B	444360
180-159655-30	B620-1 THRU B620-5 DUP T03	Leach	Solid	SM 2580B	444363
LCS 180-445985/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

Analysis Batch: 445986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-2	B615-1 THRU B615-5 T02	Leach	Solid	SM 2510B	444360
180-159655-3	B615-1 THRU B615-5 T03	Leach	Solid	SM 2510B	444363
180-159655-11	B615-1 THRU B615-5 DUP T02	Leach	Solid	SM 2510B	444360
180-159655-12	B615-1 THRU B615-5 DUP T03	Leach	Solid	SM 2510B	444363
180-159655-20	B620-1 THRU B620-5 T02	Leach	Solid	SM 2510B	444360
180-159655-21	B620-1 THRU B620-5 T03	Leach	Solid	SM 2510B	444363
180-159655-29	B620-1 THRU B620-5 DUP T02	Leach	Solid	SM 2510B	444360
180-159655-30	B620-1 THRU B620-5 DUP T03	Leach	Solid	SM 2510B	444363
MB 180-445986/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-445986/1	Lab Control Sample	Total/NA	Solid	SM 2510B	

Analysis Batch: 445987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-4	B615-1 THRU B615-5 T04	Leach	Solid	SM 2510B	444365
180-159655-5	B615-1 THRU B615-5 T05	Leach	Solid	SM 2510B	444366
180-159655-13	B615-1 THRU B615-5 DUP T04	Leach	Solid	SM 2510B	444365
180-159655-14	B615-1 THRU B615-5 DUP T05	Leach	Solid	SM 2510B	444366
180-159655-22	B620-1 THRU B620-5 T04	Leach	Solid	SM 2510B	444365

General Chemistry (Continued)

Analysis Batch: 445987 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-23	B620-1 THRU B620-5 T05	Leach	Solid	SM 2510B	444366
180-159655-31	B620-1 THRU B620-5 DUP T04	Leach	Solid	SM 2510B	444365
180-159655-32	B620-1 THRU B620-5 DUP T05	Leach	Solid	SM 2510B	444366
MB 180-445987/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-445987/1	Lab Control Sample	Total/NA	Solid	SM 2510B	

Analysis Batch: 445989

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-4	B615-1 THRU B615-5 T04	Leach	Solid	SM 2580B	444365
180-159655-5	B615-1 THRU B615-5 T05	Leach	Solid	SM 2580B	444366
180-159655-13	B615-1 THRU B615-5 DUP T04	Leach	Solid	SM 2580B	444365
180-159655-14	B615-1 THRU B615-5 DUP T05	Leach	Solid	SM 2580B	444366
180-159655-22	B620-1 THRU B620-5 T04	Leach	Solid	SM 2580B	444365
180-159655-23	B620-1 THRU B620-5 T05	Leach	Solid	SM 2580B	444366
180-159655-31	B620-1 THRU B620-5 DUP T04	Leach	Solid	SM 2580B	444365
180-159655-32	B620-1 THRU B620-5 DUP T05	Leach	Solid	SM 2580B	444366
LCS 180-445989/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

Analysis Batch: 445992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-4	B615-1 THRU B615-5 T04	Leach	Solid	EPA 9040C	444365
180-159655-5	B615-1 THRU B615-5 T05	Leach	Solid	EPA 9040C	444366
180-159655-13	B615-1 THRU B615-5 DUP T04	Leach	Solid	EPA 9040C	444365
180-159655-14	B615-1 THRU B615-5 DUP T05	Leach	Solid	EPA 9040C	444366
180-159655-22	B620-1 THRU B620-5 T04	Leach	Solid	EPA 9040C	444365
180-159655-23	B620-1 THRU B620-5 T05	Leach	Solid	EPA 9040C	444366
180-159655-31	B620-1 THRU B620-5 DUP T04	Leach	Solid	EPA 9040C	444365
180-159655-32	B620-1 THRU B620-5 DUP T05	Leach	Solid	EPA 9040C	444366
LCS 180-445992/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 445996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-6	B615-1 THRU B615-5 T06	Leach	Solid	SM 2510B	444371
180-159655-7	B615-1 THRU B615-5 T07	Leach	Solid	SM 2510B	444374
180-159655-15	B615-1 THRU B615-5 DUP T06	Leach	Solid	SM 2510B	444371
180-159655-16	B615-1 THRU B615-5 DUP T07	Leach	Solid	SM 2510B	444374
180-159655-24	B620-1 THRU B620-5 T06	Leach	Solid	SM 2510B	444371
180-159655-25	B620-1 THRU B620-5 T07	Leach	Solid	SM 2510B	444374
180-159655-33	B620-1 THRU B620-5 DUP T06	Leach	Solid	SM 2510B	444371
180-159655-34	B620-1 THRU B620-5 DUP T07	Leach	Solid	SM 2510B	444374
MB 180-445996/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-445996/1	Lab Control Sample	Total/NA	Solid	SM 2510B	

Analysis Batch: 445999

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-6	B615-1 THRU B615-5 T06	Leach	Solid	SM 2580B	444371
180-159655-7	B615-1 THRU B615-5 T07	Leach	Solid	SM 2580B	444374
180-159655-15	B615-1 THRU B615-5 DUP T06	Leach	Solid	SM 2580B	444371
180-159655-16	B615-1 THRU B615-5 DUP T07	Leach	Solid	SM 2580B	444374
180-159655-24	B620-1 THRU B620-5 T06	Leach	Solid	SM 2580B	444371
180-159655-25	B620-1 THRU B620-5 T07	Leach	Solid	SM 2580B	444374

General Chemistry (Continued)

Analysis Batch: 445999 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-33	B620-1 THRU B620-5 DUP T06	Leach	Solid	SM 2580B	444371
180-159655-34	B620-1 THRU B620-5 DUP T07	Leach	Solid	SM 2580B	444374
LCS 180-445999/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

Analysis Batch: 446000

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-6	B615-1 THRU B615-5 T06	Leach	Solid	EPA 9040C	444371
180-159655-7	B615-1 THRU B615-5 T07	Leach	Solid	EPA 9040C	444374
180-159655-15	B615-1 THRU B615-5 DUP T06	Leach	Solid	EPA 9040C	444371
180-159655-16	B615-1 THRU B615-5 DUP T07	Leach	Solid	EPA 9040C	444374
180-159655-24	B620-1 THRU B620-5 T06	Leach	Solid	EPA 9040C	444371
180-159655-25	B620-1 THRU B620-5 T07	Leach	Solid	EPA 9040C	444374
180-159655-33	B620-1 THRU B620-5 DUP T06	Leach	Solid	EPA 9040C	444371
180-159655-34	B620-1 THRU B620-5 DUP T07	Leach	Solid	EPA 9040C	444374
LCS 180-446000/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 446001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-8	B615-1 THRU B615-5 T08	Leach	Solid	SM 2510B	444377
180-159655-9	B615-1 THRU B615-5 T09	Leach	Solid	SM 2510B	444380
180-159655-17	B615-1 THRU B615-5 DUP T08	Leach	Solid	SM 2510B	444377
180-159655-18	B615-1 THRU B615-5 DUP T09	Leach	Solid	SM 2510B	444380
180-159655-26	B620-1 THRU B620-5 T08	Leach	Solid	SM 2510B	444377
180-159655-27	B620-1 THRU B620-5 T09	Leach	Solid	SM 2510B	444380
180-159655-35	B620-1 THRU B620-5 DUP T08	Leach	Solid	SM 2510B	444377
180-159655-36	B620-1 THRU B620-5 DUP T09	Leach	Solid	SM 2510B	444380
MB 180-446001/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-446001/1	Lab Control Sample	Total/NA	Solid	SM 2510B	

Analysis Batch: 446002

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-8	B615-1 THRU B615-5 T08	Leach	Solid	SM 2580B	444377
180-159655-9	B615-1 THRU B615-5 T09	Leach	Solid	SM 2580B	444380
180-159655-17	B615-1 THRU B615-5 DUP T08	Leach	Solid	SM 2580B	444377
180-159655-18	B615-1 THRU B615-5 DUP T09	Leach	Solid	SM 2580B	444380
180-159655-26	B620-1 THRU B620-5 T08	Leach	Solid	SM 2580B	444377
180-159655-27	B620-1 THRU B620-5 T09	Leach	Solid	SM 2580B	444380
180-159655-35	B620-1 THRU B620-5 DUP T08	Leach	Solid	SM 2580B	444377
180-159655-36	B620-1 THRU B620-5 DUP T09	Leach	Solid	SM 2580B	444380
LCS 180-446002/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

Analysis Batch: 446003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-8	B615-1 THRU B615-5 T08	Leach	Solid	EPA 9040C	444377
180-159655-9	B615-1 THRU B615-5 T09	Leach	Solid	EPA 9040C	444380
180-159655-17	B615-1 THRU B615-5 DUP T08	Leach	Solid	EPA 9040C	444377
180-159655-18	B615-1 THRU B615-5 DUP T09	Leach	Solid	EPA 9040C	444380
180-159655-26	B620-1 THRU B620-5 T08	Leach	Solid	EPA 9040C	444377
180-159655-27	B620-1 THRU B620-5 T09	Leach	Solid	EPA 9040C	444380
180-159655-35	B620-1 THRU B620-5 DUP T08	Leach	Solid	EPA 9040C	444377
180-159655-36	B620-1 THRU B620-5 DUP T09	Leach	Solid	EPA 9040C	444380

General Chemistry (Continued)

Analysis Batch: 446003 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-446003/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 446114

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-1	B615-1 THRU B615-5 T01	Leach	Solid	EPA 9060A	444238
180-159655-2	B615-1 THRU B615-5 T02	Leach	Solid	EPA 9060A	444360
180-159655-3	B615-1 THRU B615-5 T03	Leach	Solid	EPA 9060A	444363
MB 180-446114/35	Method Blank	Total/NA	Solid	EPA 9060A	
MB 180-446114/67	Method Blank	Total/NA	Solid	EPA 9060A	
LCS 180-446114/66	Lab Control Sample	Total/NA	Solid	EPA 9060A	

Analysis Batch: 446407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-159655-4	B615-1 THRU B615-5 T04	Leach	Solid	EPA 9060A	444365
180-159655-5	B615-1 THRU B615-5 T05	Leach	Solid	EPA 9060A	444366
180-159655-6	B615-1 THRU B615-5 T06	Leach	Solid	EPA 9060A	444371
180-159655-7	B615-1 THRU B615-5 T07	Leach	Solid	EPA 9060A	444374
180-159655-8	B615-1 THRU B615-5 T08	Leach	Solid	EPA 9060A	444377
180-159655-9	B615-1 THRU B615-5 T09	Leach	Solid	EPA 9060A	444380
180-159655-10	B615-1 THRU B615-5 DUP T01	Leach	Solid	EPA 9060A	444238
180-159655-11	B615-1 THRU B615-5 DUP T02	Leach	Solid	EPA 9060A	444360
180-159655-12	B615-1 THRU B615-5 DUP T03	Leach	Solid	EPA 9060A	444363
180-159655-13	B615-1 THRU B615-5 DUP T04	Leach	Solid	EPA 9060A	444365
180-159655-14	B615-1 THRU B615-5 DUP T05	Leach	Solid	EPA 9060A	444366
180-159655-15	B615-1 THRU B615-5 DUP T06	Leach	Solid	EPA 9060A	444371
180-159655-16	B615-1 THRU B615-5 DUP T07	Leach	Solid	EPA 9060A	444374
180-159655-17	B615-1 THRU B615-5 DUP T08	Leach	Solid	EPA 9060A	444377
180-159655-18	B615-1 THRU B615-5 DUP T09	Leach	Solid	EPA 9060A	444380
180-159655-26	B620-1 THRU B620-5 T08	Leach	Solid	EPA 9060A	444377
180-159655-27	B620-1 THRU B620-5 T09	Leach	Solid	EPA 9060A	444380
180-159655-35	B620-1 THRU B620-5 DUP T08	Leach	Solid	EPA 9060A	444377
180-159655-36	B620-1 THRU B620-5 DUP T09	Leach	Solid	EPA 9060A	444380
MB 180-446407/35	Method Blank	Total/NA	Solid	EPA 9060A	
MB 180-446407/5	Method Blank	Total/NA	Solid	EPA 9060A	
MB 180-446407/67	Method Blank	Total/NA	Solid	EPA 9060A	
LCS 180-446407/34	Lab Control Sample	Total/NA	Solid	EPA 9060A	
LCS 180-446407/4	Lab Control Sample	Total/NA	Solid	EPA 9060A	
LCS 180-446407/66	Lab Control Sample	Total/NA	Solid	EPA 9060A	
180-159655-7 MS	B615-1 THRU B615-5 T07	Leach	Solid	EPA 9060A	444374
180-159655-17 MS	B615-1 THRU B615-5 DUP T08	Leach	Solid	EPA 9060A	444377
180-159655-8 DU	B615-1 THRU B615-5 T08	Leach	Solid	EPA 9060A	444377
180-159655-18 DU	B615-1 THRU B615-5 DUP T09	Leach	Solid	EPA 9060A	444380

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238-2907
phone 412.963.7058 fax 412.963.2468

Chain of Custody Record

eurofins | Environment Testing America

Regulatory Program: DDW DNPDES ☐ RCRA ☐ other:

Eurofins Environment Testing America

Client Contact	Project Manager: Paul Canevaro	Site Contact:	Date:	COC No:
US Ecology	EniaikPaul.Canevaro@usecology.com	Lab Contact:	Carrier:	____ of ____ COCs
Address	Tel/Fax:			TALS Project #:
City/State/Zip	Analysis Turnaround Time			Sampler:
(2810900-0110 Phone	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(xxx) xxx-xxxx FAX	TAT if different from Below ____			Walk-in Client:
Project Name:	☐ 2 weeks			Lab Sampling:
Site:	☐ 1 week			Job / SDG No.:
PO #	☐ 2 days ☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cent.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	1614 74708	1614 90400	1614 90108	1614 90808	1614 90508	1614 90608	1314 TOTAL SULFIDE	Sample Specific Notes:
B615-1 thru B615-5	07/11/23	900	G	S	5			X	X	X	X	X	X	X	ANALYSIS IN DUPLICATE
B620-1 thru B620-5	07/11/23	900	G	S	5			X	X	X	X	X	X	X	ANALYS
Field Duplicate B600-1 thur B00-5	07/11/23	900	G	S	5			X	X	X	X	X	X	X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SQ4; 4=HNQ3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

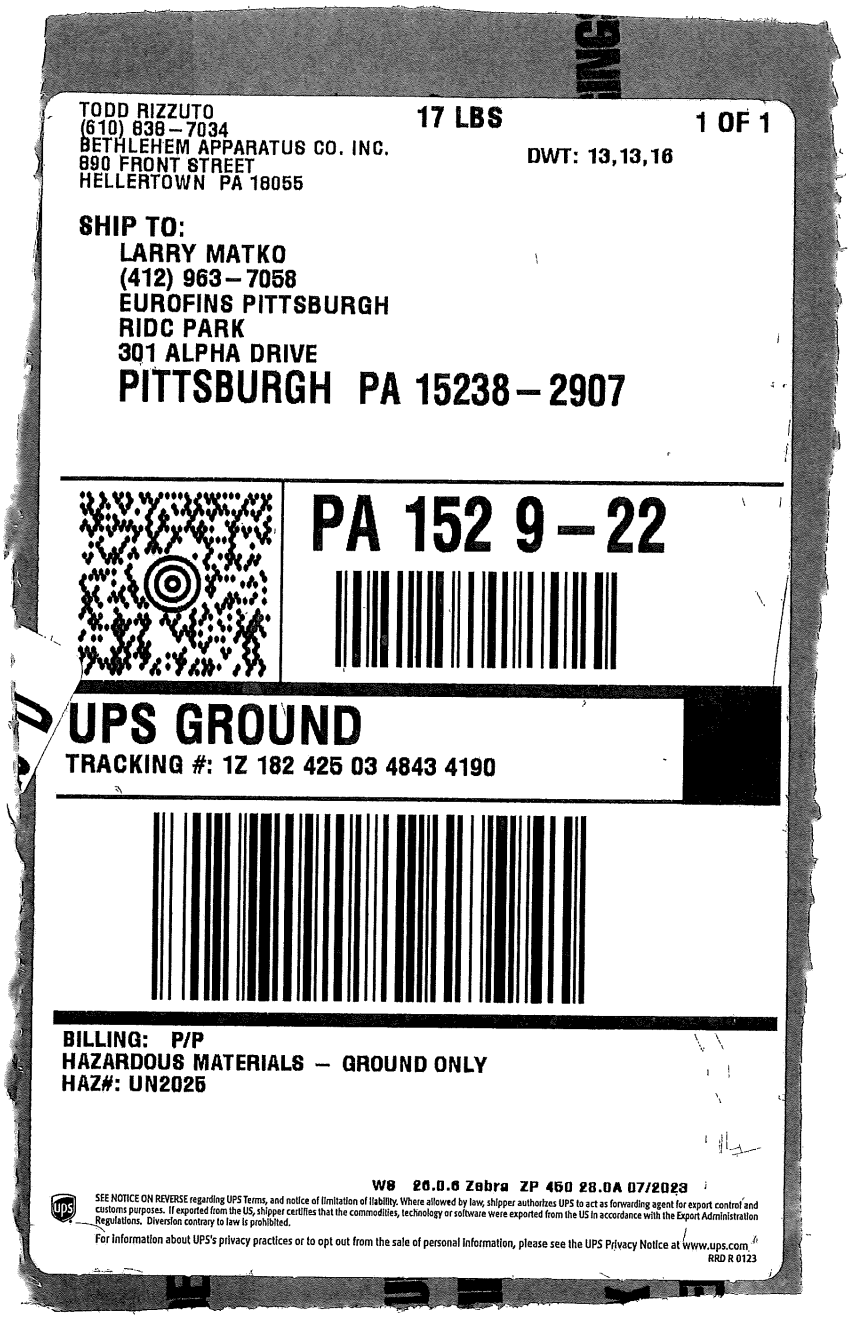
Sample Disposal (A fee may be assessed if samples are retained long

☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____

Please ask Larry Makco about QAPP for US Ecology.

180-159655 Chain of Custody

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: ____ Corr'd: ____	Therm ID No.: ____
Relinquished by:	Company: Bethlehem Apparatus	Date/Time: 7/11/23 1400	Received by:	Company: ZETNE	Date/Time: 07/20/23 0900
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:



TODD RIZZUTO
(610) 838–7034
BETHLEHEM APPARATUS CO. INC.
890 FRONT STREET
HELLERTOWN PA 18055

17 LBS

1 OF 1

DWT: 13,13,16

SHIP TO:
LARRY MATKO
(412) 963–7058
EUROFINS PITTSBURGH
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238–2907

PA 152 9–22

UPS GROUND
TRACKING #: 1Z 182 425 03 4843 4190

BILLING: P/P
HAZARDOUS MATERIALS – GROUND ONLY
HAZ#: UN2025

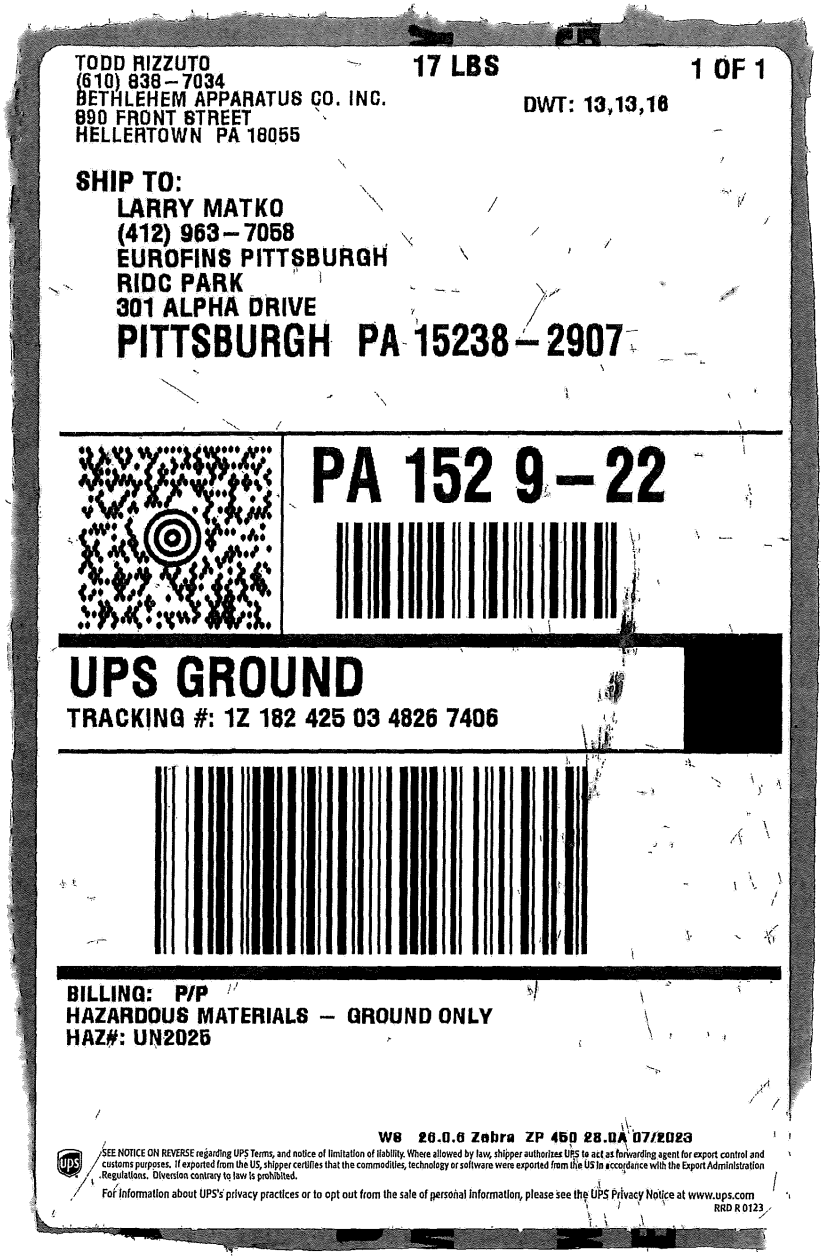
WS 26.0.6 Zebra ZP 450 26.0A 07/2023

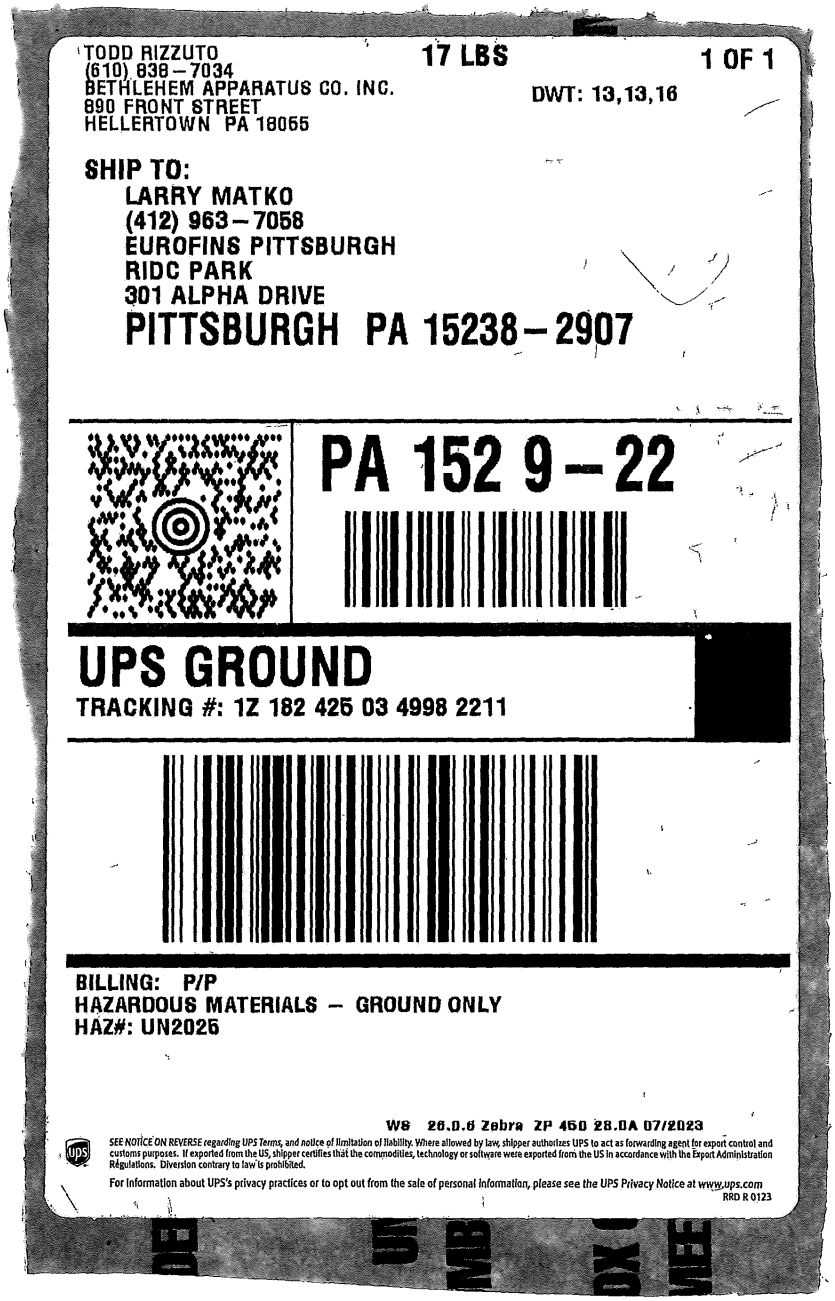
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RRD R 0123

180-159655 Waybill


TODD RIZZUTO
(610) 838-7034
BETHLEHEM APPARATUS CO. INC.
890 FRONT STREET
HELLERTOWN PA 18055
17 LBS
1 OF 1
DWT: 13,13,16
SHIP TO:
LARRY MATKO
(412) 963-7058
EUROFINS PITTSBURGH
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238-2907
PA 152 9-22
UPS GROUND
TRACKING #: 1Z 182 425 03 4826 7406
BILLING: P/P
HAZARDOUS MATERIALS - GROUND ONLY
HAZ#: UN2026
W8 26.0.6 Zebra ZP 450 28.0A 07/2023
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TODD RIZZUTO
(610) 838–7034
BETHLEHEM APPARATUS CO. INC.
890 FRONT STREET
HELLERTOWN PA 18055

17 LBS

1 OF 1

DWT: 13,13,16

SHIP TO:
LARRY MATKO
(412) 963–7058
EUROFINS PITTSBURGH
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238–2907

PA 152 9–22

UPS GROUND
TRACKING #: 1Z 182 425 03 4998 2211

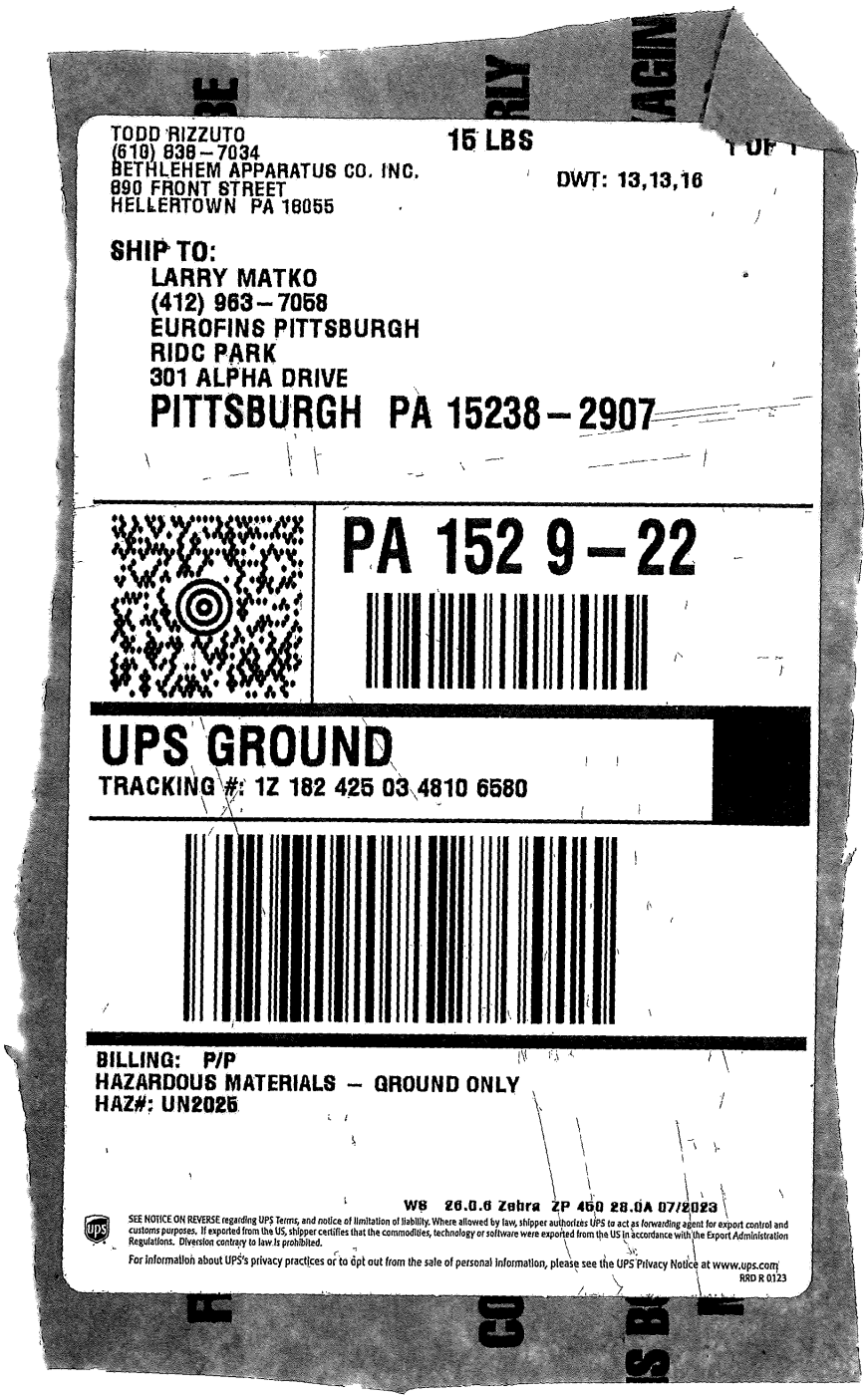
BILLING: P/P
HAZARDOUS MATERIALS – GROUND ONLY
HAZ#: UN2025

WS 26.0.6 Zebra ZP 450 28.0A 07/2023

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RRD R 0123



TODD RIZZUTO
(610) 838-7034
BETHLEHEM APPARATUS CO. INC.
890 FRONT STREET
HELLERTOWN PA 18055

15 LBS

1 OF 1

DWT: 13,13,16

SHIP TO:
LARRY MATKO
(412) 963-7058
EUROFINS PITTSBURGH
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238-2907

PA 152 9-22

UPS GROUND
TRACKING #: 1Z 182 425 03 4810 6580

BILLING: P/P
HAZARDOUS MATERIALS - GROUND ONLY
HAZ#: UN2025

W8 26.0.6 Zebra ZP 450 28.0A 07/2023

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RRD R 0123

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-493830.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-159655-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 8/24/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B615-1 THRU B615-5 T01 (180-159655-37)	8/23/23	11:18 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T01 (180-159655-46)	8/23/23	11:18 Eastern		Water			X	1	
B620-1 THRU B620-5 T01 (180-159655-55)	8/23/23	11:18 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T01 (180-159655-64)	8/23/23	11:18 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8/24/23 9:50	Company EEET

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: Raw 14.9 - COR 14.7

Ver: 06/08/2021

mB

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-493830.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-159655-1
Address: 2425 New Holland Pike,	Due Date Requested: 8/24/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B615-1 THRU B615-5 T01 (180-159655-37)	8/23/23	11:18 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T01 (180-159655-46)	8/23/23	11:18 Eastern		Water			X	1	
B620-1 THRU B620-5 T01 (180-159655-55)	8/23/23	11:18 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T01 (180-159655-64)	8/23/23	11:18 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8/24/23 9:50	Company EET

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: Raw 14.9 - COR 14.7

Ver: 06/08/2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-493878.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-159655-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 8/24/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B615-1 THRU B615-5 T02 (180-159655-38)	8/23/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 T03 (180-159655-39)	8/24/23	06:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T02 (180-159655-47)	8/23/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T03 (180-159655-48)	8/24/23	06:30 Eastern		Water			X	1	
B620-1 THRU B620-5 T02 (180-159655-56)	8/23/23	18:30 Eastern		Water			X	1	
B620-1 THRU B620-5 T03 (180-159655-57)	8/24/23	06:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T02 (180-159655-65)	8/23/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T03 (180-159655-66)	8/24/23	06:30 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	8-24-23 1100	[illegible]			
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 8/25/23 10:04	Company GUEST

Custody Seals Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
☐ Yes △ No		12.2-1 C: 1-G

Ver: 06/08/2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-493985.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-159655-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 8/24/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B615-1 THRU B615-5 T04 (180-159655-40)	8/24/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 T05 (180-159655-41)	8/25/23	06:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T04 (180-159655-49)	8/24/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T05 (180-159655-50)	8/25/23	06:30 Eastern		Water			X	1	
B620-1 THRU B620-5 T04 (180-159655-58)	8/24/23	18:30 Eastern		Water			X	1	
B620-1 THRU B620-5 T05 (180-159655-59)	8/25/23	06:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T04 (180-159655-67)	8/24/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T05 (180-159655-68)	8/25/23	06:30 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	8-25-23 1700	ETHE	[signature]		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 8/26/23 10:05	Company ELOT

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: Raw 2.7 - COR 2.5

MB

Ver: 06/08/2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-494203.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-159655-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 9/1/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601	PO #:			
Phone: 717-656-2300(Tel)	WO #:			
Email:				
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B615-1 THRU B615-5 T06 (180-159655-42)	8/27/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 T07 (180-159655-43)	8/28/23	06:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T06 (180-159655-51)	8/27/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T07 (180-159655-52)	8/28/23	06:30 Eastern		Water			X	1	
B620-1 THRU B620-5 T06 (180-159655-60)	8/27/23	18:30 Eastern		Water			X	1	
B620-1 THRU B620-5 T07 (180-159655-61)	8/28/23	06:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T06 (180-159655-69)	8/27/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T07 (180-159655-70)	8/28/23	06:30 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	8/29 1700	ELLE			
2						
3				Debra A. Byers	8-30-23 10:00	ELLE

Custody Seals Intact: Δ Yes Δ No (Yes) | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: Raw 20.1 - COR 19.9

Ver: 06/08/2021

mB

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-494750.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-159655-1
Address: 2425 New Holland Pike,	Due Date Requested: 9/12/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601	PO #:			
Phone: 717-656-2300(Tel)	WO #:			
Email:				
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B615-1 THRU B615-5 T08 (180-159655-44)	9/1/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 T09 (180-159655-45)	9/2/23	06:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T08 (180-159655-53)	9/1/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T09 (180-159655-54)	9/2/23	06:30 Eastern		Water			X	1	
B620-1 THRU B620-5 T08 (180-159655-62)	9/1/23	18:30 Eastern		Water			X	1	
B620-1 THRU B620-5 T09 (180-159655-63)	9/2/23	06:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T08 (180-159655-71)	9/1/23	18:30 Eastern		Water			X	1	
B615-1 THRU B615-5 DUP T09 (180-159655-72)	9/2/23	06:30 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:			
Relinquished by:	Date/Time: 9/6/23 1710	Company: ET	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 9/8/23 10:27	Company ET

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: RAW: 18.5-19.0 COR: 18.5-19.0

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-159655-1

Login Number: 159655
List Number: 1
Creator: Matko, Larry

List Source: Eurofins Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	thermal preservation not required
Cooler Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-159655-1

Login Number: 159655
List Number: 2
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 08/24/23 11:15 AM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-159655-1

Login Number: 159655
List Number: 3
Creator: Arroyo, Haley

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 08/25/23 11:17 AM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-159655-1

Login Number: 159655
List Number: 4
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 08/26/23 10:41 AM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-159655-1

Login Number: 159655
List Number: 5
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 08/30/23 12:00 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice present, no attempt to chill
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-159655-1

Login Number: 159655
List Number: 6
Creator: McBeth, Jessica

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 09/08/23 12:40 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Thermal preservation not required.
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	N/A	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Paul Canevaro
US Ecology Inc
101 S Capitol Boulevard Suite 1000
Boise, Idaho 83702

Generated 9/21/2023 10:57:41 AM

JOB DESCRIPTION

Republic Services Mercury Project REVISE

JOB NUMBER

180-160368-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.

myEOL

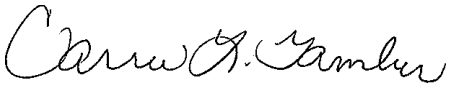
Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

Authorization



Generated
9/21/2023 10:57:41 AM

Authorized for release by
Carrie Gamber, Senior Project Manager
Carrie.Gamber@et.eurofinsus.com
(412)963-2428

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Job ID: 180-160368-1

Laboratory: Eurofins Pittsburgh

Narrative

CASE NARRATIVE

Client: US Ecology Inc

Project: Republic Services Mercury Project REVISE

Report Number: 180-160368-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 07/27/2023; the samples arrived in good condition. The temperatures of the 3 coolers at receipt time were 22.6º C, 22.7º C and 22.8º C.

IC
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GENERAL CHEMISTRY
Methods 9060A TOC, 2510B Specific Conductance and 2580B Oxidation reduction Potential are flagged as not certified for Pennsylvania, Eurofins Northeast Pittsburgh's NELAC state; however, certification flags are based on the initial sample matrix. These samples were logged in as solids for leaching. Eurofins Northeast Pittsburgh is NELAC certified for these analyses in waters for Pennsylvania.

Total Organic Carbon - Quad exceeded the RPD limit for the duplicate of sample B-623-1 THRU B-623-5 DUP T04DU (180-160368-13).

The continuing calibration blank (CCB) for analytical batch 180-446407 contained Total Organic Carbon - Quad above the reporting limit (RL). All reported samples associated with this CCB were either ND for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCB; therefore, re-analysis of samples was not performed. FIELD DUPLICATE DUP T09 (180-160368-36)

The continuing calibration verification (CCV) associated with batch 180-446407 recovered above the upper control limit for Total Organic Carbon - Quad. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. FIELD DUPLICATE DUP T09 (180-160368-36)

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
!	Laboratory is not accredited for this parameter.
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
^2	Calibration Blank (ICB and/or CCB) is outside acceptance limits.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL, and the absolute difference between results is < the upper reporting limits for both.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	02-00416	04-30-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
EPA 9060A		Solid	Total Organic Carbon - Quad
SM 2510B		Solid	Specific Conductance
SM 2580B		Solid	Oxidation Reduction Potential

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24
A2LA	ISO/IEC 17025	0001.01	11-30-24
Alabama	State	43200	01-31-24
Alaska	State	PA00009	06-30-24
Alaska (UST)	State	17-027	02-28-24
Arizona	State	AZ0780	03-12-24
Arkansas DEQ	State	88-00660	08-09-24
California	State	2792	11-30-23
Colorado	State	PA00009	06-30-24
Connecticut	State	PH-0746	06-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-24
Delaware (DW)	State	N/A	01-31-24
Florida	NELAP	E87997	06-30-24
Georgia (DW)	State	C048	01-31-24
Hawaii	State	N/A	01-31-24
Illinois	NELAP	200027	01-31-24
Iowa	State	361	03-01-24
Kansas	NELAP	E-10151	10-31-23
Kentucky (DW)	State	KY90088	12-31-23
Kentucky (UST)	State	0001.01	11-30-24
Kentucky (WW)	State	KY90088	12-31-23
Louisiana (All)	NELAP	02055	06-30-24
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-24
Massachusetts	State	M-PA009	06-30-24
Michigan	State	9930	01-31-24
Minnesota	NELAP	042-999-487	12-31-23
Mississippi	State	023	01-31-24
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-24
Nebraska	State	NE-OS-32-17	01-31-24
New Hampshire	NELAP	2730	01-10-24
New Jersey	NELAP	PA011	09-17-23
New York	NELAP	10670	04-01-24
North Carolina (DW)	State	42705	07-31-24
North Carolina (WW/SW)	State	521	12-31-23
North Dakota	State	R-205	01-31-24
Oklahoma	NELAP	9804	08-31-23 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	PA200001	09-11-24
PALA	Canada	1978	09-16-24
Pennsylvania	NELAP	36-00037	01-31-24
Rhode Island	State	LAO00338	12-31-23
South Carolina	State	89002	01-31-24
Tennessee	State	02838	01-31-24
Texas	NELAP	T104704194-23-46	08-31-24
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-23
Virginia	NELAP	460182	06-14-25
Washington	State	C457	04-11-24
West Virginia (DW)	State	9906 C	12-31-23
West Virginia DEP	State	055	07-31-24
Wyoming	State	8TMS-L	01-31-24
Wyoming (UST)	A2LA	0001.01	11-30-24

Sample Summary

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-160368-1	B-623-1 THRU B-623-5 T01	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-2	B-623-1 THRU B-623-5 T02	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-3	B-623-1 THRU B-623-5 T03	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-4	B-623-1 THRU B-623-5 T04	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-5	B-623-1 THRU B-623-5 T05	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-6	B-623-1 THRU B-623-5 T06	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-7	B-623-1 THRU B-623-5 T07	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-8	B-623-1 THRU B-623-5 T08	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-9	B-623-1 THRU B-623-5 T09	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-10	B-623-1 THRU B-623-5 DUP T01	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-11	B-623-1 THRU B-623-5 DUP T02	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-12	B-623-1 THRU B-623-5 DUP T03	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-13	B-623-1 THRU B-623-5 DUP T04	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-14	B-623-1 THRU B-623-5 DUP T05	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-15	B-623-1 THRU B-623-5 DUP T06	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-16	B-623-1 THRU B-623-5 DUP T07	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-17	B-623-1 THRU B-623-5 DUP T08	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-18	B-623-1 THRU B-623-5 DUP T09	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-19	FIELD DUPLICATE T01	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-20	FIELD DUPLICATE T02	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-21	FIELD DUPLICATE T03	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-22	FIELD DUPLICATE T04	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-23	FIELD DUPLICATE T05	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-24	FIELD DUPLICATE T06	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-25	FIELD DUPLICATE T07	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-26	FIELD DUPLICATE T08	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-27	FIELD DUPLICATE T09	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-28	FIELD DUPLICATE DUP T01	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-29	FIELD DUPLICATE DUP T02	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-30	FIELD DUPLICATE DUP T03	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-31	FIELD DUPLICATE DUP T04	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-32	FIELD DUPLICATE DUP T05	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-33	FIELD DUPLICATE DUP T06	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-34	FIELD DUPLICATE DUP T07	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-35	FIELD DUPLICATE DUP T08	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-36	FIELD DUPLICATE DUP T09	Solid	07/21/23 10:00	07/27/23 11:27
180-160368-37	B-623-1 THRU B-623-5 T01	Water	08/23/23 11:18	07/27/23 11:27
180-160368-38	B-623-1 THRU B-623-5 T02	Water	08/23/23 18:30	07/27/23 11:27
180-160368-39	B-623-1 THRU B-623-5 T03	Water	08/24/23 06:30	07/27/23 11:27
180-160368-40	B-623-1 THRU B-623-5 T04	Water	08/24/23 18:30	07/27/23 11:27
180-160368-41	B-623-1 THRU B-623-5 T05	Water	08/25/23 06:30	07/27/23 11:27
180-160368-42	B-623-1 THRU B-623-5 T06	Water	08/27/23 18:30	07/27/23 11:27
180-160368-43	B-623-1 THRU B-623-5 T07	Water	08/28/23 06:30	07/27/23 11:27
180-160368-44	B-623-1 THRU B-623-5 T08	Water	09/01/23 18:30	07/27/23 11:27
180-160368-45	B-623-1 THRU B-623-5 T09	Water	09/02/23 06:30	07/27/23 11:27
180-160368-46	B-623-1 THRU B-623-5 DUP T01	Water	08/23/23 11:18	07/27/23 11:27
180-160368-47	B-623-1 THRU B-623-5 DUP T02	Water	08/23/23 18:30	07/27/23 11:27
180-160368-48	B-623-1 THRU B-623-5 DUP T03	Water	08/24/23 06:30	07/27/23 11:27
180-160368-49	B-623-1 THRU B-623-5 DUP T04	Water	08/24/23 18:30	07/27/23 11:27
180-160368-50	B-623-1 THRU B-623-5 DUP T05	Water	08/25/23 06:30	07/27/23 11:27
180-160368-51	B-623-1 THRU B-623-5 DUP T06	Water	08/27/23 18:30	07/27/23 11:27
180-160368-52	B-623-1 THRU B-623-5 DUP T07	Water	08/28/23 06:30	07/27/23 11:27
180-160368-53	B-623-1 THRU B-623-5 DUP T08	Water	09/01/23 18:30	07/27/23 11:27
180-160368-54	B-623-1 THRU B-623-5 DUP T09	Water	09/02/23 06:30	07/27/23 11:27

Sample Summary

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-160368-55	FIELD DUPLICATE T01	Water	08/23/23 11:18	07/27/23 11:27
180-160368-56	FIELD DUPLICATE T02	Water	08/23/23 18:30	07/27/23 11:27
180-160368-57	FIELD DUPLICATE T03	Water	08/24/23 06:30	07/27/23 11:27
180-160368-58	FIELD DUPLICATE T04	Water	08/24/23 18:30	07/27/23 11:27
180-160368-59	FIELD DUPLICATE T05	Water	08/25/23 06:30	07/27/23 11:27
180-160368-60	FIELD DUPLICATE T06	Water	08/27/23 18:30	07/27/23 11:27
180-160368-61	FIELD DUPLICATE T07	Water	08/28/23 06:30	07/27/23 11:27
180-160368-62	FIELD DUPLICATE T08	Water	09/01/23 18:30	07/27/23 11:27
180-160368-63	FIELD DUPLICATE T09	Water	09/02/23 06:30	07/27/23 11:27
180-160368-64	FIELD DUPLICATE DUP T01	Water	08/23/23 11:18	07/27/23 11:27
180-160368-65	FIELD DUPLICATE DUP T02	Water	08/23/23 18:30	07/27/23 11:27
180-160368-66	FIELD DUPLICATE DUP T03	Water	08/24/23 06:30	07/27/23 11:27
180-160368-67	FIELD DUPLICATE DUP T04	Water	08/24/23 18:30	07/27/23 11:27
180-160368-68	FIELD DUPLICATE DUP T05	Water	08/25/23 06:30	07/27/23 11:27
180-160368-69	FIELD DUPLICATE DUP T06	Water	08/27/23 18:30	07/27/23 11:27
180-160368-70	FIELD DUPLICATE DUP T07	Water	08/28/23 06:30	07/27/23 11:27
180-160368-71	FIELD DUPLICATE DUP T08	Water	09/01/23 18:30	07/27/23 11:27
180-160368-72	FIELD DUPLICATE DUP T09	Water	09/02/23 06:30	07/27/23 11:27

Method Summary

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	EET PIT
6010D	Metals (ICP)	SW846	ELLE
EPA 9040C	pH	SW846	EET PIT
EPA 9060A	Organic Carbon, Total (TOC)	SW846	EET PIT
SM 2510B	Conductivity, Specific Conductance	SM	EET PIT
SM 2580B	Reduction-Oxidation (REDOX) Potential	SM	EET PIT
1314	Up-Flow Percolation Column Leach Procedure	SW846	EET PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	ELLE

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 T01
Lab Sample ID: 180-160368-1

Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	125.8 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444414	08/23/23 20:09	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			491.7 g	125.8 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445960	08/23/23 12:45	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	125.8 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 04:03	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			491.7 g	125.8 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445962	08/23/23 12:42	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	125.8 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445961	08/23/23 12:45	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 T02
Lab Sample ID: 180-160368-2

Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	154.3 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444665	08/26/23 00:49	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			491.7 g	154.3 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:16	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	154.3 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 05:18	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			491.7 g	154.3 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:11	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	154.3 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:11	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 T03
Lab Sample ID: 180-160368-3

Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	254.4 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 19:09	M1D	EET PIT
	Instrument ID: CHICS2100B									

Client Sample ID: B-623-1 THRU B-623-5 T03
Lab Sample ID: 180-160368-3
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	254.4 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 12:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	254.4 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 05:43	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			491.7 g	254.4 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:48	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	254.4 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:51	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 T04
Lab Sample ID: 180-160368-4
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	257.1 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 23:50	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			491.7 g	257.1 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:26	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	257.1 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 06:07	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			491.7 g	257.1 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:26	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	257.1 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:26	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 T05
Lab Sample ID: 180-160368-5
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	255.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 22:39	M1D	EET PIT
	Instrument ID: CHIC2100A									
Leach	Leach	1314			491.7 g	255.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 12:06	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 T05
Lab Sample ID: 180-160368-5
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	255.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 06:30	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			491.7 g	255.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 12:03	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	255.3 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 12:06	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 T06
Lab Sample ID: 180-160368-6
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	1280.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/30/23 02:00	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			491.7 g	1280.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:26	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	1280.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 06:54	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			491.7 g	1280.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:26	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	1280.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:26	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 T07
Lab Sample ID: 180-160368-7
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	247.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/29/23 22:18	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			491.7 g	247.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 12:03	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	247.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445262	08/31/23 07:18	LWM	EET PIT
	Instrument ID: SAM									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 T07
Lab Sample ID: 180-160368-7
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	247.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 12:03	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	247.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 12:03	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 T08
Lab Sample ID: 180-160368-8
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	2294.2 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 15:28	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			491.7 g	2294.2 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 14:49	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	2294.2 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 12:12	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			491.7 g	2294.2 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 14:49	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	2294.2 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 14:49	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 T09
Lab Sample ID: 180-160368-9
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	244.6 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 16:57	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			491.7 g	244.6 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 15:30	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			491.7 g	244.6 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 12:36	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			491.7 g	244.6 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 15:30	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 T09
Lab Sample ID: 180-160368-9
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			491.7 g	244.6 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 15:30	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 DUP T01
Lab Sample ID: 180-160368-10
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	91.4 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444414	08/23/23 20:28	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			498.5 g	91.4 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445960	08/23/23 12:50	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	91.4 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 13:00	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			498.5 g	91.4 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445962	08/23/23 12:47	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	91.4 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445961	08/23/23 12:50	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 DUP T02
Lab Sample ID: 180-160368-11
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	141.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444665	08/26/23 01:08	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			498.5 g	141.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:19	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	141.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 13:24	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			498.5 g	141.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:14	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	141.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:15	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 DUP T03
Lab Sample ID: 180-160368-12

Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	219.6 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 19:24	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			498.5 g	219.6 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 12:06	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	219.6 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 14:40	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			498.5 g	219.6 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:51	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	219.6 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:55	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 DUP T04
Lab Sample ID: 180-160368-13

Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	252.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 19:13	M1D	EET PIT
	Instrument ID: CHIC2100A									
Leach	Leach	1314			498.5 g	252.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:30	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	252.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 15:28	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			498.5 g	252.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:29	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	252.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:30	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 DUP T05
Lab Sample ID: 180-160368-14

Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	281.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 22:54	M1D	EET PIT
	Instrument ID: CHIC2100A									

Client Sample ID: B-623-1 THRU B-623-5 DUP T05
Lab Sample ID: 180-160368-14
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	281.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 12:10	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	281.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 16:15	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			498.5 g	281.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 12:06	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	281.2 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 12:10	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 DUP T06
Lab Sample ID: 180-160368-15
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	1162.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/29/23 21:04	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			498.5 g	1162.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:29	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	1162.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 16:39	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			498.5 g	1162.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:29	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	1162.1 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:29	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 DUP T07
Lab Sample ID: 180-160368-16
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	255 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/29/23 19:50	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			498.5 g	255 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 12:06	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 DUP T07
Lab Sample ID: 180-160368-16
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	255 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 17:03	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			498.5 g	255 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 12:06	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	255 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 12:06	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 DUP T08
Lab Sample ID: 180-160368-17
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	2071.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 15:13	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			498.5 g	2071.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 14:52	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	2071.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 17:27	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			498.5 g	2071.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 14:52	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	2071.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 14:52	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 DUP T09
Lab Sample ID: 180-160368-18
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	223 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 16:42	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			498.5 g	223 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 15:34	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	223 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 17:51	LWM	EET PIT
	Instrument ID: SAM									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 DUP T09
Lab Sample ID: 180-160368-18
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			498.5 g	223 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 15:34	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			498.5 g	223 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 15:34	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE T01
Lab Sample ID: 180-160368-19
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	89.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444414	08/23/23 21:23	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			492.4 g	89.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445960	08/23/23 12:56	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	89.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 13:00	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			492.4 g	89.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445962	08/23/23 12:52	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	89.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445961	08/23/23 12:56	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE T02
Lab Sample ID: 180-160368-20
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	148.6 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444665	08/26/23 01:26	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			492.4 g	148.6 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:23	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	148.6 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 13:24	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			492.4 g	148.6 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:16	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE T02
Lab Sample ID: 180-160368-20
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	148.6 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:18	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE T03
Lab Sample ID: 180-160368-21
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 20:08	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			492.4 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 12:14	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 13:48	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			492.4 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 12:00	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 12:01	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE T04
Lab Sample ID: 180-160368-22
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	251.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 19:27	M1D	EET PIT
	Instrument ID: CHIC2100A									
Leach	Leach	1314			492.4 g	251.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:33	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	251.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 14:12	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			492.4 g	251.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:31	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	251.8 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:33	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE T05
Lab Sample ID: 180-160368-23
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	245.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 23:09	M1D	EET PIT
	Instrument ID: CHIC2100A									
Leach	Leach	1314			492.4 g	245.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 12:16	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	245.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 14:36	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			492.4 g	245.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 12:15	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	245.9 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 12:16	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE T06
Lab Sample ID: 180-160368-24
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	1213.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444942	08/29/23 15:23	AM	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			492.4 g	1213.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:31	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	1213.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 18:15	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			492.4 g	1213.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:31	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	1213.2 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:31	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE T07
Lab Sample ID: 180-160368-25
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	231.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444962	08/29/23 19:13	M1D	EET PIT
	Instrument ID: INTEGRION									

Client Sample ID: FIELD DUPLICATE T07
Lab Sample ID: 180-160368-25
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	231.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 12:15	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	231.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 19:31	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			492.4 g	231.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 12:15	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	231.1 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 12:15	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE T08
Lab Sample ID: 180-160368-26
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	2379.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 14:59	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			492.4 g	2379.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 14:55	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	2379.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 19:55	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			492.4 g	2379.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 14:55	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	2379.8 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 14:55	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE T09
Lab Sample ID: 180-160368-27
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	264.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 16:27	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			492.4 g	264.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 15:43	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE T09
Lab Sample ID: 180-160368-27
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			492.4 g	264.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 21:12	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			492.4 g	264.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 15:43	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			492.4 g	264.7 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 15:43	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE DUP T01
Lab Sample ID: 180-160368-28
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	105.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444414	08/23/23 21:42	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.3 g	105.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445960	08/23/23 13:07	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	105.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 17:27	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.3 g	105.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445962	08/23/23 13:06	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	105.6 mL	444238	08/23/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445961	08/23/23 13:07	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE DUP T02
Lab Sample ID: 180-160368-29
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	144.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444665	08/26/23 01:45	M1D	EET PIT
	Instrument ID: INTEGRION									
Leach	Leach	1314			495.3 g	144.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 11:31	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	144.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 17:51	LWM	EET PIT
	Instrument ID: SAM									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE DUP T02
Lab Sample ID: 180-160368-29
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	144.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 11:25	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	144.9 mL	444360	08/23/23 11:18	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 11:25	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE DUP T03
Lab Sample ID: 180-160368-30
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444656	08/25/23 20:23	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.3 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445969	08/24/23 12:22	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 18:15	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.3 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445986	08/24/23 12:06	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	239.2 mL	444363	08/23/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445985	08/24/23 12:08	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE DUP T04
Lab Sample ID: 180-160368-31
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	240.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 19:42	M1D	EET PIT
	Instrument ID: CHIC2100A									
Leach	Leach	1314			495.3 g	240.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 11:40	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	240.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/29/23 23:59	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.3 g	240.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 11:40	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE DUP T04
Lab Sample ID: 180-160368-31
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	240.9 mL	444365	08/24/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 11:40	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE DUP T05
Lab Sample ID: 180-160368-32
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	241.8 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444670	08/25/23 23:53	M1D	EET PIT
	Instrument ID: CHIC2100A									
Leach	Leach	1314			495.3 g	241.8 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			445992	08/25/23 12:23	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	241.8 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	445128	08/30/23 00:23	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.3 g	241.8 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445987	08/25/23 12:21	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	241.8 mL	444366	08/24/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445989	08/25/23 12:23	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE DUP T06
Lab Sample ID: 180-160368-33
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	1209 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444942	08/29/23 16:08	AM	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.3 g	1209 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 11:40	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	1209 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 21:59	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.3 g	1209 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 11:40	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	1209 mL	444371	08/25/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 11:40	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE DUP T07
Lab Sample ID: 180-160368-34
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	233 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	444942	08/29/23 16:22	AM	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.3 g	233 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446000	08/29/23 12:21	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	233 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 22:47	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.3 g	233 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			445996	08/29/23 12:21	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	233 mL	444374	08/27/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			445999	08/29/23 12:21	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE DUP T08
Lab Sample ID: 180-160368-35
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	2163.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 17:12	M1D	EET PIT
	Instrument ID: CHICS2100B									
Leach	Leach	1314			495.3 g	2163.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 15:05	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	2163.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/12/23 23:11	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.3 g	2163.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 15:05	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	2163.1 mL	444377	08/28/23 06:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 15:05	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD DUPLICATE DUP T09
Lab Sample ID: 180-160368-36
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	232.2 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9056A		1	1 mL	1 mL	446523	09/14/23 15:43	M1D	EET PIT
	Instrument ID: CHICS2100B									

Client Sample ID: FIELD DUPLICATE DUP T09
Lab Sample ID: 180-160368-36
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Leach	Leach	1314			495.3 g	232.2 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9040C		1			446003	09/06/23 15:50	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	232.2 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	EPA 9060A		1	40 mL	40 mL	446407	09/13/23 00:27	LWM	EET PIT
	Instrument ID: SAM									
Leach	Leach	1314			495.3 g	232.2 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2510B		1			446001	09/06/23 15:50	LWM	EET PIT
	Instrument ID: NOEQUIP									
Leach	Leach	1314			495.3 g	232.2 mL	444380	09/01/23 18:30	LWM	EET PIT
Leach	Analysis	SM 2580B		1			446002	09/06/23 15:50	LWM	EET PIT
	Instrument ID: NOEQUIP									

Client Sample ID: B-623-1 THRU B-623-5 T01
Lab Sample ID: 180-160368-37
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	412316	08/24/23 22:35	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			412799	08/25/23 20:02	T8CQ	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 T02
Lab Sample ID: 180-160368-38
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413211	08/28/23 10:11	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413881	08/29/23 11:14	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 T03
Lab Sample ID: 180-160368-39
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:59	MT26	ELLE
	Instrument ID: T75 - 27278									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 T04
Lab Sample ID: 180-160368-40
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413211	08/28/23 10:11	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413881	08/29/23 11:11	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 T05
Lab Sample ID: 180-160368-41
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 08:10	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B-623-1 THRU B-623-5 T06
Lab Sample ID: 180-160368-42
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:58	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 T07
Lab Sample ID: 180-160368-43
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:14	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 T08
Lab Sample ID: 180-160368-44
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:53	MT26	ELLE
	Instrument ID: T73 - 18255									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 T09
Lab Sample ID: 180-160368-45
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:59	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 DUP T01
Lab Sample ID: 180-160368-46
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	412316	08/24/23 22:35	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			412799	08/25/23 19:37	T8CQ	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 DUP T02
Lab Sample ID: 180-160368-47
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:44	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B-623-1 THRU B-623-5 DUP T03
Lab Sample ID: 180-160368-48
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:26	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: B-623-1 THRU B-623-5 DUP T04
Lab Sample ID: 180-160368-49
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 08:36	MT26	ELLE
	Instrument ID: T75 - 27278									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: B-623-1 THRU B-623-5 DUP T05
Lab Sample ID: 180-160368-50
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413211	08/28/23 10:11	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413881	08/29/23 11:02	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 DUP T06
Lab Sample ID: 180-160368-51
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 18:04	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 DUP T07
Lab Sample ID: 180-160368-52
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 18:01	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 DUP T08
Lab Sample ID: 180-160368-53
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 01:14	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: B-623-1 THRU B-623-5 DUP T09
Lab Sample ID: 180-160368-54
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 01:18	MT26	ELLE
	Instrument ID: T73 - 18255									

Lab Chronicle

Client: US Ecology Inc
Project/Site: Republic Services Mercury Project REVISE

Job ID: 180-160368-1

Client Sample ID: FIELD DUPLICATE T01

Lab Sample ID: 180-160368-55
Matrix: Water
Date Collected: 08/23/23 11:18
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	412316	08/24/23 22:35	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			412799	08/25/23 19:31	T8CQ	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: FIELD DUPLICATE T02

Lab Sample ID: 180-160368-56
Matrix: Water
Date Collected: 08/23/23 18:30
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:41	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: FIELD DUPLICATE T03

Lab Sample ID: 180-160368-57
Matrix: Water
Date Collected: 08/24/23 06:30
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:10	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: FIELD DUPLICATE T04

Lab Sample ID: 180-160368-58
Matrix: Water
Date Collected: 08/24/23 18:30
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413211	08/28/23 10:11	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413881	08/29/23 10:58	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: FIELD DUPLICATE T05

Lab Sample ID: 180-160368-59
Matrix: Water
Date Collected: 08/25/23 06:30
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 07:46	MT26	ELLE
	Instrument ID: T75 - 27278									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE T06
Lab Sample ID: 180-160368-60
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:30	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: FIELD DUPLICATE T07
Lab Sample ID: 180-160368-61
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:26	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: FIELD DUPLICATE T08
Lab Sample ID: 180-160368-62
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 01:21	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: FIELD DUPLICATE T09
Lab Sample ID: 180-160368-63
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:08	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: FIELD DUPLICATE DUP T01
Lab Sample ID: 180-160368-64
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	412316	08/24/23 22:35	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			412799	08/25/23 19:34	T8CQ	ELLE
	Instrument ID: T73 - 18255									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE DUP T02
Lab Sample ID: 180-160368-65
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:07	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: FIELD DUPLICATE DUP T03
Lab Sample ID: 180-160368-66
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413043	08/27/23 21:13	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413362	08/28/23 13:29	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: FIELD DUPLICATE DUP T04
Lab Sample ID: 180-160368-67
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413213	08/28/23 10:16	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413825	08/29/23 08:42	MT26	ELLE
	Instrument ID: T75 - 27278									

Client Sample ID: FIELD DUPLICATE DUP T05
Lab Sample ID: 180-160368-68
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	413211	08/28/23 10:11	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			413881	08/29/23 11:21	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: FIELD DUPLICATE DUP T06
Lab Sample ID: 180-160368-69
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 17:52	MT26	ELLE
	Instrument ID: T73 - 18255									

Lab Chronicle

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE DUP T07
Lab Sample ID: 180-160368-70
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	414855	08/31/23 11:10	UAMX	ELLE
Total Recoverable	Analysis	6010D		1			416737	09/06/23 18:08	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: FIELD DUPLICATE DUP T08
Lab Sample ID: 180-160368-71
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:12	MT26	ELLE
	Instrument ID: T73 - 18255									

Client Sample ID: FIELD DUPLICATE DUP T09
Lab Sample ID: 180-160368-72
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	417838	09/10/23 20:53	HUH3	ELLE
Total Recoverable	Analysis	6010D		1			418354	09/12/23 00:18	MT26	ELLE
	Instrument ID: T73 - 18255									

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Analyst References:

Lab: EET PIT

Batch Type: Leach

LWM = Larry Matko

Batch Type: Analysis

AM = Adzuira Musule

LWM = Larry Matko

M1D = Maureen Donlin

Lab: ELLE

Batch Type: Prep

HUH3 = Emily Dickens

UAMX = Annamaria Kuhns

Batch Type: Analysis

MT26 = Jason Knight

T8CQ = Sera Bargo

Client Sample ID: B-623-1 THRU B-623-5 T01
Lab Sample ID: 180-160368-1
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 20:09	1
Chloride	**1.78**		1.00	0.713	mg/L			08/23/23 20:09	1
Sulfate	ND		1.00	0.756	mg/L			08/23/23 20:09	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.7**		0.1	0.1	SU			08/23/23 12:45	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.3**	!	1.0	0.51	mg/L			08/31/23 04:03	1
Specific Conductance (SM 2510B)	**6.5**	!	1.0	1.0	umhos/cm			08/23/23 12:42	1
Oxidation Reduction Potential (SM 2580B)	**410**	!	10	10	millivolts			08/23/23 12:45	1

Client Sample ID: B-623-1 THRU B-623-5 T02
Lab Sample ID: 180-160368-2
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/26/23 00:49	1
Chloride	ND		1.00	0.713	mg/L			08/26/23 00:49	1
Sulfate	ND		1.00	0.756	mg/L			08/26/23 00:49	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.9**		0.1	0.1	SU			08/24/23 11:16	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**4.4**	!	1.0	0.51	mg/L			08/31/23 05:18	1
Specific Conductance (SM 2510B)	**7.1**	!	1.0	1.0	umhos/cm			08/24/23 11:11	1
Oxidation Reduction Potential (SM 2580B)	**350**	!	10	10	millivolts			08/24/23 11:11	1

Client Sample ID: B-623-1 THRU B-623-5 T03
Lab Sample ID: 180-160368-3
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 19:09	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 19:09	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 19:09	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.8**		0.1	0.1	SU			08/24/23 12:02	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.1**	!	1.0	0.51	mg/L			08/31/23 05:43	1
Specific Conductance (SM 2510B)	**3.8**	!	1.0	1.0	umhos/cm			08/24/23 11:48	1
Oxidation Reduction Potential (SM 2580B)	**380**	!	10	10	millivolts			08/24/23 11:51	1

Client Sample ID: B-623-1 THRU B-623-5 T04
Lab Sample ID: 180-160368-4
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 23:50	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 23:50	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 23:50	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.5		0.1	0.1	SU			08/25/23 11:26	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.88	J !	1.0	0.51	mg/L			08/31/23 06:07	1
Specific Conductance (SM 2510B)	2.4	!	1.0	1.0	umhos/cm			08/25/23 11:26	1
Oxidation Reduction Potential (SM 2580B)	370	!	10	10	millivolts			08/25/23 11:26	1

Client Sample ID: B-623-1 THRU B-623-5 T05
Lab Sample ID: 180-160368-5
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 22:39	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 22:39	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 22:39	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.4		0.1	0.1	SU			08/25/23 12:06	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.86	J !	1.0	0.51	mg/L			08/31/23 06:30	1
Specific Conductance (SM 2510B)	2.2	!	1.0	1.0	umhos/cm			08/25/23 12:03	1
Oxidation Reduction Potential (SM 2580B)	330	!	10	10	millivolts			08/25/23 12:06	1

Client Sample ID: B-623-1 THRU B-623-5 T06
Lab Sample ID: 180-160368-6
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/30/23 02:00	1
Chloride	ND		1.00	0.713	mg/L			08/30/23 02:00	1
Sulfate	ND		1.00	0.756	mg/L			08/30/23 02:00	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.2		0.1	0.1	SU			08/29/23 11:26	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.76	J !	1.0	0.51	mg/L			08/31/23 06:54	1
Specific Conductance (SM 2510B)	1.6		1.0	1.0	umhos/cm			08/29/23 11:26	1
Oxidation Reduction Potential (SM 2580B)	380		10	10	millivolts			08/29/23 11:26	1

Client Sample ID: B-623-1 THRU B-623-5 T07
Lab Sample ID: 180-160368-7
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 22:18	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 22:18	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 22:18	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.9		0.1	0.1	SU			08/29/23 12:03	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.68	J !	1.0	0.51	mg/L			08/31/23 07:18	1
Specific Conductance (SM 2510B)	1.7		1.0	1.0	umhos/cm			08/29/23 12:03	1
Oxidation Reduction Potential (SM 2580B)	420		10	10	millivolts			08/29/23 12:03	1

Client Sample ID: B-623-1 THRU B-623-5 T08
Lab Sample ID: 180-160368-8
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 15:28	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 15:28	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 15:28	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.9		0.1	0.1	SU			09/06/23 14:49	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.70	J !	1.0	0.51	mg/L			09/12/23 12:12	1
Specific Conductance (SM 2510B)	1.7	!	1.0	1.0	umhos/cm			09/06/23 14:49	1
Oxidation Reduction Potential (SM 2580B)	390	!	10	10	millivolts			09/06/23 14:49	1

Client Sample ID: B-623-1 THRU B-623-5 T09
Lab Sample ID: 180-160368-9
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 16:57	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 16:57	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 16:57	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.8		0.1	0.1	SU			09/06/23 15:30	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.81	J !	1.0	0.51	mg/L			09/12/23 12:36	1
Specific Conductance (SM 2510B)	1.7	!	1.0	1.0	umhos/cm			09/06/23 15:30	1
Oxidation Reduction Potential (SM 2580B)	360	!	10	10	millivolts			09/06/23 15:30	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T01
Lab Sample ID: 180-160368-10
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 20:28	1
Chloride	**2.12**		1.00	0.713	mg/L			08/23/23 20:28	1
Sulfate	ND		1.00	0.756	mg/L			08/23/23 20:28	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.4**		0.1	0.1	SU			08/23/23 12:50	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.6**	**!**	1.0	0.51	mg/L			09/12/23 13:00	1
Specific Conductance (SM 2510B)	**5.1**	**!**	1.0	1.0	umhos/cm			08/23/23 12:47	1
Oxidation Reduction Potential (SM 2580B)	**430**	**!**	10	10	millivolts			08/23/23 12:50	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T02
Lab Sample ID: 180-160368-11
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/26/23 01:08	1
Chloride	ND		1.00	0.713	mg/L			08/26/23 01:08	1
Sulfate	ND		1.00	0.756	mg/L			08/26/23 01:08	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.0**		0.1	0.1	SU			08/24/23 11:19	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.1**	**!**	1.0	0.51	mg/L			09/12/23 13:24	1
Specific Conductance (SM 2510B)	**10**	**!**	1.0	1.0	umhos/cm			08/24/23 11:14	1
Oxidation Reduction Potential (SM 2580B)	**350**	**!**	10	10	millivolts			08/24/23 11:15	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T03
Lab Sample ID: 180-160368-12
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 19:24	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 19:24	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 19:24	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.9**		0.1	0.1	SU			08/24/23 12:06	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.71**	**J !**	1.0	0.51	mg/L			09/12/23 14:40	1
Specific Conductance (SM 2510B)	**4.8**	**!**	1.0	1.0	umhos/cm			08/24/23 11:51	1
Oxidation Reduction Potential (SM 2580B)	**370**	**!**	10	10	millivolts			08/24/23 11:55	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T04
Lab Sample ID: 180-160368-13
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 19:13	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 19:13	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 19:13	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.2**		0.1	0.1	SU			08/25/23 11:30	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.62**	**J !**	1.0	0.51	mg/L			09/12/23 15:28	1
Specific Conductance (SM 2510B)	**3.2**	**!**	1.0	1.0	umhos/cm			08/25/23 11:29	1
Oxidation Reduction Potential (SM 2580B)	**360**	**!**	10	10	millivolts			08/25/23 11:30	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T05
Lab Sample ID: 180-160368-14
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 22:54	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 22:54	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 22:54	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.5**		0.1	0.1	SU			08/25/23 12:10	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	ND	!	1.0	0.51	mg/L			09/12/23 16:15	1
Specific Conductance (SM 2510B)	**2.2**	**!**	1.0	1.0	umhos/cm			08/25/23 12:06	1
Oxidation Reduction Potential (SM 2580B)	**320**	**!**	10	10	millivolts			08/25/23 12:10	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T06
Lab Sample ID: 180-160368-15
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 21:04	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 21:04	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 21:04	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.2**		0.1	0.1	SU			08/29/23 11:29	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	ND	!	1.0	0.51	mg/L			09/12/23 16:39	1
Specific Conductance (SM 2510B)	**1.6**		1.0	1.0	umhos/cm			08/29/23 11:29	1
Oxidation Reduction Potential (SM 2580B)	**380**		10	10	millivolts			08/29/23 11:29	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T07
Lab Sample ID: 180-160368-16
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 19:50	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 19:50	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 19:50	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.9**		0.1	0.1	SU			08/29/23 12:06	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.53**	**J !**	1.0	0.51	mg/L			09/12/23 17:03	1
Specific Conductance (SM 2510B)	**1.5**		1.0	1.0	umhos/cm			08/29/23 12:06	1
Oxidation Reduction Potential (SM 2580B)	**420**		10	10	millivolts			08/29/23 12:06	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T08
Lab Sample ID: 180-160368-17
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 15:13	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 15:13	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 15:13	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.8**		0.1	0.1	SU			09/06/23 14:52	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	ND	!	1.0	0.51	mg/L			09/12/23 17:27	1
Specific Conductance (SM 2510B)	**1.4**	**!**	1.0	1.0	umhos/cm			09/06/23 14:52	1
Oxidation Reduction Potential (SM 2580B)	**390**	**!**	10	10	millivolts			09/06/23 14:52	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T09
Lab Sample ID: 180-160368-18
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 16:42	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 16:42	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 16:42	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.7**		0.1	0.1	SU			09/06/23 15:34	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.63**	**J !**	1.0	0.51	mg/L			09/12/23 17:51	1
Specific Conductance (SM 2510B)	**1.7**	**!**	1.0	1.0	umhos/cm			09/06/23 15:34	1
Oxidation Reduction Potential (SM 2580B)	**350**	**!**	10	10	millivolts			09/06/23 15:34	1

Client Sample ID: FIELD DUPLICATE T01
Lab Sample ID: 180-160368-19
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 21:23	1
Chloride	**2.12**		1.00	0.713	mg/L			08/23/23 21:23	1
Sulfate	ND		1.00	0.756	mg/L			08/23/23 21:23	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.4**		0.1	0.1	SU			08/23/23 12:56	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.4**		1.0	0.51	mg/L			08/29/23 13:00	1
Specific Conductance (SM 2510B)	**5.2**	**!**	1.0	1.0	umhos/cm			08/23/23 12:52	1
Oxidation Reduction Potential (SM 2580B)	**410**	**!**	10	10	millivolts			08/23/23 12:56	1

Client Sample ID: FIELD DUPLICATE T02
Lab Sample ID: 180-160368-20
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/26/23 01:26	1
Chloride	ND		1.00	0.713	mg/L			08/26/23 01:26	1
Sulfate	ND		1.00	0.756	mg/L			08/26/23 01:26	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.9**		0.1	0.1	SU			08/24/23 11:23	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.2**		1.0	0.51	mg/L			08/29/23 13:24	1
Specific Conductance (SM 2510B)	**8.4**	**!**	1.0	1.0	umhos/cm			08/24/23 11:16	1
Oxidation Reduction Potential (SM 2580B)	**350**	**!**	10	10	millivolts			08/24/23 11:18	1

Client Sample ID: FIELD DUPLICATE T03
Lab Sample ID: 180-160368-21
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 20:08	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 20:08	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 20:08	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.0**		0.1	0.1	SU			08/24/23 12:14	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.71**	**J**	1.0	0.51	mg/L			08/29/23 13:48	1
Specific Conductance (SM 2510B)	**5.8**	**!**	1.0	1.0	umhos/cm			08/24/23 12:00	1
Oxidation Reduction Potential (SM 2580B)	**370**	**!**	10	10	millivolts			08/24/23 12:01	1

Client Sample ID: FIELD DUPLICATE T04
Lab Sample ID: 180-160368-22
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 19:27	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 19:27	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 19:27	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.0		0.1	0.1	SU			08/25/23 11:33	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.65	J	1.0	0.51	mg/L			08/29/23 14:12	1
Specific Conductance (SM 2510B)	4.4	!	1.0	1.0	umhos/cm			08/25/23 11:31	1
Oxidation Reduction Potential (SM 2580B)	340	!	10	10	millivolts			08/25/23 11:33	1

Client Sample ID: FIELD DUPLICATE T05
Lab Sample ID: 180-160368-23
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 23:09	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 23:09	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 23:09	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.7		0.1	0.1	SU			08/25/23 12:16	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.80	J	1.0	0.51	mg/L			08/29/23 14:36	1
Specific Conductance (SM 2510B)	4.5	!	1.0	1.0	umhos/cm			08/25/23 12:15	1
Oxidation Reduction Potential (SM 2580B)	360	!	10	10	millivolts			08/25/23 12:16	1

Client Sample ID: FIELD DUPLICATE T06
Lab Sample ID: 180-160368-24
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 15:23	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 15:23	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 15:23	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.2		0.1	0.1	SU			08/29/23 11:31	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	1.0	!	1.0	0.51	mg/L			09/12/23 18:15	1
Specific Conductance (SM 2510B)	2.3		1.0	1.0	umhos/cm			08/29/23 11:31	1
Oxidation Reduction Potential (SM 2580B)	380		10	10	millivolts			08/29/23 11:31	1

Client Sample ID: FIELD DUPLICATE T07
Lab Sample ID: 180-160368-25
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 19:13	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 19:13	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 19:13	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.8		0.1	0.1	SU			08/29/23 12:15	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	1.1	!	1.0	0.51	mg/L			09/12/23 19:31	1
Specific Conductance (SM 2510B)	2.2		1.0	1.0	umhos/cm			08/29/23 12:15	1
Oxidation Reduction Potential (SM 2580B)	420		10	10	millivolts			08/29/23 12:15	1

Client Sample ID: FIELD DUPLICATE T08
Lab Sample ID: 180-160368-26
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 14:59	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 14:59	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 14:59	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.7		0.1	0.1	SU			09/06/23 14:55	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.87	J !	1.0	0.51	mg/L			09/12/23 19:55	1
Specific Conductance (SM 2510B)	2.1	!	1.0	1.0	umhos/cm			09/06/23 14:55	1
Oxidation Reduction Potential (SM 2580B)	400	!	10	10	millivolts			09/06/23 14:55	1

Client Sample ID: FIELD DUPLICATE T09
Lab Sample ID: 180-160368-27
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 16:27	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 16:27	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 16:27	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.7		0.1	0.1	SU			09/06/23 15:43	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.76	J !	1.0	0.51	mg/L			09/12/23 21:12	1
Specific Conductance (SM 2510B)	2.0	!	1.0	1.0	umhos/cm			09/06/23 15:43	1
Oxidation Reduction Potential (SM 2580B)	350	!	10	10	millivolts			09/06/23 15:43	1

Client Sample ID: FIELD DUPLICATE DUP T01
Lab Sample ID: 180-160368-28
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 21:42	1
Chloride	**2.59**		1.00	0.713	mg/L			08/23/23 21:42	1
Sulfate	ND		1.00	0.756	mg/L			08/23/23 21:42	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.4**		0.1	0.1	SU			08/23/23 13:07	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.3**		1.0	0.51	mg/L			08/29/23 17:27	1
Specific Conductance (SM 2510B)	**3.4**	**!**	1.0	1.0	umhos/cm			08/23/23 13:06	1
Oxidation Reduction Potential (SM 2580B)	**500**	**!**	10	10	millivolts			08/23/23 13:07	1

Client Sample ID: FIELD DUPLICATE DUP T02
Lab Sample ID: 180-160368-29
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/26/23 01:45	1
Chloride	ND		1.00	0.713	mg/L			08/26/23 01:45	1
Sulfate	ND		1.00	0.756	mg/L			08/26/23 01:45	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.9**		0.1	0.1	SU			08/24/23 11:31	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.0**		1.0	0.51	mg/L			08/29/23 17:51	1
Specific Conductance (SM 2510B)	**6.6**	**!**	1.0	1.0	umhos/cm			08/24/23 11:25	1
Oxidation Reduction Potential (SM 2580B)	**470**	**!**	10	10	millivolts			08/24/23 11:25	1

Client Sample ID: FIELD DUPLICATE DUP T03
Lab Sample ID: 180-160368-30
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 20:23	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 20:23	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 20:23	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**6.9**		0.1	0.1	SU			08/24/23 12:22	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.58**	**J**	1.0	0.51	mg/L			08/29/23 18:15	1
Specific Conductance (SM 2510B)	**4.6**	**!**	1.0	1.0	umhos/cm			08/24/23 12:06	1
Oxidation Reduction Potential (SM 2580B)	**370**	**!**	10	10	millivolts			08/24/23 12:08	1

Client Sample ID: FIELD DUPLICATE DUP T04
Lab Sample ID: 180-160368-31
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 19:42	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 19:42	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 19:42	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.5		0.1	0.1	SU			08/25/23 11:40	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.55	J	1.0	0.51	mg/L			08/29/23 23:59	1
Specific Conductance (SM 2510B)	3.0	!	1.0	1.0	umhos/cm			08/25/23 11:40	1
Oxidation Reduction Potential (SM 2580B)	340	!	10	10	millivolts			08/25/23 11:40	1

Client Sample ID: FIELD DUPLICATE DUP T05
Lab Sample ID: 180-160368-32
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 23:53	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 23:53	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 23:53	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.6		0.1	0.1	SU			08/25/23 12:23	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.76	J !	1.0	0.51	mg/L			08/30/23 00:23	1
Specific Conductance (SM 2510B)	2.7	!	1.0	1.0	umhos/cm			08/25/23 12:21	1
Oxidation Reduction Potential (SM 2580B)	360	!	10	10	millivolts			08/25/23 12:23	1

Client Sample ID: FIELD DUPLICATE DUP T06
Lab Sample ID: 180-160368-33
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 16:08	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 16:08	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 16:08	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.2		0.1	0.1	SU			08/29/23 11:40	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	0.97	J !	1.0	0.51	mg/L			09/12/23 21:59	1
Specific Conductance (SM 2510B)	2.2		1.0	1.0	umhos/cm			08/29/23 11:40	1
Oxidation Reduction Potential (SM 2580B)	380		10	10	millivolts			08/29/23 11:40	1

Client Sample ID: FIELD DUPLICATE DUP T07
Lab Sample ID: 180-160368-34
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 16:22	1
Chloride	**0.870**	**J**	1.00	0.713	mg/L			08/29/23 16:22	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 16:22	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.9**		0.1	0.1	SU			08/29/23 12:21	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**1.0**	**!**	1.0	0.51	mg/L			09/12/23 22:47	1
Specific Conductance (SM 2510B)	**2.1**		1.0	1.0	umhos/cm			08/29/23 12:21	1
Oxidation Reduction Potential (SM 2580B)	**410**		10	10	millivolts			08/29/23 12:21	1

Client Sample ID: FIELD DUPLICATE DUP T08
Lab Sample ID: 180-160368-35
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 17:12	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 17:12	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 17:12	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.8**		0.1	0.1	SU			09/06/23 15:05	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.86**	**J !**	1.0	0.51	mg/L			09/12/23 23:11	1
Specific Conductance (SM 2510B)	**2.0**	**!**	1.0	1.0	umhos/cm			09/06/23 15:05	1
Oxidation Reduction Potential (SM 2580B)	**380**	**!**	10	10	millivolts			09/06/23 15:05	1

Client Sample ID: FIELD DUPLICATE DUP T09
Lab Sample ID: 180-160368-36
Date Collected: 07/21/23 10:00
Matrix: Solid
Date Received: 07/27/23 11:27

Method: SW846 EPA 9056A - Anions, Ion Chromatography - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 15:43	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 15:43	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 15:43	1

General Chemistry - Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**5.7**		0.1	0.1	SU			09/06/23 15:50	1
Total Organic Carbon - Quad (SW846 EPA 9060A)	**0.80**	**J ! ^+ ^2**	1.0	0.51	mg/L			09/13/23 00:27	1
Specific Conductance (SM 2510B)	**1.9**	**!**	1.0	1.0	umhos/cm			09/06/23 15:50	1
Oxidation Reduction Potential (SM 2580B)	**360**	**!**	10	10	millivolts			09/06/23 15:50	1

Client Sample ID: B-623-1 THRU B-623-5 T01
Lab Sample ID: 180-160368-37
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.18	J	0.50	0.083	mg/L		08/24/23 22:35	08/25/23 20:02	1

Client Sample ID: B-623-1 THRU B-623-5 T02
Lab Sample ID: 180-160368-38
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.13	J	0.50	0.083	mg/L		08/28/23 10:11	08/29/23 11:14	1

Client Sample ID: B-623-1 THRU B-623-5 T03
Lab Sample ID: 180-160368-39
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.10	J	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:59	1

Client Sample ID: B-623-1 THRU B-623-5 T04
Lab Sample ID: 180-160368-40
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.13	J	0.50	0.083	mg/L		08/28/23 10:11	08/29/23 11:11	1

Client Sample ID: B-623-1 THRU B-623-5 T05
Lab Sample ID: 180-160368-41
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 08:10	1

Client Sample ID: B-623-1 THRU B-623-5 T06
Lab Sample ID: 180-160368-42
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:58	1

Client Sample ID: B-623-1 THRU B-623-5 T07
Lab Sample ID: 180-160368-43
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:14	1

Client Sample ID: B-623-1 THRU B-623-5 T08
Lab Sample ID: 180-160368-44
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.088	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:53	1

Client Sample ID: B-623-1 THRU B-623-5 T09
Lab Sample ID: 180-160368-45
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.22	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:59	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T01
Lab Sample ID: 180-160368-46
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.13	J	0.50	0.083	mg/L		08/24/23 22:35	08/25/23 19:37	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T02
Lab Sample ID: 180-160368-47
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.22	J	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:44	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T03
Lab Sample ID: 180-160368-48
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.10	J	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:26	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T04
Lab Sample ID: 180-160368-49
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 08:36	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T05
Lab Sample ID: 180-160368-50
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		08/28/23 10:11	08/29/23 11:02	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T06
Lab Sample ID: 180-160368-51
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 18:04	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T07
Lab Sample ID: 180-160368-52
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 18:01	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T08
Lab Sample ID: 180-160368-53
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.10	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 01:14	1

Client Sample ID: B-623-1 THRU B-623-5 DUP T09
Lab Sample ID: 180-160368-54
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.16	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 01:18	1

Client Sample ID: FIELD DUPLICATE T01
Lab Sample ID: 180-160368-55
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.14	J	0.50	0.083	mg/L		08/24/23 22:35	08/25/23 19:31	1

Client Sample ID: FIELD DUPLICATE T02
Lab Sample ID: 180-160368-56
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:41	1

Client Sample ID: FIELD DUPLICATE T03
Lab Sample ID: 180-160368-57
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.10	J	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:10	1

Client Sample ID: FIELD DUPLICATE T04
Lab Sample ID: 180-160368-58
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		08/28/23 10:11	08/29/23 10:58	1

Client Sample ID: FIELD DUPLICATE T05
Lab Sample ID: 180-160368-59
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.21	J	0.50	0.083	mg/L		08/28/23 10:16	08/29/23 07:46	1

Client Sample ID: FIELD DUPLICATE T06
Lab Sample ID: 180-160368-60
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.50		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:30	1

Client Sample ID: FIELD DUPLICATE T07
Lab Sample ID: 180-160368-61
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	2.5		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:26	1

Client Sample ID: FIELD DUPLICATE T08
Lab Sample ID: 180-160368-62
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.10	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 01:21	1

Client Sample ID: FIELD DUPLICATE T09
Lab Sample ID: 180-160368-63
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:08	1

Client Sample ID: FIELD DUPLICATE DUP T01
Lab Sample ID: 180-160368-64
Date Collected: 08/23/23 11:18
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/24/23 22:35	08/25/23 19:34	1

Client Sample ID: FIELD DUPLICATE DUP T02
Lab Sample ID: 180-160368-65
Date Collected: 08/23/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.11	J	0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:07	1

Client Sample ID: FIELD DUPLICATE DUP T03
Lab Sample ID: 180-160368-66
Date Collected: 08/24/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	1.2		0.50	0.083	mg/L		08/27/23 21:13	08/28/23 13:29	1

Client Sample ID: FIELD DUPLICATE DUP T04
Lab Sample ID: 180-160368-67
Date Collected: 08/24/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 08:42	1

Client Sample ID: FIELD DUPLICATE DUP T05
Lab Sample ID: 180-160368-68
Date Collected: 08/25/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.11	J	0.50	0.083	mg/L		08/28/23 10:11	08/29/23 11:21	1

Client Sample ID: FIELD DUPLICATE DUP T06
Lab Sample ID: 180-160368-69
Date Collected: 08/27/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.21	J	0.50	0.083	mg/L		08/31/23 11:10	09/06/23 17:52	1

Client Sample ID: FIELD DUPLICATE DUP T07
Lab Sample ID: 180-160368-70
Date Collected: 08/28/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	1.0		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 18:08	1

Client Sample ID: FIELD DUPLICATE DUP T08
Lab Sample ID: 180-160368-71
Date Collected: 09/01/23 18:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.083	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:12	1

Client: US Ecology Inc
Job ID: 180-160368-1
Project/Site: Republic Services Mercury Project REVISE

Client Sample ID: FIELD DUPLICATE DUP T09
Lab Sample ID: 180-160368-72
Date Collected: 09/02/23 06:30
Matrix: Water
Date Received: 07/27/23 11:27

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	0.12	J	0.50	0.083	mg/L		09/10/23 20:53	09/12/23 00:18	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-444414/6
Matrix: Solid
Analysis Batch: 444414

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/23/23 12:43	1
Chloride	ND		1.00	0.713	mg/L			08/23/23 12:43	1
Sulfate	ND		1.00	0.756	mg/L			08/23/23 12:43	1

Lab Sample ID: LCS 180-444414/7
Matrix: Solid
Analysis Batch: 444414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.854		mg/L		99	80 - 120
Chloride	50.0	49.70		mg/L		99	80 - 120
Sulfate	50.0	47.77		mg/L		96	80 - 120

Lab Sample ID: MB 180-444656/6
Matrix: Solid
Analysis Batch: 444656

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 11:01	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 11:01	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 11:01	1

Lab Sample ID: LCS 180-444656/7
Matrix: Solid
Analysis Batch: 444656

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	10.13		mg/L		101	80 - 120
Chloride	50.0	48.74		mg/L		97	80 - 120
Sulfate	50.0	48.33		mg/L		97	80 - 120

Lab Sample ID: MB 180-444665/36
Matrix: Solid
Analysis Batch: 444665

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 22:21	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 22:21	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 22:21	1

Lab Sample ID: LCS 180-444665/37
Matrix: Solid
Analysis Batch: 444665

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.624		mg/L		96	80 - 120
Chloride	50.0	50.33		mg/L		101	80 - 120
Sulfate	50.0	52.34		mg/L		105	80 - 120

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 180-444670/6
Matrix: Solid
Analysis Batch: 444670

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/25/23 12:04	1
Chloride	ND		1.00	0.713	mg/L			08/25/23 12:04	1
Sulfate	ND		1.00	0.756	mg/L			08/25/23 12:04	1

Lab Sample ID: LCS 180-444670/7
Matrix: Solid
Analysis Batch: 444670

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.498		mg/L		95	80 - 120
Chloride	50.0	49.34		mg/L		99	80 - 120
Sulfate	50.0	49.91		mg/L		100	80 - 120

Lab Sample ID: MB 180-444942/8
Matrix: Solid
Analysis Batch: 444942

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 11:49	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 11:49	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 11:49	1

Lab Sample ID: LCS 180-444942/9
Matrix: Solid
Analysis Batch: 444942

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	10.50		mg/L		105	80 - 120
Chloride	50.0	50.13		mg/L		100	80 - 120
Sulfate	50.0	49.93		mg/L		100	80 - 120

Lab Sample ID: MB 180-444962/36
Matrix: Solid
Analysis Batch: 444962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 22:36	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 22:36	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 22:36	1

Lab Sample ID: MB 180-444962/6
Matrix: Solid
Analysis Batch: 444962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			08/29/23 13:21	1
Chloride	ND		1.00	0.713	mg/L			08/29/23 13:21	1
Sulfate	ND		1.00	0.756	mg/L			08/29/23 13:21	1

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 180-444962/37
Matrix: Solid
Analysis Batch: 444962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.608		mg/L		96	80 - 120
Chloride	50.0	49.93		mg/L		100	80 - 120
Sulfate	50.0	51.95		mg/L		104	80 - 120

Lab Sample ID: LCS 180-444962/7
Matrix: Solid
Analysis Batch: 444962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	9.580		mg/L		96	80 - 120
Chloride	50.0	49.49		mg/L		99	80 - 120
Sulfate	50.0	51.15		mg/L		102	80 - 120

Lab Sample ID: MB 180-446523/8
Matrix: Solid
Analysis Batch: 446523

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.100	0.0530	mg/L			09/14/23 12:41	1
Chloride	ND		1.00	0.713	mg/L			09/14/23 12:41	1
Sulfate	ND		1.00	0.756	mg/L			09/14/23 12:41	1

Lab Sample ID: LCS 180-446523/9
Matrix: Solid
Analysis Batch: 446523

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	10.80		mg/L		108	80 - 120
Chloride	50.0	51.99		mg/L		104	80 - 120
Sulfate	50.0	51.14		mg/L		102	80 - 120

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 410-412316/1-A
Matrix: Water
Analysis Batch: 412799

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 412316

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/24/23 22:35	08/25/23 18:50	1

Lab Sample ID: LCS 410-412316/2-A
Matrix: Water
Analysis Batch: 412799

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 412316

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.06		mg/L		101	80 - 120

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: MB 410-413043/1-A
Matrix: Water
Analysis Batch: 413362

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 413043

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/27/23 21:13	08/28/23 12:26	1

Lab Sample ID: LCS 410-413043/2-A
Matrix: Water
Analysis Batch: 413362

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 413043

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.11		mg/L		102	80 - 120

Lab Sample ID: MB 410-413211/1-A
Matrix: Water
Analysis Batch: 413881

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 413211

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:11	08/29/23 09:35	1

Lab Sample ID: LCS 410-413211/2-A
Matrix: Water
Analysis Batch: 413881

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 413211

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.28		mg/L		106	80 - 120

Lab Sample ID: MB 410-413213/1-A
Matrix: Water
Analysis Batch: 413825

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 413213

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/28/23 10:16	08/29/23 07:08	1

Lab Sample ID: LCS 410-413213/2-A
Matrix: Water
Analysis Batch: 413825

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 413213

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.11		mg/L		102	80 - 120

Lab Sample ID: MB 410-414855/1-A
Matrix: Water
Analysis Batch: 416737

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 414855

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		08/31/23 11:10	09/06/23 16:24	1

Lab Sample ID: LCS 410-414855/2-A
Matrix: Water
Analysis Batch: 416737

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 414855

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	5.05		mg/L		101	80 - 120

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 410-417838/1-A
Matrix: Water
Analysis Batch: 418354

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 417838

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	ND		0.50	0.083	mg/L		09/10/23 20:53	09/11/23 23:31	1

Lab Sample ID: LCS 410-417838/2-A
Matrix: Water
Analysis Batch: 418354

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 417838

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	5.00	4.90		mg/L		98	80 - 120

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-445960/1
Matrix: Solid
Analysis Batch: 445960

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-445969/1
Matrix: Solid
Analysis Batch: 445969

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-445992/1
Matrix: Solid
Analysis Batch: 445992

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-446000/1
Matrix: Solid
Analysis Batch: 446000

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-446003/1
Matrix: Solid
Analysis Batch: 446003

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Method: EPA 9040C - pH (Continued)

Lab Sample ID: 180-160368-21 DU
Client Sample ID: FIELD DUPLICATE T03
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445969

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.0			7.0		SU				0	2

Lab Sample ID: 180-160368-29 DU
Client Sample ID: FIELD DUPLICATE DUP T02
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445969

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.9			6.9		SU				0	2

Lab Sample ID: 180-160368-23 DU
Client Sample ID: FIELD DUPLICATE T05
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445992

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.7			6.7		SU				0	2

Lab Sample ID: 180-160368-31 DU
Client Sample ID: FIELD DUPLICATE DUP T04
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445992

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.5			6.5		SU				0	2

Lab Sample ID: 180-160368-25 DU
Client Sample ID: FIELD DUPLICATE T07
Matrix: Solid
Prep Type: Leach
Analysis Batch: 446000

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	5.8			5.8		SU				0	2

Lab Sample ID: 180-160368-33 DU
Client Sample ID: FIELD DUPLICATE DUP T06
Matrix: Solid
Prep Type: Leach
Analysis Batch: 446000

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.2			6.2		SU				0	2

Lab Sample ID: 180-160368-27 DU
Client Sample ID: FIELD DUPLICATE T09
Matrix: Solid
Prep Type: Leach
Analysis Batch: 446003

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	5.7			5.7		SU				0	2

Lab Sample ID: 180-160368-35 DU
Client Sample ID: FIELD DUPLICATE DUP T08
Matrix: Solid
Prep Type: Leach
Analysis Batch: 446003

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	5.8			5.8		SU				0	2

Method: EPA 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 180-445128/35
Matrix: Solid
Analysis Batch: 445128

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			08/29/23 08:55	1

Lab Sample ID: MB 180-445128/5
Matrix: Solid
Analysis Batch: 445128

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			08/28/23 20:50	1

Lab Sample ID: MB 180-445128/67
Matrix: Solid
Analysis Batch: 445128

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			08/29/23 21:57	1

Lab Sample ID: LCS 180-445128/34
Matrix: Solid
Analysis Batch: 445128

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	20.8		mg/L		104	85 - 115

Lab Sample ID: LCS 180-445128/66
Matrix: Solid
Analysis Batch: 445128

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	20.7		mg/L		104	85 - 115

Lab Sample ID: MB 180-445262/5
Matrix: Solid
Analysis Batch: 445262

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			08/30/23 20:01	1

Lab Sample ID: LCS 180-445262/4
Matrix: Solid
Analysis Batch: 445262

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	20.6		mg/L		103	85 - 115

Lab Sample ID: MB 180-446407/35
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			09/12/23 07:43	1

Method: EPA 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 180-446407/5
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			09/11/23 19:35	1

Lab Sample ID: MB 180-446407/67
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Quad	ND		1.0	0.51	mg/L			09/12/23 20:45	1

Lab Sample ID: LCS 180-446407/34
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	20.9		mg/L		104	85 - 115

Lab Sample ID: LCS 180-446407/4
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	21.1		mg/L		106	85 - 115

Lab Sample ID: LCS 180-446407/66
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	20.0	21.3		mg/L		106	85 - 115

Lab Sample ID: 180-160368-12 MS
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: B-623-1 THRU B-623-5 DUP T03
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	0.71	J !	10.0	10.5		mg/L		97	85 - 115

Lab Sample ID: 180-160368-27 MS
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: FIELD DUPLICATE T09
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Quad	0.76	J !	10.0	10.7		mg/L		99	85 - 115

Lab Sample ID: 180-160368-13 DU
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: B-623-1 THRU B-623-5 DUP T04
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon - Quad	0.62	J !	0.518	J F5	mg/L		18	15

Method: EPA 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: 180-160368-33 DU
Matrix: Solid
Analysis Batch: 446407

Client Sample ID: FIELD DUPLICATE DUP T06
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Organic Carbon - Quad	0.97	J !		1.02		mg/L				5	15

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 180-445962/2
Matrix: Solid
Analysis Batch: 445962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			08/23/23 12:04	1

Lab Sample ID: LCS 180-445962/1
Matrix: Solid
Analysis Batch: 445962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Specific Conductance			84.0	85.9		umhos/cm		102	90 - 110		

Lab Sample ID: MB 180-445986/2
Matrix: Solid
Analysis Batch: 445986

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			08/24/23 10:47	1

Lab Sample ID: LCS 180-445986/1
Matrix: Solid
Analysis Batch: 445986

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Specific Conductance			84.0	85.9		umhos/cm		102	90 - 110		

Lab Sample ID: MB 180-445987/2
Matrix: Solid
Analysis Batch: 445987

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			08/25/23 11:02	1

Lab Sample ID: LCS 180-445987/1
Matrix: Solid
Analysis Batch: 445987

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Specific Conductance			84.0	86.1		umhos/cm		103	90 - 110		

Method: SM 2510B - Conductivity, Specific Conductance (Continued)

Lab Sample ID: MB 180-445996/2
Matrix: Solid
Analysis Batch: 445996

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			08/29/23 11:02	1

Lab Sample ID: LCS 180-445996/1
Matrix: Solid
Analysis Batch: 445996

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	86.3		umhos/cm		103	90 - 110

Lab Sample ID: MB 180-446001/2
Matrix: Solid
Analysis Batch: 446001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			09/06/23 14:23	1

Lab Sample ID: LCS 180-446001/1
Matrix: Solid
Analysis Batch: 446001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Specific Conductance	84.0	87.6		umhos/cm		104	90 - 110

Lab Sample ID: 180-160368-28 DU
Matrix: Solid
Analysis Batch: 445962

Client Sample ID: FIELD DUPLICATE DUP T01
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	3.4	!	3.42		umhos/cm		0	20

Lab Sample ID: 180-160368-21 DU
Matrix: Solid
Analysis Batch: 445986

Client Sample ID: FIELD DUPLICATE T03
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	5.8	!	5.81		umhos/cm		0.5	20

Lab Sample ID: 180-160368-29 DU
Matrix: Solid
Analysis Batch: 445986

Client Sample ID: FIELD DUPLICATE DUP T02
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	6.6	!	6.51		umhos/cm		0.9	20

Lab Sample ID: 180-160368-23 DU
Matrix: Solid
Analysis Batch: 445987

Client Sample ID: FIELD DUPLICATE T05
Prep Type: Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	4.5	!	4.48		umhos/cm		0.2	20

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: 180-160368-31 DU
Client Sample ID: FIELD DUPLICATE DUP T04
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445987

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	3.0	!	3.00		umhos/cm		0.3	20

Lab Sample ID: 180-160368-25 DU
Client Sample ID: FIELD DUPLICATE T07
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445996

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	2.2		2.20		umhos/cm		0.9	20

Lab Sample ID: 180-160368-33 DU
Client Sample ID: FIELD DUPLICATE DUP T06
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445996

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	2.2		2.13		umhos/cm		1	20

Lab Sample ID: 180-160368-27 DU
Client Sample ID: FIELD DUPLICATE T09
Matrix: Solid
Prep Type: Leach
Analysis Batch: 446001

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	2.0	!	1.98		umhos/cm		0.5	20

Lab Sample ID: 180-160368-35 DU
Client Sample ID: FIELD DUPLICATE DUP T08
Matrix: Solid
Prep Type: Leach
Analysis Batch: 446001

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	2.0	!	2.00		umhos/cm		0.5	20

Method: SM 2580B - Reduction-Oxidation (REDOX) Potential

Lab Sample ID: 180-160368-28 DU
Client Sample ID: FIELD DUPLICATE DUP T01
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445961

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	500	!	505		millivolts		0.6	20

Lab Sample ID: 180-160368-21 DU
Client Sample ID: FIELD DUPLICATE T03
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445985

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	370	!	368		millivolts		0.5	20

Method: SM 2580B - Reduction-Oxidation (REDOX) Potential (Continued)

Lab Sample ID: 180-160368-29 DU
Client Sample ID: FIELD DUPLICATE DUP T02
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445985

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	470	!	475		millivolts		0.4	20

Lab Sample ID: 180-160368-23 DU
Client Sample ID: FIELD DUPLICATE T05
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445989

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	360	!	357		millivolts		0.3	20

Lab Sample ID: 180-160368-31 DU
Client Sample ID: FIELD DUPLICATE DUP T04
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445989

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	340	!	341		millivolts		0.3	20

Lab Sample ID: 180-160368-25 DU
Client Sample ID: FIELD DUPLICATE T07
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445999

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	420		417		millivolts		0.5	20

Lab Sample ID: 180-160368-33 DU
Client Sample ID: FIELD DUPLICATE DUP T06
Matrix: Solid
Prep Type: Leach
Analysis Batch: 445999

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	380		378		millivolts		0.8	20

Lab Sample ID: 180-160368-27 DU
Client Sample ID: FIELD DUPLICATE T09
Matrix: Solid
Prep Type: Leach
Analysis Batch: 446002

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	350	!	355		millivolts		0.3	20

Lab Sample ID: 180-160368-35 DU
Client Sample ID: FIELD DUPLICATE DUP T08
Matrix: Solid
Prep Type: Leach
Analysis Batch: 446002

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	380	!	386		millivolts		0.8	20

HPLC/IC

Leach Batch: 444238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-1	B-623-1 THRU B-623-5 T01	Leach	Solid	1314	
180-160368-10	B-623-1 THRU B-623-5 DUP T01	Leach	Solid	1314	
180-160368-19	FIELD DUPLICATE T01	Leach	Solid	1314	
180-160368-28	FIELD DUPLICATE DUP T01	Leach	Solid	1314	

Leach Batch: 444360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-2	B-623-1 THRU B-623-5 T02	Leach	Solid	1314	
180-160368-11	B-623-1 THRU B-623-5 DUP T02	Leach	Solid	1314	
180-160368-20	FIELD DUPLICATE T02	Leach	Solid	1314	
180-160368-29	FIELD DUPLICATE DUP T02	Leach	Solid	1314	

Leach Batch: 444363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-3	B-623-1 THRU B-623-5 T03	Leach	Solid	1314	
180-160368-12	B-623-1 THRU B-623-5 DUP T03	Leach	Solid	1314	
180-160368-21	FIELD DUPLICATE T03	Leach	Solid	1314	
180-160368-30	FIELD DUPLICATE DUP T03	Leach	Solid	1314	

Leach Batch: 444365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-4	B-623-1 THRU B-623-5 T04	Leach	Solid	1314	
180-160368-13	B-623-1 THRU B-623-5 DUP T04	Leach	Solid	1314	
180-160368-22	FIELD DUPLICATE T04	Leach	Solid	1314	
180-160368-31	FIELD DUPLICATE DUP T04	Leach	Solid	1314	

Leach Batch: 444366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-5	B-623-1 THRU B-623-5 T05	Leach	Solid	1314	
180-160368-14	B-623-1 THRU B-623-5 DUP T05	Leach	Solid	1314	
180-160368-23	FIELD DUPLICATE T05	Leach	Solid	1314	
180-160368-32	FIELD DUPLICATE DUP T05	Leach	Solid	1314	

Leach Batch: 444371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-6	B-623-1 THRU B-623-5 T06	Leach	Solid	1314	
180-160368-15	B-623-1 THRU B-623-5 DUP T06	Leach	Solid	1314	
180-160368-24	FIELD DUPLICATE T06	Leach	Solid	1314	
180-160368-33	FIELD DUPLICATE DUP T06	Leach	Solid	1314	

Leach Batch: 444374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-7	B-623-1 THRU B-623-5 T07	Leach	Solid	1314	
180-160368-16	B-623-1 THRU B-623-5 DUP T07	Leach	Solid	1314	
180-160368-25	FIELD DUPLICATE T07	Leach	Solid	1314	
180-160368-34	FIELD DUPLICATE DUP T07	Leach	Solid	1314	

Leach Batch: 444377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-8	B-623-1 THRU B-623-5 T08	Leach	Solid	1314	
180-160368-17	B-623-1 THRU B-623-5 DUP T08	Leach	Solid	1314	

HPLC/IC (Continued)

Leach Batch: 444377 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-26	FIELD DUPLICATE T08	Leach	Solid	1314	
180-160368-35	FIELD DUPLICATE DUP T08	Leach	Solid	1314	

Leach Batch: 444380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-9	B-623-1 THRU B-623-5 T09	Leach	Solid	1314	
180-160368-18	B-623-1 THRU B-623-5 DUP T09	Leach	Solid	1314	
180-160368-27	FIELD DUPLICATE T09	Leach	Solid	1314	
180-160368-36	FIELD DUPLICATE DUP T09	Leach	Solid	1314	

Analysis Batch: 444414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-1	B-623-1 THRU B-623-5 T01	Leach	Solid	EPA 9056A	444238
180-160368-10	B-623-1 THRU B-623-5 DUP T01	Leach	Solid	EPA 9056A	444238
180-160368-19	FIELD DUPLICATE T01	Leach	Solid	EPA 9056A	444238
180-160368-28	FIELD DUPLICATE DUP T01	Leach	Solid	EPA 9056A	444238
MB 180-444414/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444414/7	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 444656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-3	B-623-1 THRU B-623-5 T03	Leach	Solid	EPA 9056A	444363
180-160368-4	B-623-1 THRU B-623-5 T04	Leach	Solid	EPA 9056A	444365
180-160368-12	B-623-1 THRU B-623-5 DUP T03	Leach	Solid	EPA 9056A	444363
180-160368-21	FIELD DUPLICATE T03	Leach	Solid	EPA 9056A	444363
180-160368-30	FIELD DUPLICATE DUP T03	Leach	Solid	EPA 9056A	444363
MB 180-444656/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444656/7	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 444665

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-2	B-623-1 THRU B-623-5 T02	Leach	Solid	EPA 9056A	444360
180-160368-11	B-623-1 THRU B-623-5 DUP T02	Leach	Solid	EPA 9056A	444360
180-160368-20	FIELD DUPLICATE T02	Leach	Solid	EPA 9056A	444360
180-160368-29	FIELD DUPLICATE DUP T02	Leach	Solid	EPA 9056A	444360
MB 180-444665/36	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444665/37	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 444670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-5	B-623-1 THRU B-623-5 T05	Leach	Solid	EPA 9056A	444366
180-160368-13	B-623-1 THRU B-623-5 DUP T04	Leach	Solid	EPA 9056A	444365
180-160368-14	B-623-1 THRU B-623-5 DUP T05	Leach	Solid	EPA 9056A	444366
180-160368-22	FIELD DUPLICATE T04	Leach	Solid	EPA 9056A	444365
180-160368-23	FIELD DUPLICATE T05	Leach	Solid	EPA 9056A	444366
180-160368-31	FIELD DUPLICATE DUP T04	Leach	Solid	EPA 9056A	444365
180-160368-32	FIELD DUPLICATE DUP T05	Leach	Solid	EPA 9056A	444366
MB 180-444670/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444670/7	Lab Control Sample	Total/NA	Solid	EPA 9056A	

HPLC/IC

Analysis Batch: 444942

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-24	FIELD DUPLICATE T06	Leach	Solid	EPA 9056A	444371
180-160368-33	FIELD DUPLICATE DUP T06	Leach	Solid	EPA 9056A	444371
180-160368-34	FIELD DUPLICATE DUP T07	Leach	Solid	EPA 9056A	444374
MB 180-444942/8	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444942/9	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 444962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-6	B-623-1 THRU B-623-5 T06	Leach	Solid	EPA 9056A	444371
180-160368-7	B-623-1 THRU B-623-5 T07	Leach	Solid	EPA 9056A	444374
180-160368-15	B-623-1 THRU B-623-5 DUP T06	Leach	Solid	EPA 9056A	444371
180-160368-16	B-623-1 THRU B-623-5 DUP T07	Leach	Solid	EPA 9056A	444374
180-160368-25	FIELD DUPLICATE T07	Leach	Solid	EPA 9056A	444374
MB 180-444962/36	Method Blank	Total/NA	Solid	EPA 9056A	
MB 180-444962/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-444962/37	Lab Control Sample	Total/NA	Solid	EPA 9056A	
LCS 180-444962/7	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 446523

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-8	B-623-1 THRU B-623-5 T08	Leach	Solid	EPA 9056A	444377
180-160368-9	B-623-1 THRU B-623-5 T09	Leach	Solid	EPA 9056A	444380
180-160368-17	B-623-1 THRU B-623-5 DUP T08	Leach	Solid	EPA 9056A	444377
180-160368-18	B-623-1 THRU B-623-5 DUP T09	Leach	Solid	EPA 9056A	444380
180-160368-26	FIELD DUPLICATE T08	Leach	Solid	EPA 9056A	444377
180-160368-27	FIELD DUPLICATE T09	Leach	Solid	EPA 9056A	444380
180-160368-35	FIELD DUPLICATE DUP T08	Leach	Solid	EPA 9056A	444377
180-160368-36	FIELD DUPLICATE DUP T09	Leach	Solid	EPA 9056A	444380
MB 180-446523/8	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-446523/9	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Metals

Prep Batch: 412316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-37	B-623-1 THRU B-623-5 T01	Total Recoverable	Water	3005A	
180-160368-46	B-623-1 THRU B-623-5 DUP T01	Total Recoverable	Water	3005A	
180-160368-55	FIELD DUPLICATE T01	Total Recoverable	Water	3005A	
180-160368-64	FIELD DUPLICATE DUP T01	Total Recoverable	Water	3005A	
MB 410-412316/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-412316/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 412799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-37	B-623-1 THRU B-623-5 T01	Total Recoverable	Water	6010D	412316
180-160368-46	B-623-1 THRU B-623-5 DUP T01	Total Recoverable	Water	6010D	412316
180-160368-55	FIELD DUPLICATE T01	Total Recoverable	Water	6010D	412316
180-160368-64	FIELD DUPLICATE DUP T01	Total Recoverable	Water	6010D	412316
MB 410-412316/1-A	Method Blank	Total Recoverable	Water	6010D	412316
LCS 410-412316/2-A	Lab Control Sample	Total Recoverable	Water	6010D	412316

Metals

Prep Batch: 413043

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-39	B-623-1 THRU B-623-5 T03	Total Recoverable	Water	3005A	
180-160368-47	B-623-1 THRU B-623-5 DUP T02	Total Recoverable	Water	3005A	
180-160368-48	B-623-1 THRU B-623-5 DUP T03	Total Recoverable	Water	3005A	
180-160368-56	FIELD DUPLICATE T02	Total Recoverable	Water	3005A	
180-160368-57	FIELD DUPLICATE T03	Total Recoverable	Water	3005A	
180-160368-65	FIELD DUPLICATE DUP T02	Total Recoverable	Water	3005A	
180-160368-66	FIELD DUPLICATE DUP T03	Total Recoverable	Water	3005A	
MB 410-413043/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-413043/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 413211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-38	B-623-1 THRU B-623-5 T02	Total Recoverable	Water	3005A	
180-160368-40	B-623-1 THRU B-623-5 T04	Total Recoverable	Water	3005A	
180-160368-50	B-623-1 THRU B-623-5 DUP T05	Total Recoverable	Water	3005A	
180-160368-58	FIELD DUPLICATE T04	Total Recoverable	Water	3005A	
180-160368-68	FIELD DUPLICATE DUP T05	Total Recoverable	Water	3005A	
MB 410-413211/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-413211/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 413213

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-41	B-623-1 THRU B-623-5 T05	Total Recoverable	Water	3005A	
180-160368-49	B-623-1 THRU B-623-5 DUP T04	Total Recoverable	Water	3005A	
180-160368-59	FIELD DUPLICATE T05	Total Recoverable	Water	3005A	
180-160368-67	FIELD DUPLICATE DUP T04	Total Recoverable	Water	3005A	
MB 410-413213/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-413213/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 413362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-39	B-623-1 THRU B-623-5 T03	Total Recoverable	Water	6010D	413043
180-160368-47	B-623-1 THRU B-623-5 DUP T02	Total Recoverable	Water	6010D	413043
180-160368-48	B-623-1 THRU B-623-5 DUP T03	Total Recoverable	Water	6010D	413043
180-160368-56	FIELD DUPLICATE T02	Total Recoverable	Water	6010D	413043
180-160368-57	FIELD DUPLICATE T03	Total Recoverable	Water	6010D	413043
180-160368-65	FIELD DUPLICATE DUP T02	Total Recoverable	Water	6010D	413043
180-160368-66	FIELD DUPLICATE DUP T03	Total Recoverable	Water	6010D	413043
MB 410-413043/1-A	Method Blank	Total Recoverable	Water	6010D	413043
LCS 410-413043/2-A	Lab Control Sample	Total Recoverable	Water	6010D	413043

Analysis Batch: 413825

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-41	B-623-1 THRU B-623-5 T05	Total Recoverable	Water	6010D	413213
180-160368-49	B-623-1 THRU B-623-5 DUP T04	Total Recoverable	Water	6010D	413213
180-160368-59	FIELD DUPLICATE T05	Total Recoverable	Water	6010D	413213
180-160368-67	FIELD DUPLICATE DUP T04	Total Recoverable	Water	6010D	413213
MB 410-413213/1-A	Method Blank	Total Recoverable	Water	6010D	413213
LCS 410-413213/2-A	Lab Control Sample	Total Recoverable	Water	6010D	413213

Metals

Analysis Batch: 413881

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-38	B-623-1 THRU B-623-5 T02	Total Recoverable	Water	6010D	413211
180-160368-40	B-623-1 THRU B-623-5 T04	Total Recoverable	Water	6010D	413211
180-160368-50	B-623-1 THRU B-623-5 DUP T05	Total Recoverable	Water	6010D	413211
180-160368-58	FIELD DUPLICATE T04	Total Recoverable	Water	6010D	413211
180-160368-68	FIELD DUPLICATE DUP T05	Total Recoverable	Water	6010D	413211
MB 410-413211/1-A	Method Blank	Total Recoverable	Water	6010D	413211
LCS 410-413211/2-A	Lab Control Sample	Total Recoverable	Water	6010D	413211

Prep Batch: 414855

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-42	B-623-1 THRU B-623-5 T06	Total Recoverable	Water	3005A	
180-160368-43	B-623-1 THRU B-623-5 T07	Total Recoverable	Water	3005A	
180-160368-51	B-623-1 THRU B-623-5 DUP T06	Total Recoverable	Water	3005A	
180-160368-52	B-623-1 THRU B-623-5 DUP T07	Total Recoverable	Water	3005A	
180-160368-60	FIELD DUPLICATE T06	Total Recoverable	Water	3005A	
180-160368-61	FIELD DUPLICATE T07	Total Recoverable	Water	3005A	
180-160368-69	FIELD DUPLICATE DUP T06	Total Recoverable	Water	3005A	
180-160368-70	FIELD DUPLICATE DUP T07	Total Recoverable	Water	3005A	
MB 410-414855/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-414855/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 416737

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-42	B-623-1 THRU B-623-5 T06	Total Recoverable	Water	6010D	414855
180-160368-43	B-623-1 THRU B-623-5 T07	Total Recoverable	Water	6010D	414855
180-160368-51	B-623-1 THRU B-623-5 DUP T06	Total Recoverable	Water	6010D	414855
180-160368-52	B-623-1 THRU B-623-5 DUP T07	Total Recoverable	Water	6010D	414855
180-160368-60	FIELD DUPLICATE T06	Total Recoverable	Water	6010D	414855
180-160368-61	FIELD DUPLICATE T07	Total Recoverable	Water	6010D	414855
180-160368-69	FIELD DUPLICATE DUP T06	Total Recoverable	Water	6010D	414855
180-160368-70	FIELD DUPLICATE DUP T07	Total Recoverable	Water	6010D	414855
MB 410-414855/1-A	Method Blank	Total Recoverable	Water	6010D	414855
LCS 410-414855/2-A	Lab Control Sample	Total Recoverable	Water	6010D	414855

Prep Batch: 417838

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-44	B-623-1 THRU B-623-5 T08	Total Recoverable	Water	3005A	
180-160368-45	B-623-1 THRU B-623-5 T09	Total Recoverable	Water	3005A	
180-160368-53	B-623-1 THRU B-623-5 DUP T08	Total Recoverable	Water	3005A	
180-160368-54	B-623-1 THRU B-623-5 DUP T09	Total Recoverable	Water	3005A	
180-160368-62	FIELD DUPLICATE T08	Total Recoverable	Water	3005A	
180-160368-63	FIELD DUPLICATE T09	Total Recoverable	Water	3005A	
180-160368-71	FIELD DUPLICATE DUP T08	Total Recoverable	Water	3005A	
180-160368-72	FIELD DUPLICATE DUP T09	Total Recoverable	Water	3005A	
MB 410-417838/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-417838/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 418354

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-44	B-623-1 THRU B-623-5 T08	Total Recoverable	Water	6010D	417838
180-160368-45	B-623-1 THRU B-623-5 T09	Total Recoverable	Water	6010D	417838

Metals (Continued)

Analysis Batch: 418354 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-53	B-623-1 THRU B-623-5 DUP T08	Total Recoverable	Water	6010D	417838
180-160368-54	B-623-1 THRU B-623-5 DUP T09	Total Recoverable	Water	6010D	417838
180-160368-62	FIELD DUPLICATE T08	Total Recoverable	Water	6010D	417838
180-160368-63	FIELD DUPLICATE T09	Total Recoverable	Water	6010D	417838
180-160368-71	FIELD DUPLICATE DUP T08	Total Recoverable	Water	6010D	417838
180-160368-72	FIELD DUPLICATE DUP T09	Total Recoverable	Water	6010D	417838
MB 410-417838/1-A	Method Blank	Total Recoverable	Water	6010D	417838
LCS 410-417838/2-A	Lab Control Sample	Total Recoverable	Water	6010D	417838

General Chemistry

Leach Batch: 444238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-1	B-623-1 THRU B-623-5 T01	Leach	Solid	1314	
180-160368-10	B-623-1 THRU B-623-5 DUP T01	Leach	Solid	1314	
180-160368-19	FIELD DUPLICATE T01	Leach	Solid	1314	
180-160368-28	FIELD DUPLICATE DUP T01	Leach	Solid	1314	
180-160368-28 DU	FIELD DUPLICATE DUP T01	Leach	Solid	1314	

Leach Batch: 444360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-2	B-623-1 THRU B-623-5 T02	Leach	Solid	1314	
180-160368-11	B-623-1 THRU B-623-5 DUP T02	Leach	Solid	1314	
180-160368-20	FIELD DUPLICATE T02	Leach	Solid	1314	
180-160368-29	FIELD DUPLICATE DUP T02	Leach	Solid	1314	
180-160368-29 DU	FIELD DUPLICATE DUP T02	Leach	Solid	1314	

Leach Batch: 444363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-3	B-623-1 THRU B-623-5 T03	Leach	Solid	1314	
180-160368-12	B-623-1 THRU B-623-5 DUP T03	Leach	Solid	1314	
180-160368-21	FIELD DUPLICATE T03	Leach	Solid	1314	
180-160368-30	FIELD DUPLICATE DUP T03	Leach	Solid	1314	
180-160368-12 MS	B-623-1 THRU B-623-5 DUP T03	Leach	Solid	1314	
180-160368-21 DU	FIELD DUPLICATE T03	Leach	Solid	1314	

Leach Batch: 444365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-4	B-623-1 THRU B-623-5 T04	Leach	Solid	1314	
180-160368-13	B-623-1 THRU B-623-5 DUP T04	Leach	Solid	1314	
180-160368-22	FIELD DUPLICATE T04	Leach	Solid	1314	
180-160368-31	FIELD DUPLICATE DUP T04	Leach	Solid	1314	
180-160368-13 DU	B-623-1 THRU B-623-5 DUP T04	Leach	Solid	1314	
180-160368-31 DU	FIELD DUPLICATE DUP T04	Leach	Solid	1314	

Leach Batch: 444366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-5	B-623-1 THRU B-623-5 T05	Leach	Solid	1314	
180-160368-14	B-623-1 THRU B-623-5 DUP T05	Leach	Solid	1314	
180-160368-23	FIELD DUPLICATE T05	Leach	Solid	1314	
180-160368-32	FIELD DUPLICATE DUP T05	Leach	Solid	1314	

General Chemistry (Continued)

Leach Batch: 444366 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-23 DU	FIELD DUPLICATE T05	Leach	Solid	1314	

Leach Batch: 444371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-6	B-623-1 THRU B-623-5 T06	Leach	Solid	1314	
180-160368-15	B-623-1 THRU B-623-5 DUP T06	Leach	Solid	1314	
180-160368-24	FIELD DUPLICATE T06	Leach	Solid	1314	
180-160368-33	FIELD DUPLICATE DUP T06	Leach	Solid	1314	
180-160368-33 DU	FIELD DUPLICATE DUP T06	Leach	Solid	1314	

Leach Batch: 444374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-7	B-623-1 THRU B-623-5 T07	Leach	Solid	1314	
180-160368-16	B-623-1 THRU B-623-5 DUP T07	Leach	Solid	1314	
180-160368-25	FIELD DUPLICATE T07	Leach	Solid	1314	
180-160368-34	FIELD DUPLICATE DUP T07	Leach	Solid	1314	
180-160368-25 DU	FIELD DUPLICATE T07	Leach	Solid	1314	

Leach Batch: 444377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-8	B-623-1 THRU B-623-5 T08	Leach	Solid	1314	
180-160368-17	B-623-1 THRU B-623-5 DUP T08	Leach	Solid	1314	
180-160368-26	FIELD DUPLICATE T08	Leach	Solid	1314	
180-160368-35	FIELD DUPLICATE DUP T08	Leach	Solid	1314	
180-160368-35 DU	FIELD DUPLICATE DUP T08	Leach	Solid	1314	

Leach Batch: 444380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-9	B-623-1 THRU B-623-5 T09	Leach	Solid	1314	
180-160368-18	B-623-1 THRU B-623-5 DUP T09	Leach	Solid	1314	
180-160368-27	FIELD DUPLICATE T09	Leach	Solid	1314	
180-160368-36	FIELD DUPLICATE DUP T09	Leach	Solid	1314	
180-160368-27 MS	FIELD DUPLICATE T09	Leach	Solid	1314	
180-160368-27 DU	FIELD DUPLICATE T09	Leach	Solid	1314	

Analysis Batch: 445128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-19	FIELD DUPLICATE T01	Leach	Solid	EPA 9060A	444238
180-160368-20	FIELD DUPLICATE T02	Leach	Solid	EPA 9060A	444360
180-160368-21	FIELD DUPLICATE T03	Leach	Solid	EPA 9060A	444363
180-160368-22	FIELD DUPLICATE T04	Leach	Solid	EPA 9060A	444365
180-160368-23	FIELD DUPLICATE T05	Leach	Solid	EPA 9060A	444366
180-160368-28	FIELD DUPLICATE DUP T01	Leach	Solid	EPA 9060A	444238
180-160368-29	FIELD DUPLICATE DUP T02	Leach	Solid	EPA 9060A	444360
180-160368-30	FIELD DUPLICATE DUP T03	Leach	Solid	EPA 9060A	444363
180-160368-31	FIELD DUPLICATE DUP T04	Leach	Solid	EPA 9060A	444365
180-160368-32	FIELD DUPLICATE DUP T05	Leach	Solid	EPA 9060A	444366
MB 180-445128/35	Method Blank	Total/NA	Solid	EPA 9060A	
MB 180-445128/5	Method Blank	Total/NA	Solid	EPA 9060A	
MB 180-445128/67	Method Blank	Total/NA	Solid	EPA 9060A	
LCS 180-445128/34	Lab Control Sample	Total/NA	Solid	EPA 9060A	

General Chemistry (Continued)

Analysis Batch: 445128 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-445128/66	Lab Control Sample	Total/NA	Solid	EPA 9060A	

Analysis Batch: 445262

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-1	B-623-1 THRU B-623-5 T01	Leach	Solid	EPA 9060A	444238
180-160368-2	B-623-1 THRU B-623-5 T02	Leach	Solid	EPA 9060A	444360
180-160368-3	B-623-1 THRU B-623-5 T03	Leach	Solid	EPA 9060A	444363
180-160368-4	B-623-1 THRU B-623-5 T04	Leach	Solid	EPA 9060A	444365
180-160368-5	B-623-1 THRU B-623-5 T05	Leach	Solid	EPA 9060A	444366
180-160368-6	B-623-1 THRU B-623-5 T06	Leach	Solid	EPA 9060A	444371
180-160368-7	B-623-1 THRU B-623-5 T07	Leach	Solid	EPA 9060A	444374
MB 180-445262/5	Method Blank	Total/NA	Solid	EPA 9060A	
LCS 180-445262/4	Lab Control Sample	Total/NA	Solid	EPA 9060A	

Analysis Batch: 445960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-1	B-623-1 THRU B-623-5 T01	Leach	Solid	EPA 9040C	444238
180-160368-10	B-623-1 THRU B-623-5 DUP T01	Leach	Solid	EPA 9040C	444238
180-160368-19	FIELD DUPLICATE T01	Leach	Solid	EPA 9040C	444238
180-160368-28	FIELD DUPLICATE DUP T01	Leach	Solid	EPA 9040C	444238
LCS 180-445960/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	

Analysis Batch: 445961

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-1	B-623-1 THRU B-623-5 T01	Leach	Solid	SM 2580B	444238
180-160368-10	B-623-1 THRU B-623-5 DUP T01	Leach	Solid	SM 2580B	444238
180-160368-19	FIELD DUPLICATE T01	Leach	Solid	SM 2580B	444238
180-160368-28	FIELD DUPLICATE DUP T01	Leach	Solid	SM 2580B	444238
LCS 180-445961/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-160368-28 DU	FIELD DUPLICATE DUP T01	Leach	Solid	SM 2580B	444238

Analysis Batch: 445962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-1	B-623-1 THRU B-623-5 T01	Leach	Solid	SM 2510B	444238
180-160368-10	B-623-1 THRU B-623-5 DUP T01	Leach	Solid	SM 2510B	444238
180-160368-19	FIELD DUPLICATE T01	Leach	Solid	SM 2510B	444238
180-160368-28	FIELD DUPLICATE DUP T01	Leach	Solid	SM 2510B	444238
MB 180-445962/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-445962/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-160368-28 DU	FIELD DUPLICATE DUP T01	Leach	Solid	SM 2510B	444238

Analysis Batch: 445969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-2	B-623-1 THRU B-623-5 T02	Leach	Solid	EPA 9040C	444360
180-160368-3	B-623-1 THRU B-623-5 T03	Leach	Solid	EPA 9040C	444363
180-160368-11	B-623-1 THRU B-623-5 DUP T02	Leach	Solid	EPA 9040C	444360
180-160368-12	B-623-1 THRU B-623-5 DUP T03	Leach	Solid	EPA 9040C	444363
180-160368-20	FIELD DUPLICATE T02	Leach	Solid	EPA 9040C	444360
180-160368-21	FIELD DUPLICATE T03	Leach	Solid	EPA 9040C	444363
180-160368-29	FIELD DUPLICATE DUP T02	Leach	Solid	EPA 9040C	444360
180-160368-30	FIELD DUPLICATE DUP T03	Leach	Solid	EPA 9040C	444363

General Chemistry (Continued)

Analysis Batch: 445969 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-445969/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-160368-21 DU	FIELD DUPLICATE T03	Leach	Solid	EPA 9040C	444363
180-160368-29 DU	FIELD DUPLICATE DUP T02	Leach	Solid	EPA 9040C	444360

Analysis Batch: 445985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-2	B-623-1 THRU B-623-5 T02	Leach	Solid	SM 2580B	444360
180-160368-3	B-623-1 THRU B-623-5 T03	Leach	Solid	SM 2580B	444363
180-160368-11	B-623-1 THRU B-623-5 DUP T02	Leach	Solid	SM 2580B	444360
180-160368-12	B-623-1 THRU B-623-5 DUP T03	Leach	Solid	SM 2580B	444363
180-160368-20	FIELD DUPLICATE T02	Leach	Solid	SM 2580B	444360
180-160368-21	FIELD DUPLICATE T03	Leach	Solid	SM 2580B	444363
180-160368-29	FIELD DUPLICATE DUP T02	Leach	Solid	SM 2580B	444360
180-160368-30	FIELD DUPLICATE DUP T03	Leach	Solid	SM 2580B	444363
LCS 180-445985/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-160368-21 DU	FIELD DUPLICATE T03	Leach	Solid	SM 2580B	444363
180-160368-29 DU	FIELD DUPLICATE DUP T02	Leach	Solid	SM 2580B	444360

Analysis Batch: 445986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-2	B-623-1 THRU B-623-5 T02	Leach	Solid	SM 2510B	444360
180-160368-3	B-623-1 THRU B-623-5 T03	Leach	Solid	SM 2510B	444363
180-160368-11	B-623-1 THRU B-623-5 DUP T02	Leach	Solid	SM 2510B	444360
180-160368-12	B-623-1 THRU B-623-5 DUP T03	Leach	Solid	SM 2510B	444363
180-160368-20	FIELD DUPLICATE T02	Leach	Solid	SM 2510B	444360
180-160368-21	FIELD DUPLICATE T03	Leach	Solid	SM 2510B	444363
180-160368-29	FIELD DUPLICATE DUP T02	Leach	Solid	SM 2510B	444360
180-160368-30	FIELD DUPLICATE DUP T03	Leach	Solid	SM 2510B	444363
MB 180-445986/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-445986/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-160368-21 DU	FIELD DUPLICATE T03	Leach	Solid	SM 2510B	444363
180-160368-29 DU	FIELD DUPLICATE DUP T02	Leach	Solid	SM 2510B	444360

Analysis Batch: 445987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-4	B-623-1 THRU B-623-5 T04	Leach	Solid	SM 2510B	444365
180-160368-5	B-623-1 THRU B-623-5 T05	Leach	Solid	SM 2510B	444366
180-160368-13	B-623-1 THRU B-623-5 DUP T04	Leach	Solid	SM 2510B	444365
180-160368-14	B-623-1 THRU B-623-5 DUP T05	Leach	Solid	SM 2510B	444366
180-160368-22	FIELD DUPLICATE T04	Leach	Solid	SM 2510B	444365
180-160368-23	FIELD DUPLICATE T05	Leach	Solid	SM 2510B	444366
180-160368-31	FIELD DUPLICATE DUP T04	Leach	Solid	SM 2510B	444365
180-160368-32	FIELD DUPLICATE DUP T05	Leach	Solid	SM 2510B	444366
MB 180-445987/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-445987/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-160368-23 DU	FIELD DUPLICATE T05	Leach	Solid	SM 2510B	444366
180-160368-31 DU	FIELD DUPLICATE DUP T04	Leach	Solid	SM 2510B	444365

Analysis Batch: 445989

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-4	B-623-1 THRU B-623-5 T04	Leach	Solid	SM 2580B	444365

General Chemistry (Continued)

Analysis Batch: 445989 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-5	B-623-1 THRU B-623-5 T05	Leach	Solid	SM 2580B	444366
180-160368-13	B-623-1 THRU B-623-5 DUP T04	Leach	Solid	SM 2580B	444365
180-160368-14	B-623-1 THRU B-623-5 DUP T05	Leach	Solid	SM 2580B	444366
180-160368-22	FIELD DUPLICATE T04	Leach	Solid	SM 2580B	444365
180-160368-23	FIELD DUPLICATE T05	Leach	Solid	SM 2580B	444366
180-160368-31	FIELD DUPLICATE DUP T04	Leach	Solid	SM 2580B	444365
180-160368-32	FIELD DUPLICATE DUP T05	Leach	Solid	SM 2580B	444366
LCS 180-445989/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-160368-23 DU	FIELD DUPLICATE T05	Leach	Solid	SM 2580B	444366
180-160368-31 DU	FIELD DUPLICATE DUP T04	Leach	Solid	SM 2580B	444365

Analysis Batch: 445992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-4	B-623-1 THRU B-623-5 T04	Leach	Solid	EPA 9040C	444365
180-160368-5	B-623-1 THRU B-623-5 T05	Leach	Solid	EPA 9040C	444366
180-160368-13	B-623-1 THRU B-623-5 DUP T04	Leach	Solid	EPA 9040C	444365
180-160368-14	B-623-1 THRU B-623-5 DUP T05	Leach	Solid	EPA 9040C	444366
180-160368-22	FIELD DUPLICATE T04	Leach	Solid	EPA 9040C	444365
180-160368-23	FIELD DUPLICATE T05	Leach	Solid	EPA 9040C	444366
180-160368-31	FIELD DUPLICATE DUP T04	Leach	Solid	EPA 9040C	444365
180-160368-32	FIELD DUPLICATE DUP T05	Leach	Solid	EPA 9040C	444366
LCS 180-445992/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-160368-23 DU	FIELD DUPLICATE T05	Leach	Solid	EPA 9040C	444366
180-160368-31 DU	FIELD DUPLICATE DUP T04	Leach	Solid	EPA 9040C	444365

Analysis Batch: 445996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-6	B-623-1 THRU B-623-5 T06	Leach	Solid	SM 2510B	444371
180-160368-7	B-623-1 THRU B-623-5 T07	Leach	Solid	SM 2510B	444374
180-160368-15	B-623-1 THRU B-623-5 DUP T06	Leach	Solid	SM 2510B	444371
180-160368-16	B-623-1 THRU B-623-5 DUP T07	Leach	Solid	SM 2510B	444374
180-160368-24	FIELD DUPLICATE T06	Leach	Solid	SM 2510B	444371
180-160368-25	FIELD DUPLICATE T07	Leach	Solid	SM 2510B	444374
180-160368-33	FIELD DUPLICATE DUP T06	Leach	Solid	SM 2510B	444371
180-160368-34	FIELD DUPLICATE DUP T07	Leach	Solid	SM 2510B	444374
MB 180-445996/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-445996/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-160368-25 DU	FIELD DUPLICATE T07	Leach	Solid	SM 2510B	444374
180-160368-33 DU	FIELD DUPLICATE DUP T06	Leach	Solid	SM 2510B	444371

Analysis Batch: 445999

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-6	B-623-1 THRU B-623-5 T06	Leach	Solid	SM 2580B	444371
180-160368-7	B-623-1 THRU B-623-5 T07	Leach	Solid	SM 2580B	444374
180-160368-15	B-623-1 THRU B-623-5 DUP T06	Leach	Solid	SM 2580B	444371
180-160368-16	B-623-1 THRU B-623-5 DUP T07	Leach	Solid	SM 2580B	444374
180-160368-24	FIELD DUPLICATE T06	Leach	Solid	SM 2580B	444371
180-160368-25	FIELD DUPLICATE T07	Leach	Solid	SM 2580B	444374
180-160368-33	FIELD DUPLICATE DUP T06	Leach	Solid	SM 2580B	444371
180-160368-34	FIELD DUPLICATE DUP T07	Leach	Solid	SM 2580B	444374
LCS 180-445999/1	Lab Control Sample	Total/NA	Solid	SM 2580B	

General Chemistry (Continued)

Analysis Batch: 445999 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-25 DU	FIELD DUPLICATE T07	Leach	Solid	SM 2580B	444374
180-160368-33 DU	FIELD DUPLICATE DUP T06	Leach	Solid	SM 2580B	444371

Analysis Batch: 446000

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-6	B-623-1 THRU B-623-5 T06	Leach	Solid	EPA 9040C	444371
180-160368-7	B-623-1 THRU B-623-5 T07	Leach	Solid	EPA 9040C	444374
180-160368-15	B-623-1 THRU B-623-5 DUP T06	Leach	Solid	EPA 9040C	444371
180-160368-16	B-623-1 THRU B-623-5 DUP T07	Leach	Solid	EPA 9040C	444374
180-160368-24	FIELD DUPLICATE T06	Leach	Solid	EPA 9040C	444371
180-160368-25	FIELD DUPLICATE T07	Leach	Solid	EPA 9040C	444374
180-160368-33	FIELD DUPLICATE DUP T06	Leach	Solid	EPA 9040C	444371
180-160368-34	FIELD DUPLICATE DUP T07	Leach	Solid	EPA 9040C	444374
LCS 180-446000/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-160368-25 DU	FIELD DUPLICATE T07	Leach	Solid	EPA 9040C	444374
180-160368-33 DU	FIELD DUPLICATE DUP T06	Leach	Solid	EPA 9040C	444371

Analysis Batch: 446001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-8	B-623-1 THRU B-623-5 T08	Leach	Solid	SM 2510B	444377
180-160368-9	B-623-1 THRU B-623-5 T09	Leach	Solid	SM 2510B	444380
180-160368-17	B-623-1 THRU B-623-5 DUP T08	Leach	Solid	SM 2510B	444377
180-160368-18	B-623-1 THRU B-623-5 DUP T09	Leach	Solid	SM 2510B	444380
180-160368-26	FIELD DUPLICATE T08	Leach	Solid	SM 2510B	444377
180-160368-27	FIELD DUPLICATE T09	Leach	Solid	SM 2510B	444380
180-160368-35	FIELD DUPLICATE DUP T08	Leach	Solid	SM 2510B	444377
180-160368-36	FIELD DUPLICATE DUP T09	Leach	Solid	SM 2510B	444380
MB 180-446001/2	Method Blank	Total/NA	Solid	SM 2510B	
LCS 180-446001/1	Lab Control Sample	Total/NA	Solid	SM 2510B	
180-160368-27 DU	FIELD DUPLICATE T09	Leach	Solid	SM 2510B	444380
180-160368-35 DU	FIELD DUPLICATE DUP T08	Leach	Solid	SM 2510B	444377

Analysis Batch: 446002

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-8	B-623-1 THRU B-623-5 T08	Leach	Solid	SM 2580B	444377
180-160368-9	B-623-1 THRU B-623-5 T09	Leach	Solid	SM 2580B	444380
180-160368-17	B-623-1 THRU B-623-5 DUP T08	Leach	Solid	SM 2580B	444377
180-160368-18	B-623-1 THRU B-623-5 DUP T09	Leach	Solid	SM 2580B	444380
180-160368-26	FIELD DUPLICATE T08	Leach	Solid	SM 2580B	444377
180-160368-27	FIELD DUPLICATE T09	Leach	Solid	SM 2580B	444380
180-160368-35	FIELD DUPLICATE DUP T08	Leach	Solid	SM 2580B	444377
180-160368-36	FIELD DUPLICATE DUP T09	Leach	Solid	SM 2580B	444380
LCS 180-446002/1	Lab Control Sample	Total/NA	Solid	SM 2580B	
180-160368-27 DU	FIELD DUPLICATE T09	Leach	Solid	SM 2580B	444380
180-160368-35 DU	FIELD DUPLICATE DUP T08	Leach	Solid	SM 2580B	444377

Analysis Batch: 446003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-8	B-623-1 THRU B-623-5 T08	Leach	Solid	EPA 9040C	444377
180-160368-9	B-623-1 THRU B-623-5 T09	Leach	Solid	EPA 9040C	444380
180-160368-17	B-623-1 THRU B-623-5 DUP T08	Leach	Solid	EPA 9040C	444377

General Chemistry (Continued)

Analysis Batch: 446003 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-18	B-623-1 THRU B-623-5 DUP T09	Leach	Solid	EPA 9040C	444380
180-160368-26	FIELD DUPLICATE T08	Leach	Solid	EPA 9040C	444377
180-160368-27	FIELD DUPLICATE T09	Leach	Solid	EPA 9040C	444380
180-160368-35	FIELD DUPLICATE DUP T08	Leach	Solid	EPA 9040C	444377
180-160368-36	FIELD DUPLICATE DUP T09	Leach	Solid	EPA 9040C	444380
LCS 180-446003/1	Lab Control Sample	Total/NA	Solid	EPA 9040C	
180-160368-27 DU	FIELD DUPLICATE T09	Leach	Solid	EPA 9040C	444380
180-160368-35 DU	FIELD DUPLICATE DUP T08	Leach	Solid	EPA 9040C	444377

Analysis Batch: 446407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160368-8	B-623-1 THRU B-623-5 T08	Leach	Solid	EPA 9060A	444377
180-160368-9	B-623-1 THRU B-623-5 T09	Leach	Solid	EPA 9060A	444380
180-160368-10	B-623-1 THRU B-623-5 DUP T01	Leach	Solid	EPA 9060A	444238
180-160368-11	B-623-1 THRU B-623-5 DUP T02	Leach	Solid	EPA 9060A	444360
180-160368-12	B-623-1 THRU B-623-5 DUP T03	Leach	Solid	EPA 9060A	444363
180-160368-13	B-623-1 THRU B-623-5 DUP T04	Leach	Solid	EPA 9060A	444365
180-160368-14	B-623-1 THRU B-623-5 DUP T05	Leach	Solid	EPA 9060A	444366
180-160368-15	B-623-1 THRU B-623-5 DUP T06	Leach	Solid	EPA 9060A	444371
180-160368-16	B-623-1 THRU B-623-5 DUP T07	Leach	Solid	EPA 9060A	444374
180-160368-17	B-623-1 THRU B-623-5 DUP T08	Leach	Solid	EPA 9060A	444377
180-160368-18	B-623-1 THRU B-623-5 DUP T09	Leach	Solid	EPA 9060A	444380
180-160368-24	FIELD DUPLICATE T06	Leach	Solid	EPA 9060A	444371
180-160368-25	FIELD DUPLICATE T07	Leach	Solid	EPA 9060A	444374
180-160368-26	FIELD DUPLICATE T08	Leach	Solid	EPA 9060A	444377
180-160368-27	FIELD DUPLICATE T09	Leach	Solid	EPA 9060A	444380
180-160368-33	FIELD DUPLICATE DUP T06	Leach	Solid	EPA 9060A	444371
180-160368-34	FIELD DUPLICATE DUP T07	Leach	Solid	EPA 9060A	444374
180-160368-35	FIELD DUPLICATE DUP T08	Leach	Solid	EPA 9060A	444377
180-160368-36	FIELD DUPLICATE DUP T09	Leach	Solid	EPA 9060A	444380
MB 180-446407/35	Method Blank	Total/NA	Solid	EPA 9060A	
MB 180-446407/5	Method Blank	Total/NA	Solid	EPA 9060A	
MB 180-446407/67	Method Blank	Total/NA	Solid	EPA 9060A	
LCS 180-446407/34	Lab Control Sample	Total/NA	Solid	EPA 9060A	
LCS 180-446407/4	Lab Control Sample	Total/NA	Solid	EPA 9060A	
LCS 180-446407/66	Lab Control Sample	Total/NA	Solid	EPA 9060A	
180-160368-12 MS	B-623-1 THRU B-623-5 DUP T03	Leach	Solid	EPA 9060A	444363
180-160368-27 MS	FIELD DUPLICATE T09	Leach	Solid	EPA 9060A	444380
180-160368-13 DU	B-623-1 THRU B-623-5 DUP T04	Leach	Solid	EPA 9060A	444365
180-160368-33 DU	FIELD DUPLICATE DUP T06	Leach	Solid	EPA 9060A	444371

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238-2907
phone 412.963 7058 fax 412 963 2468

Chain of Custody Record

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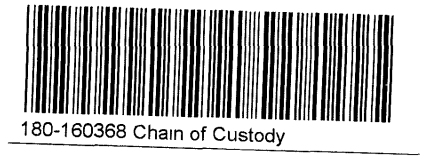
9/21/2023

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Eurofins Environment Testing America

Client Contact	Project Manager:	Site Contact:	Date:	COC No:
Your Company Name here	Email:	Lab Contact:	Carrier:	_____ of _____ COCs
Address	Tel/Fax:			TALS Project #:
City/State/Zip	Analysis Turnaround Time			Sampler:
(xxx) xxx-xxxx Phone	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(xxx) xxx-xxxx FAX	TAT if different from Below _____			Walk-in Client:
Project Name.	☐ 2 weeks			Lab Sampling.
Site:	☐ 1 week			Job / SDG No.
P O #	☐ 2 days ☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	1314 7470B	1314 9040C	1314 2510B	1314 2580B	1314 9056A	1314 9060A	1314 TOTAL SULFUR ELLE	Sample Specific Notes:
B-623-1 thru B-623-5	07/21/23	1000	G	S	5			X	X	X	X	X	X	X	ANALYSIS IN DUPLICATE
Field Duplicate	07/21/23	1000	G	S	5			X	X	X	X	X	X	X	



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No :		Cooler Temp. (°C): Obs'd: _____ Corr'd: _____		Therm ID No : _____
Relinquished by:	Company: Bethlehem Apparatus	Date/Time: 7/24/23 2000	Received by:	Company: FedEx	Date/Time: 7-27-23 1127
Relinquished by.	Company.	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

TODD RIZZUTO
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HELLERTOWN PA 18055
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1 OF
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PA 152 9-22
UPS GROUND
TRACKING #: 1Z 182 425 03 4812 4935
Uncorrected temp 23.7 C
Thermometer ID
CF
Initials
PT-WI-SR-001 effective 11/8/18
BILLING: P/P
HAZARDOUS MATERIALS - GROUND ONLY
HAZM UN2025
W8 26.0.6 Zebra ZP 450 29.0A 07/2023
RO:R 0123

180-160368 Waybill

1 OF 1
12 LBS
DWT: 13,13,16
[illegible] RIZZUTO
[illegible] 838-7034
[illegible] BETHLEHEM APPARATUS CO. INC.
[illegible] E FRONT STREET
[illegible] LEHEMTOWN PA 18055
SHIP TO:
[illegible] LARRY MATKO
(412) 963-7058
EUROFINS PITTSBURGH
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238-2907
PA 152 9-22
UPS GROUND
TRACKING #: 1Z 182 425 03 5087 7752
Uncorrected temp 24.6 14
Thermometer ID
Initials MA
CF 0.0 Note
PT-WI-SR-001 effective 11/8/18
BILLING: P/P
HAZARDOUS MATERIALS - GROUND ONLY
HAZ#: UN2025
WB 26.0.6-Zabra ZP 46G 29.0A 07/2023
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RRD.R.0123

TODD RIZZUTO
(610) 838-7034
BETHLEHEM APPARATUS CO. INC.
890 FRONT STREET
HELLERTOWN PA 18055

DWT: 13,13,16

17 LBS

1 OF 1

SHIP TO:
LARRY MATKO
(412) 963-7058
EUROFINS PITTSBURGH
RIDC PARK
301 ALPHA DRIVE
PITTSBURGH PA 15238-2907

PA 152 9-22

UPS GROUND
TRACKING #: 1Z 182 425 03 4806 8541

Uncorrected temp 24.4 °C
Thermometer ID 19
No Ice
CF 0.0 Initials MR

PT-WI-SR-001 effective 11/8/18

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-493830.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-160368-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 8/30/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B-623-1 THRU B-623-5 T01 (180-160368-37)	8/23/23	11:18 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T01 (180-160368-46)	8/23/23	11:18 Eastern		Water			X	1	
FIELD DUPLICATE T01 (180-160368-55)	8/23/23	11:18 Eastern		Water			X	1	
FIELD DUPLICATE DUP T01 (180-160368-64)	8/23/23	11:18 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8/24/23 9:50	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: Raw 14.9 - COR 14.7

Ver: 06/08/2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-493830.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-160368-1
Address: 2425 New Holland Pike,	Due Date Requested: 8/30/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B-623-1 THRU B-623-5 T01 (180-160368-37)	8/23/23	11:18 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T01 (180-160368-46)	8/23/23	11:18 Eastern		Water			X	1	
FIELD DUPLICATE T01 (180-160368-55)	8/23/23	11:18 Eastern		Water			X	1	
FIELD DUPLICATE DUP T01 (180-160368-64)	8/23/23	11:18 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 8-23-23 1700	Company EET	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8/24/23 9:50	Company EET
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: Raw 14.9 - COR 14.7		

Ver: 06/08/2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-493878.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-160368-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 8/30/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B-623-1 THRU B-623-5 T02 (180-160368-38)	8/23/23	18:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 T03 (180-160368-39)	8/24/23	06:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T02 (180-160368-47)	8/23/23	18:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T03 (180-160368-48)	8/24/23	06:30 Eastern		Water			X	1	
FIELD DUPLICATE T02 (180-160368-56)	8/23/23	18:30 Eastern		Water			X	1	
FIELD DUPLICATE T03 (180-160368-57)	8/24/23	06:30 Eastern		Water			X	1	
FIELD DUPLICATE DUP T02 (180-160368-65)	8/23/23	18:30 Eastern		Water			X	1	
FIELD DUPLICATE DUP T03 (180-160368-66)	8/24/23	06:30 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	8-24-23 1700				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8/25/23 10:04	Company: ECLET

Custody Seals Intact: X Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2-2.1 C: 1.9

LAA

Ver: 06/08/2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-493985.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-160368-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 8/30/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B-623-1 THRU B-623-5 T04 (180-160368-40)	8/24/23	18:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 T05 (180-160368-41)	8/25/23	06:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T04 (180-160368-49)	8/24/23	18:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T05 (180-160368-50)	8/25/23	06:30 Eastern		Water			X	1	
FIELD DUPLICATE T04 (180-160368-58)	8/24/23	18:30 Eastern		Water			X	1	
FIELD DUPLICATE T05 (180-160368-59)	8/25/23	06:30 Eastern		Water			X	1	
FIELD DUPLICATE DUP T04 (180-160368-67)	8/24/23	18:30 Eastern		Water			X	1	
FIELD DUPLICATE DUP T05 (180-160368-68)	8/25/23	06:30 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8-25-23 1700	EEL			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8/26/23 10:05	Company EEL

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: Raw 2-7- COR 2-5

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-494203.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-160368-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 8/31/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B-623-1 THRU B-623-5 T06 (180-160368-42)	8/27/23	18:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 T07 (180-160368-43)	8/28/23	06:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T06 (180-160368-51)	8/27/23	18:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T07 (180-160368-52)	8/28/23	06:30 Eastern		Water			X	1	
FIELD DUPLICATE T06 (180-160368-60)	8/27/23	18:30 Eastern		Water			X	1	
FIELD DUPLICATE T07 (180-160368-61)	8/28/23	06:30 Eastern		Water			X	1	
FIELD DUPLICATE DUP T06 (180-160368-69)	8/27/23	18:30 Eastern		Water			X	1	
FIELD DUPLICATE DUP T07 (180-160368-70)	8/28/23	06:30 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: Debra A-Bya	Date/Time: 8-30-23 10:00	Company EUE

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: Raw 20.1- COR 19.9

Ver: 06/08/2021

mB

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-494750.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Pennsylvania	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Pennsylvania		Job #: 180-160368-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 9/12/2023			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Republic Services Mercury Project REVISE	Project #: 18027404			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3005A (MOD) 1 metal, including prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
B-623-1 THRU B-623-5 T08 (180-160368-44)	9/1/23	18:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 T09 (180-160368-45)	9/2/23	06:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T08 (180-160368-53)	9/1/23	18:30 Eastern		Water			X	1	
B-623-1 THRU B-623-5 DUP T09 (180-160368-54)	9/2/23	06:30 Eastern		Water			X	1	
FIELD DUPLICATE T08 (180-160368-62)	9/1/23	18:30 Eastern		Water			X	1	
FIELD DUPLICATE T09 (180-160368-63)	9/2/23	06:30 Eastern		Water			X	1	
FIELD DUPLICATE DUP T08 (180-160368-71)	9/1/23	18:30 Eastern		Water			X	1	
FIELD DUPLICATE DUP T09 (180-160368-72)	9/2/23	06:30 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 9/8/23 10:27	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: RAW: 18.5-19.0 COR: 18.5-19.0

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-160368-1

Login Number: 160368
List Number: 1
Creator: Matko, Larry

List Source: Eurofins Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	thermal preservation not required
Cooler Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-160368-1

Login Number: 160368
List Number: 2
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 08/24/23 11:15 AM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-160368-1

Login Number: 160368
List Number: 3
Creator: Arroyo, Haley

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 08/25/23 11:17 AM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-160368-1

Login Number: 160368
List Number: 4
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 08/26/23 10:41 AM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	N/A	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-160368-1

Login Number: 160368
List Number: 5
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 08/30/23 12:00 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice present, no attempt to chill
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-160368-1

Login Number: 160368
List Number: 6
Creator: McBeth, Jessica

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 09/08/23 12:40 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice present, no attempt to chill
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

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1 2 3 4 5 6 7 8 9 10 11 12 13

ANALYTICAL REPORT

PREPARED FOR

Attn: Paul Canevaro
US Ecology Inc
101 S Capitol Boulevard Suite 1000
Boise, Idaho 83702

Generated 9/1/2023 3:29:01 PM Revision 1

JOB DESCRIPTION

Republic Services Mercury Project

JOB NUMBER

180-160446-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.

myEOL

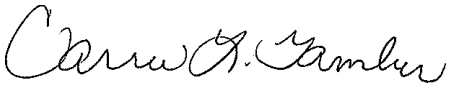
Job Notes

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PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

Authorization



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Revision 1

Authorized for release by
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Job ID: 180-160446-1

Laboratory: Eurofins Pittsburgh

Narrative

CASE NARRATIVE

Client: US Ecology Inc

Project: Republic Services Mercury Project

Report Number: 180-160446-1 REVISED

NOTE: This report was revised to report all deliverables as final.

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 08/04/2023; the samples arrived in good condition. The temperature of the coolers at receipt was 28.6 C.

GC/MS VOLATILES
Surrogate recovery for the following samples were outside the upper control limit for Dibromofluoromethane: R-5475, BLENDER #4, BATCH 26 (180-160446-2). This sample did not contain any target analytes; therefore, re-analysis was not performed.

Internal standard (ISTD) response for 1,4-Dichlorobenzene-d4 for the following samples in analytical batch 180-443493 was outside acceptance criteria: R-5473, BLENDER #3, BATCH 36 (180-160446-1), R-5475, BLENDER #4, BATCH 26 (180-160446-2), R-5476, BLENDER #2, BATCH 105 (180-160446-3) and SAMPLE DUPLICATE 08/02/23 (180-160446-4). This ISTD does not correspond to any of the requested target compounds reported from this analytical batch; therefore, the data have been reported.

The continuing calibration verification (CCV) analyzed in 180-443493 was outside the method criteria for several compounds. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analytes is considered estimated.

The continuing calibration verification (CCV) associated with batch 180-443493 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Definitions/Glossary

Client: US Ecology Inc
Job ID: 180-160446-1
Project/Site: Republic Services Mercury Project

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
^c	CCV Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: US Ecology Inc
Job ID: 180-160446-1
Project/Site: Republic Services Mercury Project

Laboratory: Eurofins Pittsburgh

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	02-00416	08-29-23

Sample Summary

Client: US Ecology Inc
Job ID: 180-160446-1
Project/Site: Republic Services Mercury Project

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-160446-1	R-5473, BLENDER #3, BATCH 36	Solid	08/02/23 13:40	08/04/23 11:45
180-160446-2	R-5475, BLENDER #4, BATCH 26	Solid	08/02/23 13:45	08/04/23 11:45
180-160446-3	R-5476, BLENDER #2, BATCH 105	Solid	08/02/23 13:50	08/04/23 11:45
180-160446-4	SAMPLE DUPLICATE 08/02/23	Solid	08/02/23 14:00	08/04/23 11:45

Method Summary

Client: US Ecology Inc
Project/Site: Republic Services Mercury Project

Job ID: 180-160446-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET PIT
1311	TCLP Extraction	SW846	EET PIT
5030C	Purge and Trap	SW846	EET PIT

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: US Ecology Inc
Project/Site: Republic Services Mercury Project

Job ID: 180-160446-1

Client Sample ID: R-5473, BLENDER #3, BATCH 36

Lab Sample ID: 180-160446-1
Date Collected: 08/02/23 13:40
Matrix: Solid
Date Received: 08/04/23 11:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			25.00 g	1.0 mL	443392	08/14/23 12:15	DMM	EET PIT
TCLP	Analysis	8260D		1	0.25 mL	5 mL	443493	08/15/23 19:17	J1T	EET PIT
	Instrument ID: CHHP9									

Client Sample ID: R-5475, BLENDER #4, BATCH 26

Lab Sample ID: 180-160446-2
Date Collected: 08/02/23 13:45
Matrix: Solid
Date Received: 08/04/23 11:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			25.11 g	1.0 mL	443392	08/14/23 12:15	DMM	EET PIT
TCLP	Analysis	8260D		1	0.25 mL	5 mL	443493	08/15/23 19:38	J1T	EET PIT
	Instrument ID: CHHP9									

Client Sample ID: R-5476, BLENDER #2, BATCH 105

Lab Sample ID: 180-160446-3
Date Collected: 08/02/23 13:50
Matrix: Solid
Date Received: 08/04/23 11:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			25.09 g	1.0 mL	443392	08/14/23 12:15	DMM	EET PIT
TCLP	Analysis	8260D		1	0.25 mL	5 mL	443493	08/15/23 19:59	J1T	EET PIT
	Instrument ID: CHHP9									

Client Sample ID: SAMPLE DUPLICATE 08/02/23

Lab Sample ID: 180-160446-4
Date Collected: 08/02/23 14:00
Matrix: Solid
Date Received: 08/04/23 11:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			25.00 g	1.0 mL	443392	08/14/23 12:15	DMM	EET PIT
TCLP	Analysis	8260D		1	0.25 mL	5 mL	443493	08/15/23 20:21	J1T	EET PIT
	Instrument ID: CHHP9									

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: EET PIT

Batch Type: Leach

DMM = Dominic Mancino

Batch Type: Analysis

J1T = Jianwu Tang

Client: US Ecology Inc
Project/Site: Republic Services Mercury Project

Job ID: 180-160446-1

Client Sample ID: R-5473, BLENDER #3, BATCH 36

Lab Sample ID: 180-160446-1
Date Collected: 08/02/23 13:40
Matrix: Solid
Date Received: 08/04/23 11:45

Method: SW846 8260D - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		0.20	0.011	mg/L			08/15/23 19:17	1
2-Butanone (MEK)	ND	^c	1.0	0.051	mg/L			08/15/23 19:17	1
Benzene	ND		0.20	0.012	mg/L			08/15/23 19:17	1
Carbon tetrachloride	ND		0.20	0.018	mg/L			08/15/23 19:17	1
Chlorobenzene	ND		0.20	0.010	mg/L			08/15/23 19:17	1
Chloroform	ND		0.20	0.012	mg/L			08/15/23 19:17	1
Tetrachloroethene	ND		0.20	0.0093	mg/L			08/15/23 19:17	1
Trichloroethene	ND		0.20	0.014	mg/L			08/15/23 19:17	1
Vinyl chloride	ND		0.20	0.0081	mg/L			08/15/23 19:17	1
1,1-Dichloroethene	ND	^c	0.20	0.011	mg/L			08/15/23 19:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*52 - 151*		*08/15/23 19:17*	*1*
4-Bromofluorobenzene (Surr)	*60*		*49 - 118*		*08/15/23 19:17*	*1*
Dibromofluoromethane (Surr)	*124*	*^c*	*60 - 132*		*08/15/23 19:17*	*1*
Toluene-d8 (Surr)	*81*		*53 - 124*		*08/15/23 19:17*	*1*

Client Sample ID: R-5475, BLENDER #4, BATCH 26

Lab Sample ID: 180-160446-2
Date Collected: 08/02/23 13:45
Matrix: Solid
Date Received: 08/04/23 11:45

Method: SW846 8260D - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		0.20	0.011	mg/L			08/15/23 19:38	1
2-Butanone (MEK)	ND	^c	1.0	0.051	mg/L			08/15/23 19:38	1
Benzene	ND		0.20	0.012	mg/L			08/15/23 19:38	1
Carbon tetrachloride	ND		0.20	0.018	mg/L			08/15/23 19:38	1
Chlorobenzene	ND		0.20	0.010	mg/L			08/15/23 19:38	1
Chloroform	ND		0.20	0.012	mg/L			08/15/23 19:38	1
Tetrachloroethene	ND		0.20	0.0093	mg/L			08/15/23 19:38	1
Trichloroethene	ND		0.20	0.014	mg/L			08/15/23 19:38	1
Vinyl chloride	ND		0.20	0.0081	mg/L			08/15/23 19:38	1
1,1-Dichloroethene	ND	^c	0.20	0.011	mg/L			08/15/23 19:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*52 - 151*		*08/15/23 19:38*	*1*
4-Bromofluorobenzene (Surr)	*66*		*49 - 118*		*08/15/23 19:38*	*1*
Dibromofluoromethane (Surr)	*148*	*^c S1+*	*60 - 132*		*08/15/23 19:38*	*1*
Toluene-d8 (Surr)	*82*		*53 - 124*		*08/15/23 19:38*	*1*

Client Sample ID: R-5476, BLENDER #2, BATCH 105

Lab Sample ID: 180-160446-3
Date Collected: 08/02/23 13:50
Matrix: Solid
Date Received: 08/04/23 11:45

Method: SW846 8260D - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		0.20	0.011	mg/L			08/15/23 19:59	1
2-Butanone (MEK)	ND	^c	1.0	0.051	mg/L			08/15/23 19:59	1
Benzene	ND		0.20	0.012	mg/L			08/15/23 19:59	1
Carbon tetrachloride	ND		0.20	0.018	mg/L			08/15/23 19:59	1
Chlorobenzene	ND		0.20	0.010	mg/L			08/15/23 19:59	1

Client Sample ID: R-5476, BLENDER #2, BATCH 105
Lab Sample ID: 180-160446-3
Date Collected: 08/02/23 13:50
Matrix: Solid
Date Received: 08/04/23 11:45

Method: SW846 8260D - Volatile Organic Compounds by GC/MS - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	ND		0.20	0.012	mg/L			08/15/23 19:59	1
Tetrachloroethene	ND		0.20	0.0093	mg/L			08/15/23 19:59	1
Trichloroethene	ND		0.20	0.014	mg/L			08/15/23 19:59	1
Vinyl chloride	ND		0.20	0.0081	mg/L			08/15/23 19:59	1
1,1-Dichloroethene	ND	^c	0.20	0.011	mg/L			08/15/23 19:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*52 - 151*		*08/15/23 19:59*	*1*
4-Bromofluorobenzene (Surr)	*68*		*49 - 118*		*08/15/23 19:59*	*1*
Dibromofluoromethane (Surr)	*117*	*^c*	*60 - 132*		*08/15/23 19:59*	*1*
Toluene-d8 (Surr)	*90*		*53 - 124*		*08/15/23 19:59*	*1*

Client Sample ID: SAMPLE DUPLICATE 08/02/23
Lab Sample ID: 180-160446-4
Date Collected: 08/02/23 14:00
Matrix: Solid
Date Received: 08/04/23 11:45

Method: SW846 8260D - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		0.20	0.011	mg/L			08/15/23 20:21	1
2-Butanone (MEK)	ND	^c	1.0	0.051	mg/L			08/15/23 20:21	1
Benzene	ND		0.20	0.012	mg/L			08/15/23 20:21	1
Carbon tetrachloride	ND		0.20	0.018	mg/L			08/15/23 20:21	1
Chlorobenzene	ND		0.20	0.010	mg/L			08/15/23 20:21	1
Chloroform	ND		0.20	0.012	mg/L			08/15/23 20:21	1
Tetrachloroethene	ND		0.20	0.0093	mg/L			08/15/23 20:21	1
Trichloroethene	ND		0.20	0.014	mg/L			08/15/23 20:21	1
Vinyl chloride	ND		0.20	0.0081	mg/L			08/15/23 20:21	1
1,1-Dichloroethene	ND	^c	0.20	0.011	mg/L			08/15/23 20:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*52 - 151*		*08/15/23 20:21*	*1*
4-Bromofluorobenzene (Surr)	*59*		*49 - 118*		*08/15/23 20:21*	*1*
Dibromofluoromethane (Surr)	*112*	*^c*	*60 - 132*		*08/15/23 20:21*	*1*
Toluene-d8 (Surr)	*78*		*53 - 124*		*08/15/23 20:21*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: LCS 180-443493/3
Matrix: Solid
Analysis Batch: 443493

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
1,2-Dichloroethane			0.0100	0.00811	J	mg/L		81	57 - 149		
2-Butanone (MEK)			0.0100	0.0119	J	mg/L		119	35 - 158		
Benzene			0.0100	0.00874	J	mg/L		87	68 - 122		
Carbon tetrachloride			0.0100	0.0108		mg/L		108	60 - 135		
Chlorobenzene			0.0100	0.00856	J	mg/L		86	72 - 123		
Chloroform			0.0100	0.0111		mg/L		111	62 - 121		
Tetrachloroethene			0.0100	0.00839	J	mg/L		84	60 - 129		
Trichloroethene			0.0100	0.00872	J	mg/L		87	67 - 121		
Vinyl chloride			0.0100	0.00866	J	mg/L		87	47 - 147		
1,1-Dichloroethene			0.0100	0.0123		mg/L		123	49 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*52 - 151*
4-Bromofluorobenzene (Surr)	*86*		*49 - 118*
Dibromofluoromethane (Surr)	*118*		*60 - 132*
Toluene-d8 (Surr)	*89*		*53 - 124*

Lab Sample ID: LB 180-443392/1-A
Matrix: Solid
Analysis Batch: 443493

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		0.20	0.011	mg/L			08/15/23 11:27	1
2-Butanone (MEK)	ND		1.0	0.051	mg/L			08/15/23 11:27	1
Benzene	ND		0.20	0.012	mg/L			08/15/23 11:27	1
Carbon tetrachloride	ND		0.20	0.018	mg/L			08/15/23 11:27	1
Chlorobenzene	ND		0.20	0.010	mg/L			08/15/23 11:27	1
Chloroform	ND		0.20	0.012	mg/L			08/15/23 11:27	1
Tetrachloroethene	ND		0.20	0.0093	mg/L			08/15/23 11:27	1
Trichloroethene	ND		0.20	0.014	mg/L			08/15/23 11:27	1
Vinyl chloride	ND		0.20	0.0081	mg/L			08/15/23 11:27	1
1,1-Dichloroethene	ND		0.20	0.011	mg/L			08/15/23 11:27	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*52 - 151*		*08/15/23 11:27*	*1*
4-Bromofluorobenzene (Surr)	*70*		*49 - 118*		*08/15/23 11:27*	*1*
Dibromofluoromethane (Surr)	*106*		*60 - 132*		*08/15/23 11:27*	*1*
Toluene-d8 (Surr)	*87*		*53 - 124*		*08/15/23 11:27*	*1*

QC Association Summary

Client: US Ecology Inc
Job ID: 180-160446-1
Project/Site: Republic Services Mercury Project

GC/MS VOA

Leach Batch: 443392

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160446-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	1311	
180-160446-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	1311	
180-160446-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	1311	
180-160446-4	SAMPLE DUPLICATE 08/02/23	TCLP	Solid	1311	
LB 180-443392/1-A	Method Blank	TCLP	Solid	1311	

Analysis Batch: 443493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-160446-1	R-5473, BLENDER #3, BATCH 36	TCLP	Solid	8260D	443392
180-160446-2	R-5475, BLENDER #4, BATCH 26	TCLP	Solid	8260D	443392
180-160446-3	R-5476, BLENDER #2, BATCH 105	TCLP	Solid	8260D	443392
180-160446-4	SAMPLE DUPLICATE 08/02/23	TCLP	Solid	8260D	443392
LB 180-443392/1-A	Method Blank	TCLP	Solid	8260D	443392
LCS 180-443493/3	Lab Control Sample	Total/NA	Solid	8260D	

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238-2907
phone 412.963.7058 fax 412.963.2468

Chain of Custody Record

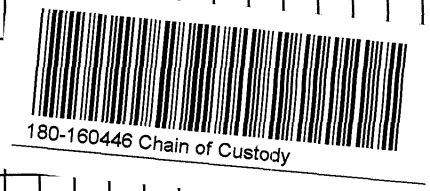
eurofins Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☑ RCRA ☐ Other:

Eurofins Environment Testing America

Client Contact	**Project Manager: Paul Canevaro**		COC No:
US Ecology	Email: paul.canevaro@usecology.com	**Site Contact: A. Dugan**	**Date: 08/02/2023**	_____ of _____ COCs
Address	**Tel/Fax: (346) 314-9769**	**Lab Contact: A. Dugan**	**Carrier: Eurofins**	TALS Project #:
City/State/Zip	**Analysis Turnaround Time**			Sampler:
(346) 314-9769 Phone	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
FAX	TAT if different from Below _____			Walk-in Client:
Project Name: **Cinnabar (HgS)**	☐ 2 weeks			Lab Sampling:
Site:	☐ 1 week			
P O #	☐ 2 days			Job / SDG No.:
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	TCLP 8260	Sample Specific Notes:
R-5473, Blender #3, Batch 36	8/2/2023	1:40 PM	G	S	1			X	
R-5475, Blender #4, Batch 26	8/2/2023	1:45 PM	G	S	1			X	
R-5476, Blender #2, Batch 105	8/2/2023	1:50 PM	G	S	1			X	
Sample Duplicate 08/02/2023	8/2/2023	2:00 PM	G	S	1			X	
								6	



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other None

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

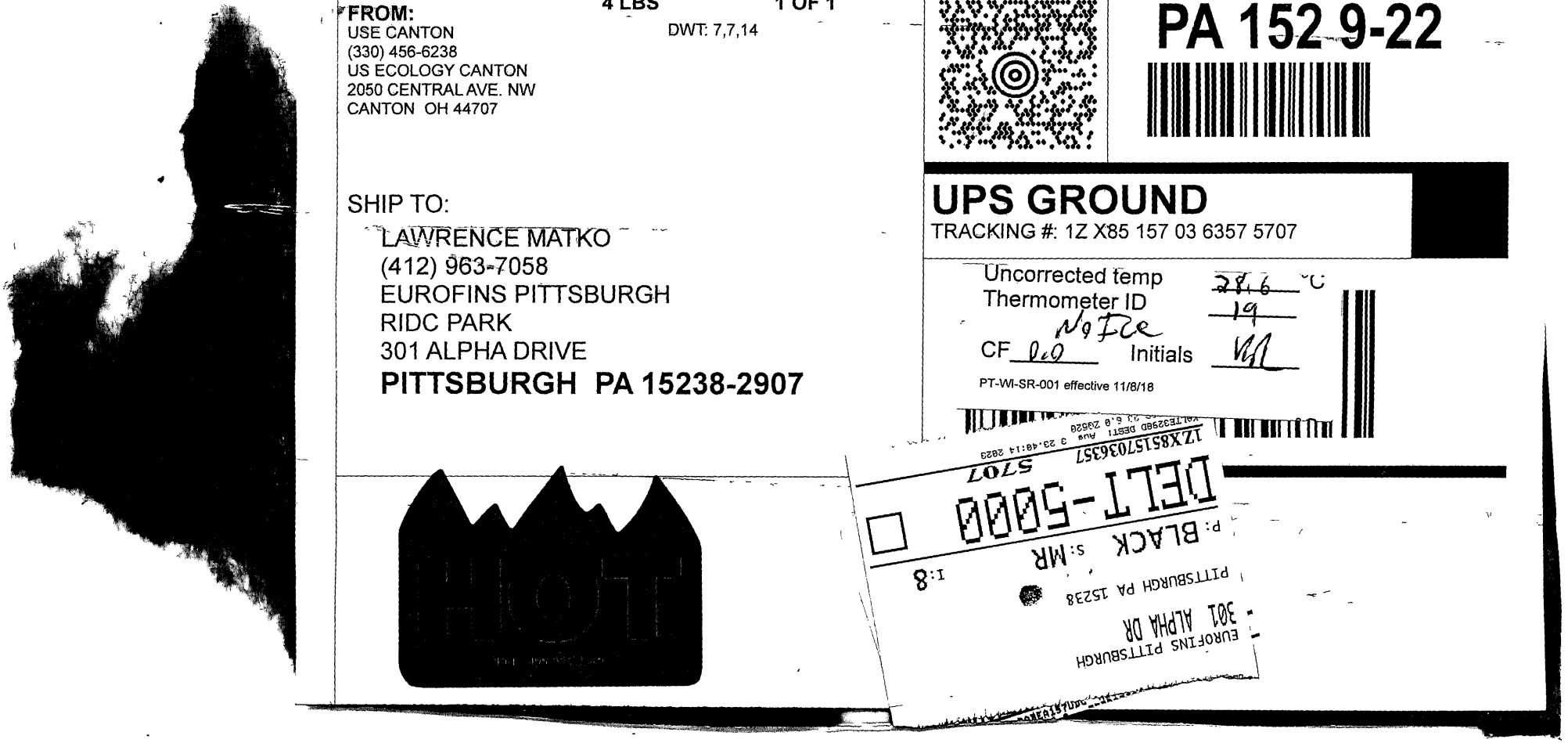
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: The US Ecology Quality Assurance Project Plan, petition for site-specific determination of equivalent treatment for elemental mercury waste (D009 and U151) under the land disposal restrictions. Please coordinate with Larry Matko.

Custody Seals Intact: ☑ Yes ☐ No	Custody Seal No.: 2307395		Cooler Temp. (°C): Obs'd:_____ Corr'd:_____		Therm ID No.:_____
Relinquished by:	Company: US Ecology	Date/Time: 8-2-2023 1445	Received by:	Company: ECI Pitt	Date/Time: 8-4-23 1145
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

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9/12/2023 (Rev. 1)



180-160446 Waybill

Login Sample Receipt Checklist

Client: US Ecology Inc

Job Number: 180-160446-1

Login Number: 160446
List Number: 1
Creator: Watson, Debbie

List Source: Eurofins Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Geosyntec consultants

APPENDIX E

Beatty Facility RCRA Permit Cover Page

September 2025

Hazardous Waste Management
RCRA Permit NEVHW0025
September 2023 – Revision 8

US Ecology Nevada, Inc.
Beatty, Nevada
EPA ID# NVT330010000

State of Nevada
Department of Conservation and Natural Resources
Division of Environmental Protection
Bureau of Sustainable Materials Management