



June 14, 2019
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Ms. Catherine Finneran, Director
Environmental Affairs
Eversource
247 Station Drive, SE270
Westwood, Massachusetts 02090

Re: Report of Post-Demolition Building Surfaces Sampling and
Evaluation of Human Health Risk
Former Schiller Mercury Power Generating Units 1 and 2
Portsmouth, New Hampshire

Dear Ms. Finneran:

GZA GeoEnvironmental, Inc. (GZA) has prepared this report of the findings of the post-dismantling sampling of interior building surfaces in the vicinity of the former mercury boiler components (Unit 1 and Unit 2 including boiler, turbine and reclaim room areas) within Schiller Station (Plant). This Study was conducted subject to the limitations included in **Appendix A**.

EXECUTIVE SUMMARY

This report presents an assessment of the significance of residual mercury on the interior surfaces and in building materials in the vicinity of the dismantled mercury Unit 1 and Unit 2 boilers at the Schiller Station Site. A total of 210 wipe samples were collected from non-porous surfaces and 142 bulk samples were collected from porous surfaces. Each sample was tested for total mercury content. In addition, indoor air quality results from areas outside of the active dismantling work were used to assess past, current, and future risk to the other workers at the Plant.

Based on the testing results for the air, wipe, and bulk samples, an evaluation of risk to current and future industrial workers at the Plant was performed by calculating risks via the inhalation pathway and by comparing wipe and bulk sample results to the risk-based screening levels derived for workers with potential exposure to mercury residuals on interior surfaces and building materials. In general, GZA adopted conservative (i.e., human health protective) assumptions for the exposure parameters and toxicity factors. Overall, the assessment demonstrates that the concentrations of residual mercury detected within the plant and associated with the former mercury boiler system do not pose Significant Risks to current and future industrial workers within the plant building.

BACKGROUND AND PROJECT OBJECTIVES

BACKGROUND

The Plant is currently owned and operated by Granite Shore Power (GSP) and includes two coal/oil-fired electricity generating units and one wood-fired unit. Two former mercury vapor power units (Unit 1 and Unit 2) were operated at the Plant between 1950 and 1968. The current and former power units are/were housed within the same building with the exception that the wood-fired boiler is housed separately. In 1968, the components of the mercury vapor power systems were partially decommissioned by draining the liquid mercury from residual components; however, the components were not removed at that time.



Between approximately October 2016 and March 2019, Manafort Brothers Inc. (Manafort) of Plainville, Connecticut was contracted by Eversource to dismantle and remove the two 7,500-kilowatt (kW) mercury vapor power units (Unit 1 and Unit 2).

Preliminary concrete sampling activities performed early in the project were beneficial to the understanding of data and helped establish the approach utilized in the 2019 sampling program. On April 17, 2017, during active boiler dismantling activities, TRC Solutions Inc. (TRC), as a subcontractor to Manafort, collected 12 concrete chip samples ranging in depth from 0 to $\frac{3}{4}$ " from the surface of a discrete area of the concrete floor slab located on floor Elevation (EL.) 11' within the footprint of the former mercury boiler units. The concrete chip samples were obtained by TRC for Manafort to evaluate mercury concentrations present in the concrete floor slab on EL. 11' prior to the start of work on that elevation. The concrete chip samples were submitted to Katahdin Analytical Services located in Scarborough, Maine for total mercury analysis via Method SW846-7471. Results from the samples obtained indicated concentrations of Mercury ranging from 22.3 mg/kg¹ to 220 mg/kg within the top 0 to $\frac{3}{4}$ " of the concrete floor slab.

Eversource and GZA reviewed TRC's concrete chip sample results, sampling methodology, location and approach and discussed with TRC the potential of the samples being biased by mercury-impacted dust and debris on the surface of the floor slab and thus not being representative of actual impacts to the concrete floor slab. As a result of these discussions, Eversource decided to conduct cleaning and decontamination of the concrete floor slab adjacent to the area of the highest observed total mercury concentration (220 mg/kg) and to re-sample the concrete at specific depth intervals from 0 to $\frac{1}{2}$ " and $\frac{1}{2}$ " to 1".

On May 23, 2017, Moran Environmental Recovery (Moran) mobilized to the Site under contract with Eversource to conduct cleaning and decontamination of the concrete floor slab. Cleaning and decontamination activities were performed from May 23 through 30, 2017. Cleaning activities consisted of an initial high-pressure wash of the areas to remove accumulated debris from the surface of the concrete floor slab. Wash water was collected, containerized and disposed of with liquid wastes generated from the boiler dismantling project. After the initial cleaning activities, the floor slab surface was decontaminated in two separate areas using two mercury decontamination products: 1) DeconGel 1108 and 2) a solution of HgX[®] Decontamination Powder (HgX) and water. Waste associated with the decontamination process was collected, containerized, and disposed of with other liquid and solid wastes generated from the boiler dismantling project. Following completion of the decontamination, GZA collected 4 discrete concrete samples from the decontamination areas on June 1, 2017. Two samples were obtained from the DeconGel 1108 decontaminated area at depths of 0 to $\frac{1}{2}$ " and $\frac{1}{2}$ " to 1" respectively and two samples were obtained from the HgX[®] decontaminated area at depths of 0 to $\frac{1}{2}$ " and $\frac{1}{2}$ " to 1" respectively. The samples were submitted to ESS Laboratory in Cranston, Rhode Island for total mercury analysis via Method SW846-7471. The total mercury concentrations in samples from the areas decontaminated with DeconGel 1108 were 31.7 mg/kg from the 0 to $\frac{1}{2}$ " sample location and 12.1 mg/kg from the $\frac{1}{2}$ " to 1" sample location. The total mercury concentrations in samples from the areas decontaminated with HgX[®] Decontamination Powder were 14.9 mg/kg from the 0 to $\frac{1}{2}$ " sample location and 5.2 mg/kg from the $\frac{1}{2}$ " to 1" sample location. A summary of sampling results and analytical laboratory report was submitted to Eversource via email on June 19, 2017.

Based upon the results of the surface decontamination and subsequent GZA sampling, mercury concentrations were reduced from the original 220 mg/kg concentration in the 0 to $\frac{1}{2}$ " samples with a greater reduction in concentration observed in the sample from the HgX[®] decontaminated area. In addition, a lower mercury concentration (5.2 mg/kg) was observed at the $\frac{1}{2}$ " to 1" sample depth in comparison to the concentration observed at the floor surface (220 mg/kg) prior to cleaning and decontamination.

Given the results of the samples obtained, a risk evaluation was deemed necessary to assess the current and future risk of mercury residuals to industrial workers at the Plant. In the absence of regulatory requirements related to acceptable

¹ Milligram per kilogram.



mercury concentrations in building materials, direct sampling of residual building materials and calculation of risk-based screening values assuming the continued future use of the facility as an operating power plant were performed.

PROJECT OBJECTIVES

GZA understands that Eversource's objectives for this study were to:

- Assess post dismantling conditions within the Unit 1 and 2 boiler area (i.e., including boiler component, the turbine area, and the reclaim room area) relative to residual mercury impacts to non-porous building surfaces and porous concrete and brick surfaces through the collection of wipe and bulk samples; and
- Evaluate potential risks posed to current and future industrial workers at the Plant via exposure to residual mercury in the building. GZA developed human health risk-based screening values based on potential exposure to mercury-impacted non-porous building surfaces and porous building material in the areas described above; and compared the sampling data to the human health risk-based screening values.

POST-DISMANTLING SAMPLING

GENERAL SAMPLING APPROACH

The following outlines the general approach to post-dismantling sampling activities utilized as part of GZA's study.

- Sample collection occurred following the mercury boiler dismantling work and removal of containments, which was completed in early March 2019.
- Sampling was limited to the Unit 1 and Unit 2 boiler and associated boiler component, turbine, and reclaim room areas.
- Wipe samples of primarily metal surfaces were collected from representative interior non-porous horizontal and vertical surfaces within the Unit 1 and 2 boiler sampling area.
- Bulk samples of the concrete floor slabs, brick walls, concrete walls, and concrete equipment pedestals and slabs were collected from targeted areas within the Unit 1 and 2 boiler sampling area where impacts from residual mercury are considered most likely, such as under the former mercury-containing machinery, storage areas, etc.
- Both wipe samples and bulk samples were submitted to ESS Laboratory of Cranston, Rhode Island for analysis of total mercury via METHOD 7471B.
- The results of the wipe samples and bulk samples were used to assess the extent and distribution of mercury impacts in the former Unit 1 and 2 boiler area of the Plant.
- Washing of porous concrete floor surfaces within the Unit 1 and 2 boiler areas was completed following sampling activities. Washing included an initial cleaning with an industrial degreaser to remove accumulated debris from the floor surface followed by washing with a solution of HgX[®] and water using the manufacturer's "wet method", which consisted of application of the HgX[®] in solution on the cleaned floor surface followed by rinsing of the floor surface and collection of rinsate after a minimum 24-hour contact period.

SAMPLING METHODS

Wipe Samples of Non-Porous Surfaces

To assess extent and distribution of potential mercury impact within the building, GZA collected wipe samples from representative interior building surfaces. Sampling locations and surface types were selected based on historic operations. Prior to the collection of each wipe sample, the sample surface was wet wiped with deionized water moistened towels to remove accumulated dust in order to eliminate interference from dust deposited from current Plant activities. Each



sample was then collected over a 100-square-centimeter area framed by a template utilizing deionized water wetted gauze pads provided by the laboratory in 4-ounce glass jars with Teflon lined caps. Wiping of the surface proceeded from left to right in rows from the top to the bottom of the framed sampling area. The gauze was then folded over onto itself for a fresh sampling surface and sample area was wiped again with the same uniform pressure in columns from the top to the bottom from the left side to the right side of the entire framed area. Once the area was wiped, the gauze was folded and returned to the sample jar.

Bulk Samples of Porous Material

Concrete and brick floor and wall samples were collected from targeted areas within the Unit 1 and 2 boiler area where impacts from residual mercury are considered more likely, such as under former mercury-containing machinery, storage areas, etc. Prior to collection of the concrete or brick samples, the surface in the immediate area of the sampling location was wet wiped with deionized water moistened towels to remove accumulated dust in order to eliminate interference from dust deposited from current Plant activities. Consistent with the methods utilized for the concrete floor cleaning described above, each sample location was washed including an initial cleaning with an industrial degreaser to remove accumulated debris from the floor surface followed by washing with HgX[®] using the manufacturer's "wet method", which consisted of application of the HgX[®] Decontamination Powder in solution on the cleaned floor surface followed by rinsing of the floor surface and collection of rinsate after a minimum 24-hour contact period.

The samples were collected using a drill with ½-inch or ¾-inch masonry drill bits without the use of water. At each sampling location, discrete samples were collected at 0-0.5 inch below the floor or wall surface to assess the mercury concentration within the concrete and brick. Care was taken to operate the drill slowly so as to not significantly increase the temperature of the sample by friction-generated heat. The drilling process also generated bulk samples that were fully pulverized and homogenized prior to submittal to the laboratory. Samples were placed in 4-ounce glass jars with Teflon lined caps. The bulk samples were analyzed for total mercury. The drilling bits were cleaned between sampling locations using a dilute acid solution.

REAL TIME INDOOR AIR MONITORING

GZA monitored real time indoor air mercury concentrations outside of the containment systems throughout the mercury boiler system dismantling and post-dismantling activities. GZA's real-time air monitoring activities occurred exclusively outside the containment areas where no active dismantling or floor and drain cleaning activities occurred. The Lumex analyzers were installed near the perimeter of containments and exclusion zones and outside the containment areas to collect worst-case-scenario exposures to Plant personnel who worked strictly outside the designated containment/exclusion areas and did not perform dismantling related tasks. Furthermore, the Lumex measurement stations were periodically moved throughout the Unit 1 and 2 boiler areas depending on where containment/exclusion areas were located. Thus, the real-time measurements provided instantaneous determination of personnel exposures to mercury vapor outside the containment/exclusion areas and also allowed for an evaluation of potential future exposure to industrial workers at the Plant.

GZA utilized three direct-reading, real-time Lumex RA915+ Mercury Vapor Analyzers (Lumex) to provide indoor air mercury concentration measurements. Two monitors were installed in December 2016 and an additional monitor was installed in May 2017 within the Unit 1 and Unit 2 boiler area within the Plant. These monitors have run continuously since installation and continue to operate and log data as of the date of issuance of this report.

The Lumex analyzer uses Zeeman atomic absorption and background correction technology to provide mercury vapor measurements in air. The Lumex has been used in industry for almost 20 years to measure mercury vapor in real time. The Lumex analyzers were programmed to record mercury vapor concentrations every minute and to conduct a self-zeroing cycle every 5 minutes.



SAMPLE DATA MANAGEMENT

GZA developed a site-specific GIS-based data management system for the post-dismantling wipe sample and bulk sample collection activities. This system allowed field personnel to record pertinent sampling information on a mobile device concurrent to the field sampling activities. Upon receipt, the sample analytical results were uploaded and stored within the GIS database and used to track the sampling progress and perform the data evaluation.

The following sample attribute information was recorded in the GIS-based data management system:

- Sampling location
- Sample ID
- Sample type
- Sampler identification
- Sample date and time
- Surface type
- Surface description (paint, condition, color, stains)
- Sample type
- Elevation
- Sample area and surface preparation
- Laboratory analyses to be performed
- Laboratory results
- Photographs
- General comments

RISK EVALUATION AND DERIVATION OF RISK-BASED SCREENING LEVEL

GZA evaluated potential risks via exposure to indoor air to determine if risks via inhalation of indoor air would be a significant risk to current and future industrial workers. GZA then derived risk-based screening levels for worker exposure to mercury residuals on the non-porous interior building surfaces (wipe sampling) and for exposure to the porous interior building surfaces (bulk sampling). The results of our analyses are presented below.

RISKS VIA INHALATION OF MERCURY IN INDOOR AIR

As discussed above, GZA monitored real time indoor air quality for mercury vapor concentrations outside of the dismantling containment systems. The indoor air quality data are summarized in Table 1. As part of the Lumex monitor data analysis, GZA summarized the average and maximum concentrations of each Lumex monitor over a monitoring period that typically was approximately one week in duration. The data were summarized in this manner over the course of the project in order to efficiently analyze the vast quantity of data generated by each monitor on a weekly basis and compare the detected mercury concentrations to project-specific and other applicable worker exposure action levels. The data are summarized in Table 1, including average and maximum detected concentrations, and associated Lumex monitor location. The continuous raw data generated by each monitor have also been logged throughout the project and are available in electronic data files, if requested.



The Regional Screening Level (RSL)² published by the U.S. Environmental Protection Agency (USEPA) for mercury (including elemental mercury and mercuric chloride and other mercury salts) in air for industrial workers is 1.3 $\mu\text{g}/\text{m}^3$. The RSL of 1.3 $\mu\text{g}/\text{m}^3$ corresponds to a target hazard index of 1.

The daily average mercury concentration across the building from December 2016 through April 2019 was calculated to be 0.83 $\mu\text{g}/\text{m}^3$ based on the data provided in Table 1. Note that average concentrations were provided for various periods with different durations. As shown in Table 1, GZA first multiplied the average concentration for each period by the number of days for the period. The multiplication for each period was then summed up and divided by total number of days for the monitoring period (i.e., 3010 days) to derive the daily average mercury concentration. This daily average concentration of 0.83 $\mu\text{g}/\text{m}^3$ is less than the RSL (1.3 $\mu\text{g}/\text{m}^3$) for the industrial scenario evaluated. Furthermore, the measured mercury concentration is expected to be overstated due to the fact that this daily average concentration was based on the concentrations measured during active mercury boiler dismantling, as well as floor and drain cleaning activities conducted from December 2016 through April 2019. Throughout the course of the project, the highest observed mercury vapor concentrations recorded by the Lumex monitors have been observed during periods of significant torch cutting and other hot-cutting operations of mercury impacted components inside the containment systems. As the removal of these components has been completed and the generation of mercury vapor inside containments associated with the removal of these components has lessened, the observed mercury concentrations recorded by the Lumex monitors have also lessened. Since the completion of mercury boiler dismantling activities in December 2018 through the completion of post-dismantling cleaning and restoration activities, the daily average concentration has dropped to 0.27 $\mu\text{g}/\text{m}^3$. Note that other activities potentially impacting mercury such as tear down of containments, floor drain cleaning, and floor cleaning activities continued until April 24, 2019. Reduction of the indoor air mercury concentrations are expected to continue as normal indoor air exchange with ambient air is re-established.

In summary, risks via the potential indoor air inhalation pathway are not expected to contribute significantly to overall risks to future industrial workers. Therefore, the indoor air inhalation pathway was not included in deriving the risk-based screening values for the wipe or bulk samples as further discussed below.

RISK-BASED SCREENING VALUE FOR WIPE SAMPLES

GZA developed a risk-based screening value for mercury, based on the approach adopted by Karen DiBiasio and Kimiko Klein (2003)³. The exposure pathways evaluated in deriving the risk-based screening value included:

- Dermal contact of contaminated surfaces, and
- Incidental ingestion of contaminants on hands.

As discussed in the preceding section, risks via inhalation of mercury in indoor air are not expected to contribute significantly to overall risks to future industrial workers and therefore the inhalation pathway was not included in the risk-based screening value derivation.

GZA adopted the conservative exposure assumptions for workers presented in the Karen DiBiasio and Kimiko Klein (2003) report. In brief, workers were assumed to work 5 days per week and 50 weeks each year (with 2 weeks of vacation each year) for 25 years. On each work day, workers were assumed to contact contaminated surfaces 8 events during the day. During each event, workers' head, forearms, hands, and lower legs (total of 5,070 cm^2) were assumed to contact contamination surfaces and 10% of the surface contamination was assumed to be transferred to the skin. Of the

² USEPA, 2019. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites. On-line resources at <https://www.epa.gov/risk/regional-screening-levels-rsls>. Recently updated May 2019.

³ Karen DiBiasio and Kimiko Klein, 2003. Human Health Risk Evaluation of Structural Surfaces Contaminated with Metals. California Environmental Protection Agency, Sacramento, CA. On-line resources available at <https://www.dtsc.ca.gov/AssessingRisk/upload/Eval-Metal-Contaminated-Surfaces.pdf>.



contaminants that contacted the skin, contaminants on both hands were assumed to be incidentally ingested with the fraction transferred from dermal to oral to be 0.04. A default dermal absorption fraction factor (ABS_{der}) of 0.001 was assumed for mercury, in accordance with the USEPA Region 3 proposal⁴. It should be noted that certain default exposure parameters such as skin surface area and body weight have been updated by USEPA since the DiBiasio et al (2003) report became available. GZA compared the values adopted in the DiBiasio et al (2003) and the USEPA (2014)⁵ updated values and concluded that the assumptions adopted by DiBiasio et al (2003) and consequently used in deriving the screening values for this project were conservative relative to the USEPA updated values and appropriate for use in the derivation due to the specific history and use conditions at the Site. For example, the body weight for adults of 70 kilogram (kg) was used in the screening value derivation for this project while USEPA proposes a default value of 80 kg in the 2014 Guidance. As another example, the skin surface areas for dermal contact (3,200 cm² and 5,070 cm²) used for this project were higher than the USEPA proposed default soil skin surface area (2,373 cm² for residential children and 3,527 cm² for workers).

Residual mercury is expected to be predominantly in elemental form. However, an oral reference dose for elemental mercury is not available. Oral and dermal absorption of elemental mercury is very limited⁶; consequently, risks via exposure to elemental mercury through oral and dermal pathways are not expected to be significant. Nonetheless, as a conservative approach, GZA adopted the oral reference dose of 3E-4 mg/kg-day proposed by the USEPA Integrated Risk Information System (IRIS; an on-line database) for mercuric chloride and other mercury salts to derive the risk-based screening values for this project.

For the dermal exposure pathway, the USEPA (2004) Risk Assessment Guidance for Superfund (RAGS)⁷ proposes to adjust the oral RfD (administered) by a Gastrointestinal tract (GI) absorption factor to be used for the dermal exposure pathway (to convert the administered referenced dose to the absorbed referenced dose), for certain compounds. Although USEPA (2004) recommended an adjustment factor for mercuric chloride and other soluble salts of 0.07, USEPA did not recommend adjustment for insoluble, metallic mercury, or methyl mercury. Mercury at the Site is expected to be in the elemental form as the boilers only utilized elemental mercury for their operation. As a result, GZA did not adjust the oral RfD for evaluating risks via dermal contact for mercury.

Karen DiBiasio and Kimiko Klein (2003) assumed a wipe removal efficiency of 50%. This assumption was adopted to derive the risk-based screening value for wipe samples.

The derivation of the risk-based screening value for wipe samples is presented in Table 2 and the result is provided below.

Risk-Based Screening Value for Mercury in Wipe Samples Industrial Use (µg/100cm ²)	
Mercury	52

⁴ USEPA Region 3 proposed range for dermal absorption of inorganics from soil was 0.1% to 1%. On-line resources available at <https://www.epa.gov/risk/assessing-dermal-exposure-soil>.

⁵ USEPA Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. February, 2014.

⁶ As an example, the Mercury Toxicity published at the Medscape website indicated that "Only 2-10% of the ingested mercury is absorbed from the gut, and ingested elemental mercury is not absorbed at all." On-line resources available at <https://emedicine.medscape.com/article/1175560-overview>.

⁷ USEPA, 2004. Supplemental Guidance for Dermal Risk Assessment, Part E of Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual. Office of Solid Waste and Emergency and Remedial Response (OSWER) Directive 9285.7-02. August.



RISK-BASED SCREENING VALUE FOR BULK SAMPLES

In the Environmental Compliance and Area Completion Projects Regulatory Document Handbook by United States Department of Energy (USDOE)⁸, USDOE proposes to use 10 times of the USEPA Region 9 Soil Preliminary Remediation Goal (PRG) for concrete (Module 6, P.6.5, Human Health Constituents of Concern, p.432).

The USEPA Region 9 RPG, or USEPA (2019) RSL⁹, is 46 mg/kg for elemental mercury and is 350 mg/kg for mercuric chloride and other mercury salts for the industrial use scenario, corresponding to a hazard quotient of 1.0. GZA adopted a screening value of 460 mg/kg for the bulk samples for this project. Note that the RSL was derived by USEPA (2019) based on the inhalation of elemental mercury emitted from soil. As noted in Section 4.1, based on the real time indoor air monitoring, the inhalation pathway is not expected to be of concern for this project. Therefore, adopting the USEPA (2019) RSL as the basis to derive the risk-based screening value for bulk samples would result in overly stringent screening value for this project.

RISK-BASED SCREENING VALUE UNCERTAINTY AND APPLICATION

There is variability associated with the derivation of the risk-based screening values. In general, GZA adopted conservative (i.e., human health protective) assumptions for the exposure parameters and toxicity factors. The multiple conservative assumptions would result in overly stringent screening values.

It should be noted that the derivation of the risk-based screening values is based on a continuous long-time exposure period (i.e., 25 years). Due to the nature of this continuous long-time exposure, it is GZA's position that the risk-based screening values should be used to compare with the average concentrations for an appropriately identified area/space where potential receptors would be exposed continuously for a long period of time. It may not be appropriate to compare the maximum or individual sample concentrations with the screening values and make management decisions based on this point comparison.

Note that cumulative risks via exposure to non-porous surface and porous concrete were not evaluated. It is unlikely for a potential receptor to be exposed to contaminated non-porous surface via dermal contact and incidental ingestion (8 events/day) AND to be exposed to contaminated porous material via dermal contact and ingestion during the same day with the magnitude of exposure assumed above for the screening value derivation.

If a potential receptor would be exposed to BOTH non-porous surface and porous concrete, the cumulative risks for the receptor can be evaluated using the following equation:

$$\text{Cumulative HI} = \sum_i f_i HI_i$$

Where:

HI_i = Hazard index for specific exposure route i (porous or non-porous), and

In the above equation, f_i is the fraction of risks from exposure route i that would be contributed to the cumulative risks. It was assumed that receptors could be exposed solely to one exposure route (which is the assumption used for the

⁸ USDOE, 2012. Environmental Compliance and Area Completion Projects Regulatory Document Handbook by ERD-AG-003. June.

⁹ The RSLs were developed with DOE's Oak Ridge National Laboratory (ORNL) under an Interagency Agreement as a merger of the EPA Region 3 Risk-Based Concentration (RBC) Table, Region 6 Human Health Medium-Specific Screening Level (HMMSSL) Table and the Region 9 PRG Table. The inhalation of volatiles and fugitive dust pathway was evaluated in deriving the RSL for elemental mercury. Workers were assumed to inhale mercury emitted from soil for 8 hours each day, 250 days each year for 25 years.



screening value derivation for each exposure route) or they could be exposed to both exposure routes with a fraction (e.g., with 50% dose from each exposure route). The sum of f_i should be one:

$$\sum_i f_i = 1$$

As a result, the cumulative HI can be expressed as:

$$\text{Cumulative HI} \leq \text{Maximum}(HI_1, HI_2)$$

That is, as long as the screening value for each exposure route is met, the cumulative risks to a receptor from both exposure routes should not exceed the risk limit.

SAMPLING RESULTS

As presented above, the post-dismantling sampling focused on the Unit 1 and 2 boiler and associated boiler component, turbine, and reclaim room areas. The two types of sampling included:

- Wipe sampling of representative non-porous surfaces, including walls, floors, columns, beams, girts, etc., and
- Bulk sampling of porous surfaces, including brick walls and concrete floors, walls, and equipment pedestals and slabs.

As mentioned above, prior to sampling, the non-porous surfaces were wiped with deionized water moistened towels to remove accumulated dust generated from the operation of the coal/oil fired boiler units within the plant building. Porous surfaces were washed with a solution of HgX[®] Decontamination powder following the established concrete slab post-demolition cleaning protocol as described above.

Mercury sampling locations are shown on **Figures 2** through **7**. The mercury sampling results for the wipe and bulk samples are summarized in **Tables 4** and **5**, respectively, along with pertinent sampling information (surface type, condition, and description, etc.). The laboratory reports for the wipe and bulk samples are provided in **Appendix B**. The sampling results shown on **Figures 2** through **7** are presented in the following subsections organized by primary elevation levels¹⁰ within the Plant building.

ELEVATION 11'

Non-Porous Surfaces

At elevation 11', GZA collected a total of 32 post-dismantling assessment wipe samples at the locations shown on **Figure 2**. Mercury was detected above the risk-based screening value of 52 ug/100 cm² in only one non-porous sample collected at elevation 11', sample W-1201 at a concentration of 78.4 ug/100 cm². Sample W-1201 was collected from a vertical beam beneath the former Turbine 1 Area, north of the former Mercury Storage Tank area. The mercury concentrations in the remainder of the wipe samples collected at elevation 11' ranged from 0.079 ug/100 cm² to 17.3 ug/100 cm².

¹⁰ The elevations for individual samples were measured and used to group the samples by primary elevation levels. Spatial locations were also considered when grouping the samples by primary elevation levels. Both the primary elevation levels and individual sample elevations are included in Tables 4 and 5.



Porous Surfaces

At elevation 11', GZA collected a total of 77 post-dismantling bulk samples at the locations shown on **Figure 2**. Mercury was detected above the risk-based screening value of 460 mg/kg in four of the bulk samples collected at elevation 11' (C-1076, C-1082, C-1084, and C-1111) as detailed in the table below.

Sample ID	Mercury Concentration (mg/kg)	Location Description
C-1076	3,130	Concrete bulk sample collected from the floor at the base of the former Stack.
C-1082	2,000	Concrete bulk sample collected from the west wall of the former Reclaim Room.
C-1084	595	Concrete bulk sample collected from the floor in the middle of the former Reclaim Room.
C-1111	682	Concrete bulk sample collected from the west side of the pedestal for the former Mercury Storage Tank.

The remainder of the bulk samples collected at elevation 11' had mercury concentrations ranging from 0.377 mg/kg to 327 mg/kg.

ELEVATION 24'

Non-Porous Surfaces

At elevation 24', GZA collected a total of 32 post-dismantling assessment wipe samples at the locations shown on **Figure 3**. Mercury was not detected above the risk-based screening value of 52 ug/100 cm² in any of the samples collected at elevation 24'. The mercury results at this elevation ranged from non-detect to 51.1 ug/100 cm². The sample with a mercury concentration of 51.1 ug/100 cm², W-1166, was collected from a beam adjacent to the east exterior wall of the #2 Load Center below the former Unit 2 Turbine. The remainder of the wipe samples collected at elevation 24' had mercury concentrations below 21.9 ug/100 cm².

Porous Surfaces

At elevation 24', GZA collected a total of 24 post-dismantling bulk samples at the locations shown on **Figure 3**. Mercury was not detected above the risk-based screening value of 460 mg/kg in any of the bulk samples collected at elevation 24'. The mercury concentrations in the samples collected at this elevation ranged from 1.98 mg/kg to 174 mg/kg.

ELEVATION 36'

Non-Porous Surfaces

At elevation 36', GZA collected a total of 32 post-dismantling assessment wipe samples at the locations shown on **Figure 4**. Mercury was detected above the risk-based screening value of 52 ug/100 cm² in only one non-porous sample collected at elevation 36', sample W-1129 at a concentration of 95.3 ug/100 cm². Sample W-1129 was collected from a beam adjacent to the former east sidewall of the Unit 2 Boiler. The mercury concentrations in the remainder of the wipe samples collected at elevation 36' ranged from non-detect to 48.7 ug/100 cm². The sample with a mercury concentration of 48.7 ug/100 cm², W-1126, was collected from a beam adjacent to the former east sidewall of the Unit 1 Boiler. The remaining wipe samples collected at elevation 36' had mercury concentrations below 12.7 ug/100 cm².

Porous Surfaces

At elevation 36', GZA collected a total of 34 post-dismantling bulk samples at the locations shown on **Figure 4**. Mercury was not detected above the risk-based screening value of 460 mg/kg in any of the bulk samples collected at elevation 36'. The mercury concentrations in the samples collected at this elevation ranged from 0.167 mg/kg to 415 mg/kg.



ELEVATIONS 49' AND 56'

Non-Porous Surfaces

At elevations 49' and 56', GZA collected a total of 57 post-dismantling assessment wipe samples at the locations shown on **Figure 5**. Mercury was not detected above the risk-based screening value of 52 ug/100 cm² in any of the samples collected at elevations 49' and 56'. The mercury concentrations in the samples collected at these elevations ranged from non-detect to 20.5 ug/100 cm².

Porous Surfaces

At elevation 56', GZA collected a total of 5 post-dismantling bulk samples at the locations shown on **Figure 5**.¹¹ Mercury was not detected above the risk-based screening value of 460 mg/kg in any of the bulk samples collected at elevation 56'. The mercury concentrations in the samples collected at this elevation ranged from 3.53 mg/kg to 50.6 mg/kg.

There are no porous surfaces on elevation 49' as elevation 49' is a mezzanine. The flooring at elevation 49' is metal grating.

ELEVATION 69'

Non-Porous Surfaces

At elevation 69', GZA collected a total of 18 post-dismantling assessment wipe samples at the locations shown on **Figure 6**. Mercury was not detected above the risk-based screening value of 52 ug/100 cm² in any of the samples collected at elevation 69'. The mercury concentrations in the samples collected at this elevation ranged from non-detect to 1.33 ug/100 cm².

Porous Surfaces

No post-dismantling bulk samples were collected at elevation 69' due to the presence of metal floor grating throughout the elevation.

ELEVATIONS 82' AND 95'

Non-Porous Surfaces

At elevations 82' and 95', GZA collected a total of 39 post-dismantling assessment wipe samples at the locations shown on **Figure 7**. Mercury was not detected above the risk-based screening value of 52 ug/100 cm² in any of the samples collected at elevations 82' and 95'. The mercury concentrations in the samples collected at these elevations ranged from non-detect to 14 ug/100 cm².

Porous Surfaces

At elevation 82', GZA collected a total of 2 post-dismantling bulk samples at the locations shown on **Figure 7**.¹² Mercury was not detected above the risk-based screening value of 460 mg/kg in either of the bulk samples collected at elevation 82'. The mercury concentrations in the samples collected at this elevation were 17.9 mg/kg in sample C-1001 and 43.1 mg/kg in sample C-1002.

¹¹ No post-dismantling bulk samples were collected at elevation 49' due to the presence of metal floor grating throughout the elevation.

¹² No post-dismantling bulk samples were collected at elevation 95' due to the presence of metal flooring and metal wall surfaces throughout the elevation.



DATA EVALUATION

GZA reviewed the wipe sample data collected for this project and noted that all wipe sample results had mercury concentrations below the risk-based screening value of 52 $\mu\text{g}/100\text{cm}^2$ with the following exceptions.

- W-1129 (95.3 $\mu\text{g}/100\text{cm}^2$, Beam Wipe Horizontal)
- W-1201 (78.4 $\mu\text{g}/100\text{cm}^2$, Beam Wipe Vertical)

GZA reviewed the bulk sample data collected for this project and noted that all bulk sample results had mercury concentrations below the risk-based screening value of 460 mg/kg with the following exceptions.

- C-1076 (3,130 mg/kg, Floor Bulk)
- C-1082 (2,000 mg/kg, Wall Bulk)
- C-1084 (595 mg/kg, Floor Bulk)
- C-1111 (682 mg/kg, Pedestal Bulk Vertical)

Although exceedances of the risk-based screening value were noted for two wipe samples W-1129 and W-1201, the average wipe sample concentration (3.1 $\mu\text{g}/100\text{cm}^2$, including the results for W-1129 and W-1201) is an order of magnitude lower than the risk-based screening value of 52 $\mu\text{g}/100\text{cm}^2$. GZA further calculated the 90% Upper Confidence Limit (UCL)¹³ using the USEPA ProUCL version 5.1 based on the wipe sample results. The 90% UCL recommended by the ProUCL is 2.5 $\mu\text{g}/100\text{cm}^2$ based on Kaplan-Meier Land's H-statistic. The calculated 90% UCL is below the screening value (2.5 $\mu\text{g}/100\text{cm}^2$ vs. 52 $\mu\text{g}/100\text{cm}^2$), indicating that residual mercury on building surface is not expected to pose significant risks to current and future industrial workers at the Site.

Although exceedances of the risk-based screening value were noted for four bulk samples (C-1076, C-1082, C-1084, and C-1111), the average bulk sample concentration (82 mg/kg, including the results for C-1076, C-1082, C-1084, and C-1111) is much lower than the risk-based screening value of 460 mg/kg. GZA further calculated the 90% UCL using the USEPA ProUCL version 5.1 based on the bulk sample results. The 90% UCL recommended by the ProUCL is 162 mg/kg based on Chebyshev's theorem¹⁴. The calculated 90% UCL is below the screening value (162 mg/kg vs. 460 mg/kg), indicating that residual mercury in building material is not expected to pose significant risks to current and future industrial workers at the Site.

It should be noted that the wipe sample and bulk sample results represent the residual mercury levels resulting from the historic operation of the plant (associated with both mercury boiler operation and coal/oil-fired electricity generating). Note that coal/oil-fired electricity generating is still on-going at the Site and the operation could potentially produce dust containing mercury at the Site. Now that the mercury power system dismantling activities has been completed at the Site, residual mercury associated with mercury boiler operation is not expected to increase. Therefore, the conclusion of

¹³ The 90% UCL is the value when calculated for a random data set equals or exceeds the true mean 90% of the time. Note that the selection of specific UCL type should be determined by multiple factors including project-/site-specific factors, model uncertainties, data distributions, and statistical method used to derive UCLs. As an example, the USEPA ProUCL Version 5.0.00 Technical Guide indicates that "The use of the Chebyshev inequality to compute UCLs tends to yield more conservative (but stable) UCLs than other methods available in ProUCL software. In such cases, when the sample size is large (and other UCL methods such as the bootstrap-t method yield unrealistically high values due to presence of outlier(s)), one may want to use a 95% Chebyshev UCL or a Chebyshev UCL with lower confidence coefficient such as 90% as an estimate of the population mean, especially when the sample size is large (e.g., >100, 150)." For this project, the 90% UCL was selected for comparison to the wipe sample screening value based on the uncertainty associated with the screening value derivation.

¹⁴ In accordance with the USEPA ProUCL Version 5.0.00 Technical Guide, 90% UCL based on the Chebyshev theorem was an appropriate estimate of the mean.



No Significant Risk associated with residual mercury from mercury boiler operation under the current use condition would also be valid for the future use condition.

6.0 SUMMARY AND CONCLUSIONS

This report presents an assessment of the significance of residual mercury on the interior surfaces and in the building material in the vicinity of the dismantled mercury Unit 1 and Unit 2 boilers at the Schiller Station Site. A total of 210 wipe samples were collected from non-porous surfaces and 142 bulk samples were collected from porous surfaces. Each sample was tested for total mercury content. In addition, indoor air quality from areas outside of the active dismantling work was used to assess past, current, and future risk to the other workers at the Plant.

The indoor air quality monitoring results indicate that measured mercury vapor concentrations do not pose a significant risk to the current or future industrial workers at the Plant. A comparison of the wipe and bulk sampling results to the risk-based screening values indicates that while 6 individual samples exceeded the risk-based screening levels, the average concentrations and the 90% UCL of the arithmetic mean values are below the risk-based screening levels. In summary, the overall sampling results demonstrate that residual mercury associated with the former mercury boiler system would not pose Significant Risks to current and future industrial workers within the plant building.

We appreciate the opportunity to assist Eversource with this project. We trust that this report meets your current needs. If you have any questions, please contact us.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read 'Chunhua Liu'.

Chunhua Liu, Doctor of Science
Senior Risk Assessor

A handwritten signature in black ink, appearing to read 'Stephen M. Raymond'.

Stephen M. Raymond
Principal

A handwritten signature in blue ink, appearing to read 'John R. Paquin'.

John R. Paquin
Consultant/Reviewer

A handwritten signature in black ink, appearing to read 'John Murphy'.

John Murphy
Consultant/Reviewer

Attachments: Table 1 – Indoor Air Monitoring Summary
Table 2 – Risk-based Screening Value Derivation
Table 3 – Sampling Summary Table
Table 4 – Laboratory Analytical Results – Non-Porous Surfaces
Table 5 – Laboratory Analytical Results – Porous Surfaces
Figure 1 – Locus Plan
Figures 2-7 – Sample Location and Laboratory Testing Results (Plan per each elevation)
Appendix A – Limitations
Appendix B – Laboratory Analytical Data



Tables

TABLE 1
INDOOR AIR MONITORING SUMMARY
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

Monitor No.	Monitoring Period	Monitor Location	Mercury Vapor Concentration (mg/m ³)		Time Period			Concentration x Number of Days (mg-day/m ³)
			Average	Maximum	Start	Finish	Number of Days	
1	12/7/2016	East side of Turbine Deck at El. 36'	0.00159	0.00193	12/7/2016	12/7/2016	1	0.00159
	12/15/16-12/21/16		0.00053	0.00365	12/15/2016	12/21/2016	7	0.00371
	12/21/16 - 12/23/16		0.00074	0.00881	12/21/2016	12/23/2016	3	0.00222
	12/23/16 - 12/28/16		0.00057	0.00283	12/23/2016	12/28/2016	6	0.00340
	12/29/16 - 1/5/17		0.00059	0.00377	12/29/2016	1/5/2017	8	0.00474
	1/6/17 - 1/13/17		0.00062	0.00279	1/6/2017	1/13/2017	8	0.00492
	1/14/17 - 1/27/17		0.00090	0.00848	1/14/2017	1/27/2017	14	0.01258
	1/27/17 - 2/2/17		0.00088	0.00809	1/27/2017	2/2/2017	7	0.00617
	2/3/17 - 2/7/17		0.00086	0.00678	2/3/2017	02/07/17	5	0.00431
	2/7/17 - 2/14/17		0.00085	0.00603	2/7/2017	02/14/17	8	0.00681
	2/14/17 - 2/20/17		0.00057	0.00683	2/14/2017	02/20/17	7	0.00402
	2/21/17 - 2/24/17		0.00112	0.01047	2/21/2017	02/24/17	4	0.00446
	2/24/17 - 2/28/17		0.00172	0.00863	2/24/2017	02/28/17	5	0.00858
	2/28/17 - 3/3/17		0.00246	0.01579	2/28/2017	03/03/17	4	0.00983
	3/3/17 - 3/9/17		0.00127	0.00870	3/3/2017	03/09/17	7	0.00889
	3/9/17 - 3/15/17		0.00134	0.01436	3/9/2017	03/15/17	7	0.00939
	3/15/17 - 4/3/17		0.00038	0.00268	3/15/2017	04/03/17	20	0.00770
	4/3/17 - 4/7/17		0.00091	0.00402	4/3/2017	04/07/17	5	0.00454
	4/7/17 - 4/10/17		0.00076	0.00196	4/7/2017	04/10/17	4	0.00303
	4/10/17 - 4/12/17		0.00063	0.00394	4/10/2017	04/12/17	3	0.00188
	4/12/17 - 4/20/17		0.00308	0.01196	4/12/2017	04/20/17	9	0.02773
	4/20/17 - 4/28/17		0.00146	0.00977	4/20/2017	04/28/17	9	0.01318
	4/28/17 - 5/1/17		0.00010	0.00017	4/28/2017	05/01/17	4	0.00038
	5/1/17 - 5/9/17		0.00139	0.01056	5/1/2017	05/09/17	9	0.01250
	5/10/17 - 5/15/17		0.00237	0.01473	5/10/2017	05/15/17	6	0.01420
	5/16/17 - 5/18/17		0.00251	0.00789	5/16/2017	05/18/17	3	0.00752
	5/18/17 - 5/20/17		0.00122	0.00560	5/18/2017	5/20/2017	3	0.00366
	5/20/17 - 5/30/17		0.00143	0.01159	5/20/2017	5/30/2017	11	0.01576
	5/30/17 - 6/14/17		0.00195	0.01072	5/30/2017	6/14/2017	16	0.03120
	6/14/17 - 6/27/17		0.00077	0.00751	6/14/2017	6/27/2017	14	0.01072
	6/27/17 - 7/11/17		0.00084	0.00687	6/27/2017	7/11/2017	15	0.01263
	7/21/17 - 7/24/17		0.00122	0.01067	7/21/2017	7/24/2017	4	0.00487
	7/28/17 - 8/10/17		0.00107	0.01452	7/28/2017	8/10/2017	14	0.01503
	8/10/17 - 8/22/17	0.00093	0.00306	8/10/2017	8/22/2017	13	0.01205	
	8/22/17 - 9/5/17	0.00071	0.00520	8/22/2017	9/5/2017	15	0.01065	
	9/5/17 - 9/14/17	0.00071	0.00681	9/5/2017	9/14/2017	10	0.00709	
	9/14/17 - 10/4/17	0.00073	0.00562	9/14/2017	10/4/2017	21	0.01530	
	10/4/17 - 10/12/17	0.00133	0.00739	10/4/2017	10/12/2017	9	0.01198	
	10/12/17 - 10/25/17	0.00148	0.00505	10/12/2017	10/25/2017	14	0.02078	
	10/25/17 - 10/31/17	0.00117	0.01295	10/25/2017	10/31/2017	7	0.00821	
	11/1/17 - 11/20/17	0.00085	0.00427	11/1/2017	11/20/2017	20	0.01706	
	11/21/17 - 11/28/17	0.00095	0.00234	11/21/2017	11/28/2017	8	0.00763	
	11/28/17 - 12/5/17	0.00161	0.00907	11/28/2017	12/5/2017	8	0.01285	
	12/5/17 - 12/20/17	0.00092	0.00793	12/5/2017	12/20/2017	16	0.01468	
	12/20/17 - 1/2/18	0.00046	0.00431	12/20/2017	1/2/2018	14	0.00643	
	1/2/18 - 1/9/18	0.00208	0.00542	1/2/2018	1/9/2018	8	0.01664	
	1/9/18 - 1/30/18	0.00093	0.01039	1/9/2018	1/30/2018	22	0.02047	
	2/1/18 - 2/13/18	0.00048	0.00123	2/1/2018	2/13/2018	13	0.00618	
	2/13/18 - 2/20/18	0.00064	0.00330	2/13/2018	2/20/2018	8	0.00514	
	2/20/18 - 2/28/18	0.00101	0.00530	2/20/2018	2/28/2018	9	0.00905	
2/28/18 - 3/6/18	0.00114	0.01930	2/28/2018	3/6/2018	7	0.00798		
3/6/18 - 3/23/18	0.00101	0.01438	3/6/2018	3/23/2018	18	0.01809		
3/23/18 - 3/29/18	0.00071	0.01280	3/23/2018	3/29/2018	7	0.00495		
3/29/18 - 4/18/18	0.00097	0.00307	3/29/2018	4/18/2018	21	0.02033		
4/18/18 - 4/26/18	0.00171	0.01034	4/18/2018	4/26/2018	9	0.01535		
4/27/18 - 5/4/18	0.00137	0.00526	4/27/2018	5/4/2018	8	0.01096		
5/4/18 - 5/9/18	0.00110	0.00650	5/4/2018	5/9/2018	6	0.00659		
5/9/18 - 5/14/18	0.00118	0.00431	5/9/2018	5/14/2018	6	0.00710		
5/14/18 - 5/22/18	0.00131	0.01498	5/14/2018	5/22/2018	9	0.01175		
5/22/18 - 5/29/18	0.00071	0.00957	5/22/2018	5/29/2018	8	0.00565		
5/29/18 - 6/5/18	0.00051	0.01590	5/29/2018	6/5/2018	8	0.00412		
6/5/18 - 6/12/18	0.00266	0.04764	6/5/2018	6/12/2018	8	0.02127		
6/12/18 - 6/19/18	0.00066	0.02070	6/12/2018	6/19/2018	8	0.00528		
6/22/18 - 6/26/18	0.00121	0.00417	6/22/2018	6/26/2018	5	0.00607		
6/26/18 - 7/3/18	0.00096	0.00873	6/26/2018	7/3/2018	8	0.00769		
7/3/18 - 7/10/18	0.00074	0.00980	7/3/2018	7/10/2018	8	0.00590		
7/10/18 - 7/17/18	0.00055	0.01544	7/10/2018	7/17/2018	8	0.00440		
7/17/18 - 7/24/18	0.00041	0.00936	7/17/2018	7/24/2018	8	0.00330		
7/24/18 - 7/31/18	0.00034	0.00416	7/24/2018	7/31/2018	8	0.00273		
7/31/18 - 8/7/18	0.00026	0.00321	7/31/2018	8/7/2018	8	0.00212		
8/7/18 - 8/10/18	0.00068	0.01607	8/7/2018	8/10/2018	4	0.00273		
8/10/18 - 8/21/18	0.00045	0.01353	8/10/2018	8/21/2018	12	0.00534		
8/21/18 - 8/22/18	0.00053	0.00535	8/21/2018	8/22/2018	2	0.00107		
8/22/18 - 8/23/18	0.00026	0.00245	8/22/2018	8/23/2018	2	0.00052		
8/23/18 - 8/27/18	0.00018	0.00235	8/23/2018	8/27/2018	5	0.00092		
8/28/18 - 9/4/18	0.00123	0.00649	8/28/2018	9/4/2018	8	0.00983		
9/4/18 - 9/11/18	0.00083	0.05492	9/4/2018	9/11/2018	8	0.00663		
9/11/18 - 9/18/18	0.00114	0.00838	9/11/2018	9/18/2018	8	0.00912		
9/18/18 - 9/25/18	0.00106	0.01388	9/18/2018	9/25/2018	8	0.00847		
9/25/18 - 10/2/18	0.00131	0.00883	9/25/2018	10/2/2018	8	0.01052		
10/2/18 - 10/9/18	0.00090	0.00728	10/2/2018	10/9/2018	8	0.00717		
10/9/18 - 10/16/18	0.00126	0.00936	10/9/2018	10/16/2018	8	0.01008		
10/16/18 - 10/23/18	0.00072	0.00300	10/16/2018	10/23/2018	8	0.00578		
10/23/18 - 10/30/18	0.00086	0.00407	10/23/2018	10/30/2018	8	0.00690		
10/30/18 - 11/6/18	0.00111	0.00480	10/30/2018	11/6/2018	8	0.00889		
		El. 24' Between Turbines 1 and 2						
		El. 24' Column east of the north elevator						

TABLE 1
INDOOR AIR MONITORING SUMMARY
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

Monitor No.	Monitoring Period	Monitor Location	Mercury Vapor Concentration (mg/m ³)		Time Period			Concentration x Number of Days (mg-day/m ³)		
			Average	Maximum	Start	Finish	Number of Days			
1	11/6/18 - 11/13/18	El. 24' Southwest side of Boiler Containment	0.00142	0.01048	11/6/2018	11/13/2018	8	0.01137		
	11/13/18 - 11/20/18		0.00105	0.00642	11/13/2018	11/20/2018	8	0.00843		
	11/20/18 - 11/27/18		0.00064	0.00240	11/20/2018	11/27/2018	8	0.00515		
	11/27/18 - 12/4/18		0.00086	0.01219	11/27/2018	12/4/2018	8	0.00684		
	12/4/18 - 12/11/18		0.00045	0.00504	12/4/2018	12/11/2018	8	0.00357		
	12/11/18 - 12/18/18		0.00058	0.01285	12/11/2018	12/18/2018	8	0.00463		
	12/18/18 - 12/26/18		0.00062	0.00516	12/18/2018	12/26/2018	9	0.00560		
	Boiler Dismantling Work Completed									
	12/26/18 - 1/2/19	El. 24' Southwest side of Boiler Containment	0.00055	0.00259	12/26/2018	1/2/2019	8	0.00443		
	1/2/19 - 1/8/19		0.00075	0.00251	1/2/2019	1/8/2019	7	0.00522		
	1/8/19 - 1/15/19		0.00036	0.00162	1/8/2019	1/15/2019	8	0.00284		
	1/15/19 - 1/23/19		0.00027	0.00155	1/15/2019	1/23/2019	9	0.00241		
	1/23/19 - 1/30/19		0.00037	0.00492	1/23/2019	1/30/2019	8	0.00297		
	1/30/19 - 2/5/19		0.00066	0.00328	1/30/2019	2/5/2019	7	0.00462		
	2/5/19 - 2/12/19		0.00068	0.02005	2/5/2019	2/12/2019	8	0.00542		
	2/12/19 - 2/19/19		0.00057	0.00358	2/12/2019	2/19/2019	8	0.00453		
	2/19/19 - 2/26/19		0.00077	0.00839	2/19/2019	2/26/2019	8	0.00619		
	2/26/19 - 3/5/19		0.00058	0.01266	2/26/2019	3/5/2019	8	0.00465		
	3/5/19 - 3/12/19		0.00035	0.00556	3/5/2019	3/12/2019	8	0.00281		
	3/12/19 - 3/19/19		0.00095	0.01715	3/12/2019	3/19/2019	8	0.00764		
	3/19/19 - 3/28/19		0.00054	0.00838	3/19/2019	3/28/2019	10	0.00544		
	3/28/19 - 4/4/19		0.00033	0.00116	3/28/2019	4/4/2019	8	0.00267		
	4/4/19 - 4/11/19		0.00043	0.00303	4/4/2019	4/11/2019	8	0.00341		
	4/11/19 - 4/18/19		0.00045	0.00140	4/11/2019	4/18/2019	8	0.00357		
	2		12/7/2016	Adjacent to El. 59' and El. 82' containment decon area at El. 56'	0.00093	0.00151	12/7/2016	12/7/2016	1	0.00093
			12/8/16 - 12/12/16		0.00063	0.00103	12/8/2016	12/12/2016	5	0.00315
		12/13/16 - 12/19/16	0.00040		0.00213	12/13/2016	12/19/2016	7	0.00278	
		12/19/16 - 12/21/16	0.00035		0.00182	12/19/2016	12/21/2016	3	0.00106	
12/21/16 - 12/23/16		0.00053	0.00224		12/21/2016	12/23/2016	3	0.00159		
12/23/16 - 12/28/16		0.00047	0.00207		12/23/2016	12/28/2016	6	0.00282		
12/28/16 - 1/5/17		0.00049	0.00287		12/28/2016	1/5/2017	9	0.00445		
1/5/17 - 1/13/17		0.00058	0.00334		1/5/2017	1/13/2017	9	0.00521		
1/13/17 - 1/27/17		0.00068	0.00969		1/13/2017	1/27/2017	15	0.01021		
1/27/17 - 1/29/17		0.00074	0.00133		1/27/2017	1/29/2017	3	0.00222		
1/29/17 - 2/7/17		0.00093	0.00430		1/29/2017	2/7/2017	10	0.00928		
2/7/17 - 2/21/17		0.00067	0.00570		2/7/2017	2/21/2017	15	0.00998		
2/21/17 - 3/14/17		0.00103	0.01017		2/21/2017	3/14/2017	22	0.02266		
3/15/17 - 3/28/17		0.00069	0.00551		3/15/2017	3/28/2017	14	0.00964		
3/28/17 - 3/30/17		0.00096	0.00997		3/28/2017	3/30/2017	3	0.00288		
3/30/17 - 4/7/17		0.00083	0.00798		3/30/2017	4/7/2017	9	0.00750		
4/7/17 - 4/20/17		0.00116	0.00689		4/7/2017	4/20/2017	14	0.01627		
4/20/17 - 4/27/17		0.00158	0.01174		4/20/2017	4/27/2017	8	0.01264		
4/27/17 - 5/1/17		0.00245	0.01054		4/27/2017	5/1/2017	5	0.01227		
5/1/17 - 5/24/17		0.00160	0.01334		5/1/2017	5/24/2017	24	0.03849		
5/24/17 - 5/30/17		0.00111	0.00124		5/24/2017	5/30/2017	372	0.41300		
5/30/17 - 6/2/17		0.00168	0.01177		5/30/2017	6/2/2017	4	0.00672		
6/3/17 - 6/26/17		0.00520	0.01492		6/3/2017	6/26/2017	24	0.12472		
6/26/17 - 7/5/17		0.00267	0.01104		6/26/2017	7/5/2017	10	0.02671		
7/5/17 - 7/11/17		0.00176	0.00462		7/5/2017	7/11/2017	7	0.01230		
7/11/17 - 7/18/17		0.00100	0.00464		7/11/2017	7/18/2017	8	0.00798		
7/18/17 - 8/4/17		0.00036	0.00653		7/18/2017	8/4/2017	18	0.00648		
8/4/17 - 9/13/17		0.00092	0.00466		8/4/2017	9/13/2017	41	0.03780		
9/13/17 - 10/4/17		0.00086	0.00569		9/13/2017	10/4/2017	22	0.01883		
10/4/17 - 10/12/17		0.00128	0.00516		10/4/2017	10/12/2017	9	0.01155		
10/12/17 - 10/25/17		0.00031	0.00275		10/12/2017	10/25/2017	14	0.00429		
10/25/17 - 10/31/17		0.00112	0.01291		10/25/2017	10/31/2017	7	0.00785		
10/31/17 - 11/7/17		0.00135	0.01496		10/31/2017	11/7/2017	8	0.01079		
11/7/17 - 11/15/17		0.00031	0.00275		11/7/2017	11/15/2017	9	0.00276		
11/15/17 - 11/20/17		0.00027	0.00119		11/15/2017	11/20/2017	6	0.00160		
11/21/17 - 11/28/17		0.00061	0.00212		11/21/2017	11/28/2017	8	0.00490		
11/29/17 - 12/5/17		0.00081	0.00710		11/29/2017	12/5/2017	7	0.00568		
12/20/17 - 1/2/18		0.00028	0.00266		12/20/2017	1/2/2018	14	0.00397		
1/2/18 - 1/9/18		0.00025	0.00146		1/2/2018	1/9/2018	8	0.00197		
1/18/18 - 1/22/18		0.00075	0.00292		1/18/2018	1/22/2018	5	0.00375		
1/22/18 - 1/30/18		0.00072	0.01157		1/22/2018	1/30/2018	9	0.00649		
1/30/18 - 2/6/18		0.00054	0.00126		1/30/2018	2/6/2018	8	0.00432		
2/6/18 - 2/13/18		0.00089	0.01582		2/6/2018	2/13/2018	8	0.00709		
2/13/18 - 2/28/18		0.00122	0.03372		2/13/2018	2/28/2018	16	0.01950		
2/28/18 - 3/6/18		0.00125	0.01759		2/28/2018	3/6/2018	7	0.00877		
3/6/18 - 3/15/18		0.00096	0.00859		3/6/2018	3/15/2018	10	0.00960		
3/15/18 - 3/23/18		0.00053	0.01171		3/15/2018	3/23/2018	9	0.00477		
3/23/18 - 3/27/18		0.00028	0.01479		3/23/2018	3/27/2018	5	0.00142		
3/27/18 - 4/4/18		0.00059	0.01486		3/27/2018	4/4/2018	9	0.00534		
4/4/18 - 4/16/18		0.00039	0.00521		4/4/2018	4/16/2018	13	0.00504		
4/16/18 - 4/26/18		0.00101	0.01232		4/16/2018	4/26/2018	11	0.01116		
4/27/18 - 5/4/18		0.00109	0.01421		4/27/2018	5/4/2018	8	0.00870		
5/4/18 - 5/7/18	0.00127	0.01299	5/4/2018	5/7/2018	4	0.00509				
5/7/18 - 5/14/18	0.00098	0.01367	5/7/2018	5/14/2018	8	0.00783				
5/14/18 - 5/22/18	0.00189	0.02818	5/14/2018	5/22/2018	9	0.01700				
5/22/18 - 5/29/18	0.00173	0.01421	5/22/2018	5/29/2018	8	0.01388				
5/29/18 - 6/5/18	0.00106	0.04002	5/29/2018	6/5/2018	8	0.00849				
6/5/18 - 6/12/18	0.00121	0.04106	6/5/2018	6/12/2018	8	0.00972				
6/12/18 - 6/19/18	0.00163	0.02491	6/12/2018	6/19/2018	8	0.01307				
6/20/18 - 6/26/18	0.00093	0.00874	6/20/2018	6/26/2018	7	0.00652				
6/26/18 - 7/3/18	0.00090	0.01207	6/26/2018	7/3/2018	8	0.00719				
7/3/18 - 7/10/18	0.00092	0.02352	7/3/2018	7/10/2018	8	0.00735				
7/10/18 - 7/12/18	0.00104	0.03069	7/10/2018	7/12/2018	3	0.00311				

TABLE 1
INDOOR AIR MONITORING SUMMARY
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

Monitor No.	Monitoring Period	Monitor Location	Mercury Vapor Concentration (mg/m ³)		Time Period			Concentration x Number of Days (mg-day/m ³)	
			Average	Maximum	Start	Finish	Number of Days		
2	7/12/18 - 7/17/18	Adjacent to El. 59' and El. 82' containment decon area at El. 56'	0.00057	0.02601	7/12/2018	7/17/2018	6	0.00343	
	7/17/18 - 7/24/18		0.00099	0.01692	7/17/2018	7/24/2018	8	0.00795	
	7/24/18 - 7/31/18		0.00068	0.01736	7/24/2018	7/31/2018	8	0.00542	
	7/31/18 - 8/7/18		0.00047	0.02933	7/31/2018	8/7/2018	8	0.00375	
	8/7/18 - 8/10/18		0.00053	0.00277	8/7/2018	8/10/2018	4	0.00211	
	8/10/18 - 8/21/18		0.00032	0.00407	8/10/2018	8/21/2018	12	0.00386	
	8/21/18 - 8/28/18		0.00038	0.00366	8/21/2018	8/28/2018	8	0.00305	
	8/28/18 - 9/4/18		0.00023	0.00190	8/28/2018	9/4/2018	8	0.00186	
	9/4/18 - 9/11/18		0.00015	0.00229	9/4/2018	9/11/2018	8	0.00122	
	9/11/18 - 9/18/18		0.00017	0.00625	9/11/2018	9/18/2018	8	0.00138	
	9/18/18 - 9/25/18		0.00017	0.00196	9/18/2018	9/25/2018	8	0.00136	
	9/25/18 - 10/2/18		0.00009	0.00103	9/25/2018	10/2/2018	8	0.00076	
	10/2/18 - 10/9/18		0.00013	0.00307	10/2/2018	10/9/2018	8	0.00101	
	10/9/18 - 10/16/18		0.00014	0.00182	10/9/2018	10/16/2018	8	0.00112	
	10/16/18 - 10/23/18		0.00029	0.01030	10/16/2018	10/23/2018	8	0.00236	
	10/23/18 - 10/30/18		0.00023	0.00460	10/23/2018	10/30/2018	8	0.00187	
	10/30/18 - 11/7/18		0.00013	0.00067	10/30/2018	11/7/2018	9	0.00114	
	11/7/18 - 11/13/18		0.00017	0.01124	11/7/2018	11/13/2018	7	0.00116	
	11/13/18 - 11/20/18	0.00009	0.00040	11/13/2018	11/20/2018	8	0.00075		
	11/20/18 - 11/27/18	0.00008	0.00021	11/20/2018	11/27/2018	8	0.00060		
	11/27/18 - 12/4/18	0.00025	0.00371	11/27/2018	12/4/2018	8	0.00201		
	12/4/18 - 12/11/18	0.00011	0.00071	12/4/2018	12/11/2018	8	0.00086		
	12/11/18 - 12/18/18	0.00014	0.00130	12/11/2018	12/18/2018	8	0.00114		
	12/18/18 - 12/26/18	0.00011	0.00104	12/18/2018	12/26/2018	9	0.00097		
	Boiler Dismantling Work Completed								
	12/26/18 - 1/2/19	0.000082	0.00021	12/26/2018	1/2/2019	8	0.00000		
	1/2/19 - 1/8/19	0.000114	0.00061	1/2/2019	1/8/2019	7	0.00057		
	1/8/19 - 1/15/19	0.000086	0.00018	1/8/2019	1/15/2019	8	0.00091		
	1/15/19 - 1/23/19	0.000156	0.00074	1/15/2019	1/23/2019	9	0.00077		
	1/23/19 - 1/30/19	0.000061	0.00009	1/23/2019	1/30/2019	8	0.00125		
	1/30/19 - 2/5/19	0.000068	0.00009	1/30/2019	2/5/2019	7	0.00042		
	2/5/19 - 2/12/19	0.000102	0.00029	2/5/2019	2/12/2019	8	0.00054		
	2/12/19 - 2/19/19	0.000111	0.00026	2/12/2019	2/19/2019	8	0.00081		
	2/19/19 - 2/26/19	0.000168	0.00184	2/19/2019	2/26/2019	8	0.00089		
	2/26/19 - 3/5/19	0.000111	0.00040	2/26/2019	3/5/2019	8	0.00134		
	3/5/19 - 3/12/19	0.000079	0.00019	3/5/2019	3/12/2019	8	0.00089		
	3/12/19 - 3/20/19	0.000147	0.00084	3/12/2019	3/20/2019	9	0.00071		
	3/20/19 - 3/28/19	0.000064	0.00009	3/20/2019	3/28/2019	9	0.00132		
3/28/19 - 4/4/19	0.000063	0.00007	3/28/2019	4/4/2019	8	0.00051			
4/4/19 - 4/11/19	0.000067	0.00010	4/4/2019	4/11/2019	8	0.00051			
4/11/19 - 4/18/19	0.000003	0.00004	4/11/2019	4/18/2019	8	0.00054			
3	5/18/17 - 5/30/17	Between Turbine #1 and Turbine #2 at El. 11'	0.00170	0.00933	5/18/2017	5/30/2017	13	0.00083	
	5/30/17 - 6/5/17		0.00230	0.01732	5/30/2017	6/5/2017	7	0.00044	
	6/6/17 - 6/29/17		0.00144	0.01454	6/6/2017	6/29/2017	24	0.00161	
	6/29/17 - 7/11/17		0.00139	0.00980	6/29/2017	7/11/2017	13	0.00003	
	7/11/17 - 7/21/17		0.00350	0.00876	7/11/2017	7/21/2017	11	0.01875	
	7/21/17 - 8/10/17		0.00039	0.00903	7/21/2017	8/10/2017	21	0.04837	
	8/10/17 - 8/22/17		0.00056	0.00563	8/10/2017	8/22/2017	13	0.01876	
	8/22/17 - 8/29/17		0.00044	0.00534	8/22/2017	8/29/2017	8	0.01115	
	8/29/17 - 9/5/17		0.00051	0.00391	8/29/2017	9/5/2017	8	0.02802	
	9/5/17 - 9/14/17		0.00139	0.00443	9/5/2017	9/14/2017	10	0.00394	
	9/14/17 - 10/4/17	0.00021	0.00146	9/14/2017	10/4/2017	21	0.01178		
	10/4/17 - 10/12/17	0.00096	0.00456	10/4/2017	10/12/2017	9	0.00394		
	10/12/17 - 10/24/17	0.00064	0.00903	10/12/2017	10/24/2017	13	0.00657		
	10/24/17 - 10/31/17	0.00039	0.01251	10/24/2017	10/31/2017	8	0.01110		
	10/31/17 - 11/7/17	0.00102	0.01414	10/31/2017	11/7/2017	8	0.00168		
	11/7/17 - 11/21/17	0.00044	0.00290	11/7/2017	11/21/2017	15	0.01439		
	11/21/17 - 11/28/17	0.00020	0.00804	11/21/2017	11/28/2017	8	0.00512		
	11/28/17 - 12/5/17	0.00013	0.00144	11/28/2017	12/5/2017	8	0.00309		
	12/5/17 - 12/20/17	0.00014	0.00444	12/5/2017	12/20/2017	16	0.01639		
	12/20/17 - 1/2/18	0.00026	0.00457	12/20/2017	1/2/2018	14	0.00620		
	1/2/18 - 1/9/18	0.00174	0.00765	1/2/2018	1/9/2018	8	0.00157		
	1/9/18 - 1/26/18	0.00015	0.00391	1/9/2018	1/26/2018	18	0.00240		
	1/26/18 - 1/30/18	0.00019	0.00144	1/26/2018	1/30/2018	5	0.00068		
	1/30/18 - 2/10/18	0.00015	0.00211	1/30/2018	2/10/2018	12	0.00317		
	2/10/18 - 2/14/18	0.00008	0.00011	2/10/2018	2/14/2018	5	0.00870		
	2/14/18 - 2/21/18	0.00013	0.00167	2/14/2018	2/21/2018	8	0.00123		
	2/21/18 - 2/28/18	0.00026	0.00146	2/21/2018	2/28/2018	8	0.00152		
	2/28/18 - 3/12/18	0.00038	0.00449	2/28/2018	3/12/2018	13	0.00201		
	3/12/18 - 3/23/18	0.00030	0.00104	3/12/2018	3/23/2018	12	0.00098		
	3/23/18 - 3/29/18	0.00067	0.01273	3/23/2018	3/29/2018	7	0.00090		
	3/29/18 - 4/4/18	0.00075	0.00226	3/29/2018	4/4/2018	7	0.00180		
	4/4/18 - 4/19/18	0.00048	0.00453	4/4/2018	4/19/2018	16	0.00610		
	4/19/18 - 4/27/18	0.00141	0.01254	4/19/2018	4/27/2018	9	0.00268		
	4/27/18 - 5/4/18	0.00125	0.01744	4/27/2018	5/4/2018	8	0.00535		
	5/4/18 - 5/8/18	0.00124	0.01233	5/4/2018	5/8/2018	5	0.00375		
	5/8/18 - 5/14/18	0.00115	0.01028	5/8/2018	5/14/2018	7	0.00336		
	5/14/18 - 5/22/18	0.00170	0.01481	5/14/2018	5/22/2018	9	0.01266		
	5/22/18 - 5/29/18	0.00056	0.00826	5/22/2018	5/29/2018	8	0.01002		
	5/29/18 - 6/5/18	0.00159	0.01226	5/29/2018	6/5/2018	8	0.00991		
	6/5/18 - 6/12/18	0.00239	0.02335	6/5/2018	6/12/2018	8	0.00916		
	6/12/18 - 6/19/18	0.00120	0.01943	6/12/2018	6/19/2018	8	0.01360		
	6/20/18 - 6/26/18	0.00090	0.01232	6/20/2018	6/26/2018	7	0.00392		
6/26/18 - 7/3/18	0.00162	0.01694	6/26/2018	7/3/2018	8	0.01270			
7/3/18 - 7/10/18	0.00127	0.00997	7/3/2018	7/10/2018	8	0.01909			
7/10/18 - 7/17/18	0.00111	0.01130	7/10/2018	7/17/2018	8	0.00959			
		South side of Former Coal Bunker at El. 56'							

TABLE 1
INDOOR AIR MONITORING SUMMARY
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 4 of 4
5/3/2019

Monitor No.	Monitoring Period	Monitor Location	Mercury Vapor Concentration (mg/m ³)		Time Period			Concentration x Number of Days (mg-day/m ³)	
			Average	Maximum	Start	Finish	Number of Days		
3	7/17/18 - 7/24/18	South east of the Unit #2 Boiler at El. 11'	0.00171	0.01155	7/17/2018	7/24/2018	8	0.00722	
	7/24/18 - 7/31/18		0.00171	0.04902	7/24/2018	7/31/2018	8	0.01293	
	7/31/18 - 8/7/18		0.00133	0.02817	7/31/2018	8/7/2018	8	0.01016	
	8/7/18 - 8/10/18	Adjacent to Unit #4 FD Fan at El. 11'	0.00046	0.00469	8/7/2018	8/10/2018	4	0.00444	
	8/10/18 - 8/16/18		0.00052	0.00275	8/10/2018	8/16/2018	7	0.01194	
	8/16/18 - 8/21/18		0.00020	0.00150	8/16/2018	8/21/2018	6	0.01025	
	8/21/18 - 8/26/18		0.00031	0.00157	8/21/2018	8/26/2018	6	0.00796	
	8/27/18 - 8/28/18		0.00028	0.00169	8/27/2018	8/28/2018	2	0.00093	
	8/28/18 - 9/4/18		0.00013	0.00101	8/28/2018	9/4/2018	8	0.00413	
	9/4/18 - 9/11/18		0.00016	0.00145	9/4/2018	9/11/2018	8	0.00157	
	9/12/18 - 9/18/18	East of Reclaim Room at El. 11'	0.00016	0.00109	9/12/2018	9/18/2018	7	0.00215	
	9/18/18 - 9/25/18		0.00013	0.00141	9/18/2018	9/25/2018	8	0.00222	
	9/25/18 - 10/2/18		0.00020	0.00415	9/25/2018	10/2/2018	8	0.00108	
	10/3/18 - 10/9/18		0.00018	0.00546	10/3/2018	10/9/2018	7	0.00114	
	10/9/18 - 10/16/18		0.00016	0.00275	10/9/2018	10/16/2018	8	0.00124	
	10/16/18 - 10/23/18		0.00017	0.00146	10/16/2018	10/23/2018	8	0.00108	
	10/23/18 - 10/30/18		0.00020	0.00371	10/23/2018	10/30/2018	8	0.00163	
	10/30/18 - 11/7/18		0.00012	0.00136	10/30/2018	11/7/2018	9	0.00159	
	11/7/18 - 11/13/18		0.00027	0.00816	11/7/2018	11/13/2018	7	0.00110	
	11/13/18 - 11/20/18		0.00011	0.00076	11/13/2018	11/20/2018	8	0.00137	
	11/20/18 - 11/27/18		0.00010	0.00056	11/20/2018	11/27/2018	8	0.00159	
	11/27/18 - 12/4/18		0.00017	0.00668	11/27/2018	12/4/2018	8	0.00093	
	12/4/18 - 12/11/18		0.00017	0.00795	12/4/2018	12/11/2018	8	0.00219	
	12/11/18 - 12/18/18		0.00028	0.02489	12/11/2018	12/18/2018	8	0.00088	
	12/18/18 - 12/26/18		0.00014	0.00828	12/18/2018	12/26/2018	9	0.00094	
	Boiler Dismantling Work Completed								
	12/26/18 - 1/2/19	East of Reclaim Room at El. 11'	0.00014	0.01758	12/26/2018	1/2/2019	8	0.00139	
	1/2/19 - 1/8/19		0.00012	0.00114	1/2/2019	1/8/2019	7	0.00119	
	1/8/19 - 1/15/19		0.00011	0.00079	1/8/2019	1/15/2019	8	0.00223	
	1/15/19 - 1/23/19		0.00014	0.00143	1/15/2019	1/23/2019	9	0.00129	
	1/23/19 - 1/30/19		0.00021	0.00293	1/23/2019	1/30/2019	8	0.00000	
	1/30/19 - 2/5/19		0.00015	0.00202	1/30/2019	2/5/2019	7	0.00100	
	2/5/19 - 2/12/19		0.00023	0.00457	2/5/2019	2/12/2019	8	0.00097	
2/12/19 - 2/19/19	0.00019		0.00365	2/12/2019	2/19/2019	8	0.00086		
2/19/19 - 2/26/19	0.00037		0.01008	2/19/2019	2/26/2019	8	0.00113		
2/26/19 - 3/5/19	0.00032		0.01184	2/26/2019	3/5/2019	8	0.00171		
3/5/19 - 3/12/19	0.00024		0.00459	3/5/2019	3/12/2019	8	0.00122		
3/12/19 - 3/20/19	0.00006		0.00008	3/12/2019	3/20/2019	9	0.00209		
3/20/19 - 3/28/19	0.00036		0.01307	3/20/2019	3/28/2019	9	0.00169		
3/28/19 - 4/4/19	0.00016		0.00394	3/28/2019	4/4/2019	8	0.00293		
4/4/19 - 4/11/19	0.00012		0.00222	4/4/2019	4/11/2019	8	0.00255		
4/11/19 - 4/13/19	0.00014		0.00114	4/11/2019	4/13/2019	3	0.00072		
4/15/19 - 4/18/19	0.00012		0.00109	4/15/2019	4/18/2019	4	0.00024		
Sum (Whole Monitoring Period)							3010	2.48	
Daily Average mg/m³ (Whole Monitoring Period) = sum of (Average Concentration x Number of Days)/sum of (Number of Days)								0.00083	
Sum (Post-Dismantling)							386	0.104	
Daily Average mg/m³ (Post-Dismantling) = sum of (Average Concentration x Number of Days)/sum of (Number of Days)								0.00027	

- Notes:
1. Boiler dismantling and mercury removal work already commenced prior to installation of Lumex monitors.
 2. Vapor monitoring was performed with Lumex RA915+ Mercury Vapor Analyzers.
 3. Mercury vapor analyzers were deployed at locations outside of the contained dismantling activities, and at locations intended to monitor general plant worker exposure potential
 4. Grey-highlighted results represent post-dismantling conditions.

TABLE 2
RISK-BASED SCREENING LEVEL DERIVATION FOR NON-POROUS SURFACE
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 1 of 1
5/3/2019

RISK CHARACTERIZATION EQUATIONS

HI=ADI/RfD

Where:

HI = Hazard Index
ADI = Average Daily Dose
RfD = Reference Dose

Calculation of Risk-Based Screening Value for Wipe Samples

	Parameter	Definition	Unit	Value	Reference
Ingestion		$C_{wipe} = \frac{RfD \times HQ \times UCF}{2 \times CNST_{ing}}$	ug/m2	6064	Calculated
Dermal		$C_{wipe} = \frac{RfD \times fgi \times HQ \times UCF}{2 \times ABS_{der} \times CNST_{der}}$	ug/m2	37796	Calculated
Ingestion + Dermal		$C_{wipe} = \frac{RfD \times HI \times UCF}{2 \times (ABS_{der} \times CNST_{der} / fgi + CNST_{ing})}$	ug/m2	5226	Calculated
			ug/wipe, or ug/100cm²	52	Calculated

Where:

HQ =	Hazard Quotient				
HI =	Target Hazard Index			1.0	
RfD =	Oral Reference Dose		mg/kg-day	3E-04	IRIS, 1995 for mercuric chloride
UCF =	Unit Conversion Factor		ug/mg	1000	
ABS _{der} =	dermal absorption (fraction)			0.001	USEPA Region 3, https://www.epa.gov/risk/assessing-dermal-exposure-soil
fgi	fractional GI absorption			1	
	$CNST_{der} = \frac{SA_d \times CF \times TE \times EF \times ED}{BW \times AT \times UCF2}$		m ² /kg-day	4.0E-03	Calculated
	$CNST_{ing} = \frac{SA_i \times CF \times TE \times fdo \times EF \times ED}{BW \times AT \times UCF2}$		m ² /kg-day	2.5E-05	Calculated

Where:	SA _d =	skin surface area	cm ² /event	5070	DiBiasio et al. (2003)
	SA _i =	skin surface area, ingestion	cm ² /event	790	DiBiasio et al. (2003)
	CF =	contact frequency	events/day	8	DiBiasio et al. (2003)
	BW =	body weight	kg	70	DiBiasio et al. (2003)
	AT =	averaging time - non-cancer	days	9125	DiBiasio et al. (2003)
	EF =	exposure frequency	days/yr	250	DiBiasio et al. (2003)
	ED =	exposure duration	yr	25	DiBiasio et al. (2003)
	TE =	surface-to-skin transfer efficiency		0.1	DiBiasio et al. (2003)
	fdo =	fraction transferred from dermal-to-oral		0.04	DiBiasio et al. (2003)
	UCF2=	unit conversion factor	cm ² /m ²	1E+04	

Notes:

- The equations and default exposure assumptions from Karen DiBiasio et al (2003) Human Health Risk Evaluation of Structural Surfaces Contaminated with Metals.

TABLE 3
SAMPLING SUMMARY TABLE
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 1 of 1
5/3/2019

Location	Porous Surfaces				Non-Porous Surfaces												
	Floor Bulk Sample	Wall Bulk Sample	Pedestal Bulk Sample Horizontal	Pedestal Bulk Sample Vertical	Beam Wipe Horizontal	Beam Wipe Horizontal Incline	Beam Wipe Vertical	Column Wipe Vertical	Cross Beam Horizontal	Cross Beam Horizontal Incline	Cross Bracing Horizontal Incline	Floor Wipe	Girt Horizontal	Stair Stringer	Stair Stringer Vertical	Wall Wipe	Other
El. 11'	43	24	6	4	0	0	15	13	0	0	0	2	0	2	0	0	0
El. 24'	12	12	0	0	11	2	0	9	0	0	0	4	0	0	0	6	0
El. 36'	27	7	0	0	9	0	0	6	0	1	3	2	2	0	0	8	1
El. 49' and 56'	3	2	0	0	17	0	0	10	2	0	0	5	7	0	1	10	5
El. 69'	0	0	0	0	4	0	1	7	0	1	0	0	3	0	0	2	0
El. 82' and 95'	2	0	0	0	12	0	0	4	0	1	0	3	3	0	0	15	1
Totals	87	45	6	4	53	2	16	49	2	3	3	16	15	2	1	41	7

Notes:

1. Refer to Table 4 for descriptions of non-porous surface samples designated as "Other".

TABLE 4
LABORATORY ANALYTICAL RESULTS FOR NON-POROUS SURFACES
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 1 of 3
5/3/2019

Floor Elevation	Sample Measured Elevation	Sample Name	Sample Date	Surface Type	Surface Description	Paint Color	Paint Condition	General notes	Mercury Concentration (ug/100cm ²)
11	15	W-1179	3/29/2019	Column Wipe Vertical	Steel	Gray	Damaged	Column near stack foundation	0.465
11	15	W-1180	3/29/2019	Stair Stringer	Steel	Gray	Damaged	Stair stringer south of stack foundation	0.82
11	14	W-1181	3/29/2019	Stair Stringer	Steel	Gray	Damaged	East face of stair stringer at bottom of stairwell to south of stack foundation	0.166
11	15	W-1182	3/29/2019	Column Wipe Vertical	Steel	Gray	Damaged	East face of column adjacent to boiler leak gear door	0.218
11	23	W-1183	3/29/2019	Beam Wipe Vertical	Steel			North face of beam above office just north of south elevator	1.06
11	21	W-1184	3/29/2019	Beam Wipe Vertical	Steel	Gray	Damaged	Center of south beam of boiler #2 pit	1.35
11	18	W-1185	3/29/2019	Column Wipe Vertical	Concrete	Gray	Damaged	Northwest column of boiler 2 pit	0.525
11	23	W-1186	3/29/2019	Beam Wipe Vertical	Steel	Gray	Damaged	Beam adjacent to compressed air tank to northwest of boiler #2 pit	0.438
11	15	W-1187	3/29/2019	Column Wipe Vertical	Steel	Gray	Damaged	East face of southeast column of boiler #1 pit	0.318
11	22	W-1188	3/29/2019	Beam Wipe Vertical	Steel	Gray	Damaged	Center of west face of west center beam of boiler #1 pit	0.079
11	22	W-1189	3/29/2019	Beam Wipe Vertical	Steel	Gray	Damaged	Center of south face of north beam of boiler #1 pit	0.116
11	15	W-1190	3/29/2019	Column Wipe Vertical	Steel	Gray	Intact	South face of northeast column of boiler #1 pit	0.275
11	15	W-1191	3/29/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged	East face of column on east side of north elevator	2.61
11	23.5	W-1192	3/29/2019	Beam Wipe Vertical	Steel	Gray	Damaged	Southface at west end of north beam of pit to east of boiler #2 pit	0.769
11	22	W-1193	3/29/2019	Beam Wipe Vertical	Steel	Gray	Slightly Damaged	West face of south end of east beam of boiler #2 pit	0.712
11	17	W-1194	3/29/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged	Boiler pit #2, southeast column, west face	0.404
11	11	W-1195	3/29/2019	Floor Wipe	Steel	Black	Damaged	Plate on ground adjacent to unit 4 switch board	2.56
11	16	W-1196	3/29/2019	Beam Wipe Vertical	Steel	Gray	Slightly Damaged	Beam to west of KAYDON a Turbo-Tec Turbine Oil Conditioner	17.3
11	14	W-1197	3/29/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged	North face of column to south east of north elevator	0.549
11	23	W-1198	3/29/2019	Beam Wipe Vertical	Steel	Gray	Slightly Damaged	West face of beam to east of north elevator	0.382
11	23.5	W-1199	3/29/2019	Beam Wipe Vertical	Steel	Gray	Slightly Damaged	West face of beam to east of north elevator	0.716
11	15	W-1200	3/29/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged	North face of column to northeast of north elevator	1.08
11	23	W-1201	3/29/2019	Beam Wipe Vertical	Steel	Gray	Slightly Damaged	South face of north beam of crane bay to northeast of north elevator	78.4
11	20	W-1202	3/29/2019	Beam Wipe Vertical	Steel	Gray	Slightly Damaged	South face of beam in northeast corner	0.248
11	14	W-1203	3/29/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged	North face of column in northeast corner	0.095
11	23	W-1204	3/29/2019	Beam Wipe Vertical	Steel	Gray	Slightly Damaged	East face of beam to east of northeast stairwell	1.68
11	23	W-1205	3/29/2019	Beam Wipe Vertical	Steel	Gray	Slightly Damaged	North face of beam adjacent to northeast stairwell	1.08
11	15	W-1206	3/29/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged	East face of column to southwest of machine shop	0.172
11	11	W-1207	3/29/2019	Floor Wipe	Steel	Red	Slightly Damaged	Steel plate on floor near entrance to locker room	0.565
11	15	W-1208	3/29/2019	Beam Wipe Vertical	Steel	Gray	Slightly Damaged	Cross face to west of spare parts storage	0.386
11	16	W-1209	3/29/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged	North face of southwest column of spare parts storage	0.762
11	14	W-1210	3/29/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged	West face of steel column beneath south turbine deck	0.682
24	24	W-1144	3/15/2019	Floor Wipe	Steel				0.373
24	28.5	W-1145	3/18/2019	Column Wipe Vertical	Steel	Gray	Damaged		1.54
24	24	W-1146	3/18/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		1.23
24	24	W-1147	3/18/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		0.883
24	24	W-1148	3/18/2019	Beam Wipe Horizontal	Steel	Gray	Slightly Damaged		0.309
24	29.25	W-1149	3/18/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged		0.341
24	28	W-1150	3/18/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		1.75
24	27.5	W-1151	3/18/2019	Beam Wipe Horizontal	Steel	Gray	Slightly Damaged		0.698
24	28	W-1152	3/18/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged		0.043
24	29.25	W-1153	3/18/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged		0.643
24	32.5	W-1154	3/18/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged		1.48
24	29	W-1155	3/18/2019	Wall Wipe	Steel	Gray	Intact		0.21
24	30	W-1156	3/18/2019	Wall Wipe	Steel	Gray	Intact		0.097
24	27.75	W-1157	3/18/2019	Beam Wipe Horizontal	Steel	Beige	Slightly Damaged		12.1
24	29.5	W-1158	3/18/2019	Column Wipe Vertical	Steel	Gray	Intact		0.086
24	27.75	W-1160	3/18/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		16.3
24	27	W-1161	3/18/2019	Column Wipe Vertical	Steel	Gray	Damaged		0.173
24	24	W-1162	3/20/2019	Floor Wipe	Steel	Red	Damaged	#1 Load Center, floor, adjacent to entrance to East	0.654
24	29.25	W-1163	3/21/2019	Wall Wipe	Steel	Gray	Intact	South exterior wall of #1 Load Center 12 feet east of entrance	0.086
24	24	W-1164	3/21/2019	Beam Wipe Horizontal	Steel	Gray	Intact	East end of beam spanning south side of pit to east of Boiler 1 Pit	0.686
24	24	W-1165	3/21/2019	Beam Wipe Horizontal	Steel	Gray	Slightly Damaged	West end of beam at North side of Northeast corner below south turbine deck	1.31
24	28.5	W-1166	3/21/2019	Beam Wipe Horizontal Incline	Steel	Gray	Damaged	North 45 degree beam on east exterior wall of #2 Load Center	51.1
24	28	W-1167	3/21/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged	Column to south of southeast corner of pit to east of boiler 2 pit	5.56
24	24	W-1168	3/21/2019	Beam Wipe Horizontal	Steel	Gray	Damaged	West end of beam 4 feet North of south end of pit to east of boiler 2 pit	21.9
24	24	W-1169	3/21/2019	Floor Wipe	Other - Linoleum flooring		Intact	Men's locker room floor center of bathroom between sinks	0.201
24	29	W-1170	3/21/2019	Beam Wipe Horizontal Incline	Steel	Gray	Slightly Damaged	East stairwell stringer of stairwell up to EL 36 on west side of crane bay	0.037
24	29	W-1171	3/21/2019	Column Wipe Vertical	Steel		Intact	Column in Northeast corner of crane bay on North wall to east of garage door adjacent to vending machines	0.087
24	26.5	W-1172	3/21/2019	Wall Wipe	Steel	Gray	Intact	North end of east wall of crane bay behind ice machine	<0.020
24	30.5	W-1173	3/21/2019	Wall Wipe	Steel	Gray	Intact	East wall of crane bay adjacent to I&C Dept entrance	0.021
24	24	W-1174	3/21/2019	Beam Wipe Horizontal	Steel	Gray	Damaged	Beam adjacent to walkway to southeast of mechanical room behind crane bay	3.02
24	26	W-1175	3/21/2019	Wall Wipe	Steel	Gray	Slightly Damaged	North exterior wall of office at end of walkway on east wall of crane bay to south of mechanical room	0.073
24	24	W-1178	3/18/2019	Floor Wipe	Steel			Steel plate on walkway 6 feet northwest of northwest corner of stack pit. Sample ID was duplicated during sampling. ID changed from W-1144 to W-1178 during QA/QC.	1.97
36	42	W-1114	3/14/2019	Other - Staircase diamond plate angle iron	Steel		Intact	Staircase to rear building (next to old stack)	0.356
36	40	W-1115	3/14/2019	Wall Wipe	Steel	Gray	Intact	Under staircase	0.03
36	45	W-1116	3/14/2019	Girt Horizontal	Steel	Gray	Damaged	Girt under window, paint peeling	0.127
36	42.5	W-1117	3/14/2019	Wall Wipe	Other - Galbestos paneling	Gray	Slightly Damaged		0.084
36	40	W-1118	3/14/2019	Girt Horizontal	Steel	Gray	Damaged	Girt next to staircase	0.691
36	40	W-1119	3/14/2019	Wall Wipe	Steel	Gray	Intact	Next to opening to rear building	0.03

TABLE 4
LABORATORY ANALYTICAL RESULTS FOR NON-POROUS SURFACES
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 2 of 3
5/3/2019

Floor Elevation	Sample Measured Elevation	Sample Name	Sample Date	Surface Type	Surface Description	Paint Color	Paint Condition	General notes	Mercury Concentration (ug/100cm ²)
36	44	W-1120	3/14/2019	Wall Wipe	Steel	Green	Intact	Above door with Red painted doorframe	0.03
36	45	W-1121	3/14/2019	Beam Wipe Horizontal	Steel		Intact	Inside beam	0.263
36	45	W-1122	3/14/2019	Beam Wipe Horizontal	Steel	Gray	Intact		0.061
36	36	W-1123	3/14/2019	Beam Wipe Horizontal	Steel	Red	Intact	Beam near boiler, three feet in from column	1.37
36	36	W-1124	3/14/2019	Beam Wipe Horizontal	Steel	Red	Slightly Damaged		12.7
36	41	W-1125	3/14/2019	Column Wipe Vertical	Steel	Beige	Slightly Damaged	Outer beam facing away from boiler	2.53
36	36	W-1126	3/14/2019	Beam Wipe Horizontal	Steel	Red	Intact		48.7
36	36	W-1127	3/14/2019	Column Wipe Vertical	Steel	Gray	Intact		0.082
36	41	W-1128	3/14/2019	Column Wipe Vertical	Steel	Gray	Intact		0.038
36	36	W-1129	3/14/2019	Beam Wipe Horizontal	Steel	Red	Intact		95.3
36	41	W-1130	3/14/2019	Wall Wipe	Other - Metal exterior office wall	Gray	Intact		0.575
36	40	W-1131	3/14/2019	Column Wipe Vertical	Steel	Beige	Intact		<0.020
36	41	W-1132	3/15/2019	Cross Beam Horizontal Incline	Steel	Gray	Slightly Damaged		5.71
36	44	W-1133	3/15/2019	Column Wipe Vertical	Steel	Gray	Intact		0.79
36	35	W-1134	3/15/2019	Beam Wipe Horizontal	Steel	Gray	Intact		0.069
36	36	W-1135	3/15/2019	Floor Wipe	Steel	Gray	Intact		0.057
36	43.5	W-1136	3/15/2019	Cross Bracing Horizontal Incline	Steel	Gray	Intact	Next to control room office door	<0.020
36	38	W-1137	3/15/2019	Beam Wipe Horizontal	Steel	Gray	Intact		<0.020
36	43	W-1138	3/15/2019	Wall Wipe	Steel	Gray	Intact	Control room wall	0.126
36	44	W-1139	3/15/2019	Cross Bracing Horizontal Incline	Steel	Gray	Intact		0.072
36	36	W-1140	3/15/2019	Beam Wipe Horizontal	Steel	Gray	Intact		<0.020
36	42	W-1141	3/15/2019	Column Wipe Vertical	Steel	Green	Intact	Column by day door.	<0.020
36	42	W-1142	3/15/2019	Wall Wipe	Steel	Gray	Intact	Office wall next to air conditioner/stairs.	0.04
36	39	W-1143	3/15/2019	Wall Wipe	Steel	Gray	Intact	Office wall between door and air conditioner	0.046
36	36	W-1159	3/21/2019	Floor Wipe	Other - LNoleum flooring	Other	Slightly Damaged	Center of planning office floor	0.09
36	48	W-1176	3/21/2019	Cross Bracing Horizontal Incline	Steel	Gray	Slightly Damaged	Cross bracing adjacent to North wall of turbine deck on roof of planning office	3.98
49	52	W-1097	3/12/2019	Girt Horizontal	Steel	Gray	Slightly Damaged		0.108
49	54	W-1098	3/12/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged		<0.020
49	49	W-1099	3/12/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		9.5
49	49	W-1100	3/12/2019	Other - Kickplate (Vertical)	Steel	Gray	Intact		1.37
49	49	W-1101	3/12/2019	Beam Wipe Horizontal	Steel	Gray/Red	Damaged		0.528
49	52	W-1102	3/12/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged		0.123
49	49	W-1103	3/12/2019	Other - Grating beam	Steel	Brown/Red	Damaged		0.809
49	55.5	W-1104	3/12/2019	Wall Wipe	Steel	Gray	Intact	On elevator outer wall	0.077
49	49	W-1105	3/12/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		2.71
49	59	W-1106	3/12/2019	Beam Wipe Horizontal	Steel	Gray	Slightly Damaged		1.47
49	58	W-1107	3/12/2019	Beam Wipe Horizontal	Steel	Gray	Intact		0.509
49	49	W-1108	3/12/2019	Other - Angle iron on floor beam	Steel	Gray	Intact		1.11
49	53	W-1109	3/12/2019	Column Wipe Vertical	Steel	Gray	Intact		0.184
49	55	W-1110	3/12/2019	Wall Wipe	Other - Galbestos paneling	Gray	Damaged		0.089
49	56	W-1111	3/12/2019	Girt Horizontal	Steel	Gray	Damaged		1.54
49	48	W-1112	3/12/2019	Beam Wipe Horizontal	Steel	Gray	Slightly Damaged		1.83
49	54	W-1113	3/12/2019	Column Wipe Vertical	Steel				<0.020
49	49	W-1177	3/21/2019	Column Wipe Vertical	Steel	Gray	Damaged	Column south or cross bracing adjacent to North wall of turbine deck on roof of planning office	0.53
56	64.5	W-1058	3/11/2019	Wall Wipe	Steel	Gray	Intact		0.31
56	69	W-1059	3/11/2019	Girt Horizontal	Steel	Gray	Intact	More dust than average, on top of third panel up	0.263
56	62	W-1060	3/11/2019	Wall Wipe	Steel	Gray	Intact		0.348
56	64	W-1061	3/11/2019	Cross Beam Horizontal	Steel	Gray	Intact		0.151
56	69	W-1062	3/11/2019	Wall Wipe	Steel	Gray	Intact	Sampled bottom of fourth panel high	<0.020
56	59	W-1063	3/11/2019	Floor Wipe	Steel	No paint	Intact	Rusted Steel floor	20.5
56	59	W-1064	3/11/2019	Floor Wipe	Steel	Rusted Steel floor			15.3
56	59	W-1065	3/11/2019	Beam Wipe Horizontal	Steel	Beige	Damaged		9.52
56	63	W-1066	3/11/2019	Column Wipe Vertical	Steel	Beige	Slightly Damaged		17.7
56	64	W-1067	3/11/2019	Wall Wipe	Steel	Gray	Intact		0.469
56	64	W-1068	3/11/2019	Column Wipe Vertical	Steel	Beige and Red	Damaged		0.259
56	59	W-1069	3/11/2019	Other - Floor plate	Steel				2.87
56	59	W-1070	3/11/2019	Floor Wipe	Steel				4.98
56	59	W-1071	3/11/2019	Floor Wipe	Steel			Sampled floorplate	0.408
56	69	W-1072	3/11/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		0.36
56	63	W-1073	3/11/2019	Wall Wipe	Steel	Green	Intact		0.039
56	67	W-1074	3/11/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		0.292
56	59	W-1075	3/11/2019	Floor Wipe	Steel			Sampled baseplate (kick plate)	0.379
56	59	W-1076	3/11/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		1.79
56	68	W-1077	3/11/2019	Beam Wipe Horizontal	Steel	Gray	Intact		1.95
56	64.5	W-1078	3/11/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged		0.035
56	61	W-1079	3/11/2019	Girt Horizontal	Steel	Gray	Intact		1.78
56	65	W-1080	3/11/2019	Wall Wipe	Other - Galbestos paneling	Gray	Intact		0.108
56	59	W-1081	3/11/2019	Beam Wipe Horizontal	Steel	Gray	Intact		0.938
56	59	W-1082	3/11/2019	Beam Wipe Horizontal	Steel	Gray	Intact		0.423
56	62	W-1083	3/11/2019	Cross Beam Horizontal	Steel	Gray	Intact		0.289
56	63	W-1084	3/11/2019	Column Wipe Vertical	Steel	Gray	Damaged	Paint severely chipping/peeling	12.4
56	59	W-1085	3/11/2019	Beam Wipe Horizontal	Steel	Gray	Slightly Damaged	Beam adjacent to stairs	0.372
56	59	W-1086	3/11/2019	Beam Wipe Horizontal	Steel	Gray	Intact		0.202
56	61	W-1087	3/11/2019	Girt Horizontal	Steel	Gray/Red	Damaged	Paint is peeling	0.153

TABLE 4
LABORATORY ANALYTICAL RESULTS FOR NON-POROUS SURFACES
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 3 of 3
5/3/2019

Floor Elevation	Sample Measured Elevation	Sample Name	Sample Date	Surface Type	Surface Description	Paint Color	Paint Condition	General notes	Mercury Concentration (ug/100cm ²)
56	60	W-1088	3/12/2019	Beam Wipe Horizontal	Steel	Red/Gray	Damaged	Below window, peeling paint	0.173
56	63	W-1089	3/12/2019	Wall Wipe	Other - Galbestos paneling	Gray	Slightly Damaged		0.052
56	62	W-1090	3/12/2019	Column Wipe Vertical	Steel	Gray	Intact		0.061
56	59	W-1091	3/12/2019	Other - Foot plate on beam	Steel	Gray	Intact	Floor plate on top of beam	0.35
56	65	W-1092	3/12/2019	Wall Wipe	Other - Galbestos paneling	Gray	Damaged		0.047
56	60	W-1093	3/12/2019	Girt Horizontal	Steel	Gray/Red	Damaged	Paint peeling	0.401
56	62	W-1094	3/12/2019	Girt Horizontal	Steel	Gray/Red	Damaged	Sampled in duct, above average amount of dust	0.669
56	57	W-1095	3/12/2019	Stair Stringer Vertical	Steel	Gray	Intact	On vertical plate of staircase beam	0.191
56	59	W-1096	3/12/2019	Beam Wipe Horizontal	Steel	Gray	Slightly Damaged		0.079
69	74	W-1040	3/5/2019	Beam Wipe Vertical	Steel	Beige/Red/green	Damaged	Multiple paint layers	0.094
69	70.5	W-1041	3/5/2019	Wall Wipe	Steel	Green	Intact	On wall near staircase platform	<0.020
69	75	W-1042	3/5/2019	Beam Wipe Horizontal	Steel	Green	Intact		0.02
69	69	W-1043	3/5/2019	Beam Wipe Horizontal	Steel	Beige/Red/black	Damaged	Paint is peeling away	0.198
69	74	W-1044	3/5/2019	Column Wipe Vertical	Steel	Gray/Red	Damaged	Peeling paint	0.101
69	75	W-1045	3/5/2019	Column Wipe Vertical	Steel	Gray/Red	Slightly Damaged	Inside beam facing old boiler	0.023
69	74.5	W-1046	3/5/2019	Column Wipe Vertical	Steel	Gray/Red	Slightly Damaged	Above newly installed and painted railing	0.03
69	69	W-1047	3/5/2019	Girt Horizontal	Steel	Gray/Red	Damaged		0.69
69	75	W-1048	3/5/2019	Column Wipe Vertical	Steel	Gray/Red	Damaged		0.14
69	69	W-1049	3/5/2019	Girt Horizontal	Steel	Gray/Red	Damaged		0.677
69	72	W-1050	3/5/2019	Cross Beam Horizontal Incline	Steel	Gray	Intact	Angled crossbeam	<0.020
69	69	W-1051	3/5/2019	Beam Wipe Horizontal	Steel	Gray	Damaged	Sampled upper portion of metal	0.188
69	73	W-1052	3/5/2019	Column Wipe Vertical	Steel	Gray	Damaged	More dust than average amount	1.06
69	75	W-1053	3/6/2019	Wall Wipe	Other - Galbestos paneling	Gray	Damaged	Paint peeling	0.376
69	69	W-1054	3/5/2019	Girt Horizontal	Steel	Gray	Damaged	Moved template and cleaned/samples areas adjacent to each Other to reach 10cm*2	1.33
69	72	W-1055	3/5/2019	Column Wipe Vertical	Steel	Gray/Red	Damaged		0.08
69	68	W-1056	3/5/2019	Beam Wipe Horizontal	Steel	Gray/Red	Damaged	Moved template and cleaned adjacent area to cover 10cm*2	0.141
69	69	W-1057	3/5/2019	Column Wipe Vertical	Steel	Gray	Slightly Damaged		0.525
82	87.5	W-1014	3/4/2019	Wall Wipe	Other - Galbestos panel	Gray	Intact	Between the window and door	<0.020
82	89	W-1015	3/4/2019	Girt Horizontal	Steel	Gray	Damaged	Previously 1 inch of dust	0.095
82	89.5	W-1016	3/5/2019	Cross Beam Horizontal Incline	Steel	Gray	Intact		0.039
82	83.5	W-1017	3/4/2019	Girt Horizontal	Steel	Gray	Intact		0.025
82	88	W-1018	3/4/2019	Wall Wipe	Other - Galbestos paneling	Gray	Intact	Multiple layers of paint (black, white, Gray)	<0.020
82	88	W-1019	3/4/2019	Girt Horizontal	Steel	Gray	Intact	Rust circle and horizontal paint peeling present	0.072
82	82	W-1020	3/4/2019	Beam Wipe Horizontal	Steel	Gray/Red	Intact	Multiple layers of paint (Red, Gray, black)	0.027
82	87	W-1021	3/4/2019	Wall Wipe	Other - Galbestos paneling	Gray/black	Damaged	Approximately 1 foot right of window	0.068
82	88.5	W-1022	3/4/2019	Wall Wipe	Steel	Gray	Intact		0.03
82	82.5	W-1023	3/4/2019	Beam Wipe Horizontal	Steel	Gray	Damaged	Paint is worn	0.729
82	94	W-1024	3/4/2019	Beam Wipe Horizontal	Steel	Gray	Slightly Damaged	On stair platform to mezzanine (to the right)	0.045
82	87	W-1025	3/4/2019	Wall Wipe	Concrete	Gray	Intact		0.034
82	83	W-1026	3/4/2019	Wall Wipe	Steel	Gray	Slightly Damaged	Under mezzanine staircase	0.034
82	83	W-1027	3/4/2019	Wall Wipe	Steel	Gray	Slightly Damaged		0.051
82	100	W-1028	3/4/2019	Wall Wipe	Steel	Gray	Damaged	Corroded	0.04
82	87	W-1029	3/4/2019	Column Wipe Vertical	Steel	Gray, white, Red, black	Slightly Damaged	Multiple paint colors	<0.020
82	87	W-1030	3/4/2019	Column Wipe Vertical	Steel	Gray	Intact		0.055
82	82	W-1031	3/4/2019	Beam Wipe Horizontal	Steel	Gray	Intact		0.151
82	85	W-1032	3/4/2019	Column Wipe Vertical	Steel	Beige and Red	Intact	Boiler beam	0.466
82	82	W-1033	3/4/2019	Beam Wipe Horizontal	Steel	Gray	Damaged		0.388
82	82	W-1034	3/4/2019	Beam Wipe Horizontal	Steel	Beige, Red	Slightly Damaged	Boiler beam	0.104
82	88	W-1035	3/4/2019	Column Wipe Vertical	Steel	Gray	Damaged	Multiple paint colors	0.035
82	86	W-1036	3/4/2019	Wall Wipe	Steel	Gray	Intact	Elevator room wall	0.117
82	87	W-1037	3/4/2019	Wall Wipe	Steel	Gray	Intact	Inside elevator, on the east wall looking in behind protective covers	<0.020
82	98	W-1038	3/6/2019	Beam Wipe Horizontal	Steel	Gray	Damaged	On mezzanine beam	14
82	98	W-1039	3/6/2019	Beam Wipe Horizontal	Steel	Gray	Damaged	On mezzanine beam	3.62
95	100	W-1001	3/4/2019	Wall Wipe	Other - Galbestos panel	No paint, off white panel			<0.020
95	94	W-1002	3/4/2019	Floor Wipe	Steel	Red/black	Intact		0.027
95	100	W-1003	3/4/2019	Wall Wipe	Other - Galbestos panel	Gray	Intact		0.021
95	98	W-1004	3/4/2019	Wall Wipe	Steel	Gray	Intact		0.293
95	94	W-1005	3/4/2019	Floor Wipe	Steel	Red/black	Intact		0.047
95	100.5	W-1006	3/4/2019	Beam Wipe Horizontal	Steel	Gray	Intact		0.036
95	95	W-1007	3/4/2019	Beam Wipe Horizontal	Concrete	Red	Intact		0.407
95	100.5	W-1008	3/4/2019	Beam Wipe Horizontal	Steel	Gray	Intact		<0.020
95	97	W-1009	3/4/2019	Other - Window Wipe	Other - Glass		Intact		<0.020
95	94	W-1010	3/4/2019	Floor Wipe	Steel	Red/black	Intact		<0.020
95	102	W-1011	3/4/2019	Wall Wipe	Steel	Gray	Intact		<0.020
95	104	W-1012	3/4/2019	Beam Wipe Horizontal	Steel	Gray	Intact		0.026
95	104.5	W-1013	3/4/2019	Wall Wipe	Steel	Gray	Intact	Approximately 10.5 feet off ground	<0.020

Notes:

1. "<0.020" indicates the mercury result was not detected above the laboratory reporting limit to the right.
2. Bold, shaded results were detected at a concentration above the risk-based screening value of 52 ug/100 cm².

TABLE 5
LABORATORY ANALYTICAL RESULTS FOR POROUS SURFACES
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 1 of 5
5/3/2019

Floor Elevation	Sample Measured Elevation	Sample Name	Sample Date	Surface Type	Surface Description	Paint Color	Paint Condition	General notes	Mercury Concentration (mg/kg)
11	15	C-1067	3/28/2019	Wall Bulk Sample	Concrete		Intact		28.2
11	11	C-1068	3/28/2019	Floor Bulk Sample	Concrete		Intact	C-1068 HgX @ 0909 3/27 Rinsed @ 1011 3/28	3.8
11	11	C-1069	3/28/2019	Floor Bulk Sample	Concrete		Intact	C-1069 HgX @ 0915 3/27 Rinsed @ 1013 3/28	15.9
11	11	C-1070	3/28/2019	Floor Bulk Sample	Concrete			C-1070 HgX @ 0930 3/27 Rinsed @ 1017 3/28	22.3
11	11	C-1071	3/28/2019	Floor Bulk Sample	Concrete	Gray	Damaged	C-1071 HgX @ 0940 3/27 Rinsed @ 1015 3/28	0.377
11	17	C-1072	3/28/2019	Wall Bulk Sample	Concrete			Included Concrete lip	3.99
11	11	C-1073	3/28/2019	Floor Bulk Sample	Concrete			C-1073 HgX @ 0950 3/27 Rinsed @ 1025 3/28	9.77
11	13	C-1074	3/29/2019	Pedestal Bulk Sample Horizontal	Concrete			Bottom of staircase on west wall adjacent to stack foundation to west of north elevator	5.35
11	13	C-1075	3/29/2019	Pedestal Bulk Sample Horizontal	Concrete			West wall between stack foundation and caustic acid tank	2.16
11	11	C-1076	3/29/2019	Floor Bulk Sample	Concrete			South perimeter inside of stack foundation on west wall adjacent to caustic acid tank	3130
11	13	C-1077	3/29/2019	Pedestal Bulk Sample Horizontal	Concrete			Pedestal wall just south of stack foundation on west wall	2.75
11	11	C-1078	3/28/2019	Floor Bulk Sample	Concrete			C-1078 HgX @ 0955 3/27 Rinsed @ 1030 3/28	19.6
11	15	C-1079	3/28/2019	Wall Bulk Sample	Concrete		Intact		4.91
11	11	C-1080	3/28/2019	Floor Bulk Sample	Concrete		Intact	C-1080 HgX @ 1005 3/27 Rinsed @ 1037 3/28	84.1
11	16	C-1081	3/28/2019	Wall Bulk Sample	Concrete			Just outside mercury reclaim room	9.45
11	15	C-1082	3/28/2019	Wall Bulk Sample	Concrete			In mercury reclaim room	2000
11	11	C-1083	3/28/2019	Floor Bulk Sample	Concrete			C-1083 HgX @ 1018 3/27 Rinsed @ 1038 3/28 Jerome: 0.012 - 0.01 within former walls of the mercury reclaim room	133
11	11	C-1084	3/28/2019	Floor Bulk Sample	Concrete			C-1084 HgX @ 1025 3/27 Rinsed @ 1040 3/28 Jerome: 0.169 - 0.545	595
11	11	C-1085	3/28/2019	Floor Bulk Sample	Concrete		Intact	C-1085 HgX @ 1034 3/27 Rinsed @ 1034 3/28	32
11	11	C-1086	3/28/2019	Floor Bulk Sample	Concrete		Intact	C-1086 HgX @ 1040 3/27 Rinsed @ 1028 3/28	36.1
11	11	C-1087	3/28/2019	Floor Bulk Sample	Concrete		Intact	C-1087 HgX @ 1050 3/27 Rinsed @ 1020 3/28	9.7
11	15	C-1088	3/28/2019	Wall Bulk Sample	Brick	Gray	Intact		11.8
11	11	C-1089	3/28/2019	Floor Bulk Sample	Concrete			C-1089 HgX @ 1100 3/27 Rinsed @ 1400 3/28 Near drain	24
11	11	C-1090	3/28/2019	Floor Bulk Sample	Concrete			C-1090 HgX @ 1110 3/27 Rinsed @ 1354 3/28	40.1
11	11	C-1091	3/28/2019	Floor Bulk Sample	Concrete			Close to sulphuric acid tank C-1091 HgX @ 1120 3/27 Rinsed @ 1352 3/28	35.2
11	11	C-1092	3/28/2019	Floor Bulk Sample	Concrete		Intact	White acid residue, possibly sulphuric acid C-1092 HgX @ 1135 3/27 Rinsed @ 1342 3/28	69.8

TABLE 5
LABORATORY ANALYTICAL RESULTS FOR POROUS SURFACES
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 2 of 5
5/3/2019

Floor Elevation	Sample Measured Elevation	Sample Name	Sample Date	Surface Type	Surface Description	Paint Color	Paint Condition	General notes	Mercury Concentration (mg/kg)
11	11	C-1093	3/28/2019	Floor Bulk Sample	Concrete		Intact	C-1093 HgX @ 1150 3/27 Rinsed @ 1340 3/28	21.9
11	11	C-1094	3/28/2019	Wall Bulk Sample	Brick				47.2
11	15	C-1095	3/28/2019	Wall Bulk Sample	Brick	Gray	Intact	Wiped existing dust	40
11	11	C-1096	3/28/2019	Floor Bulk Sample	Concrete			C-1096 HgX @ 1330 3/27 Rinsed @ 1340 3/28	5.87
11	11	C-1097	3/28/2019	Floor Bulk Sample	Concrete		Intact	C-1097 HgX @ 1340 3/27 Rinsed @ 1345 3/28	6.02
11	11.5	C-1098	3/29/2019	Pedestal Bulk Sample Vertical	Concrete			South of north elevator	69.8
11	11	C-1099	3/28/2019	Floor Bulk Sample	Concrete			C-1099 HgX @ 1348 3/27 Rinsed @ 1350 3/28	68.9
11	11	C-1100	3/28/2019	Floor Bulk Sample	Concrete		Intact	Sampled in cracked area C-1110 HgX @ 1355 3/27 Rinsed @ 1355 3/28	228
11	11	C-1101	3/28/2019	Floor Bulk Sample	Concrete			C-1101 HgX @ 1400 3/27 Rinsed @ 1358 3/28	10.7
11	13	C-1102	3/29/2019	Pedestal Bulk Sample Vertical	Concrete			West face of pedestal to southwest of S-3 cooling water tank	19.3
11	14	C-1103	3/29/2019	Pedestal Bulk Sample Horizontal	Concrete			Wiped with dry towel	8.69
11	11	C-1104	3/28/2019	Wall Bulk Sample	Concrete				26.3
11	11	C-1105	3/28/2019	Floor Bulk Sample	Concrete			Sample area contains black stain C-1105 HgX @ 1410 3/27 Rinsed @ 1552 3/28	109
11	15	C-1106	3/29/2019	Wall Bulk Sample	Concrete			South face of northeast column of Hg boiler filler pumps foundation	48.6
11	14	C-1107	3/29/2019	Wall Bulk Sample	Concrete			South face of east column of Hg boiler filler pump foundation	15.8
11	15	C-1108	3/29/2019	Wall Bulk Sample	Concrete			North face of west center column of Hg boiler filling pumps	26.8
11	11	C-1109	3/28/2019	Floor Bulk Sample	Concrete			C-1109 HgX @ 1430 3/27 Rinsed @ 1556 3/28	67.1
11	11	C-1110	3/28/2019	Floor Bulk Sample	Concrete			C-1110 HgX @ 1420 3/27 Rinsed @ 1555 3/28	130
11	11.25	C-1111	3/29/2019	Pedestal Bulk Sample Vertical	Concrete			Drilling in area where floor is chipped	682
11	12	C-1112	3/29/2019	Pedestal Bulk Sample Horizontal	Concrete			West face of large rectangular foundation to southeast of S-3 cooling water tank East end of large rectangular foundation to southeast of S-3 water cooling tank	18.6
11	11	C-1113	3/29/2019	Floor Bulk Sample	Concrete			C-1113 HgX @ 1435 3/27 Rinsed @ 1603 3/28	142
11	16	C-1114	3/29/2019	Wall Bulk Sample	Concrete			Sampled in cracked area	11.5
11	11	C-1115	3/28/2019	Floor Bulk Sample	Concrete			C-1115	0.734
11	19	C-1116	3/29/2019	Wall Bulk Sample	Concrete			East face of column adjacent to KAYDON a Turbo-Toc Turbine oil conditioner	6.57
11	11	C-1117	3/28/2019	Floor Bulk Sample	Concrete		Intact	C-1117 HgX @ 1450 3/27 Rinsed @ 1610 3/28	327
11	11	C-1118	3/28/2019	Floor Bulk Sample	Concrete			C-1118 HgX @ 1457 3/27 Rinsed @ 1615 3/28	13.6
11	15	C-1119	3/29/2019	Wall Bulk Sample	Concrete			East face of column east side beneath south turbine deck	10.8
11	11	C-1120	3/28/2019	Floor Bulk Sample	Concrete			C-1120 HgX @ 1503 3/27 Rinsed @ 1608 3/28	45.1
11	11	C-1121	3/28/2019	Floor Bulk Sample	Concrete			C-1121 HgX @ 1510 3/27 Rinsed @ 1605 3/28	11.1
11	11	C-1122	3/28/2019	Floor Bulk Sample	Concrete			C-1122 HgX @ 1517 3/27 Rinsed @ 1602 3/28	25.4
11	11	C-1123	3/28/2019	Floor Bulk Sample	Concrete			C-1123 HgX @ 1520 3/27 Rinsed @ 1555 3/28	26.2

TABLE 5
LABORATORY ANALYTICAL RESULTS FOR POROUS SURFACES
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 3 of 5
5/3/2019

Floor Elevation	Sample Measured Elevation	Sample Name	Sample Date	Surface Type	Surface Description	Paint Color	Paint Condition	General notes	Mercury Concentration (mg/kg)
11	11	C-1124	3/29/2019	Wall Bulk Sample	Concrete		Intact	Behind air compressor	6.07
11	11	C-1125	3/28/2019	Wall Bulk Sample	Concrete				8.35
11	11	C-1126	3/28/2019	Floor Bulk Sample	Concrete			C-1126 HgX @ 1540 3/27 Rinsed @ 1600	7.35
11	11	C-1127	3/29/2019	Floor Bulk Sample	Concrete	Red	Damaged	Center of machine shop	27.5
11	15	C-1128	3/29/2019	Wall Bulk Sample	Concrete	White	Intact	Machine shop northwest corner	47
11	11	C-1129	3/29/2019	Floor Bulk Sample	Concrete	Red	Damaged	Floor at entrance to machine shop	26.1
11	11	C-1130	3/29/2019	Floor Bulk Sample	Concrete	Red	Damaged	Machine shop office floor	8.06
11	14	C-1131	3/29/2019	Wall Bulk Sample	Concrete	Gray	Intact	In machine shop	15.6
11	11	C-1132	3/29/2019	Floor Bulk Sample	Concrete	Red	Damaged	Bottom of steps to locker room	12.1
11	11	C-1133	3/29/2019	Floor Bulk Sample	Concrete			Spare parts storage south of machine shop	22.6
11	16	C-1134	3/29/2019	Wall Bulk Sample	Concrete				8.74
11	11	C-1135	3/29/2019	Floor Bulk Sample	Concrete			South end of spare parts storage	22
11	14	C-1136	3/29/2019	Wall Bulk Sample	Concrete				9.95
11	17	C-1137	3/29/2019	Wall Bulk Sample	Brick				9.21
11	11	C-1138	3/29/2019	Floor Bulk Sample	Concrete			West of spare parts storage	35.3
11	11	C-1139	3/29/2019	Floor Bulk Sample	Concrete			Southwest of southwest corner of machine shop	35.7
11	14	C-1140	3/29/2019	Pedestal Bulk Sample Horizontal	Concrete			Top of pedestal west of machine shop adjacent to salt water inlet pipe	8.59
11	12	C-1141	3/29/2019	Pedestal Bulk Sample Vertical	Concrete			North face of pedestal west of machine shop adjacent to salt water inlet	13.8
11	17	C-1142	4/5/2019	Wall Bulk Sample	Concrete				16.4
11	37	C-1143	4/5/2019	Wall Bulk Sample	Concrete	Gray	slight	Former ash room	48.1
24	29.5	C-1042	3/20/2019	Wall Bulk Sample	Other - Plaster	Gray	Intact	Insulation storage room, center of North wall	1.98
24	26.5	C-1043	3/22/2019	Wall Bulk Sample	Other - Gypsum board	Green	Slightly Damaged	Men's bathroom south exterior wall adjacent to entrance to men's locker room	7.51
24	24	C-1044	3/21/2019	Floor Bulk Sample	Concrete			Concrete walkway to west of #2 Load Center and south of boiler #2 pit. HGX 1021 3/20/19, Rinsed 1044 3/21/19	5.48
24	24	C-1045	3/21/2019	Floor Bulk Sample	Concrete			West of crane bay beneath North turbine deck. HGX 0835 3/20/19, Rinsed 0925 3/21/19	161
24	24	C-1046	3/21/2019	Floor Bulk Sample	Concrete			HGX 0830 3/20/19, Rinsed 0931 3/21/19	38.6
24	24	C-1047	3/29/2019	Floor Bulk Sample	Concrete	Gray	slight	Center of west side of crane bay at bottom of stairs to EL 36' turbine deck	3
24	24	C-1048	3/21/2019	Wall Bulk Sample	Concrete	Gray	Damaged	Adjacent to stairwell on east side of crane bay south of vending machines. HGX 0946 3/20/19, Rinsed 0950 3/21/19	5.88
24	24	C-1049	3/21/2019	Floor Bulk Sample	Concrete			Beneath North end of south turbine deck. HGX 0910 3/20/19, Rinsed 0936 3/21/19	22.1
24	24	C-1050	3/21/2019	Floor Bulk Sample	Concrete			Beneath south end of south turbine deck. HGX 0933 3/20/19, Rinsed 0941 3/21/19	27.5
24	24	C-1051	3/21/2019	Floor Bulk Sample	Concrete			Beneath center of south turbine deck. HGX 0921 3/20/19, Rinsed 0938 3/21/19	19.7
24	29.25	C-1052	3/21/2019	Wall Bulk Sample	Concrete			Northwest corner of Concrete column beneath south east corner of south turbine deck	20.3
24	30.5	C-1053	3/21/2019	Wall Bulk Sample	Concrete			South side of North center Concrete column on east side beneath south turbine deck	37.7
24	30.5	C-1054	3/22/2019	Wall Bulk Sample	Concrete			West face of North Center column beneath west side of south turbine deck	16.3
24	31.25	C-1055	3/22/2019	Wall Bulk Sample	Concrete			Beneath center of North and south turbine decks above cylinder storage	24.6
24	33.25	C-1056	3/22/2019	Wall Bulk Sample	Concrete			West face of arch between south and south center column beneath east side of North turbine deck	14.1
24	33	C-1057	3/22/2019	Wall Bulk Sample	Concrete			South face of arch adjacent to Northwest column beneath North turbine deck	158
24	24	C-1058	3/21/2019	Floor Bulk Sample	Concrete	Red	Damaged	Entrance to mechanic room south of crane bay. HGX 0958 3/20/19, Rinsed 1037 3/21/19	30.5
24	30	C-1059	3/22/2019	Wall Bulk Sample	Brick			Interior North wall of crane bay adjacent to exit door	174
24	24	C-1060	3/21/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	East end of #1 Load Center. HGX 156 3/20/19, Rinsed 1234 3/21/19	17
24	24	C-1061	3/21/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	West end of #1 Load Center. HGX 1202 3/20/19, Rinsed 1236 3/21/19	7.32
24	30	C-1063	3/20/2019	Wall Bulk Sample	Brick			#1 Load center, west end of North wall	2.22
24	29.5	C-1064	3/20/2019	Wall Bulk Sample	Concrete	Green		#2 Load Center, West end of south wall	37.2
24	24	C-1065	3/21/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	East end of #2 Load Center. HGX 1232 3/20/19, Rinsed 1244 3/21/19	16.4
24	24	C-1066	3/21/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	West end of #2 Load Center. HGX 1238 3/20/19, Rinsed 1242 3/21/19	9.28
36	36	C-1008	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	Under stairs between boiler pit and old stack room HGX: 1014 3/14/19 Rinsed: 0950 3/15/19	10.3
36	36	C-1009	3/15/2019	Floor Bulk Sample	Concrete	Red	Damaged	Floor near entrance to old stack room HGX: 1023 3/14/19 Rinsed: 1000 3/15/19	2.04
36	36	C-1010	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	Between northern stairs and electrical shop HGX: 1055 3/14/19 Rinsed: 1200 3/15/19	5.75
36	36	C-1011	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	Northwest corner of northern pit HGX: 1045 3/14/19 Rinsed: 1209 3/15/19	2.97
36	36	C-1012	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	SW corner of northern boiler pit HGX: 1036 3/14/19 Rinsed: 1005 3/15/19	16.9

TABLE 5
LABORATORY ANALYTICAL RESULTS FOR POROUS SURFACES
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 4 of 5
5/3/2019

Floor Elevation	Sample Measured Elevation	Sample Name	Sample Date	Surface Type	Surface Description	Paint Color	Paint Condition	General notes	Mercury Concentration (mg/kg)
36	36	C-1013	3/15/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	Corner of southern boiler pit closest to electrical shop. HGX: 1030 3/14/19 Rinse: 1005 3/15/19	4.94
36	36	C-1014	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	By transformers at southern boiler pit HGX: 1000 3/14/19 Rinse: 0945 3/15/19	1.93
36	36	C-1015	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	Between staircase and structure on eastern side of southern pit HGX: 1145 3/14/19 Rinse: 1305 3/15/19	19.7
36	36	C-1016	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	Eastern edge of southern boiler pit Next to elevator door by boiler pits	23.6
36	36	C-1017	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	HGX: 1113 3/14/19 Rinse: 1315 3/15/19	55.2
36	36	C-1018	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	Bordering elevator wall closest to turbine deck HGX: 1124 3/14/19 Rinse: 1318 3/15/19	15.5
36	36	C-1019	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	NE corner by northern pit HGX: 1140 3/14/19 Rinse: 1322 3/15/19	16.2
36	36	C-1020	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	Between stairs and northern boiler pit HGX: 1105 3/14/19 Rinse: 1213 3/15/19	5.81
36	38.5	C-1021	3/14/2019	Wall Bulk Sample	Brick				14.9
36	40	C-1022	3/14/2019	Wall Bulk Sample	Concrete	Gray	Slightly Damaged		15
36	46.5	C-1023	3/14/2019	Wall Bulk Sample	Concrete	Gray	Intact		25.9
36	36	C-1024	3/19/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	SE corner of turbine deck HGX 0847 3/18/19 Rinsed 1004 3/19/19	15.6
36	36	C-1025	3/19/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	SW corner of turbine deck HGX 0825 3/18/19 Rinsed 1000 3/19/19	71
36	36	C-1026	3/19/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	Just south of center of turbine deck HGX 0857 3/18/19 Rinsed 1008 3/19/19	415
36	40	C-1027	3/15/2019	Wall Bulk Sample	Brick			North wall Inside electrical shop	320
36	36	C-1028	3/15/2019	Floor Bulk Sample	Concrete	Red	Intact	HGX: 1310 3/14/19 Rinse: 1158 3/15/19	2.83
36	41	C-1029	3/15/2019	Wall Bulk Sample	Other - Wood	Gray	Intact	Eye level near opening to old stack room	0.207
36	38	C-1030	3/15/2019	Wall Bulk Sample	Other - Wood	Gray	Intact	On office wall by Northern boiler pit	0.337
36	40	C-1031	3/15/2019	Wall Bulk Sample	Other - Wood	Gray	Intact	Near stairs on electrical shop wall Near offices on outside wall	0.167
36	36	C-1032	3/19/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	HGX 0935 3/18/19 Rinsed 1015 3/19/19	145
36	36	C-1033	3/19/2019	Floor Bulk Sample	Concrete	Red	Damaged	Sampled along cracks at top of stairs by main entrance HGX 1007 3/18/19 Rinsed 1025 3/19/19	16.6
36	36	C-1034	3/19/2019	Floor Bulk Sample	Concrete	Red	Damaged	Middle of turbine deck HGX 1000 3/18/19 Rinsed 1034 3/19/19	2.69
36	36	C-1035	3/19/2019	Floor Bulk Sample	Concrete	Red	Intact	Just North of center of turbine deck, HGX 1018 3/18/19, Rinsed 1035 3/19/19 Near stairs by main entrance	14.9
36	36	C-1036	3/19/2019	Floor Bulk Sample	Concrete	Red	Intact	HGX 1034 3/18/19 Rinsed 1044 3/19/19	35.4

TABLE 5
LABORATORY ANALYTICAL RESULTS FOR POROUS SURFACES
Schiller Station
400 Gosling Road
Portsmouth, New Hampshire

File No. 04.0190348.01
Page 5 of 5
5/3/2019

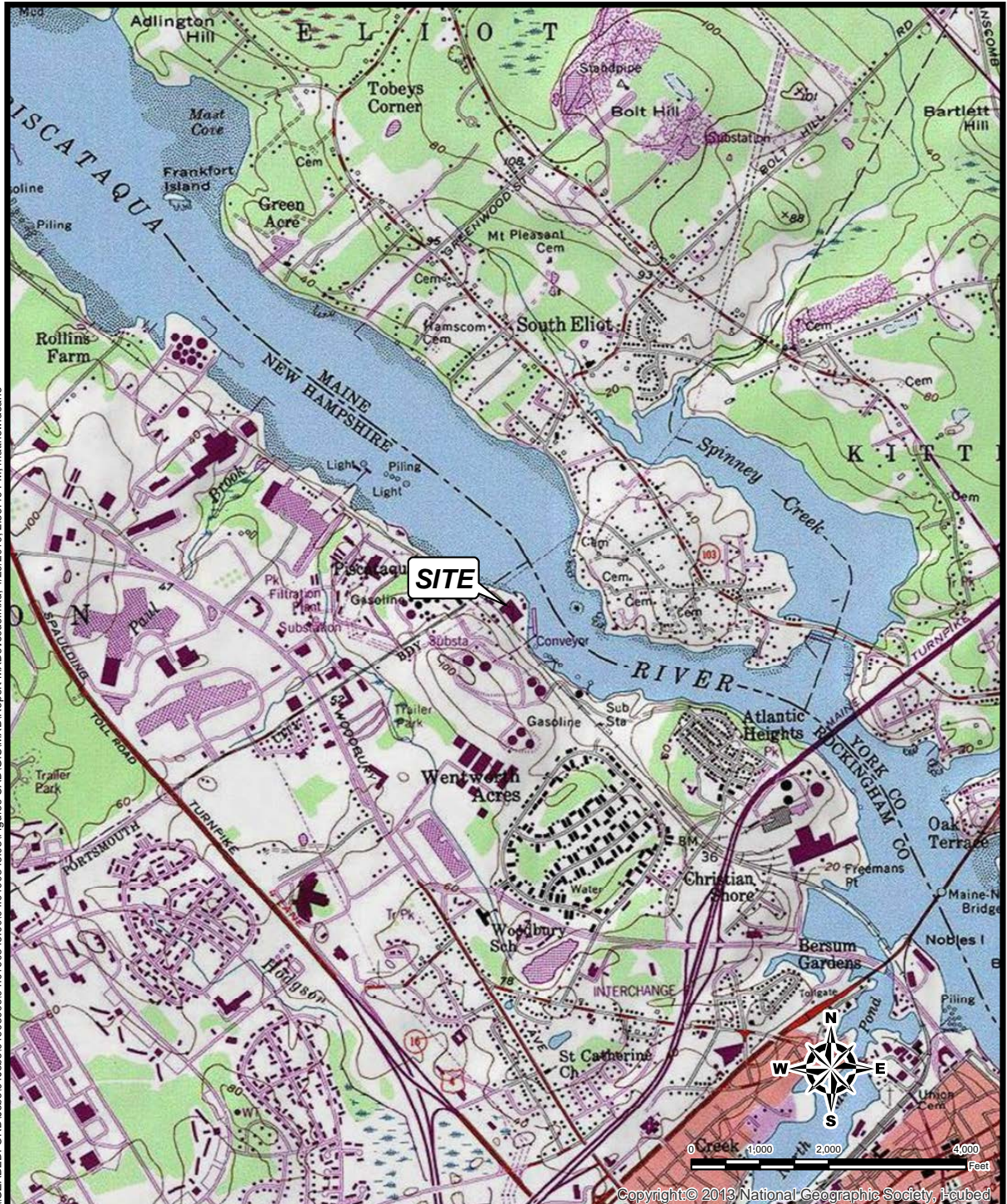
Floor Elevation	Sample Measured Elevation	Sample Name	Sample Date	Surface Type	Surface Description	Paint Color	Paint Condition	General notes	Mercury Concentration (mg/kg)
36	36	C-1037	3/19/2019	Floor Bulk Sample	Concrete	Red	Damaged	Within curve of green structure in NW corner of turbine deck HGX 1059 3/18/19 Rinsed 1100 3/19/19	208
36	36	C-1038	3/21/2019	Floor Bulk Sample	Concrete	Red	Damaged	North of North turbine deck adjacent to planning room door and North exterior wall of crane bay. HGX 1047 3/20/19, Rinsed 1051 3/21/19	17.5
36	36	C-1039	3/19/2019	Floor Bulk Sample	Concrete	Red	Slightly Damaged	NE corner of turbine deck HGX 1043 3/18/19 Rinsed 1050 3/19/19	16.5
36	36	C-1040	3/19/2019	Floor Bulk Sample	Concrete	Red	Damaged	Catwalk east of main entrance HGX 0926 3/18/19 Rinsed 1040 3/19/19	4.39
36	36	C-1041	3/19/2019	Floor Bulk Sample	Concrete	Red	Intact	Inside Dick Gregoire's office HGX 0911 3/18/19 Rinsed 1012 3/19/19	47.5
56	59	C-1003	3/13/2019	Floor Bulk Sample	Concrete			Hg _x applied at 12:50pm on 3/12/19 Rinsed at 1:51pm on 3/12/19 Jerome read .002 to .008 +/- .003 Drilled 6 Bulk Samples	7.87
56	59	C-1004	3/13/2019	Floor Bulk Sample	Concrete			Hg _x applied 12:40pm on 3/11/19 Rinsed at 2:00pm on 3/12/19 Drilled 6 Bulk Samples	15.6
56	59	C-1005	3/13/2019	Floor Bulk Sample	Concrete			Hg _x applied on 3/11/19 at 3:15pm Rinse on 3/12/19 at 2:05pm Jerome read .000 to .008	3.53
56	63	C-1006	3/14/2019	Wall Bulk Sample	Brick		Intact	Vacuum dust beforehand Threw out first sample (too deep)	50.6
56	67	C-1007	3/14/2019	Wall Bulk Sample	Brick		Intact	Threw out first sample (too deep)	26.4
82	82	C-1001	3/6/2019	Floor Bulk Sample	Concrete			Prep work complete at 2:47 pm on 3/4/2019 Rinsing complete at 2:50 pm on 3/5/2019	17.9
82	82	C-1002	3/6/2019	Floor Bulk Sample	Concrete			Prep complete at 2:49 pm on 3/4/2019 Rinsing complete at 2:55 pm on 3/5/2019	43.1

Notes:

1. Bold, shaded results were detected at a concentration above the risk-based screening value of 460 mg/kg.



Figures



© 2019 - GZA GeoEnvironmental, Inc. \\GZABED\FORD\U:\ob\04\190438\01\190438_001\04\190438_03\Figures-CAD\GIS\XDR\Report\MXD\locus.mxd, 4/29/2019, 2:56:49 PM, matthew.deane

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

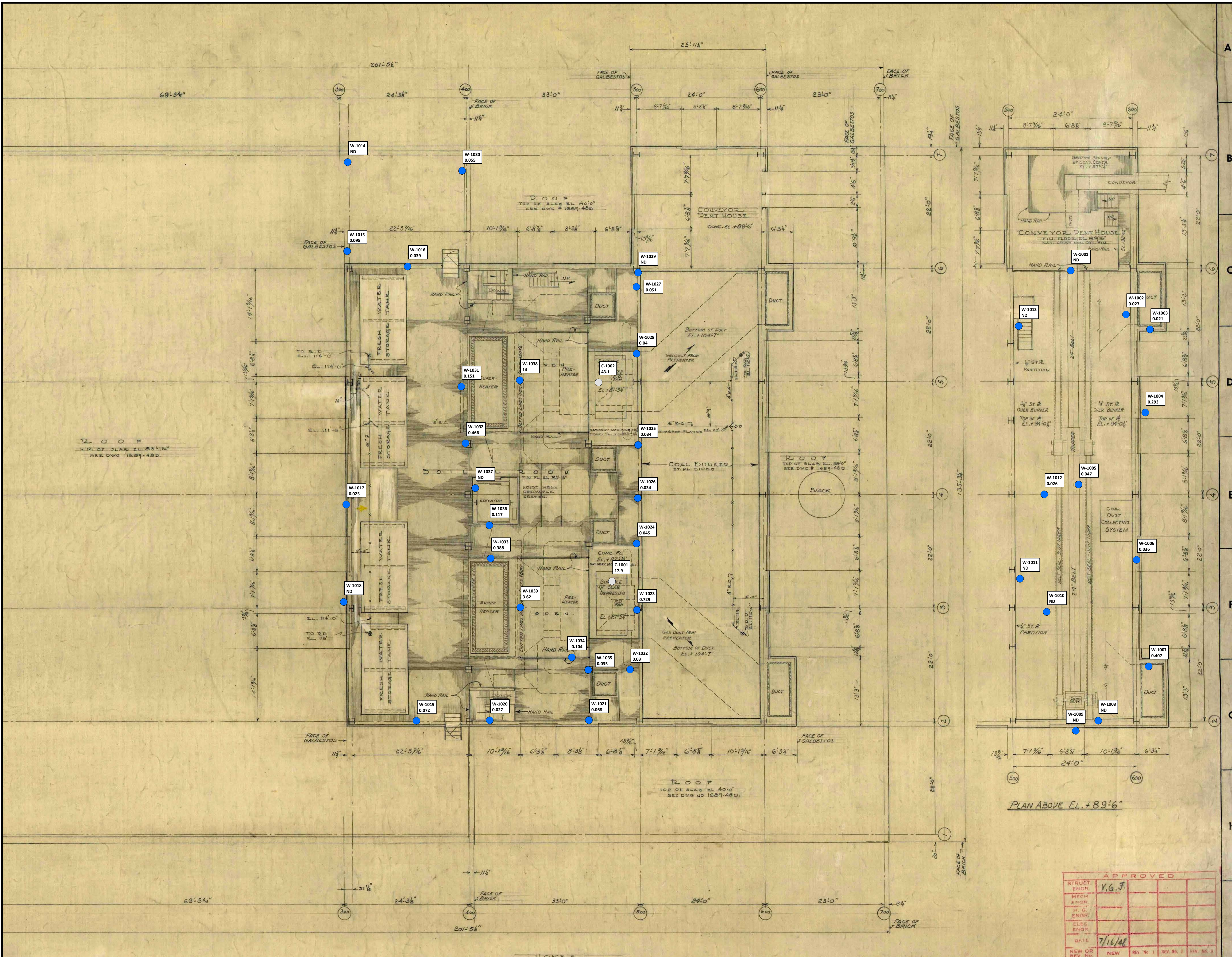
SCHILLER STATION
400 GOSLING ROAD
PORTSMOUTH, NEW HAMPSHIRE

SITELUCUS

NO.	ISSUE / DESCRIPTION	BY	DATE

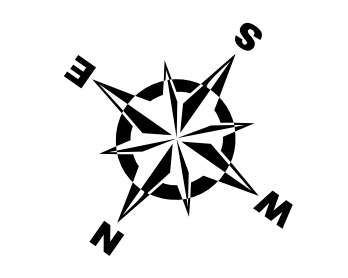
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: EVERSOURCE ENERGY	
PROJ MGR: RBC	REVIEWED BY: SMR	CHECKED BY: RBC	FIGURE 1
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE: 1 in = 2,000 ft	
DATE: APRIL 2019	PROJECT NO. 04.0190438.03	REVISION NO.	

© 2019 - GZA GeoEnvironmental, Inc. 10274Bedford04060190300304.011903048.00104.01903048.031903048.CADD\GIS\BIM\DCI\Report\WAS\Figures\Figures 1.indd 5/2/2019 5:12:07 PM mntmhw.dbae



- EL 82 and 95 Bulk Sample Location
 - EL 82 and 95 Wipe Sample Location
- C-1001** Sample Designation
17.9 Total Mercury Concentration (mg/kg)
*ND indicates mercury was not detected above the laboratory reporting limit
 *Highlighted value indicates an exceedance of the risk-based mercury screening level
- W-1002** Sample Designation
0.027 Total Mercury Concentration (ug/100cm²)
*ND indicates mercury was not detected above the laboratory reporting limit
 *Highlighted value indicates an exceedance of the risk-based mercury screening level

- GENERAL NOTES
1. BASE MAP DEVELOPED FROM SCANNED IMAGE OF DRAWINGS 'BUILDING, ARCHITECTURAL PLANS 739-48E THROUGH 744-48E.'
 2. SAMPLE LOCATIONS DETERMINED BY REFERENCING TO KNOWN BUILDING FEATURES.
 3. SAMPLES WERE COLLECTED BETWEEN 3/4/19 AND 4/5/19, AFTER COMPLETION OF THE MERCURY BOILER DISMANTLING WORK AND REMOVAL OF TEMPORARY CONTAINMENTS.
 4. BOTH BULK AND WIPE SAMPLING LOCATIONS, ON POROUS AND NON-POROUS MATERIALS RESPECTIVELY, WERE SURFACE WASHED PRIOR TO OBTAINING SAMPLES TO ELIMINATE INTERFERENCE FROM DUST RE-DEPOSITED FROM OTHER PLANT OPERATIONS. CONCRETE FLOOR AND PAD SURFACES WERE PRE-WASHED FOLLOWED BY A FINAL WASH WITH A SOLUTION OF HCl DECONTAMINATION POWDER AND WATER. ALL OTHER SAMPLED SURFACES WERE WET WIPED WITH PRE-MOISTENED TOWELS.
 5. BULK SAMPLES WERE OBTAINED FROM CORES DRILLED UP TO 1/2-INCH DEEP AT EACH LOCATION. SAMPLES WERE ANALYZED FOR TOTAL INORGANIC MERCURY BY EPA METHOD 7471.
 6. WIPE SAMPLES WERE OBTAINED USING DEIONIZED WATER MOISTENED VERTICES FROM A 100 SQUARE CENTIMETER AREA OF NON-POROUS HORIZONTAL AND VERTICAL SURFACES AND ANALYZED FOR TOTAL INORGANIC MERCURY BY EPA METHOD 7471.



APPROVED			
STRUCT. ENGR.	V.G.F.		
MECH. ENGR.			
M.G. ENGR.			
ELEC. ENGR.			
DATE	7/16/19		
NEW OR REV. NO.	NEW	REV. NO. 1	REV. NO. 2

GENERAL ELECTRIC

**SCHILLER STATION
 400 GOSLING ROAD
 PORTSMOUTH, NEW HAMPSHIRE**

**FLOOR ELEVATION 82 AND 95
 SAMPLE LOCATIONS AND ANALYTICAL SUMMARY**

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: EVERSOURCE ENERGY
PROJ MGR: RBC DESIGNED BY: RBC DATE: 05-02-2019	REVIEWED BY: SMR DRAWN BY: MJD PROJECT NO.: 04.0190438.03
CHECKED BY: RBC SCALE: 1 INCH = 8 FT	FIG NO.: 7 SHEET NO.: 6 OF 6



Appendix A – Limitations



USE OF REPORT

1. GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of the Client for the stated purpose(s) and location(s) identified in the Report. Use of this Report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. Our findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. The interpretations and conclusions presented in the Report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services. The work described in this report was carried out in accordance with the agreed upon Terms and Conditions.
4. GZA's risk characterization was performed in accordance with generally accepted practices of qualified professionals performing the same type of services at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. The findings of the risk characterization are dependent on numerous assumptions and uncertainties inherent in the risk assessment process. Sources of uncertainty may include the description of site conditions, the nature and extent of chemical distribution and the reliability of toxicity information. Consequently, the findings of the risk characterization are not an absolute characterization of actual risks, but rather serve to highlight potential sources of risk at the site. Although the range of uncertainties has not been quantified, the use of conservative assumptions and parameters throughout the assessment would be expected to err on the side of protection of human health and the environment.

RELIANCE ON INFORMATION FROM OTHERS

5. In conducting our work, GZA has relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Any inconsistencies in this information which we have noted are discussed in the Report.

ADDITIONAL INFORMATION

6. In the event that the Client, or others authorized to use this Report, obtain information on environmental or hazardous waste issues at the site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.

COMPLIANCE WITH CODES AND REGULATIONS

7. We used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various, and possibly contradictory, interpretations. Interpretations with codes and regulations by other parties are beyond our control.



Appendix B – Laboratory Analytical Data



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190348.03)
ESS Laboratory Work Order Number: 1903059

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 3:31 pm, Mar 13, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903059

SAMPLE RECEIPT

The following samples were received on March 05, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Revision 1 March 13, 2019: This report has been revised to change reporting units from ug/wipe to ug/100cm2.

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1903059-01	W-1011	Wipe	7471B
1903059-02	W-1012	Wipe	7471B
1903059-03	W-1013	Wipe	7471B
1903059-04	W-1014	Wipe	7471B
1903059-05	W-1015	Wipe	7471B
1903059-06	W-1016	Wipe	7471B
1903059-07	W-1017	Wipe	7471B
1903059-08	W-1018	Wipe	7471B
1903059-09	W-1019	Wipe	7471B
1903059-10	W-1020	Wipe	7471B
1903059-11	W-1001	Wipe	7471B
1903059-12	W-1002	Wipe	7471B
1903059-13	W-1003	Wipe	7471B
1903059-14	W-1004	Wipe	7471B
1903059-15	W-1005	Wipe	7471B
1903059-16	W-1006	Wipe	7471B
1903059-17	W-1007	Wipe	7471B
1903059-18	W-1008	Wipe	7471B
1903059-19	W-1009	Wipe	7471B
1903059-20	W-1010	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903059

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903059

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 04-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1011
Date Sampled: 03/04/19 10:43
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 9:58	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1012
Date Sampled: 03/04/19 10:54
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.026 (0.020)		7471B		1	MKS	03/06/19 10:04	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1013
Date Sampled: 03/04/19 10:40
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 10:06	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1014
Date Sampled: 03/04/19 12:30
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 10:08	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1015
Date Sampled: 03/04/19 12:35
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.095 (0.020)		7471B		1	MKS	03/06/19 10:10	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1016
Date Sampled: 03/04/19 12:50
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.041 (0.020)		7471B		1	MKS	03/06/19 10:12	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1017
Date Sampled: 03/04/19 13:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.025 (0.020)		7471B		1	MKS	03/06/19 10:14	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1018
Date Sampled: 03/04/19 13:10
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 10:16	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1019
Date Sampled: 03/04/19 13:11
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.072 (0.020)		7471B		1	MKS	03/06/19 10:18	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1020
Date Sampled: 03/04/19 13:12
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.027 (0.020)		7471B		1	MKS	03/06/19 10:20	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1001
Date Sampled: 03/04/19 09:30
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 10:22	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1002
Date Sampled: 03/04/19 09:42
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.027 (0.020)		7471B		1	MKS	03/06/19 13:57	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1003
Date Sampled: 03/04/19 09:50
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.021 (0.020)		7471B		1	MKS	03/06/19 10:30	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1004
Date Sampled: 03/04/19 09:56
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.293 (0.020)		7471B		1	MKS	03/06/19 10:32	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1005
Date Sampled: 03/04/19 10:01
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.047 (0.020)		7471B		1	MKS	03/06/19 10:34	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1006
Date Sampled: 03/04/19 10:09
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.036 (0.020)		7471B		1	MKS	03/06/19 10:36	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1007
Date Sampled: 03/04/19 10:24
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-17
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.407 (0.100)		7471B		5	MKS	03/06/19 13:59	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1008
Date Sampled: 03/04/19 10:29
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-18
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 10:40	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1009
Date Sampled: 03/04/19 10:34
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-19
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 10:42	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1010
Date Sampled: 03/04/19 10:40
Percent Solids: N/A

ESS Laboratory Work Order: 1903059
ESS Laboratory Sample ID: 1903059-20
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 10:44	1	40	CC90601



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903059

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC90601 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.123	0.020	ug/100cm ²	0.1208		102	85-115			
LCS Dup										
Mercury	0.128	0.020	ug/100cm ²	0.1208		106	85-115	4	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903059

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903059

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1903059
Date Received: 3/5/2019
Shipped/Delivered Via: ESS Courier Project Due Date: 3/11/2019
Days for Project: 4 Day

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? Yes

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 0.5 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? No

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about **short holds & rushes**? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

COC = W-1011 collected 1043, W-1012 collected 1054, W-1010 collected 1040

Labels = W-1011 collected 1035, W-1012 collected 1050, W-1010 collected 1030

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	320815	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	320814	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	320813	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	320812	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	320811	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	320810	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	320809	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	320808	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	320807	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	320806	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
11	320805	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	320804	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
13	320803	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
14	320802	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
15	320801	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
16	320800	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
17	320799	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
18	320798	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
19	320797	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
20	320796	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review
All containers scanned into storage/lab

Initials: W

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1903059
Date Received: 3/5/2019

Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: [Signature] Date & Time: 3/5/19 1955
Reviewed By: [Signature] Date & Time: 3/5/19 2011
Delivered By: [Signature] Date & Time: 3/5/19 2011



ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903059

Turn Time	<u>4.8</u>	Days
Regulatory State		
Is this project for any of the following?: <input type="radio"/> CT RCP <input type="radio"/> MA MCP <input type="radio"/> RGP		

Reporting Limits
Electronic Deliverables <input type="checkbox"/> Data Checker <input type="checkbox"/> Excel <input type="checkbox"/>
Other (Please Specify →)

Company Name <u>GZA Geo Environmental</u>	Project # <u>04-090318-03</u>	Project Name <u>Schiller Boiler Demo</u>
Contact Person <u>Rebecca Cox</u>	Address <u>5 Commerce Park No. Suite 201</u>	
City <u>Bedford</u>	State <u>NH</u>	Zip Code <u>03110</u>
Telephone Number <u>603-315-7520</u>	FAX Number	PO #
		Email Address <u>rebecca.cox@gza.com</u>

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
1	3/4/19	10:43	Wipe	Wipe	W-1011	X
2	3/4/19	10:54	Wipe		W-1012	X
3	3/4/19	10:40	Wipe		W-1013	X
4	3/4/19	12:30	Wipe		W-1014	X
5	3/4/19	12:35	Wipe		W-1015	X
6	3/4/19	12:50	Wipe		W-1016	X
7	3/4/19	13:00	Wipe		W-1017	X
8	3/4/19	13:10	Wipe		W-1018	X
9	3/4/19	13:11	Wipe		W-1019	X
10	3/4/19	13:12	Wipe		W-1020	X

Container Type: AC-Air Cassette AG-Ambic Glass B-BOD Bottle C-Cubitaier J-Jar O-Other P-Poly S-Sterile V-Vial	AG
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*	Q
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*	
Number of Containers per Sample:	1

Laboratory Use Only Cooler Present: <input checked="" type="checkbox"/> <input type="checkbox"/> Drop Off Seals Intact: <u>NA</u> <input checked="" type="checkbox"/> Pickup Cooler Temperature: <u>0.5</u> °C @ temp	Sampled by: <u>Brian Luhrs, Erik Dyrness</u> Comments: <u>DI Wipes</u> Please specify "Other" preservative and containers types in this space
---	---

Relinquished by: (Signature, Date & Time) <u>[Signature]</u> 3/5/19 11:22	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/5/19 11:22	Relinquished By: (Signature, Date & Time) <u>[Signature]</u> 3/5/19 19:32	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/5/19 19:26
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

SS Laboratory
Division of Thielsch Engineering, Inc.
5 Frances Avenue, Cranston RI 02910
Tel (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time: 4.5 Days
Regulatory State: [Blank]
Is this project for any of the following?:
 CT RCP MA MCP RGP

ESS Lab #: 1903059
Reporting Limits: [Blank]
Electronic Deliverables: Data Checker Excel
 Other (Please Specify --)

Company Name: GZA Geo Environmental
Contact Person: Rebecca Cox
City: Bedford
Telephone Number: 603-315-7520
Project #: 04-090318-03
Project Name: Schiller Boiler Demo
Address: 5 Commerce Park No. Suite 201
State: NH Zip Code: 03110 PO #: [Blank]
Email Address: rebecca.cox@gza.com

SS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
11	3/4/19	9:30	Wipe	Wipe	W-1001	X
12	3/4/19	9:42			W-1002	X
13		9:50			W-1003	X
14		9:56			W-1004	X
15		10:04			W-1005	X
16		10:09			W-1006	X
17		10:24			W-1007	X
18		10:29			W-1008	X
19		10:34			W-1009	X
20		10:40			W-1010	X

Container Type: AG-Air Cassette AG-Ambel Glass B-80D Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pick Up
Cooler Temperature: °C (ice temp): 0.5

Sampled by: Brian Luhrs, Erik Dyrness
Comments: DI Wipes
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) [Signature] 3/5/19 14:20	Received By: (Signature, Date & Time) Custody Seal/ESS [Signature] 3/5/19 15:20	Relinquished By: (Signature, Date & Time) [Signature] 3/5/19 18:32	Received By: (Signature, Date & Time) [Signature] 3/5/19 19:26
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ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190348.03)
ESS Laboratory Work Order Number: 1903060

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in cursive script, appearing to read 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 3:36 pm, Mar 13, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903060

SAMPLE RECEIPT

The following samples were received on March 05, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Revision 1 March 13, 2019: This report has been revised to change reporting units from ug/wipe to ug/100cm2.

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1903060-01	W-1031	Wipe	7471B
1903060-02	W-1032	Wipe	7471B
1903060-03	W-1033	Wipe	7471B
1903060-04	W-1034	Wipe	7471B
1903060-05	W-1035	Wipe	7471B
1903060-06	W-1036	Wipe	7471B
1903060-07	W-1037	Wipe	7471B
1903060-08	030419-BLANK-1	Wipe	7471B
1903060-09	030419-BLANK-1	Wipe	7471B
1903060-10	W-1016	Wipe	7471B
1903060-11	W-1021	Wipe	7471B
1903060-12	W-1022	Wipe	7471B
1903060-13	W-1023	Wipe	7471B
1903060-14	W-1024	Wipe	7471B
1903060-15	W-1025	Wipe	7471B
1903060-16	W-1026	Wipe	7471B
1903060-17	W-1027	Wipe	7471B
1903060-18	W-1028	Wipe	7471B
1903060-19	W-1029	Wipe	7471B
1903060-20	W-1030	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903060

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903060

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 04-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1031
Date Sampled: 03/04/19 14:35
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.151 (0.020)		7471B		1	MKS	03/06/19 12:14	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1032
Date Sampled: 03/04/19 14:45
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.466 (0.100)		7471B		5	MKS	03/06/19 14:01	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1033
Date Sampled: 03/04/19 14:50
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.388 (0.020)		7471B		1	MKS	03/06/19 12:18	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1034
Date Sampled: 03/04/19 14:50
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.104 (0.020)		7471B		1	MKS	03/06/19 12:20	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1035
Date Sampled: 03/04/19 15:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.035 (0.020)		7471B		1	MKS	03/06/19 12:22	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1036
Date Sampled: 03/04/19 13:20
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.117 (0.020)		7471B		1	MKS	03/06/19 12:24	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1037
Date Sampled: 03/04/19 15:05
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 12:26	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: 030419-BLANK-1
Date Sampled: 03/04/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 12:32	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: 030419-BLANK-1
Date Sampled: 03/04/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 12:34	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1016
Date Sampled: 03/04/19 10:18
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.039 (0.020)		7471B		1	MKS	03/06/19 12:36	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1021
Date Sampled: 03/04/19 13:25
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.068 (0.020)		7471B		1	MKS	03/06/19 12:38	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1022
Date Sampled: 03/04/19 13:30
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.030 (0.020)		7471B		1	MKS	03/06/19 12:40	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1023
Date Sampled: 03/04/19 13:40
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.729 (0.200)		7471B		10	MKS	03/06/19 14:05	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1024
Date Sampled: 03/04/19 13:45
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.045 (0.020)		7471B		1	MKS	03/06/19 12:44	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1025
Date Sampled: 03/04/19 13:50
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.034 (0.020)		7471B		1	MKS	03/06/19 12:46	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1026
Date Sampled: 03/04/19 13:58
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.034 (0.020)		7471B		1	MKS	03/06/19 12:48	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1027
Date Sampled: 03/04/19 14:02
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-17
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.051 (0.020)		7471B		1	MKS	03/06/19 12:50	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1028
Date Sampled: 03/04/19 14:15
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-18
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.040 (0.020)		7471B		1	MKS	03/06/19 12:56	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1029
Date Sampled: 03/04/19 14:25
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-19
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/06/19 12:58	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1030
Date Sampled: 03/05/19 14:30
Percent Solids: N/A

ESS Laboratory Work Order: 1903060
ESS Laboratory Sample ID: 1903060-20
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.055 (0.020)		7471B		1	MKS	03/06/19 13:00	1	40	CC90602



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903060

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC90602 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.158	0.020	ug/100cm ²	0.1208	131	65-135				
LCS Dup										
Mercury	0.158	0.020	ug/100cm ²	0.1208	131	65-135	0.1	20		



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903060

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903060

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1903060
Shipped/Delivered Via: ESS Courier Date Received: 3/5/2019
Project Due Date: 3/11/2019
Days for Project: 4 Day

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? Yes

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 0.5 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? No

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

COC = sample 8 "030419 - Blank - 1," sample 9 "030419 - Blank - 1"

Labels = "030419 - Blank -" and "030419 - Blank - 1." Samples set aside unlabeled in SR fridge.

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	320835	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	320834	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	320833	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	320832	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	320831	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	320830	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	320829	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	320828	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	320827	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	320826	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
11	320825	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	320824	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
13	320823	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
14	320822	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
15	320821	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
16	320820	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
17	320819	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
18	320818	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
19	320817	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
20	320816	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review

All containers scanned into storage/lab

Initials: ll

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM

ESS Project ID: 1903060
Date Received: 3/5/2019

Are barcode labels on correct containers? Yes No
Are all necessary stickers attached? Yes No

Completed
By: [Signature] Date & Time: 3/5/19 2003
Reviewed
By: [Signature] Date & Time: 3/5/19 2015
Delivered
By: [Signature] 3/5/19 2015 3/5/19 2015

SS Laboratory

Division of Thielsch Engineering, Inc.
5 Frances Avenue, Cranston RI 02910
TEL (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Company Name GZA Geo Environmental		Project # 04-090318.03		Project Name Schiller Boiler Demo		ESS Lab # 1903060	
Contact Person Rebecca Cox		Address 5 Commerce Park No. Suite 201		Reporting Limits		Electronic Deliverables	
City Bradford		State NH		Zip Code 03110		<input type="checkbox"/> Data Checker <input type="checkbox"/> Other (Please Specify --)	
Telephone Number 603-315-7520		FAX Number		Email Address rebecca.cox@gza.com		<input type="checkbox"/> Excel	

SS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
1	3/4/19	14:35	Wipe	Wipe	W-1031	Total Hg
2	3/4/19	14:45			W-1032	X
3	3/4/19	14:50			W-1033	X
4	3/4/19	14:50			W-1034	X
5	3/4/19	15:00			W-1035	X
6	3/4/19	13:20			W-1036	X
7	3/4/19	15:05			W-1037	X
8	3/4/19				Blank	X
9	3/4/19				030419-Blank-1	X
10	3/5/19	10:18			030419-Blank-1	X
					W-1016	X

Container Type: AC-Air Cassette AG-Ambet Glass B-BOD Bottle C-Cubitaizer J-Jar O-Other P-Poly S-Sterile V-Vial

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers per Sample: 1

Laboratory Use Only Cooler Present: <input checked="" type="checkbox"/> <input type="checkbox"/> Drop Off Seals Intact: <input checked="" type="checkbox"/> <input type="checkbox"/> Pickup Cooler Temperature: °C refer to 10.5	Sampled by: Comments: DI Wipes	Please specify "Other" preservative and containers types in this space
--	---	--

Relinquished by: (Signature, Date & Time) R Cox 3/5/19 11:22	Received By: (Signature, Date & Time) [Signature] 3/5/19 11:20	Relinquished By: (Signature, Date & Time) [Signature] 3/5/19 18:32	Received By: (Signature, Date & Time) [Signature] 3/5/19 19:26
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SS Laboratory

Division of Thielisch Engineering, Inc.
5 Frances Avenue, Cranston RI 02910
t. (401) 461-7181 Fax (401) 461-4486
www.eslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **1903060**

Turn Time **4.5** Days
Regulatory State

Reporting Limits
Electronic Data Checker Excel

Is this project for any of the following?:
 CT RCP MA MCP RGP

Deliverables Other (Please Specify →)

Company Name **GZA Geo Environmental**
Contact Person **Rebecca Cox**
City **Bedford**
Telephone Number **603-315-7520**

Project # **04.090318-03** Project Name **Schiller Boiler Demo**
Address **5 Commerce Park No. Suite 201**
State **NH** Zip Code **03110** PO #
FAX Number Email Address **rebecca.cox@gza.com**

Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis

SS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis	Analysis
-----------	-----------------	-----------------	-------------	---------------	-----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

11	3/4/19	13:25	Wipe	Wipe	W-1021	X								
12	3/4/19	13:30			W-1022	X								
13	3/4/19	13:40			W-1023	X								
14	3/4/19	13:45			W-1024	X								
15	3/4/19	13:50			W-1025	X								
16	3/4/19	13:58			W-1026	X								
17	3/4/19	14:02			W-1027	X								
18	3/4/19	14:15			W-1028	X								
19	3/4/19	14:25			W-1029	X								
20	3/4/19	14:30	✓	✓	W-1030	X								

Container Type: AG-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial **AG**
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other **9**

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2,NaOH 9-NH4Cl 10-DI H2O 11-Other **1**
Number of Containers per Sample: **1**

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: NA Pickup
Cooler Temperature: **Clock temp; 0.5**
Sampled by: **Brian Luhrs, Erik Dyrness**
Comments: **DI Wipe** Please specify "Other" preservative and containers types in this space:

Relinquished by: (Signature, Date & Time) [Signature] 3/5/19 11:22 A	Received By: (Signature, Date & Time) [Signature] 3/5/19 11:22	Relinquished By: (Signature, Date & Time) [Signature] 3/5/19 18:32	Received By: (Signature, Date & Time) [Signature] 3/5/19 19:26
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CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190348.03)
ESS Laboratory Work Order Number: 1903104

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 3:37 pm, Mar 13, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903104

SAMPLE RECEIPT

The following samples were received on March 06, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Revision 1 March 13, 2019: This report has been revised to change reporting units from ug/wipe to ug/100cm².

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1903104-01	W-1040	Wipe	7471B
1903104-02	W-1041	Wipe	7471B
1903104-03	W-1042	Wipe	7471B
1903104-04	W-1043	Wipe	7471B
1903104-05	W-1044	Wipe	7471B
1903104-06	W-1045	Wipe	7471B
1903104-07	W-1046	Wipe	7471B
1903104-08	W-1047	Wipe	7471B
1903104-09	W-1048	Wipe	7471B
1903104-10	W-1049	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903104

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903104

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 04-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1040
Date Sampled: 03/05/19 08:08
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.094 (0.020)		7471B		1	MKS	03/07/19 11:57	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1041
Date Sampled: 03/05/19 08:11
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/07/19 11:59	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1042
Date Sampled: 03/05/19 13:10
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.020 (0.020)		7471B		1	MKS	03/07/19 12:01	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1043
Date Sampled: 03/05/19 08:10
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.198 (0.020)		7471B		1	MKS	03/07/19 12:03	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1044
Date Sampled: 03/05/19 08:25
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.101 (0.020)		7471B		1	MKS	03/07/19 12:09	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1045
Date Sampled: 03/05/19 08:28
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.023 (0.020)		7471B		1	MKS	03/07/19 12:11	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1046
Date Sampled: 03/05/19 08:33
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.030 (0.020)		7471B		1	MKS	03/07/19 12:13	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1047
Date Sampled: 03/05/19 08:41
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.690 (0.100)		7471B		5	MKS	03/07/19 13:28	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1048
Date Sampled: 03/05/19 08:40
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.140 (0.020)		7471B		1	MKS	03/07/19 12:17	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1049
Date Sampled: 03/05/19 09:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903104
ESS Laboratory Sample ID: 1903104-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.677 (0.100)		7471B		5	MKS	03/07/19 13:30	1	40	CC90701



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903104

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC90701 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.125	0.020	ug/100cm ²	0.1208		103	85-115			
LCS Dup										
Mercury	0.129	0.020	ug/100cm ²	0.1208		107	85-115	4	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903104

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903104

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903104
Shipped/Delivered Via: ESS Courier Date Received: 3/6/2019
Project Due Date: 3/12/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? No Yes

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 0.8 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	321246	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	321245	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	321244	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	321243	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	321242	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	321241	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	321240	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	321239	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	321238	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	321237	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review

All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: de
 Yes / No
 Yes / No

Completed By: [Signature] Date & Time: 3/6/19 1739
Reviewed By: [Signature] Date & Time: 3/6/19 1752
Delivered By: [Signature] Date & Time: 3/6/19 1752

1 of 3

SS Laboratory

Division of Thielsch Engineering, Inc.
5 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Company Name GZA Geo Environmental		Project # 04-090318-03		Project Name Schiller Boiler Demo		ESS Lab # 1903104	
Contact Person Rebecca Cox		Address 5 Commerce Park No. Suite 201		City Bedford		State NH	
Telephone Number 603-315-7520		Zip Code 03110		PO #		Reporting Limits	
FAX Number		Email Address rebecca.cox@gza.com		Sample ID		Electronic Deliverables <input type="checkbox"/> Data Checker <input type="checkbox"/> Other (Please Specify →) <input type="checkbox"/> Excel <input type="checkbox"/>	
SS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix		Analysis	Total Hg
1	3/5/19	0808	Wipe	Wipe	W-1040		X
2	3/5/19	0811			W-1041		X
3	3/5/19	1310			W-1042		X
4	3/5/19	0810			W-1043		X
5	3/5/19	0825			W-1044		X
6	3/5/19	0828			W-1045		X
7	3/5/19	0833			W-1046		X
8	3/5/19	0841			W-1047		X
9	3/5/19	0840			W-1048		X
10	3/5/19	0900			W-1049		X
Container Type: AC-Air Cassette AG-Ambel Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial		AG		Number of Containers per Sample: 1			
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other		9					
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other		1					
Laboratory Use Only Cooler Present: <input checked="" type="checkbox"/> Drop Off <input type="checkbox"/> Seals Intact: <input checked="" type="checkbox"/> Pickup <input type="checkbox"/> Cooler Temperature: °C Return: 0.8		Sampled by: Brian Luhrs + Erik Dyrness		Comments: DI Wipes, 10x10 cm			
Relinquished by: (Signature, Date & Time) Erik Dyrness 3/6/19		Received By: (Signature, Date & Time) [Signature] 3/6/19 11:36		Relinquished By: (Signature, Date & Time) [Signature] 3/6/19 16:39		Received By: (Signature, Date & Time) [Signature] 3/6/19 17:26	
Relinquished by: (Signature, Date & Time)		Received By: (Signature, Date & Time)		Relinquished By: (Signature, Date & Time)		Received By: (Signature, Date & Time)	



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190348.03)
ESS Laboratory Work Order Number: 1903105

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 3:38 pm, Mar 13, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903105

SAMPLE RECEIPT

The following samples were received on March 06, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Revision 1 March 13, 2019: This report has been revised to change reporting units from ug/wipe to ug/100cm2.

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1903105-01	W-1050	Wipe	7471B
1903105-02	W-1051	Wipe	7471B
1903105-03	W-1052	Wipe	7471B
1903105-04	W-1053	Wipe	7471B
1903105-05	W-1054	Wipe	7471B
1903105-06	W-1055	Wipe	7471B
1903105-07	W-1056	Wipe	7471B
1903105-08	W-1057	Wipe	7471B
1903105-09	030519-BLANK-1	Wipe	7471B
1903105-10	030519-BLANK-2	Wipe	7471B
1903105-11	W-1038	Wipe	7471B
1903105-12	W-1039	Wipe	7471B
1903105-13	C-1001	Solid	7471B
1903105-14	C-1002	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903105

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903105

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 04-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1050
Date Sampled: 03/05/19 13:30
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/07/19 12:27	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1051
Date Sampled: 03/05/19 13:40
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.188 (0.020)		7471B		1	MKS	03/07/19 12:33	1	40	CC90702



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1052
Date Sampled: 03/05/19 09:20
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.06 (0.200)		7471B		10	MKS	03/07/19 13:32	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1053
Date Sampled: 03/05/19 08:33
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.376 (0.020)		7471B		1	MKS	03/07/19 12:37	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1054
Date Sampled: 03/05/19 11:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.33 (0.200)		7471B		10	MKS	03/07/19 13:35	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1055
Date Sampled: 03/05/19 09:15
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.080 (0.020)		7471B		1	MKS	03/07/19 12:41	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1056
Date Sampled: 03/05/19 10:40
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.141 (0.020)		7471B		1	MKS	03/07/19 12:43	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1057
Date Sampled: 03/05/19 11:15
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.525 (0.100)		7471B		5	MKS	03/07/19 13:37	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: 030519-BLANK-1
Date Sampled: 03/05/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/07/19 12:47	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: 030519-BLANK-2
Date Sampled: 03/05/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/07/19 12:49	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1038
Date Sampled: 03/06/19 10:20
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	14.0 (2.00)		7471B		100	MKS	03/07/19 13:39	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1039
Date Sampled: 03/06/19 10:35
Percent Solids: N/A

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	3.62 (1.00)		7471B		50	MKS	03/07/19 13:41	1	40	CC90702



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1001
Date Sampled: 03/06/19 09:10
Percent Solids: 99

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-13
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	17.9 (2.81)		7471B		100	MKS	03/07/19 13:05	0.71	40	CC90648



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1002
Date Sampled: 03/06/19 08:45
Percent Solids: 99

ESS Laboratory Work Order: 1903105
ESS Laboratory Sample ID: 1903105-14
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	43.1 (2.48)		7471B		100	MKS	03/07/19 13:07	0.81	40	CC90648



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory
*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903105

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC90648 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.76	0.381	mg/kg wet	3.710		101	80-120			
LCS Dup										
Mercury	3.69	0.347	mg/kg wet	3.710		99	80-120	2	20	
Reference										
Mercury	1.07	0.194	mg/kg wet	1000		0.1	0-200			
Batch CC90702 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.117	0.020	ug/100cm ²	0.1208		97	85-115			
LCS Dup										
Mercury	0.128	0.020	ug/100cm ²	0.1208		106	85-115	9	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903105

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903105

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903105
Shipped/Delivered Via: ESS Courier Date Received: 3/6/2019
Project Due Date: 3/12/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? No Yes
initials

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 0.8 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about **short holds & rushes**? Yes / No / NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	321260	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	321259	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	321258	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	321257	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	321256	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	321255	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	321254	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	321253	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	321252	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	321251	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
11	321250	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	321249	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
13	321248	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
14	321247	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review

All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials:
 Yes / No
 Yes / No

Completed By: Date & Time: 3/6/19 1743
Reviewed

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903105
By: [Signature] Date & Time: 3/6/19 1759 Date Received: 3/6/2019
Delivered By: [Signature] 3/6/19 1759



2 of 3

SS Laboratory

Division of Thielisch Engineering, Inc.
5 Frances Avenue, Cranston RI 02910
t. (401) 461-7181 Fax (401) 461-4486
www.eslaboratory.com

CHAIN OF CUSTODY

Company Name
GZA Geo Environmental
Contact Person
Rebecca Cox
City
Bedford
Telephone Number
603-315-7520

Turn Time **48** Days
Regulatory State
is this project for any of the following?:
 CT MCP MA MCP RGP
Project # **24.090318-03** Project Name **Schiller Boiler Demo**
Address **5 Commerce Park No. Suite 201**
State **NH** Zip Code **03110** PO #
Email Address **rebecca.cox@gza.com**

ESS Lab # **1903105**
Reporting Limits
Electronic Deliverables Data Checker Excel
Other (Please Specify --)

SS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
1	3/5/19	9:02	Wipe	Wipe	W-1050	X Total Ag
2	3/5/19	1340			W-1051	X
3	3/5/19	0920			W-1052	X
4	3/6/19	0833			W-1053	X
5	3/5/19	1100			W-1054	X
6	3/5/19	0915			W-1055	X
7	3/5/19	1040			W-1056	X
8	3/5/19	1115			W-1057	X
9	3/5/19	-			030519-Blank-1	X
10	3/6/19	-			030619-Blank-2	X

Container Type: AC-Air Cassette AG-Ambet Glass B-BOD Bottle C-Cubitalner J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-D1 H2O 11-Other

Laboratory Use Only
Cooler Present Drop Off
Seals Intact Pickup
Cooler Temperature: °C Ice Temp: **0.8**

Number of Containers per Sample: **1**
Sampled by: **Brian Lubbs & ENK Dyrness**
Comments: **DI Wipe, 10x10 cm**
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) Enk Dyrness 3/6/19	Received By: (Signature, Date & Time) [Signature] 3/6/19 11:26	Relinquished By: (Signature, Date & Time) [Signature] 3/6/19 16:39	Received By: (Signature, Date & Time) [Signature] 3/6/19 1726
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SS Laboratory

Vision of Thielsch Engineering, Inc.
5 Frances Avenue, Cranston RI 02910
tL (401) 461-7181 Fax (401) 461-4486
www.eslaboratory.com

3 of 3

CHAIN OF CUSTODY

Company Name
GZA Geo Environmental
Contact Person
Rebecca Cox
City
Bedford
Telephone Number
603-315-7520

Turn Time **48** Days
Regulatory State
Is this project for any of the following?:
 CT RCP MA MCP RGP
Project # **24-070318-03** Project Name **Schiller Boiler Demo**
Address **5 Commerce Park No. Suite 201**
State **NH** Zip Code **03110** PO #
FAX Number
Email Address **rebecca.cox@gza.com**

ESS Lab # **1903105**
Reporting Limits
Electronic Deliverables Data Checker Excel Other (Please Specify -->)

SS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID
11	3/6/19	1020	Wipe	wipe	W-1038
12	3/6/19	1035	wipe	wipe	W-1039
13	3/6/19	0910	G	solid	C-1001
14	3/6/19	0845	G	solid	C-1002

Analysis	Total Hg
	Y
	X
	Y
	N

Container Type: AC-Air Cassette AG-Ambet Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial **AG**
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* **9**
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other* **9**
Number of Containers per Sample:

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: °C Re Temp: **0.8**

Sampled by: **Brian Luhrs, Erik Dymness**
Comments: **DI wipes, 10x10 cm**
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) Erik Dymness 3/6/19	Received By: (Signature, Date & Time) [Signature] 3/6/19 11:26	Relinquished By: (Signature, Date & Time) [Signature] 3/6/19 16:34	Received By: (Signature, Date & Time) [Signature] 3/6/19 17:26
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ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903262

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 4:14 pm, Mar 18, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903262

SAMPLE RECEIPT

The following samples were received on March 12, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903262-01	W-1058	Wipe	7471B
1903262-02	W-1059	Wipe	7471B
1903262-03	W-1060	Wipe	7471B
1903262-04	W-1061	Wipe	7471B
1903262-05	W-1062	Wipe	7471B
1903262-06	W-1063	Wipe	7471B
1903262-07	W-1064	Wipe	7471B
1903262-08	W-1065	Wipe	7471B
1903262-09	W-1066	Wipe	7471B
1903262-10	W-1067	Wipe	7471B
1903262-11	W-1068	Wipe	7471B
1903262-12	W-1069	Wipe	7471B
1903262-13	W-1070	Wipe	7471B
1903262-14	W-1071	Wipe	7471B
1903262-15	W-1072	Wipe	7471B
1903262-16	W-1073	Wipe	7471B
1903262-17	W-1074	Wipe	7471B
1903262-18	W-1075	Wipe	7471B
1903262-19	W-1076	Wipe	7471B
1903262-20	W-1077	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903262

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903262

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1058
Date Sampled: 03/11/19 09:10
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.310 (0.020)		7471B		1	MKS	03/13/19 12:21	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1059
Date Sampled: 03/11/19 09:15
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.263 (0.020)		7471B		1	MKS	03/13/19 12:23	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1060
Date Sampled: 03/11/19 09:22
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.348 (0.020)		7471B		1	MKS	03/13/19 12:25	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1061
Date Sampled: 03/11/19 09:26
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.151 (0.020)		7471B		1	MKS	03/13/19 12:27	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1062
Date Sampled: 03/11/19 09:48
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/13/19 12:29	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1063
Date Sampled: 03/11/19 09:35
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	20.5 (2.00)		7471B		100	MKS	03/13/19 15:11	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1064
Date Sampled: 03/11/19 09:40
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	15.3 (2.00)		7471B		100	MKS	03/13/19 15:17	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1065
Date Sampled: 03/11/19 10:10
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	9.52 (2.00)		7471B		100	MKS	03/13/19 15:19	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1066
Date Sampled: 03/11/19 10:13
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	17.7 (2.00)		7471B		100	MKS	03/13/19 15:21	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1067
Date Sampled: 03/11/19 10:15
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.469 (0.100)		7471B		5	MKS	03/13/19 15:23	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1068
Date Sampled: 03/11/19 10:18
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.259 (0.020)		7471B		1	MKS	03/13/19 12:45	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1069
Date Sampled: 03/11/19 10:20
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.87 (0.400)		7471B		20	MKS	03/13/19 15:25	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1070
Date Sampled: 03/11/19 10:25
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	4.98 (1.00)		7471B		50	MKS	03/13/19 15:27	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1071
Date Sampled: 03/11/19 11:12
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.408 (0.100)		7471B		5	MKS	03/13/19 15:29	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1072
Date Sampled: 03/11/19 11:16
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.360 (0.020)		7471B		1	MKS	03/13/19 12:53	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1073
Date Sampled: 03/11/19 11:18
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.039 (0.020)		7471B		1	MKS	03/13/19 12:55	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1074
Date Sampled: 03/11/19 11:21
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-17
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.292 (0.020)		7471B		1	MKS	03/13/19 12:57	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1075
Date Sampled: 03/11/19 11:29
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-18
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.379 (0.020)		7471B		1	MKS	03/13/19 12:59	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1076
Date Sampled: 03/11/19 11:31
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-19
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.79 (0.400)		7471B		20	MKS	03/13/19 15:31	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1077
Date Sampled: 03/11/19 11:45
Percent Solids: N/A

ESS Laboratory Work Order: 1903262
ESS Laboratory Sample ID: 1903262-20
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.95 (0.400)		7471B		20	MKS	03/13/19 15:33	1	40	CC91301



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903262

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC91301 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.121	0.020	ug/100cm ²	0.1208		100	85-115			
LCS Dup										
Mercury	0.118	0.020	ug/100cm ²	0.1208		98	85-115	2	20	



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903262

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903262

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903262
Shipped/Delivered Via: ESS Courier Date Received: 3/12/2019
Project Due Date: 3/19/2019 3/18/19
Days for Project: 3 days 5 Day 4 day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? Yes No

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 2.3 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes No / NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes No
b. Does methanol cover soil completely? Yes No NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	322614	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	322613	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	322612	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	322611	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	322610	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	322609	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	322608	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	322607	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	322606	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	322605	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
11	322604	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	322603	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
13	322602	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
14	322601	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
15	322600	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
16	322599	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
17	322598	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
18	322597	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
19	322596	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
20	322595	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review
All containers scanned into storage/lab

Initials: kl

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903262
Date Received: 3/12/2019

Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: <u>[Signature]</u>	Date & Time: <u>3/12/19</u> <u>1756</u>
Reviewed By: <u>[Signature]</u>	Date & Time: <u>3/12/19</u> <u>1816</u>
Delivered By: <u>[Signature]</u>	Date & Time: <u>3/12/19</u> <u>1816</u>



1 of 35

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

Company Name
GZA GeoEnvironmental

Contact Person
Rebecca Cox

City
Bedford

State
NH

Telephone Number
603-319-7520

ESS Lab ID
603-319-7520

Collection Date
3/11/19

Collection Time
0910

Sample Type
Wipe

Sample Matrix
Wipe

Sample ID
W-1058

Analysis
Y

Electronic Deliverables
X

Data Checker
X

Other (Please Specify)
Total Hg

Excel

CHAIN OF CUSTODY

Turn Time
14 Days

Regulatory State
MA MCP

Is this project for any of the following?
CT RCP MA MCP RGP

Project #
0409031803

Project Name
Schiller Berler Demo

Address
5 Commerce Park Dr.

Zip Code
03110

Email Address
rebecca_cox@gza.com

PO #

Sample ID

Sample Matrix

Sample Type

Sample ID

Analysis

Electronic Deliverables

Data Checker

Other (Please Specify)

Excel

ESS Lab #
1903267

Reporting Limits

Electronic Deliverables

Data Checker

Other (Please Specify)

Excel

Sample ID

Sample Matrix

Sample ID

Sample Type

Sample ID

Analysis

Electronic Deliverables

Data Checker

Other (Please Specify)

Excel

Turn Time
14 Days

Regulatory State
MA MCP

Is this project for any of the following?
CT RCP MA MCP RGP

Project #
0409031803

Project Name
Schiller Berler Demo

Address
5 Commerce Park Dr.

Zip Code
03110

Email Address
rebecca_cox@gza.com

PO #

Sample ID

Sample Matrix

Sample ID

Sample Type

Sample ID

Analysis

Electronic Deliverables

Data Checker

Other (Please Specify)

Excel

ESS Lab #
1903267

Reporting Limits

Electronic Deliverables

Data Checker

Other (Please Specify)

Excel

Sample ID

Sample Matrix

Sample ID

Sample Type

Sample ID

Analysis

Electronic Deliverables

Data Checker

Other (Please Specify)

Excel

Container Type: AC-Air Cassette AG-Ambet Glass B-BOD Bottle C-Cubitaliner J-Jar O-Other P-Poly S-Sterile V-Vial

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other*

Number of Containers per Sample: 1

Sampled by: E. Dyrness + C. Madison

Comments: DI Wipes, 10x10 cm

Please specify "Other" preservative and containers types in this space

Laboratory Use Only

Cooler Present: Drop Off

Seals Intact: Pickup

Cooler Temperature: NA °C or temp 2.3

Relinquished by: (Signature, Date & Time)

Received by: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time)

Received by: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time)

Received by: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time)

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Received by: (Signature, Date & Time)

Relinquished by: (Signature, Date & Time)

2 of 35

ESS Laboratory

Division of Thielisch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time		Days		ESS Lab #		Reporting Limits	
Regulatory State		Is this project for any of the following?:		Electronic Deliverables		Data Checker	
Project #		MA MCP		Other (Please Specify ->)		Excel	
04.0190318.03		Schiller Isotek Remo					
Company Name		Address		Project Name		PO #	
GZA Geoscientific		5 Commerce Park N		Schiller Isotek Remo			
Contact Person		Zip Code		Email Address		Sample ID	
Rebecca Cox		03410		Rebecca.Cox@GZA.com			
Telephone Number		State		Sample Matrix		Analysis	
603-315-7520		RI		Wife		H H Tefel H H	
ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID		
11	3/11/19	1018	Wife		W-1068		
12	3/11/19	1020			W-1069		
13	3/11/19	1025			W-1070		
14	3/11/19	1112			W-1071		
15	3/11/19	1116			W-1072		
16	3/11/19	1118			W-1073		
17	3/11/19	1121			W-1074		
18	3/11/19	1129			W-1075		
19	3/11/19	1131			W-1076		
20	3/11/19	1145			W-1077		

Container Type: AC-Air Cassette AG-Ambiel Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial AG
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* 9
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 8-Methanol 7-Na2S2O3 8-ZnAc2, MeOH 9-NH4Cl 10-DI H2O 11-Other

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: NA °C NA °F
Relinquished by: (Signature, Date & Time) 3/12/19
Relinquished by: (Signature, Date & Time) 3/12/19

Comments:
D1 wipes, 10 N10 con
Sampled by: E. D. P. Press + C. Madrya
Please specify "Other" preservative and containers types in this space
Relinquished By: (Signature, Date & Time) 3/12/19 16:45
Relinquished By: (Signature, Date & Time) 3/12/19 0722



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903263

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 4:19 pm, Mar 18, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903263

SAMPLE RECEIPT

The following samples were received on March 12, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903263-01	031119-BLANK1	Wipe	7471B
1903263-02	031119-BLANK2	Wipe	7471B
1903263-03	W-1088	Wipe	7471B
1903263-04	W-1089	Wipe	7471B
1903263-05	W-1090	Wipe	7471B
1903263-06	W-1091	Wipe	7471B
1903263-07	W-1092	Wipe	7471B
1903263-08	W-1093	Wipe	7471B
1903263-09	W-1094	Wipe	7471B
1903263-10	W-1095	Wipe	7471B
1903263-11	W-1096	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903263

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903263

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: 031119-BLANK1
Date Sampled: 03/11/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/13/19 13:15	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: 031119-BLANK2
Date Sampled: 03/11/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/13/19 13:17	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1088
Date Sampled: 03/11/19 08:42
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.173 (0.020)		7471B		1	MKS	03/13/19 13:19	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1089
Date Sampled: 03/11/19 08:43
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.052 (0.020)		7471B		1	MKS	03/13/19 13:21	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1090
Date Sampled: 03/11/19 08:45
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.061 (0.020)		7471B		1	MKS	03/13/19 13:23	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1091
Date Sampled: 03/11/19 08:46
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.350 (0.020)		7471B		1	MKS	03/13/19 13:29	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1092
Date Sampled: 03/11/19 08:50
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.047 (0.020)		7471B		1	MKS	03/13/19 13:31	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1093
Date Sampled: 03/11/19 08:53
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.401 (0.100)		7471B		5	MKS	03/13/19 15:35	1	40	CC91302



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1094
Date Sampled: 03/11/19 08:55
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.669 (0.200)		7471B		10	MKS	03/13/19 15:41	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1095
Date Sampled: 03/11/19 08:56
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.191 (0.020)		7471B		1	MKS	03/13/19 13:37	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1096
Date Sampled: 03/11/19 09:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903263
ESS Laboratory Sample ID: 1903263-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.079 (0.020)		7471B		1	MKS	03/13/19 13:40	1	40	CC91302



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903263

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC91302 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.118	0.020	ug/100cm ²	0.1208		98	85-115			
LCS Dup										
Mercury	0.116	0.020	ug/100cm ²	0.1208		96	85-115	2	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903263

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903263

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903263
Shipped/Delivered Via: ESS Courier Date Received: 3/12/2019
Project Due Date: 3/19/2019 3/18/19
Days for Project: 5 Day 4 day

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? Yes

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 2.3 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? Yes

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	322634	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	322633	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	322632	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	322631	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	322630	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	322629	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	322628	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	322627	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	322626	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	322625	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
11	322624	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review

All containers scanned into storage/lab
Are barcode labels on correct containers? Initials: GA
Are all necessary stickers attached? Yes / No

Completed By: [Signature] Date & Time: 3/12/19 1757
Reviewed By: [Signature] Date & Time: 3/12/19 1817
Delivered By: [Signature] Date & Time: 3/12/19 1817

41 085

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

Company Name
GTA Co Environmental
Contact Person
Rebecca Cox

CHAIN OF CUSTODY

Turn Time 7 Days
Regulatory State RI
Is this project for any of the following?
 CT RCP MA MCP RGP

Project # 04019031803 Project Name Schwab Biot Demo
Address 5 Commerce Park N. PO #

State RI Zip Code 03118
City Bedford Email Address rebecca.cox@gtaco.com
FAX Number

ESS Lab # 1903263
Reporting Limits
Electronic Data Checker Excel
Deliverables Other (Please Specify →)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
1	3/11/19	-	Wipe	Wipe	03119 - Blank 1	X
2	3/11/19	-	-	-	03119 - Blank 2	X
3	3/12/19	0842	-	-	W-1088	X
4	3/12/19	0843	-	-	W-1089	X
5	3/12/19	0845	-	-	W-1090	X
6	3/12/19	0846	-	-	W-1091	X
7	3/12/19	0850	-	-	W-1092	X
8	3/12/19	0853	-	-	W-1093	X
9	3/12/19	0855	-	-	W-1094	X
10	3/12/19	0856	-	-	W-1095	X

Container Type: AC-Air Cassette AG-Ambier Glass B-BOD Bottle C-Subtainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2 9-NH4Cl 10-D1 H2O 11-Other

Number of Containers per Sample: 1
Sampled by: E. Dyress & B. Luby
Comments: D1 wipes, 10x10cm Report in
Please specify "Other" preservative and containers types in this space

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: NA Pickup
Cooler Temperature: 3.3 °C (at temp)
Relinquished by: (Signature, Date & Time) Rebecca Cox 3/12/19 16:45
Received By: (Signature, Date & Time) [Signature] 3/12/19 17:22

CHAIN OF CUSTODY

ESS Lab # 1903263

Reporting Limits Excel

Electronic Deliverables Data Checker Other (Please Specify →)

Turn Time 64 Days

Regulatory State MA MA MCP RGP CT RCP

Is this project for any of the following?
 Project # 04019031803 Project Name Commence Park N1

Project # 04019031803 Project Name Commence Park N1

Address 5 Commence Park N1 PO # 03110

State MA Zip Code 03110 Email Address rebecca_cox@gee.com

FAX Number 603-315-7520 Sample ID W-1096

Company Name GZA GeoEnvironmental Contact Person Rebecca Cox

City Needham State MA

Telephone Number 603-315-7520

ESS Lab ID 11 Collection Date 3/12/19 Collection Time 0900 Sample Type Wipe Sample Matrix Wipe

Container Type: AC-Air Cassette AG-Ambient Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial
Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2SO3 8-ZnAc2 NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers per Sample: 1

Sampled by: E. Dymness & J. Lohas
Comments: D1 wipes, 10 x 10 cm
Please specify "Other" preservative and containers types in this space

Laboratory Use Only
Cooler Present: Drop off
Seals Intact: NA Pickup
Cooler Temperature: 2.3 °C (2.3) °F

Relinquished by: (Signature, Date & Time) Rebecca Cox 3/12/19
Received by: (Signature, Date & Time) [Signature] 3/12/19 1722

Relinquished by: (Signature, Date & Time) [Signature] 3/12/19 16:45
Received by: (Signature, Date & Time) [Signature] 3/12/19 1722

5085

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BAL Laboratory

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of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903264

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 4:21 pm, Mar 18, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903264

SAMPLE RECEIPT

The following samples were received on March 12, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903264-01	W-1078	Wipe	7471B
1903264-02	W-1079	Wipe	7471B
1903264-03	W-1080	Wipe	7471B
1903264-04	W-1081	Wipe	7471B
1903264-05	W-1082	Wipe	7471B
1903264-06	W-1083	Wipe	7471B
1903264-07	W-1084	Wipe	7471B
1903264-08	W-1085	Wipe	7471B
1903264-09	W-1086	Wipe	7471B
1903264-10	W-1087	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903264

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903264

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1078
Date Sampled: 03/11/19 11:38
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.035 (0.020)		7471B		1	MKS	03/13/19 13:48	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1079
Date Sampled: 03/11/19 12:10
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.78 (0.400)		7471B		20	MKS	03/13/19 15:43	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1080
Date Sampled: 03/11/19 12:22
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.108 (0.020)		7471B		1	MKS	03/13/19 14:52	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1081
Date Sampled: 03/11/19 14:30
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.938 (0.200)		7471B		10	MKS	03/13/19 15:45	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1082
Date Sampled: 03/11/19 14:35
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.423 (0.100)		7471B		5	MKS	03/13/19 15:47	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1083
Date Sampled: 03/11/19 14:39
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.289 (0.020)		7471B		1	MKS	03/13/19 14:58	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1084
Date Sampled: 03/11/19 14:41
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	12.4 (2.00)		7471B		100	MKS	03/13/19 15:49	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1085
Date Sampled: 03/11/19 14:45
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.372 (0.020)		7471B		1	MKS	03/13/19 15:02	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1086
Date Sampled: 03/11/19 14:50
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.202 (0.020)		7471B		1	MKS	03/13/19 15:04	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1087
Date Sampled: 03/11/19 14:55
Percent Solids: N/A

ESS Laboratory Work Order: 1903264
ESS Laboratory Sample ID: 1903264-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.153 (0.020)		7471B		1	MKS	03/13/19 15:06	1	40	CC91303



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903264

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC91303 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.120	0.020	ug/100cm ²	0.1208		99	85-115			
LCS Dup										
Mercury	0.121	0.020	ug/100cm ²	0.1208		100	85-115	1	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903264

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory
*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903264

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS
Shipped/Delivered Via: ESS Courier

ESS Project ID: 1903264
Date Received: 3/12/2019
Project Due Date: 3/19/2019 3/18/19
Days for Project: 5 Day 4 day

- 1. Air bill manifest present? No Yes
- Air No.: NA
- 2. Were custody seals present? Yes No
- 3. Is radiation count <100 CPM? Yes No
- 4. Is a Cooler Present? Yes No
Temp: 2.3 Iced with: Ice
- 5. Was COC signed and dated by client? Yes No
- 6. Does COC match bottles? Yes No
- 7. Is COC complete and correct? Yes No
- 8. Were samples received intact? Yes No
- 9. Were labs informed about short holds & rushes? Yes / No / NA
- 10. Were any analyses received outside of hold time? Yes / No

- 11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____
- 12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

- 13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

- 14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	322645	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	322644	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	322643	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	322642	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	322641	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	322640	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	322639	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	322638	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	322637	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	322636	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review

All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: W
 Yes / No
 Yes / No

Completed By: [Signature] Date & Time: 3/12/19 1758
Reviewed By: [Signature] Date & Time: 3/12/19 1818
Delivered By: [Signature] Date & Time: 3/12/19 1818

3 of 3

ESS Laboratory

Division of Thielisch Engineering, Inc.
 185 Frances Avenue, Cranston RI 02910
 Tel. (401) 461-7181 Fax (401) 461-4486
 www.esslaboratory.com

Company Name
 GZA Ge-Environmental

Contact Person
 Rebecca

City
 Isford

Telephone Number
 318-7520

FAX Number
 318-7520

CHAIN OF CUSTODY

Turn Time 84 Days
 Regulatory State
 Is this project for any of the following?:
 CT RCP MA MCP RGP
 Project # 04-040 318.03 Schwilke Debra
 Address 5 Commerce Project Name
 State NH Zip Code 03110 PO #
 Email Address
rebecca.cox@ge.com

ESS Lab #	Reporting Limits	Electronic Deliverables	Data Checker	Other (Please Specify →)
1903264				

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis														
						1	2	3	4	5	6	7	8	9	10					
1	3/14/19	1138	wipe	wipe	W-1078															
2	3/14/19	1210			W-1079															
3	3/14/19	1222			W-1080															
4	3/14/19	1430			W-1081															
5	3/14/19	1435			W-1082															
6	3/14/19	1439			W-1083															
7	3/14/19	1441			W-1084															
8	3/14/19	1445			W-1085															
9	3/14/19	1450			W-1086															
10	3/14/19	1455			W-1087															

Container Type: AC-Air Cassette AG-Ambler Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial AG
 Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2.0Z 9-4.0Z 10-8.0Z 11-Other* 9
 Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NeOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other 1

Laboratory Use Only
 Cooler Present: Drop-off
 Seals Intact: Pickup
 Cooler Temperature: NA °C (Reference) 2.3

Number of Containers per Sample: 1
 Sampled by: E. Dymess & C. Neelsen
 Comments: D1 Wipes, 10x10cm
 Please specify "Other" preservative and containers types in this space

Received By: (Signature, Date & Time)
E. Dymess 3/14/19 12:12
 Relinquished By: (Signature, Date & Time)
J. Schwilke 3/12/19 16:45

Received By: (Signature, Date & Time)
J. Schwilke 3/12/19 17:22
 Relinquished By: (Signature, Date & Time)



ESS Laboratory
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BAL Laboratory

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CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903301

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 12:28 pm, Mar 19, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903301

SAMPLE RECEIPT

The following samples were received on March 13, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903301-03	C-1003	Solid	7471B
1903301-04	C-1004	Solid	7471B
1903301-05	C-1005	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903301

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903301

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1003
Date Sampled: 03/12/19 08:38
Percent Solids: 98

ESS Laboratory Work Order: 1903301
ESS Laboratory Sample ID: 1903301-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	7.87 (1.38)		7471B		50	MKS	03/14/19 12:20	0.73	40	CC91401



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1004
Date Sampled: 03/12/19 08:28
Percent Solids: 98

ESS Laboratory Work Order: 1903301
ESS Laboratory Sample ID: 1903301-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	15.6 (1.29)		7471B		50	MKS	03/14/19 13:52	0.78	40	CC91401



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1005
Date Sampled: 03/12/19 08:15
Percent Solids: 99

ESS Laboratory Work Order: 1903301
ESS Laboratory Sample ID: 1903301-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	3.53 (0.681)		7471B		20	MKS	03/14/19 13:05	0.59	40	CC91401



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903301

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC91401 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.09	0.325	mg/kg wet	4.850		64	80-120			
LCS Dup										
Mercury	3.13	0.314	mg/kg wet	4.850		65	80-120	1	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903301

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903301

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903301
Shipped/Delivered Via: ESS Courier Date Received: 3/13/2019
Project Due Date: 3/19/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? No Yes

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 1.5 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	322889	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	322888	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	322887	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	322886	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	322885	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review
All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: GA
 Yes / No
 Yes / No

Completed By: [Signature] Date & Time: 3/13/19 1642
Reviewed By: [Signature] Date & Time: 3/13/19 1644
Delivered By: [Signature] Date & Time: 3/13/19 1644

1 of 1

ESS Laboratory

Division of Thielson Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **1003301**

Turn Time **24** Days

Reporting Limits

Regulatory State

Electronic Deliverables Data Checker Excel Other (Please Specify -->)

Is this project for any of the following?:
 CT RCP MA MCP RGP

Company Name
GZA Geo Environmental Inc

Project # **04.0190318.03** Project Name **Schiller Boiler Demo**

Contact Person
Rebecca Cox

Address
5 Commerce Park N.

City
Bedford

State **NH** Zip Code **03110** PO #

Telephone Number
603-319-7520

FAX Number Email Address
rebecca.cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total
1	3/12/19	1324	G	Solid	C-1003 ^{EDS} C-1006	✓	
2	3/12/19	1333	G	Solid	C-1007	✓	
3	3/13/19	0838	G	Solid	C-1003	✓	
4	3/13/19	0828	G	Solid	C-1004	✓	
5	3/13/19	0815	G	Solid	C-1005	✓	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubtainer J-Jar O-Other P-Poly S-Sterile V-Vial **AG**

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* **9**

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other* **1**

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: **0°C + 1.5**

Sampled by: **E. Dymness & T. Lohrs**
Comments: **Changes made per client**
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) CarD [Signature] 2/13/19 1325	Received By: (Signature, Date & Time) [Signature] 2/13/19 13.25	Relinquished By: (Signature, Date & Time) [Signature] 3/13/19 16:16	Received By: (Signature, Date & Time) [Signature] 3/13/19 16:31
---	---	---	---

1 of 1

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **103301**

Turn Time **14** Days
Regulatory State

Reporting Limits

Is this project for any of the following?:
 CT RCP MA MCP RGP

Electronic Deliverables Data Checker Excel
 Other (Please Specify ->)

Company Name **GZA Geo Environmental Inc**
Contact Person **Rebecca Cox**
City **Bedford**
Telephone Number **603-515-7520**

Project # **04.0190318.03** Project Name **Schiller Boiler Dome**
Address **5 Commerce Park N.**
State **NH** Zip Code **03110** PO #
FAX Number Email Address **rebecca.cox@gza.com**

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID		Analysis	Total HB
1	3/12/19	1324	G	solid	C-1003 ^{EDD}	C-1006		
2	3/12/19	1333	G	solid	C-1007			
3	3/13/19	0838	G	solid	C-1003			
4	3/13/19	0828	G	solid	C-1004			
5	3/13/19	0815	G	solid	C-1005			

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial **AG**
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* **9**
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other* **1**
Number of Containers per Sample: **1**

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: **1.5** °C (at temp)

Sampled by: **E. Dymess & T. Lohrs**
Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) Caro Dymess 2/13/19 1325	Received By: (Signature, Date & Time) [Signature] 2/13/19 13.25	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time) [Signature] 3/13/19 163



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CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903403

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:52 pm, Mar 21, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903403

SAMPLE RECEIPT

The following samples were received on March 15, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903403-01	C-1022	Solid	7471B
1903403-02	C-1023	Solid	7471B
1903403-03	W-1114	Wipe	7471B
1903403-04	W-1115	Wipe	7471B
1903403-05	W-1116	Wipe	7471B
1903403-06	W-1117	Wipe	7471B
1903403-07	W-1118	Wipe	7471B
1903403-08	W-1119	Wipe	7471B
1903403-09	W-1120	Wipe	7471B
1903403-10	W-1121	Wipe	7471B
1903403-11	W-1122	Wipe	7471B
1903403-12	W-1123	Wipe	7471B
1903403-13	W-1124	Wipe	7471B
1903403-14	W-1125	Wipe	7471B
1903403-15	W-1126	Wipe	7471B
1903403-16	W-1127	Wipe	7471B
1903403-17	W-1128	Wipe	7471B
1903403-18	W-1129	Wipe	7471B
1903403-19	W-1130	Wipe	7471B
1903403-20	W-1131	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903403

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903403

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1022
Date Sampled: 03/14/19 13:24
Percent Solids: 100

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	15.0 (1.48)		7471B		50	MKS	03/19/19 16:51	0.67	40	CC91854



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1023
Date Sampled: 03/14/19 13:33
Percent Solids: 100

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	25.9 (1.46)		7471B		50	MKS	03/19/19 16:53	0.68	40	CC91854



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1114
Date Sampled: 03/14/19 14:15
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.356 (0.020)		7471B		1	MKS	03/19/19 12:28	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1115
Date Sampled: 03/14/19 14:17
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.030 (0.020)		7471B		1	MKS	03/19/19 12:30	1	40	CC91841



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1116
Date Sampled: 03/14/19 14:20
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.127 (0.020)		7471B		1	MKS	03/19/19 12:32	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1117
Date Sampled: 03/14/19 14:22
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.084 (0.020)		7471B		1	MKS	03/19/19 12:34	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1118
Date Sampled: 03/14/19 14:25
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.691 (0.100)		7471B		5	MKS	03/19/19 15:59	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1119
Date Sampled: 03/14/19 14:08
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.030 (0.020)		7471B		1	MKS	03/19/19 12:38	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1120
Date Sampled: 03/14/19 14:05
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.030 (0.020)		7471B		1	MKS	03/19/19 12:40	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1121
Date Sampled: 03/14/19 14:38
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.263 (0.020)		7471B		1	MKS	03/19/19 12:46	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1122
Date Sampled: 03/14/19 14:54
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.061 (0.020)		7471B		1	MKS	03/19/19 12:48	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1123
Date Sampled: 03/14/19 15:03
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.37 (0.200)		7471B		10	MKS	03/19/19 16:01	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1124
Date Sampled: 03/14/19 15:21
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	12.7 (2.00)		7471B		100	MKS	03/19/19 16:03	1	40	CC91841



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1125
Date Sampled: 03/14/19 15:24
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.53 (0.500)		7471B		25	MKS	03/19/19 16:05	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1126
Date Sampled: 03/14/19 15:11
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	48.7 (10.0)		7471B		500	MKS	03/19/19 17:12	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1127
Date Sampled: 03/14/19 15:13
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.082 (0.020)		7471B		1	MKS	03/19/19 12:58	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1128
Date Sampled: 03/14/19 15:16
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-17
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.038 (0.020)		7471B		1	MKS	03/19/19 13:00	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1129
Date Sampled: 03/14/19 15:27
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-18
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	95.3 (10.0)		7471B		500	MKS	03/19/19 17:14	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1130
Date Sampled: 03/14/19 15:29
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-19
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.575 (0.100)		7471B		5	MKS	03/19/19 16:11	1	40	CC91841



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1131
Date Sampled: 03/14/19 15:31
Percent Solids: N/A

ESS Laboratory Work Order: 1903403
ESS Laboratory Sample ID: 1903403-20
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 13:10	1	40	CC91841



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903403

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC91841 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.123	0.020	ug/100cm ²	0.1208		102	85-115			
LCS Dup										
Mercury	0.124	0.020	ug/100cm ²	0.1208		102	85-115	0.4	20	
Batch CC91854 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.06	0.374	mg/kg wet	4.850		63	50-103			
LCS Dup										
Mercury	2.87	0.367	mg/kg wet	4.850		59	50-103	6	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903403

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903403

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903403
Shipped/Delivered Via: ESS Courier Date Received: 3/15/2019
Project Due Date: 3/21/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? No Yes

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 5.2 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	324085	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	324084	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	324083	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	324082	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	324081	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	324080	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	324079	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	324078	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	324077	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	324076	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
11	324075	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	324074	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
13	324073	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
14	324072	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
15	324071	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
16	324070	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
17	324069	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
18	324068	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
19	324067	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
20	324066	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS

ESS Project ID: 1903403

Date Received: 3/15/2019

All containers scanned into storage/lab

Are barcode labels on correct containers?

Initials:

Yes / No

Are all necessary stickers attached?

Yes / No

Completed

By: [Signature]

Date & Time: 3/18/19 11:22

Reviewed

By: [Signature]

Date & Time: 3/18/19 11:38

Delivered

By: [Signature]

Date & Time: 3/18/19 12:30

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

3 of 5
EISD

CHAIN OF CUSTODY

ESS Lab # 1903403

Turn Time 64 Days
Regulatory State
Is this project for any of the following?:
 CT RCP MA MCP RGP

Reporting Limits
Electronic Data Checker Excel
Deliverables Other (Please Specify --)

Company Name GZA Geo Environmental
Project # 04.0190318.03 Project Name Schiller Boiler Demo
Contact Person Rebecca Cox Address 5 Commerce Park N.
City Bedford State NH Zip Code 03110 PO #
Telephone Number 603-315-7520 FAX Number Email Address rebecca.cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
1	3/14/19	1324	G	solid	C-1022	Y
2	3/14/19	1333	G	solid	C-1023	Y
3	3/14/19	1415	wipe	wipe	W-1114	Y
4	3/14/19	1417			W-1115	Y
5	3/14/19	1420			W-1116	Y
6	3/14/19	1422			W-1117	Y
7	3/14/19	1425			W-1118	Y
8	3/14/19	1408			W-1119	Y
9	3/14/19	1405			W-1120	Y
10	3/14/19	1438			W-1121	Y

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial AG
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* 9
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other* 1
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: Ice 5.2°C

Sampled by: E. Dymess, C. Madison, B. Lehrs
Comments: DI wipes, 10x10 cm
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) Erick Payer 3/15/19 2 PM Received By: (Signature, Date & Time) Julia 3/15/19 2 PM
Relinquished by: (Signature, Date & Time) Received By: (Signature, Date & Time) 2/15/20

4 of 5
ESD

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903403

Turn Time 64 Days
Regulatory State

Reporting Limits
Electronic Deliverables Data Checker Excel Other (Please Specify -->)

Company Name: GZA GeoEnvironmental
Contact Person: Rebecca Cox
City: Bedford
State: NH
Zip Code: 0340
Project #: 04.0190318.03
Project Name: Iso Schiller TSoiler Demo
Address: 5 Commerce Park N.
Telephone Number: 603-315-7520
FAX Number:
Email Address: rebecca.cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
11	3/14/19	1454	wipe	wipe	W-1122	✓
12	3/14/19	1503			W-1123	✓
13	3/14/19	1521			W-1124	✓
14	3/14/19	1524			W-1125	✓
15	3/14/19	1511			W-1126	✓
16	3/14/19	1513			W-1127	✓
17	3/14/19	1516			W-1128	✓
18	3/14/19	1527			W-1129	✓
19	3/14/19	1529			W-1130	✓
20	3/14/19	1531			W-1131	✓

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubtainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other*
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: See 5.2 °C
Sampled by: E. Dymess, C. Madison, T. Lohus
Comments: Please specify "Other" preservative and containers types in this space
DI wipes, 10x10cm

Relinquished by: (Signature, Date & Time) Received By: (Signature, Date & Time) Relinquished By: (Signature, Date & Time) Received By: (Signature, Date & Time)
Eric Dymess 3/15/19 Del Riva 3/15/19 2 PM Al Riva 8 PM
Relinquished by: (Signature, Date & Time) Received By: (Signature, Date & Time) Relinquished By: (Signature, Date & Time) Received By: (Signature, Date & Time)
2/3/19 2010



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903404

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:54 pm, Mar 21, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903404

SAMPLE RECEIPT

The following samples were received on March 15, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903404-01	W-1107	Wipe	7471B
1903404-02	W-1108	Wipe	7471B
1903404-03	W-1109	Wipe	7471B
1903404-04	W-1110	Wipe	7471B
1903404-05	W-1111	Wipe	7471B
1903404-06	W-1112	Wipe	7471B
1903404-07	W-1113	Wipe	7471B
1903404-08	C-1006	Solid	7471B
1903404-09	C-1007	Solid	7471B
1903404-10	C-1021	Solid	7471B
1903404-11	W-1097	Wipe	7471B
1903404-12	W-1098	Wipe	7471B
1903404-13	W-1099	Wipe	7471B
1903404-14	W-1100	Wipe	7471B
1903404-15	W-1101	Wipe	7471B
1903404-16	W-1102	Wipe	7471B
1903404-17	W-1103	Wipe	7471B
1903404-18	W-1104	Wipe	7471B
1903404-19	W-1105	Wipe	7471B
1903404-20	W-1106	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903404

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903404

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1107
Date Sampled: 03/12/19 11:13
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.509 (0.100)		7471B		5	MKS	03/19/19 16:13	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1108
Date Sampled: 03/12/19 11:21
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.11 (0.200)		7471B		10	MKS	03/19/19 16:15	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1109
Date Sampled: 03/12/19 11:24
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.184 (0.020)		7471B		1	MKS	03/19/19 13:22	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1110
Date Sampled: 03/12/19 11:30
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.089 (0.020)		7471B		1	MKS	03/19/19 13:24	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1111
Date Sampled: 03/12/19 11:32
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.54 (0.400)		7471B		20	MKS	03/19/19 16:17	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1112
Date Sampled: 03/12/19 11:35
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.83 (0.400)		7471B		20	MKS	03/19/19 16:23	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1113
Date Sampled: 03/12/19 11:38
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 13:34	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1006
Date Sampled: 03/14/19 08:40
Percent Solids: 95

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-08
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	50.6 (3.16)		7471B		100	MKS	03/19/19 16:55	0.66	40	CC91854



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1007
Date Sampled: 03/14/19 08:50
Percent Solids: 99

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-09
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	26.4 (1.49)		7471B		50	MKS	03/19/19 16:58	0.67	40	CC91854



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1021
Date Sampled: 03/14/19 13:20
Percent Solids: 99

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-10
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	14.9 (1.29)		7471B		50	MKS	03/19/19 17:00	0.78	40	CC91854



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1097
Date Sampled: 03/12/19 10:40
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.108 (0.020)		7471B		1	MKS	03/19/19 13:36	1	40	CC91850



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1098
Date Sampled: 03/12/19 10:43
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 13:38	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1099
Date Sampled: 03/12/19 10:45
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	9.50 (1.00)		7471B		50	MKS	03/19/19 16:25	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1100
Date Sampled: 03/12/19 10:46
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.37 (0.400)		7471B		20	MKS	03/19/19 16:27	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1101
Date Sampled: 03/12/19 10:52
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.528 (0.100)		7471B		5	MKS	03/19/19 16:29	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1102
Date Sampled: 03/12/19 10:54
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.123 (0.020)		7471B		1	MKS	03/19/19 13:46	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1103
Date Sampled: 03/12/19 10:56
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-17
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.809 (0.200)		7471B		10	MKS	03/19/19 16:31	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1104
Date Sampled: 03/12/19 11:02
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-18
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.077 (0.020)		7471B		1	MKS	03/19/19 13:50	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1105
Date Sampled: 03/12/19 10:58
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-19
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.71 (0.400)		7471B		20	MKS	03/19/19 16:33	1	40	CC91850



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1106
Date Sampled: 03/12/19 11:05
Percent Solids: N/A

ESS Laboratory Work Order: 1903404
ESS Laboratory Sample ID: 1903404-20
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.47 (0.200)		7471B		10	MKS	03/19/19 16:35	1	40	CC91850



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory
*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903404

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC91850 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.119	0.020	ug/100cm ²	0.1208		99	85-115			
LCS Dup										
Mercury	0.124	0.020	ug/100cm ²	0.1208		103	85-115	4	20	
Batch CC91854 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.06	0.374	mg/kg wet	4.850		63	50-103			
LCS Dup										
Mercury	2.87	0.367	mg/kg wet	4.850		59	50-103	6	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903404

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903404

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903404
Shipped/Delivered Via: ESS Courier Date Received: 3/15/2019
Project Due Date: 3/21/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? No Yes

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 5.2 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes No NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes No
b. Does methanol cover soil completely? Yes No

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	324105	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	324104	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	324103	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	324102	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	324101	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	324100	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	324099	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	324098	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	324097	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	324096	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	324095	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	324094	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
13	324093	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
14	324092	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
15	324091	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
16	324090	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
17	324089	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
18	324088	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
19	324087	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
20	324086	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS

ESS Project ID: 1903404
Date Received: 3/15/2019

All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: E
Yes / No
Yes / No

Completed			
By:	<u>[Signature]</u>	Date & Time:	<u>3/18/19 11:24</u>
Reviewed			
By:	<u>[Signature]</u>	Date & Time:	<u>3/18/19 11:30</u>
Delivered			
By:	<u>[Signature]</u>	Date & Time:	<u>3/16/19 12:30</u>

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

1 of 5
ESD

CHAIN OF CUSTODY

ESS Lab # 1903 404

Company Name
GZA GeoEnvironmental
Contact Person
Rebecca Cox
City
Isford
Telephone Number
603-315-7520

Turn Time 84 Days
Regulatory State
Is this project for any of the following?:
 CT RCP MA MCP RGP
Project # 04.090 318.03 Schiller Project Name Isford Demo
Address 5 Commerce Park U.
City Isford State NH Zip Code 03106 PO #
FAX Number Email Address rebecca.cox@gza.com

Reporting Limits
Electronic Deliverables Data Checker Excel Other (Please Specify →)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
11	3/12/19	1040	Wipe	wipe	W-1097	X
12	3/12/19	1043			W-1098	X
13	3/12/19	1045			W-1099	X
14	3/12/19	1046			W-1100	X
16	3/12/19	1052			W-1101	✓
16	3/12/19	1054			W-1102	X
17	3/12/19	1056			W-1103	Y
18	3/12/19	1102			W-1104	Y
19	3/12/19	1058			W-1105	Y
20	3/12/19	1105	4	✓	W-1106	Y

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: Ke 5.2 °C

Sampled by: E. Dymos, B. Lohus, C. Manton
Comments: Please specify "Other" preservative and containers types in this space
DI wipes, 10x10 cm

Relinquished by: (Signature, Date & Time) Eud Dymos 3/15/19 2:00 pm	Received By: (Signature, Date & Time) Al Keys 3/15/19 2:15 pm	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time) Al Keys 3/15/19 8:12 pm
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time) 20 3/15/19 2:10

2 of 5
EISS

ESS Laboratory

Division of Thielsch Engineering, Inc.
 185 Frances Avenue, Cranston RI 02910
 Tel. (401) 461-7181 Fax (401) 461-4486
 www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903404

Turn Time 84 Days
 Regulatory State _____
 Is this project for any of the following?
 CT RCP MA MCP RGP
 Project # 09090318.03 Project Name Schiller Boiler Demo
 Contact Person Rebecca Cox Address 5 Commack Rd N.
 City Belford State NH Zip Code 03110 PO # _____
 Telephone Number 603-315-7520 FAX Number _____ Email Address rebecca.cox@schiller.com

Reporting Limits
 Electronic Deliverables
 Data Checker Excel
 Other (Please Specify -->)

Company Name GZA Geo Environmental
 Contact Person Rebecca Cox
 City Belford State NH Zip Code 03110 PO # _____
 Telephone Number 603-315-7520 FAX Number _____ Email Address rebecca.cox@schiller.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID
1	3/12/19	1113	Wipe	wipe	w-1107
2	3/12/19	1121			w-1108
3	3/12/19	1124			w-1109
4	3/12/19	1130			w-1110
5	3/12/19	1132			w-1111
6	3/12/19	1135			w-1112
7	3/12/19	1138	↓	↓	w-1113
8	3/14/19	0840	G	solid	C-1006
9	3/14/19	0850	G	solid	C-1007
10	3/14/19	1320	G	Solid	C-1021

Analysis	Total Hg																					

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial
 Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*
 Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*
 Number of Containers per Sample: 1

Laboratory Use Only
 Cooler Present: Drop Off
 Seals Intact: Pickup
 Cooler Temperature: Freezer °C
 Sampled by: E. Dyrest, C. Madison, B. Luhrs
 Comments: DI wipes, 10x10 cm
 Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <u>E. Dyrest 3/15/19 2PM</u>	Received By: (Signature, Date & Time) <u>Carl Rice 2PM 3/15/19</u>	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time) <u>Carl Rice 8 PM</u>
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time) <u>Carl 3/15/19 2:00</u>



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903405

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in cursive script, appearing to read 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:55 pm, Mar 21, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903405

SAMPLE RECEIPT

The following samples were received on March 15, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903405-01	031419-BLANK1	Wipe	7471B
1903405-02	031419-BLANK2	Wipe	7471B
1903405-03	031519-BLANK3	Wipe	7471B
1903405-04	W-1132	Wipe	7471B
1903405-05	W-1133	Wipe	7471B
1903405-06	W-1134	Wipe	7471B
1903405-07	W-1135	Wipe	7471B
1903405-08	W-1136	Wipe	7471B
1903405-09	W-1137	Wipe	7471B
1903405-10	W-1138	Wipe	7471B
1903405-11	W-1139	Wipe	7471B
1903405-12	W-1140	Wipe	7471B
1903405-13	W-1141	Wipe	7471B
1903405-14	W-1142	Wipe	7471B
1903405-15	W-1143	Wipe	7471B
1903405-16	W-1144	Wipe	7471B
1903405-17	C-1027	Solid	7471B
1903405-18	C-1029	Solid	7471B
1903405-19	C-1030	Solid	7471B
1903405-20	C-1031	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903405

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903405

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: 031419-BLANK1
Date Sampled: 03/14/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 14:06	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: 031419-BLANK2
Date Sampled: 03/14/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 14:08	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: 031519-BLANK3
Date Sampled: 03/15/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 14:10	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1132
Date Sampled: 03/15/19 08:03
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	5.71 (1.00)		7471B		50	MKS	03/19/19 16:41	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1133
Date Sampled: 03/15/19 08:05
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.790 (0.200)		7471B		10	MKS	03/19/19 16:47	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1134
Date Sampled: 03/15/19 08:10
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.069 (0.020)		7471B		1	MKS	03/19/19 14:16	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1135
Date Sampled: 03/15/19 08:15
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.057 (0.020)		7471B		1	MKS	03/19/19 14:22	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1136
Date Sampled: 03/15/19 08:20
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 14:24	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1137
Date Sampled: 03/15/19 08:17
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 14:26	1	40	CC91855



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1138
Date Sampled: 03/15/19 08:23
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.126 (0.020)		7471B		1	MKS	03/19/19 14:28	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1139
Date Sampled: 03/15/19 08:26
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.072 (0.020)		7471B		1	MKS	03/19/19 14:30	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1140
Date Sampled: 03/15/19 08:30
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 14:32	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1141
Date Sampled: 03/15/19 08:35
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/19/19 14:34	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1142
Date Sampled: 03/15/19 08:40
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.040 (0.020)		7471B		1	MKS	03/19/19 14:36	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1143
Date Sampled: 03/15/19 08:47
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.046 (0.020)		7471B		1	MKS	03/19/19 14:38	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1144
Date Sampled: 03/15/19 10:20
Percent Solids: N/A

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.373 (0.020)		7471B		1	MKS	03/19/19 14:40	1	40	CC91855



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1027
Date Sampled: 03/15/19 10:28
Percent Solids: 99

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-17
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	320 (16.4)		7471B		500	MKS	03/19/19 17:16	0.61	40	CC91854



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1029
Date Sampled: 03/15/19 09:18
Percent Solids: 99

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-18
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.207 (0.048)		7471B		5	MKS	03/19/19 17:04	2.07	40	CC91854



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1030
Date Sampled: 03/15/19 08:30
Percent Solids: 98

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-19
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.337 (0.049)		7471B		5	MKS	03/19/19 17:06	2.06	40	CC91854



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1031
Date Sampled: 03/15/19 09:40
Percent Solids: 97

ESS Laboratory Work Order: 1903405
ESS Laboratory Sample ID: 1903405-20
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.167 (0.010)		7471B		1	MKS	03/19/19 15:41	2.09	40	CC91854



ESS Laboratory
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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903405

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC91854 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.06	0.374	mg/kg wet	4.850		63	50-103			
LCS Dup										
Mercury	2.87	0.367	mg/kg wet	4.850		59	50-103	6	20	
Batch CC91855 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.125	0.020	ug/100cm ²	0.1208		104	85-115			
LCS Dup										
Mercury	0.128	0.020	ug/100cm ²	0.1208		106	85-115	2	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903405

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903405

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903405
Shipped/Delivered Via: ESS Courier Date Received: 3/15/2019
Project Due Date: 3/21/2019
Days for Project: 4 Day

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? No

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 5.2 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? Yes

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	324344	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	324345	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	324346	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	324347	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	324348	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	324349	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	324350	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	324351	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	324352	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	324353	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
11	324354	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	324355	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
13	324356	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
14	324358	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
15	324357	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
16	324359	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
17	324360	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
18	324343	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
19	324342	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
20	324341	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS

ESS Project ID: 1903405
Date Received: 3/15/2019

All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: e
Yes / No
Yes / No

Completed By: <u>[Signature]</u>	Date & Time: <u>3/18/19 11:17</u>
Reviewed By: <u>[Signature]</u>	Date & Time: <u>3/18/19 11:40</u>
Delivered By: <u>[Signature]</u>	Date & Time: <u>3/18/19 12:30</u>

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903405

Company Name
GZA Geo Environmental
Contact Person
Rebecca Cox
City
Bedford
Telephone Number
603-315-7520

Turn Time 84 Days
Regulatory State
Is this project for any of the following?
 CT RCP MA MCP RGP
Project # 04.0190318.03 Project Name Schiller Boiler Demo
Address
5 Commerce Park N.
State NH Zip Code 03110 PO #
FAX Number
Email Address
rebecca_cox@gza.com

Reporting Limits
Electronic Deliverables Data Checker Excel Other (Please Specify --)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total Hg
11	3/15/19	0826	wipe	wipe	W-1139		
12	3/15/19	0830	wipe	wipe	W-1140		
13	3/15/19	0835	wipe	wipe	W-1141		
14	3/15/19	0840	wipe	wipe	W-1142		
15	3/15/19	0847	wipe	wipe	W-1143		
16	3/15/19	1020	wipe	wipe	W-1144		
17	3/15/19	1028	G	solid	C-1027		
18	3/15/19	0918	G	solid	C-1029		
19	3/15/19	0930	G	solid	C-1030		
20	3/15/19	0940	G	solid	C-1031		

Container Type: AG-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other*
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: 5.2 °C

Sampled by: E. Dymess, C. Madigan, B. Luhrs
Comments: D1 wipe, 10x10 cm
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <u>Erik Dymess 3/15/19 2pm</u>	Received By: (Signature, Date & Time) <u>Oliver Nye 3/15/19 2pm</u>	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time) <u>Oliver Nye 8pm</u>
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time) <u>Oliver Nye 3/15/19 2pm</u>

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.eslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903405

Turn Time 64 Days
Regulatory State

Reporting Limits

Is this project for any of the following?
 CT RCP MA MCP RGP

Electronic Deliverables Data Checker Excel
 Other (Please Specify --)

Company Name
GZA Geo Environmental
Contact Person
Rebecca Cox
City
Boston
State
MA
Telephone Number
603-315-7520
FAX Number

Email Address
rebecca.cox@gza.com

Project #
04.0190318.05
Project Name
5 Commerce Park N
Address
Schiller Boiler Dome
Zip Code
03106
PO #

State
NH

Analysis	Total HS																			
----------	----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID															
1	3/14/19	-	wipe	wipe	031419 - Blank 1															
2	3/14/19	-	wipe	wipe	031419 - Blank 2															
3	3/15/19	-	wipe	wipe	031519 - Blank 3															
4	3/15/19	0803	wipe	wipe	W-1132															
6	3/15/19	0805	wipe	wipe	W-1133															
6	3/15/19	0810	wipe	wipe	W-1134															
7	3/15/19	0815	wipe	wipe	W-1135															
8	3/15/19	0820	wipe	wipe	W-1136															
9	3/15/19	0817	wipe	wipe	W-1137															
10	3/15/19	0825	wipe	wipe	W-1138															

Container Type: AG-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitaier J-Jar O-Other P-Poly S-Sterile V-Vial AG
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* 9
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcO, NaOH 9-NH4Cl 10-DI H2O 11-Other* 1
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: _____ Drop Off
Seals Intact: _____ Pickup
Cooler Temperature: 5C 5.2 °C
Sampled by: E. Dymess, J. Luhrs, C. Madison
Comments: Please specify "Other" preservative and containers types in this space
DI wipe, 10x10 cm

Relinquished by: (Signature, Date & Time) EPA 3/15/19 2PM	Received By: (Signature, Date & Time) AL 3/15/19	Relinquished By: (Signature, Date & Time) 2PM	Received By: (Signature, Date & Time) AL Res 8 PM
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time) AL 3/15/19 2PM



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903433

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 12:33 pm, Mar 22, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903433

SAMPLE RECEIPT

The following samples were received on March 18, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903433-01	C-1008	Solid	7471B
1903433-02	C-1009	Solid	7471B
1903433-03	C-1010	Solid	7471B
1903433-04	C-1011	Solid	7471B
1903433-05	C-1012	Solid	7471B
1903433-06	C-1013	Solid	7471B
1903433-07	C-1014	Solid	7471B
1903433-08	C-1015	Solid	7471B
1903433-09	C-1016	Solid	7471B
1903433-10	C-1017	Solid	7471B
1903433-11	C-1018	Solid	7471B
1903433-12	C-1019	Solid	7471B
1903433-13	C-1020	Solid	7471B
1903433-14	C-1028	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903433

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903433

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1008
Date Sampled: 03/15/19 11:29
Percent Solids: 99

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	10.3 (1.59)		7471B		50	MKS	03/20/19 13:15	0.63	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1009
Date Sampled: 03/15/19 11:38
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.04 (0.336)		7471B		10	MKS	03/20/19 13:17	0.6	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1010
Date Sampled: 03/15/19 13:30
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	5.75 (1.25)		7471B		50	MKS	03/20/19 13:19	0.81	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1011
Date Sampled: 03/15/19 13:40
Percent Solids: 97

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.97 (0.628)		7471B		25	MKS	03/20/19 13:21	0.81	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1012
Date Sampled: 03/15/19 12:00
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	16.9 (1.68)		7471B		50	MKS	03/20/19 13:23	0.6	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1013
Date Sampled: 03/15/19 11:50
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-06
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	4.94 (0.824)		7471B		25	MKS	03/20/19 13:25	0.61	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1014
Date Sampled: 03/15/19 11:20
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-07
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.93 (0.552)		7471B		20	MKS	03/20/19 13:27	0.73	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1015
Date Sampled: 03/15/19 14:08
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-08
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	19.7 (1.69)		7471B		50	MKS	03/20/19 13:29	0.6	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1016
Date Sampled: 03/15/19 14:15
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-09
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	23.6 (1.31)		7471B		50	MKS	03/20/19 13:31	0.77	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1017
Date Sampled: 03/15/19 13:58
Percent Solids: 99

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-10
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	55.2 (3.27)		7471B		100	MKS	03/20/19 13:47	0.61	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1018
Date Sampled: 03/15/19 14:22
Percent Solids: 99

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-11
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	15.5 (1.45)		7471B		50	MKS	03/20/19 13:39	0.69	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1019
Date Sampled: 03/15/19 14:27
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-12
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	16.2 (1.47)		7471B		50	MKS	03/20/19 13:41	0.69	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1020
Date Sampled: 03/15/19 13:45
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-13
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	5.81 (0.609)		7471B		25	MKS	03/20/19 13:43	0.83	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1028
Date Sampled: 03/15/19 13:53
Percent Solids: 98

ESS Laboratory Work Order: 1903433
ESS Laboratory Sample ID: 1903433-14
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.83 (0.622)		7471B		20	MKS	03/20/19 13:45	0.65	40	CC91941



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903433

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC91941 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.05	0.325	mg/kg wet	4.850	63	50-103				
LCS Dup										
Mercury	3.05	0.291	mg/kg wet	4.850	63	50-103	0.04	20		



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903433

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory
*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903433

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903433
Shipped/Delivered Via: ESS Courier Date Received: 3/18/2019
Project Due Date: 3/25/2019
Days for Project: 5 Day

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? No

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 0.6 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? Yes

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	324578	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	324577	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	324576	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	324575	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	324574	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	324573	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	324572	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	324571	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	324570	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	324569	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	324568	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	324567	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	324566	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	324565	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Completed By: [Signature] Date & Time: 3/18/19 1823

Initials: [Signature]
Yes / No
Yes / No

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903433
Date Received: 3/18/2019
Reviewed By: [Signature] Date & Time: 3/18/19 1853
Delivered By: [Signature] 3/18/19 1853

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **1003433**

Company Name
GZA GeoEnvironmental
Contact Person
Rebecca Cox
City
Bedford
Telephone Number
603-315-7520

Turn Time **64** Days
Regulatory State
Is this project for any of the following?
 CT RCP MA MCP RGP
Project # **04.0190348.03** Project Name **Schiller Boiler Demo**
Address
5 Commerce Park N.
State **NH** Zip Code **03110** PO #
FAX Number
Email Address
rebecca.cox@gza.com

Reporting Limits
Electronic Deliverables Data Checker Excel
 Other (Please Specify →)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
1	3/15/19	1129	G	solid	C-1008	✓
2	3/15/19	1138	G	solid	C-1009	✓
3	3/15/19	1330	G	solid	C-1010	✓
4	3/15/19	1340	G	solid	C-1011	✓
5	3/15/19	1200	G	solid	C-1012	✓
6	3/15/19	1150	G	solid	C-1013	✓
7	3/15/19	1120	G	solid	C-1014	✓
8	3/15/19	1408	G	solid	C-1015	✓
9	3/15/19	1415	G	solid	C-1016	✓
10	3/15/19	1358	G	solid	C-1017	✓

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other*
Number of Containers per Sample: **1**

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: **0.6** °C ice temp

Sampled by: **E. Dymosh, B. Lohs, C. Madison**
Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) [Signature] 3/18/19 12:43	Received By: (Signature, Date & Time) [Signature] 3/18/19 12:43	Relinquished By: (Signature, Date & Time) [Signature] 3/18/19 16:50	Received By: (Signature, Date & Time) [Signature] 3/18/19 18:20
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7161 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 180 1903433						
Turn Time <u>8/4</u> Days			Reporting Limits			
Regulatory State						
Is this project for any of the following?: <input type="radio"/> CT RCP <input type="radio"/> MA MCP <input type="radio"/> RGP						
Electronic Deliverables			<input type="checkbox"/> Data Checker <input type="checkbox"/> Excel			
<input type="checkbox"/> Other (Please Specify →)						
Company Name <u>GZA Geo Environmental</u>		Project # <u>07.0190348.03</u>	Project Name <u>Schiller Boiler Demo</u>			
Contact Person <u>Rebecca Cox</u>		Address <u>5 Commerce Park Dr.</u>				
City <u>Bedford</u>		State <u>NH</u>	Zip Code <u>03110</u>	PO #		
Telephone Number <u>603-315-7520</u>		Email Address <u>rebecca_cox@gza.com</u>				
ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis <u>Total Hg</u>
<u>11</u>	<u>3/15/19</u>	<u>1422</u>	<u>G</u>	<u>Solid</u>	<u>C-1018</u>	
<u>12</u>	<u>3/15/19</u>	<u>1427</u>	<u>G</u>	<u>Solid</u>	<u>C-1019</u>	
<u>13</u>	<u>3/15/19</u>	<u>1345</u>	<u>G</u>	<u>Solid</u>	<u>C-1020</u>	
<u>14</u>	<u>3/15/19</u>	<u>1353</u>	<u>G</u>	<u>Solid</u>	<u>C-1028</u>	
Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial <u>AG</u>						
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other <u>9</u>						
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other <u>1</u>						
Number of Containers per Sample: <u>1</u>						
Laboratory Use Only Cooler Present: <input checked="" type="checkbox"/> <input type="checkbox"/> Drop Off Seals Intact: <u>NA</u> <input type="checkbox"/> Pickup Cooler Temperature: <u>10°C (ice temp), 0.6</u>				Sampled by: <u>E. Dyrness, C. Madison, B. Luhrs.</u> Comments: Please specify "Other" preservative and containers types in this space		
Relinquished by: (Signature, Date & Time)		Received By: (Signature, Date & Time)		Relinquished By: (Signature, Date & Time)		Received By: (Signature, Date & Time)
<u>[Signature]</u> 3/18/19 12:43		<u>[Signature]</u> 3/18/19 12:43		<u>[Signature]</u> 3/18/19 16:50		<u>[Signature]</u> 3/18/19 16:21
Relinquished by: (Signature, Date & Time)		Received By: (Signature, Date & Time)		Relinquished By: (Signature, Date & Time)		Received By: (Signature, Date & Time)



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CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903461

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 1:41 pm, Mar 25, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903461

SAMPLE RECEIPT

The following samples were received on March 19, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903461-01	W-1178	Wipe	7471B
1903461-02	W-1145	Wipe	7471B
1903461-03	W-1146	Wipe	7471B
1903461-04	W-1147	Wipe	7471B
1903461-05	W-1148	Wipe	7471B
1903461-06	W-1149	Wipe	7471B
1903461-07	W-1150	Wipe	7471B
1903461-08	W-1151	Wipe	7471B
1903461-09	W-1152	Wipe	7471B
1903461-10	W-1153	Wipe	7471B
1903461-11	W-1154	Wipe	7471B
1903461-12	W-1155	Wipe	7471B
1903461-13	W-1156	Wipe	7471B
1903461-14	W-1157	Wipe	7471B
1903461-15	W-1158	Wipe	7471B
1903461-16	W-1160	Wipe	7471B
1903461-17	W-1161	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903461

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903461

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1178
Date Sampled: 03/18/19 15:22
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.97 (0.200)		7471B		10	KJK	03/21/19 19:27	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1145
Date Sampled: 03/18/19 14:10
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.54 (0.200)		7471B		10	KJK	03/21/19 19:29	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1146
Date Sampled: 03/18/19 14:46
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.23 (0.200)		7471B		10	KJK	03/21/19 19:31	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1147
Date Sampled: 03/18/19 14:51
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.883 (0.200)		7471B		10	KJK	03/21/19 19:33	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1148
Date Sampled: 03/18/19 14:03
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.309 (0.020)		7471B		1	KJK	03/21/19 17:35	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1149
Date Sampled: 03/18/19 13:57
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.341 (0.020)		7471B		1	KJK	03/21/19 17:37	1	40	CC92043



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1150
Date Sampled: 03/18/19 14:15
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.25 (0.200)		7471B		10	KJK	03/21/19 19:35	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1151
Date Sampled: 03/18/19 15:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.698 (0.200)		7471B		10	KJK	03/21/19 19:37	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1152
Date Sampled: 03/18/19 13:33
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.043 (0.020)		7471B		1	KJK	03/21/19 17:47	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1153
Date Sampled: 03/18/19 13:51
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.643 (0.200)		7471B		10	KJK	03/21/19 19:39	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1154
Date Sampled: 03/18/19 13:43
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.48 (0.200)		7471B		10	KJK	03/21/19 19:41	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1155
Date Sampled: 03/18/19 13:37
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.210 (0.020)		7471B		1	KJK	03/21/19 17:54	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1156
Date Sampled: 03/18/19 13:20
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.097 (0.020)		7471B		1	KJK	03/21/19 17:56	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1157
Date Sampled: 03/18/19 12:51
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	12.1 (2.00)		7471B		100	KJK	03/21/19 20:07	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1158
Date Sampled: 03/18/19 12:31
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.086 (0.020)		7471B		1	KJK	03/21/19 18:00	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1160
Date Sampled: 03/18/19 14:35
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	16.3 (2.00)		7471B		100	KJK	03/21/19 20:09	1	40	CC92043



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1161
Date Sampled: 03/18/19 14:20
Percent Solids: N/A

ESS Laboratory Work Order: 1903461
ESS Laboratory Sample ID: 1903461-17
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.173 (0.020)		7471B		1	KJK	03/21/19 18:04	1	40	CC92043



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903461

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC92043 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.130	0.020	ug/100cm ²	0.1208		108	85-115			
LCS Dup										
Mercury	0.127	0.020	ug/100cm ²	0.1208		105	85-115	3	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903461

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903461

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903461
Date Received: 3/19/2019
Shipped/Delivered Via: ESS Courier Project Due Date: 3/25/2019
Days for Project: 7 Day 40 cont

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? No

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 1.3 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? Yes

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about **short holds & rushes**? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	325067	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	325066	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	325065	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	325064	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	325063	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	325062	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	325061	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	325060	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	325059	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	325058	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
11	325057	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	325056	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
13	325055	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
14	325054	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
15	325053	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
16	325052	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
17	325051	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review
All containers scanned into storage/lab
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Initials: [Signature]

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903461
Date Received: 3/19/2019

Completed By: [Signature] Date & Time: 3/19/19 1830
Reviewed By: [Signature] Date & Time: 3/19/19 2035
Delivered By: [Signature] Date & Time: 3/19/19 2035

1 of 2

ESS Laboratory		CHAIN OF CUSTODY				ESS Lab #
Division of Thielsch Engineering, Inc. 185 Frances Avenue, Cranston RI 02910 Tel. (401) 461-7181 Fax (401) 461-4488 www.esslaboratory.com		Turn Time	64	Days		1903461
Company Name GZA Geo Environmental		Regulatory State	Is this project for any of the following?: <input type="radio"/> CT RCP <input type="radio"/> MA MCP <input type="radio"/> RSP			Reporting Limits
Contact Person Rebecca Cox		Project #	04-0190346-02 Schiller Boiler Demo			Electronic Deliverables <input type="checkbox"/> Data Checker <input type="checkbox"/> Excel <input type="checkbox"/> Other (Please Specify →)
City Rosford		Address	5 Commerce Park N			Analysis
State NH		Zip Code	03110			
Telephone Number 603-315-7520		FAX Number	rebecca.cox@GZA.com			
Email Address rebecca.cox@GZA.com						
ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	
1	3/18/19	1522	wipe	wipe	W-1144 W-1178 <i>change sample ID</i>	X
2		1410			W-1145	X
3		1446			W-1146	X
4		1451			W-1147	X
5		1403			W-1148	X
6		1357			W-1149	X
7		1415			W-1150	X
8		1500			W-1151	X
9		1333			W-1152	X
10		1351			W-1153	X
Container Type: AC-Alr Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial AG						
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* 9						
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other* 1						
Number of Containers per Sample: 1						
Laboratory Use Only Cooler Present: <input checked="" type="checkbox"/> <input type="checkbox"/> Drop Off Seals Intact: <input checked="" type="checkbox"/> NA <input type="checkbox"/> Pickup Cooler Temperature: °C 10 temp: 1.3			Sampled by: B. Labrus Comments: DI water wipe 100cm² Please specify "Other" preservative and containers types in this space			
Relinquished by: (Signature, Date & Time)		Received By: (Signature, Date & Time)		Received By: (Signature, Date & Time)		
Rebecca Cox 3/19/19 0940		Custody Seal 3/19/19 0940		3/14/19 12:50		
Relinquished by: (Signature, Date & Time)		Received By: (Signature, Date & Time)		Received By: (Signature, Date & Time)		
3/19/19 16:17		3/19/19 1820				



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903499

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 1:02 pm, Mar 26, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903499

SAMPLE RECEIPT

The following samples were received on March 20, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903499-01	C-1024	Solid	7471B
1903499-02	C-1025	Solid	7471B
1903499-03	C-1026	Solid	7471B
1903499-04	C-1032	Solid	7471B
1903499-05	C-1033	Solid	7471B
1903499-06	C-1034	Solid	7471B
1903499-07	C-1035	Solid	7471B
1903499-08	C-1036	Solid	7471B
1903499-09	C-1037	Solid	7471B
1903499-10	C-1039	Solid	7471B
1903499-11	C-1040	Solid	7471B
1903499-12	C-1041	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903499

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903499

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1024
Date Sampled: 03/19/19 13:24
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	15.6 (2.78)		7471B		100	MKS	03/25/19 13:40	0.72	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1025
Date Sampled: 03/19/19 13:01
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	71.0 (13.4)		7471B		500	MKS	03/25/19 14:45	0.75	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1026
Date Sampled: 03/19/19 13:37
Percent Solids: 98

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	415 (28.3)		7471B		1000	MKS	03/25/19 14:51	0.71	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1032
Date Sampled: 03/19/19 14:13
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	145 (15.5)		7471B		500	MKS	03/25/19 13:46	0.65	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1033
Date Sampled: 03/19/19 14:55
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	16.6 (3.18)		7471B		100	MKS	03/25/19 13:48	0.63	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1034
Date Sampled: 03/19/19 15:06
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-06
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.69 (0.760)		7471B		25	MKS	03/25/19 13:50	0.66	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1035
Date Sampled: 03/19/19 15:52
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-07
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	14.9 (2.41)		7471B		100	MKS	03/25/19 13:52	0.83	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1036
Date Sampled: 03/19/19 15:18
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-08
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	35.4 (2.67)		7471B		100	MKS	03/25/19 13:54	0.75	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1037
Date Sampled: 03/19/19 16:21
Percent Solids: 98

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-09
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	208 (14.2)		7471B		500	MKS	03/25/19 13:56	0.71	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1039
Date Sampled: 03/19/19 16:04
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-10
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	16.5 (3.23)		7471B		100	MKS	03/25/19 14:02	0.62	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1040
Date Sampled: 03/19/19 14:41
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-11
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	4.39 (3.19)		7471B		100	MKS	03/25/19 14:04	0.63	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1041
Date Sampled: 03/19/19 13:55
Percent Solids: 99

ESS Laboratory Work Order: 1903499
ESS Laboratory Sample ID: 1903499-12
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	47.5 (3.28)		7471B		100	MKS	03/25/19 14:06	0.61	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903499

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC92202 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.54	0.325	mg/kg wet	4.850		73	50-103			
LCS Dup										
Mercury	3.61	0.309	mg/kg wet	4.850		75	50-103	2	20	



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903499

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903499

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903499
Date Received: 3/20/2019
Shipped/Delivered Via: ESS Courier Project Due Date: 3/26/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? No Yes

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 1.1 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes No NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes No
b. Does methanol cover soil completely? Yes No NA

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

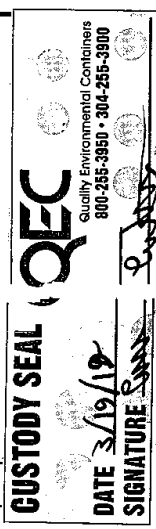
14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	325303	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	325302	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	325301	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	325300	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	325299	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	325298	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	325297	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	325296	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	325295	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	325294	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	325293	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	325292	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

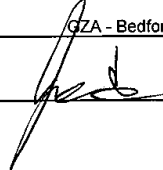
2nd Review
All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Completed By: [Signature] Date & Time: 3/20/19 1657
Reviewed By: [Signature] Date & Time: 3/20/19 17:00

Initials: [Signature]
Yes / No
Yes / No



ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903499
Date Received: 3/20/2019
Delivered By:  3/20/19 17:01

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903499

Turn Time 64 Days
Regulatory State NH
Is this project for any of the following?:
 CT RCP MA MCP RGP

Reporting Limits
Electronic Data Checker Excel
Deliverables Other (Please Specify --)

Company Name GZA GeoEnvironmental
Project # 04.0190348.03 Project Name Schiller Boiler Demo
Contact Person Rebecca Cox Address 5 Commerce Park N
City Bedford State NH Zip Code 03110 PO #
Telephone Number 603-315-7500 FAX Number Email Address rebecca.cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
1	3/19/19	1324	Grab	Solid	C-1024	X
2		1301			C-1025	X
3		1337			C-1026	X
4		1413			C-1032	X
5		1455			C-1033	X
6		1506			C-1034	X
7		1552			C-1035	X
8		1518			C-1036	X
9		1621			C-1037	X
10	↓	1604	↓	↓	C-1039	X

Container Type: AC-Air-Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial AG
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other 9
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other 1
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: °C (Ice Temp: 1.1)

Sampled by: B. Lubers
Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
3/20/19 11:45	3/20/19 11:45	3/20/19 16:17	3/20/19 16:49
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903563

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 2:32 pm, Mar 27, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903563

SAMPLE RECEIPT

The following samples were received on March 21, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903563-01	W-1179	Wipe	7471B
1903563-02	W-1162	Wipe	7471B
1903563-03	C-1042	Solid	7471B
1903563-04	C-1063	Solid	7471B
1903563-05	C-1064	Solid	7471B
1903563-06	BLANK	Wipe	7471B
1903563-07	W-1163	Wipe	7471B
1903563-08	W-1164	Wipe	7471B
1903563-09	W-1165	Wipe	7471B
1903563-10	W-1166	Wipe	7471B
1903563-11	W-1167	Wipe	7471B
1903563-12	W-1168	Wipe	7471B
1903563-13	W-1170	Wipe	7471B
1903563-14	W-1171	Wipe	7471B
1903563-15	W-1172	Wipe	7471B
1903563-16	W-1173	Wipe	7471B
1903563-17	W-1174	Wipe	7471B
1903563-18	W-1175	Wipe	7471B
1903563-19	BLANK	Wipe	7471B
1903563-20	W-1169	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903563

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903563

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1179
Date Sampled: 03/20/19 12:29
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.29 (0.500)		7471B		25	MKS	03/25/19 14:15	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1162
Date Sampled: 03/20/19 11:50
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.654 (0.200)		7471B		10	MKS	03/25/19 14:17	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1042
Date Sampled: 03/20/19 08:45
Percent Solids: 99

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.98 (0.553)		7471B		25	MKS	03/25/19 14:08	0.9	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1063
Date Sampled: 03/20/19 11:37
Percent Solids: 100

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.22 (0.729)		7471B		25	MKS	03/25/19 14:10	0.68	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1064
Date Sampled: 03/20/19 12:25
Percent Solids: 100

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	37.2 (3.20)		7471B		100	MKS	03/25/19 14:53	0.62	40	CC92202



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: BLANK
Date Sampled: 03/20/19 13:47
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/25/19 10:55	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1163
Date Sampled: 03/21/19 07:45
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.086 (0.020)		7471B		1	MKS	03/25/19 10:57	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1164
Date Sampled: 03/21/19 07:51
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.686 (0.200)		7471B		10	MKS	03/25/19 14:19	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1165
Date Sampled: 03/21/19 08:06
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.31 (0.200)		7471B		10	MKS	03/25/19 14:21	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1166
Date Sampled: 03/21/19 08:10
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	51.1 (10.0)		7471B		500	MKS	03/25/19 14:55	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1167
Date Sampled: 03/21/19 07:57
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	5.56 (1.00)		7471B		50	MKS	03/25/19 14:29	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1168
Date Sampled: 03/21/19 08:01
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	21.9 (2.00)		7471B		100	MKS	03/25/19 14:31	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1170
Date Sampled: 03/21/19 08:25
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.037 (0.020)		7471B		1	MKS	03/25/19 11:13	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1171
Date Sampled: 03/21/19 08:31
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.087 (0.020)		7471B		1	MKS	03/25/19 11:15	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1172
Date Sampled: 03/21/19 08:37
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/25/19 11:17	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1173
Date Sampled: 03/21/19 08:42
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.021 (0.020)		7471B		1	MKS	03/25/19 11:19	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1174
Date Sampled: 03/21/19 08:49
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-17
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	3.02 (0.500)		7471B		25	MKS	03/25/19 14:33	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1175
Date Sampled: 03/21/19 08:52
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-18
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.073 (0.020)		7471B		1	MKS	03/25/19 11:23	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: BLANK
Date Sampled: 03/20/19 09:08
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-19
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	03/25/19 11:27	1	40	CC92203



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1169
Date Sampled: 03/21/19 10:28
Percent Solids: N/A

ESS Laboratory Work Order: 1903563
ESS Laboratory Sample ID: 1903563-20
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.201 (0.020)		7471B		1	MKS	03/25/19 11:25	1	40	CC92203



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory
*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903563

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC92202 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.54	0.325	mg/kg wet	4.850		73	50-103			
LCS Dup										
Mercury	3.61	0.309	mg/kg wet	4.850		75	50-103	2	20	
Batch CC92203 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.115	0.020	ug/100cm ²	0.1208		95	85-115			
LCS Dup										
Mercury	0.120	0.020	ug/100cm ²	0.1208		100	85-115	5	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903563

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903563

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS
Shipped/Delivered Via: ESS Courier
ESS Project ID: 1903563
Date Received: 3/21/2019
Project Due Date: 3/27/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? No Yes
in study

3. Is radiation count <100 CPM? No Yes

4. Is a Cooler Present? No Yes
Temp: 2.3 Iced with: Ice

5. Was COC signed and dated by client? No Yes

6. Does COC match bottles? No Yes

7. Is COC complete and correct? No Yes

8. Were samples received intact? No Yes

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes / No / NA
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

Sample 19 "Blank" rec'd with no sample in jar

14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	326559	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	326558	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	326557	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	326556	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	326555	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	326554	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	326553	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	326552	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	326551	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	326550	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
11	326549	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	326548	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
13	326547	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
14	326546	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
15	326545	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
16	326544	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
17	326543	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
18	326542	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
19	326541	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
20	326540	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review
All containers scanned into storage/lab

Initials: GA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903563
Date Received: 3/21/2019

Are barcode labels on correct containers? Yes No
Are all necessary stickers attached? Yes No

Completed By: [Signature] Date & Time: 3/21/19 1948
Reviewed By: [Signature] Date & Time: 3/21/19 2022
Delivered By: [Signature] Date & Time: 3/21/19 2022



ESS Laboratory
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185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7161 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Company Name: **GZA Geo Environmental**
Contact Person: **Rebecca Cox**
City: **Redford** State: **NH**
Address: **5 Commerce Park N**
Zip Code: **03110** PO#:
Telephone Number: **603-315-7520** FAX Number:
Project #: **04-0190348.03** Project Name: **Schiller Boiler Demo**
Email Address: **rebecca.cox@gza.com**

ESS Lab #: **1903563**
Reporting Limits:
Electronic Deliverables: Data Checker Excel Other (Please Specify ->)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID
1	3/20/19	12:29	wipe	wipe	W-1155
2		11:50	wipe	wipe	W-1162
3		08:45	Grab	solid	C-1042
4		11:37	Grab	solid	C-1063
5	↘	12:25	Grab	solid	C-1064
6	↘	13:47	wipe	wipe	BLANK
7	3/21/19	07:45	wipe	wipe	W-1163
8		07:51			W-1164
9		08:06			W-1165
10	↘	08:10	↘	↘	W-1166

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial **AG**
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* **9**
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other* **9**
Laboratory Use Only:
Cooler Present: Cooler Temperature: **10°C**
Seals Intact: Seals Intact: **NA**
Number of Containers per Sample: **1**
Sampled by: **JLK, BRI**
Comments: **DI water wipe 100cm²**
Relinquished by: (Signature, Date & Time) **[Signature] 3/21/19 12:10**
Received By: (Signature, Date & Time) **[Signature] 3/21/19 12:10**
Relinquished by: (Signature, Date & Time) **[Signature] 3/21/19 17:28**
Received By: (Signature, Date & Time) **[Signature] 3/21/19 17:28**
Relinquished by: (Signature, Date & Time) **[Signature] 3/21/19 19:30**
Received By: (Signature, Date & Time) **[Signature] 3/21/19 19:30**

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185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

Company Name
GZA Geo-Environmental
Contact Person
Rebecca Cox

City
Bedford
Telephone Number
603-315-7520

State
NH
FAX Number

CHAIN OF CUSTODY

Turn Time **24** Days

Regulatory State **NH**

Is this project for any of the following?:
 CT RCP MA MCP RGP

Project # **04019034803** Project Name **Schiller Boiler Demo**

Address
5 Commerce Park N

City
Bedford State
NH Zip Code
03110 PO #

Email Address
rebecca.cox@gza.com

ESS Lab # **1903563**

Reporting Limits

Electronic Deliverables Data Checker Excel Other (Please Specify -->)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID
1	3/20/19	1229	wipe	wipe	W-1155
2		1150	wipe	wipe	W-1162
3		0845	Grab	solid	C-1042
4		1137	Grab	solid	C-1063
5	↓	1225	Grab	solid	C-1064
6	↓	1347	wipe	wipe	BLANK
7	3/21/19	0745	wipe	wipe	W-1163
8		0751			W-1164
9		0806			W-1165
10	↓	0810	↓	↓	W-1166

Total Hg

Container Type: AG-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial
 Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*
 Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other*
 Number of Containers per Sample: **9**

Laboratory Use Only
 Cooler Present: Drop Off
 Seals Intact: Pickup
 Cooler Temperature: **0°C ice temp id: 3**

Sampled by: **JLK, BRI**
 Comments: **DI water wipe 100cm²**
 Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)
[Signature] 3/21/19 12:10

Received By: (Signature, Date & Time)
[Signature] 3/21/19 12:10

Relinquished By: (Signature, Date & Time)
[Signature] 3/21/19 17:28

Received By: (Signature, Date & Time)
[Signature] 3/21/19 19:26

Relinquished by: (Signature, Date & Time)

Received By: (Signature, Date & Time)

Relinquished By: (Signature, Date & Time)

Received By: (Signature, Date & Time)

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www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **1903563**

Turn Time **84** Days
Regulatory State **NH**

Reporting Limits
Electronic Data Checker Excel
Deliverables Other (Please Specify --)

Is this project for any of the following?:
 CT RCP MA MCP RGP
Project # _____ Project Name _____

Company Name **GZA GeoEnvironmental**
Contact Person **Rebecca Cox**

Address **5 Commerce Park N**
City **Bedford** State **NH** Zip Code **03110** PO # _____

Telephone Number **603-315-7500**
FAX Number _____ Email Address **rebecca.cox@gza.com**

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
11	3/21/19	0757	wipe	wipe	W-1167	X
12		0801			W-1168	X
13		0805			W-1170	X
14		0831			W-1171	X
15		0837			W-1172	X
16		0842			W-1173	X
17		0849			W-1174	X
18		0852			W-1175	X
19	*	0908	*	*	BLANK	X
20	*	1028	*	*	W-1169	X

Container Type: AG-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: **°C Ice temp: 2.3**

Sampled by: **JLK, BRL**
Comments: **DI water wipe 100cm²**
Number of Containers per Sample: **1**
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) [Signature] 3/21/19 12:10	Received By: (Signature, Date & Time) [Signature] 3/21/19 12:20	Relinquished By: (Signature, Date & Time) [Signature] 3/21/19 17:28	Received By: (Signature, Date & Time) [Signature] 3/21/19 19:36
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CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903597

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 4:50 pm, Mar 28, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903597

SAMPLE RECEIPT

The following samples were received on March 22, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903597-01	C-1038	Solid	7471B
1903597-02	C-1044	Solid	7471B
1903597-03	C-1045	Solid	7471B
1903597-04	C-1046	Solid	7471B
1903597-05	C-1048	Solid	7471B
1903597-06	C-1049	Solid	7471B
1903597-07	C-1050	Solid	7471B
1903597-08	C-1051	Solid	7471B
1903597-09	C-1052	Solid	7471B
1903597-10	C-1053	Solid	7471B
1903597-11	C-1058	Solid	7471B
1903597-12	C-1060	Solid	7471B
1903597-13	C-1061	Solid	7471B
1903597-14	C-1065	Solid	7471B
1903597-15	C-1066	Solid	7471B
1903597-16	W-1159	Wipe	7471B
1903597-17	W-1176	Wipe	7471B
1903597-18	W-1177	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903597

PROJECT NARRATIVE

Total Metals
CC92655-BSD1 Blank Spike recovery is above upper control limit (B+).
Mercury (119% @ 85-115%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903597

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1038
Date Sampled: 03/21/19 15:12
Percent Solids: 98

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	17.5 (2.72)		7471B		100	MKS	03/27/19 15:07	0.74	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1044
Date Sampled: 03/21/19 16:11
Percent Solids: 98

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	5.48 (0.868)		7471B		25	MKS	03/27/19 15:09	0.58	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1045
Date Sampled: 03/21/19 12:50
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	161 (17.0)		7471B		500	MKS	03/27/19 15:11	0.59	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1046
Date Sampled: 03/21/19 13:30
Percent Solids: 98

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	38.6 (3.20)		7471B		100	MKS	03/27/19 15:13	0.63	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1048
Date Sampled: 03/21/19 15:36
Percent Solids: 97

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	5.88 (0.794)		7471B		25	MKS	03/27/19 15:19	0.64	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1049
Date Sampled: 03/21/19 13:36
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-06
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	22.1 (3.44)		7471B		100	MKS	03/27/19 15:21	0.58	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1050
Date Sampled: 03/21/19 13:52
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-07
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	27.5 (3.07)		7471B		100	MKS	03/27/19 15:23	0.65	40	CC92649



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1051
Date Sampled: 03/21/19 13:44
Percent Solids: 98

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-08
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	19.7 (2.92)		7471B		100	MKS	03/27/19 15:25	0.69	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1052
Date Sampled: 03/21/19 14:04
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-09
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	20.3 (3.03)		7471B		100	MKS	03/27/19 15:27	0.66	40	CC92649



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1053
Date Sampled: 03/21/19 14:10
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-10
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	37.7 (2.81)		7471B		100	MKS	03/27/19 15:29	0.71	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1058
Date Sampled: 03/21/19 15:32
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-11
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	30.5 (3.08)		7471B		100	MKS	03/27/19 15:31	0.65	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1060
Date Sampled: 03/21/19 14:24
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-12
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	17.0 (2.86)		7471B		100	MKS	03/27/19 15:34	0.7	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1061
Date Sampled: 03/21/19 14:33
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-13
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	7.32 (1.62)		7471B		50	MKS	03/27/19 15:36	0.62	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1065
Date Sampled: 03/21/19 15:00
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-14
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	16.4 (3.14)		7471B		100	MKS	03/27/19 15:38	0.64	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1066
Date Sampled: 03/21/19 14:45
Percent Solids: 99

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-15
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	9.28 (1.52)		7471B		50	MKS	03/27/19 16:29	0.66	40	CC92649



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1159
Date Sampled: 03/21/19 17:00
Percent Solids: N/A

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.090 (0.020)		7471B		1	MKS	03/27/19 12:54	1	40	CC92655



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1176
Date Sampled: 03/21/19 15:52
Percent Solids: N/A

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-17
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	3.98 (1.00)		7471B		50	MKS	03/27/19 16:31	1	40	CC92655



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1177
Date Sampled: 03/21/19 16:55
Percent Solids: N/A

ESS Laboratory Work Order: 1903597
ESS Laboratory Sample ID: 1903597-18
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.530 (0.100)		7471B		5	MKS	03/27/19 16:33	1	40	CC92655



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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903597

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC92649 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	4.09	0.360	mg/kg wet	4.850		84	50-103			
LCS Dup										
Mercury	4.36	0.367	mg/kg wet	4.850		90	50-103	7	20	
Batch CC92655 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.118	0.020	ug/100cm ²	0.1208		98	85-115			
LCS Dup										
Mercury	0.144	0.020	ug/100cm ²	0.1208		119	85-115	20	20	B+



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903597

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
B+	Blank Spike recovery is above upper control limit (B+).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903597

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1903597
Date Received: 3/22/2019
Shipped/Delivered Via: ESS Courier Project Due Date: 3/28/2019
Days for Project: 4 Day

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? Yes

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 2.5 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? No

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

COC = sample 16 is a wipe ; sample 16 is a solid

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: 3/25/ Time: _____ By: DR

Sample is a

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	326639	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	326638	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	326637	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	326636	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	326635	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	326634	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	326633	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	326632	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	326631	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	326630	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	326629	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	326628	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	326627	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	326626	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
15	326625	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
16	326642	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
17	326641	Yes	NA	Yes	4 oz. Jar - Hexane	Hexane	
18	326640	Yes	NA	Yes	4 oz. Jar - Hexane	Hexane	

2nd Review
All containers scanned into storage/lab
Are barcode labels on correct containers?

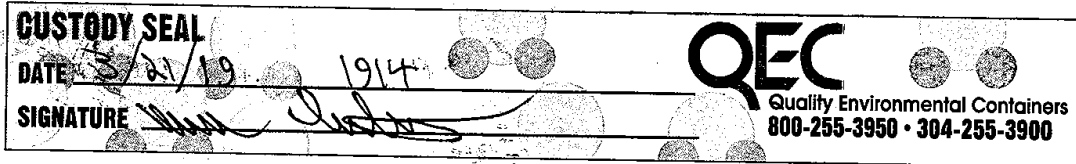
Initials: M
Yes / No

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1903597
Date Received: 3/22/2019

Are all necessary stickers attached? Yes / No

Completed By: [Signature] Date & Time: 3/22/19 17:00
Reviewed By: [Signature] Date & Time: 3/22/19 17:33
Delivered By: [Signature] Date & Time: 3/22/19 17:33



ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1903597
Date Received: 3/22/2019
Shipped/Delivered Via: ESS Courier Project Due Date: 3/28/2019
Days for Project: 4 Day

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? Yes

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 2.5 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? No

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

COC = sample 16 is a wipe ; sample 16 is a solid

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	326639	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	326638	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	326637	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	326636	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	326635	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	326634	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	326633	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	326632	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	326631	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	326630	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	326629	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	326628	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	326627	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	326626	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
15	326625	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
16	326642	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
17	326641	Yes	NA	Yes	4 oz. Jar - Hexane	Hexane	
18	326640	Yes	NA	Yes	4 oz. Jar - Hexane	Hexane	

2nd Review
All containers scanned into storage/lab
Are barcode labels on correct containers?

Initials: mm
Yes / No

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1903597
Date Received: 3/22/2019

Are all necessary stickers attached? Yes / No

Completed By: [Signature] Date & Time: 3/22/19 17:00
Reviewed By: [Signature] Date & Time: 3/22/19 17:33
Delivered By: [Signature] Date & Time: 3/22/19 17:33

CUSTODY SEAL
DATE: 3/22/19 1914
SIGNATURE: [Signature]

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

1/2

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab #		1903597	
Reporting Limits		Electronic Deliverables <input type="checkbox"/> Limit Checker <input type="checkbox"/> Standard Excel <input type="checkbox"/>	
Is this project for any of the following?: <input type="radio"/> OCT RCP <input type="radio"/> OMA MCP <input type="radio"/> ORGP		Other (Please Specify -->)	
Company Name	Project #	Project Name	
GZA Geo Environmental	04.0190348.08	Schiller Boiler Demo	
Contact Person	Address		
Rebecca Cox	5 Commerce Park N		
City	State	Zip Code	PO #
Bedford	NH	03110	
Telephone Number	FAX Number	Email Address	
603-315-7520		rebecca.cox@gza.com	
ESS Lab ID	Collection Date	Collection Time	Sample ID
1	3/21/19	1512	C-1038
2		1611	C-1044
3		1250	C-1045
4		1330	C-1046
5		1536	C-1048
6		1336	C-1049
7		1352	C-1050
8		1344	C-1051
9		1404	C-1052
10		1410	C-1053
Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G-Glass O-Other P-Poly S-Sterile V-Vial Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* Preservation Code: 1-Non Preserved 2-HCl 3-H2EO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Ascorbic Acid 12-Other* Number of Containers per Sample: 1			
Laboratory Use Only		Sampled by: BRL	
Cooler Present: <input checked="" type="checkbox"/>	Seals Intact: NA	Comments: Please specify "Other" preservative and containers types in this space	
Cooler Temperature: °C ice temp: 1.2			
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
<i>[Signature]</i> 3/21/19 1914	Custody Seal 3/21/19 1914	GZA fridge 3/22/19 10:36	<i>[Signature]</i> 3/22/19 10:36
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
<i>[Signature]</i> 3/22/19 16:35	<i>[Signature]</i> 3/22/19 16:47		

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903597

Turn Time 4 days Rush
Regulatory State NH
Is this project for any of the following?:
 OCT RCP OMA MCP ORGP

Reporting Limits
Electronic Limit Checker Standard Excel
Deliverables Other (Please Specify →)

Company Name GZA Geo Environmental Project # 04.019034808 Project Name Schiller Boiler Demo
Contact Person Rebecca Cox Address 5 Commerce Park N
City Bedford State NH Zip Code 03110 PO #
Telephone Number 603-315-7520 FAX Number Email Address rebecca.cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
11	3/21/19	1532	Grab	Solid	C-1058	Total # XXXXXX
12		1424			C-1060	
13		1433			C-1061	
14		1500			C-1065	
15		1445	↓	↓	C-1066	
16		1700	wipe	wipe	W-1159	
17		1552	↓	↓	W-1176	
18		1655	↓	↓	W-1177	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G-Glass O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Ascorbic Acid 12-Other*
Number of Containers per Sample: 9

Laboratory Use Only
Cooler Present:
Seals Intact: NH
Cooler Temperature: 0°C ice temp: 1.2
Sampled by: BRL
Comments: DI water wipe 100cm² Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <u>[Signature]</u> 3/21/19 1914	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/21/19 Custody Seal 1914	Relinquished By: (Signature, Date & Time) <u>[Signature]</u> GZA fridge 3/22/19 10:36	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/22/19 10:36
Relinquished by: (Signature, Date & Time) <u>[Signature]</u> 3/22/19 16:35	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/22/19 16:47	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

The Microbiology Division
of Thielsch Engineering, Inc.



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903664

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 3:30 pm, Mar 29, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903664

SAMPLE RECEIPT

The following samples were received on March 25, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903664-01	C-1043	Solid	7471B
1903664-02	C-1054	Solid	7471B
1903664-03	C-1055	Solid	7471B
1903664-04	C-1056	Solid	7471B
1903664-05	C-1057	Solid	7471B
1903664-06	C-1059	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903664

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903664

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1043
Date Sampled: 03/22/19 08:27
Percent Solids: 99

ESS Laboratory Work Order: 1903664
ESS Laboratory Sample ID: 1903664-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	7.51 (1.51)		7471B		50	MKS	03/29/19 11:40	0.66	40	CC92848



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1054
Date Sampled: 03/22/19 08:47
Percent Solids: 99

ESS Laboratory Work Order: 1903664
ESS Laboratory Sample ID: 1903664-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	16.3 (2.60)		7471B		100	MKS	03/29/19 11:42	0.77	40	CC92848



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1055
Date Sampled: 03/22/19 08:57
Percent Solids: 99

ESS Laboratory Work Order: 1903664
ESS Laboratory Sample ID: 1903664-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	24.6 (2.47)		7471B		100	MKS	03/29/19 11:44	0.81	40	CC92848



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1056
Date Sampled: 03/22/19 09:09
Percent Solids: 100

ESS Laboratory Work Order: 1903664
ESS Laboratory Sample ID: 1903664-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	14.1 (2.69)		7471B		100	MKS	03/29/19 11:46	0.74	40	CC92848



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1057
Date Sampled: 03/22/19 09:20
Percent Solids: 99

ESS Laboratory Work Order: 1903664
ESS Laboratory Sample ID: 1903664-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	158 (15.3)		7471B		500	MKS	03/29/19 13:10	0.65	40	CC92848



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1059
Date Sampled: 03/22/19 09:31
Percent Solids: 99

ESS Laboratory Work Order: 1903664
ESS Laboratory Sample ID: 1903664-06
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	174 (13.2)		7471B		500	MKS	03/29/19 13:12	0.76	40	CC92848



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903664

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC92848 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.55	0.360	mg/kg wet	4.850		73	50-103			
LCS Dup										
Mercury	3.76	0.336	mg/kg wet	4.850		78	50-103	6	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903664

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903664

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903664
Shipped/Delivered Via: ESS Courier Date Received: 3/25/2019
Project Due Date: 4/1/2019
Days for Project: 5 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? Yes No

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 1.1 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes No

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes No
b. Does methanol cover soil completely? Yes No NA

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

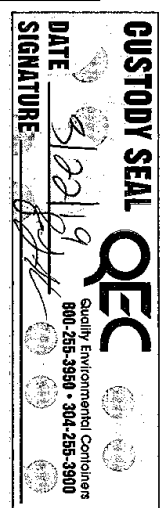
14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	327242	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	327241	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	327240	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	327239	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	327238	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	327237	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Completed By: [Signature] Date & Time: 3/25/19 1645
Reviewed By: [Signature] Date & Time: 3/25/19 1652
Delivered By: [Signature] Date & Time: 3/25/19 1652

Initials: [Signature]
Yes No
Yes No



ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **P05604**

Turn Time **64** Days

Reporting Limits

Regulatory State
is this project for any of the following?:
 CT RCP MA MCP RGP

Electronic Deliverables Data Checker Excel
 Other (Please Specify →)

Company Name **GTA Geo Environmental, Inc**
Project # **01050512.01** Project Name **Stoller-Baker Demo**
Contact Person **Rebecca Cox** Address **5 Commerce Park N**
City **Bellford** State **NH** Zip Code **03260** PO #
Telephone Number **603-315-7000** FAX Number Email Address **rebecca.cox@gta.com**

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total HS
1	3/22/19	0827	G	Solid	C-1043	X	
2	3/22/19	0847	G	Solid	C-1054	X	
3	3/22/19	0857	G	Solid	C-1055	X	
4	3/22/19	0909	G	Solid	C-1056	X	
5	3/22/19	0920	G	Solid	C-1059	X	
6	3/22/19	0931	G	Solid	C-1059	X	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*
Number of Containers per Sample: **1**

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: **1.1** °C re temp

Sampled by: **J. Kief**
Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
<i>J. Kief</i> 3/22/19 12:41	<i>GTA Fridge</i> 3/22/19 04:11	<i>GTA Fridge</i> 3/22/19 11:09	<i>J. Kief</i> 3/22/19 11:09
<i>J. Kief</i> 3/25/19 16:00	<i>J. Kief</i> 3/25/19 16:04		



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903825

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 3:20 pm, Apr 04, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903825

SAMPLE RECEIPT

The following samples were received on March 29, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903825-01	C-1067	Solid	7471B
1903825-02	C-1068	Solid	7471B
1903825-03	C-1070	Solid	7471B
1903825-04	C-1072	Solid	7471B
1903825-05	C-1078	Solid	7471B
1903825-06	C-1080	Solid	7471B
1903825-07	C-1082	Solid	7471B
1903825-08	C-1084	Solid	7471B
1903825-09	C-1086	Solid	7471B
1903825-10	C-1088	Solid	7471B
1903825-11	C-1069	Solid	7471B
1903825-12	C-1071	Solid	7471B
1903825-13	C-1073	Solid	7471B
1903825-14	C-1079	Solid	7471B
1903825-15	C-1081	Solid	7471B
1903825-16	C-1083	Solid	7471B
1903825-17	C-1085	Solid	7471B
1903825-18	C-1087	Solid	7471B
1903825-19	C-1089	Solid	7471B
1903825-20	C-1090	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903825

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903825

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1067
Date Sampled: 03/28/19 09:12
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	28.2 (3.07)		7471B		100	MKS	04/02/19 13:59	0.65	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1068
Date Sampled: 03/28/19 10:47
Percent Solids: 98

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	3.80 (0.787)		7471B		25	MKS	04/02/19 14:01	0.64	40	CD90125



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1070
Date Sampled: 03/28/19 12:24
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	22.3 (3.29)		7471B		100	MKS	04/02/19 14:07	0.61	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1072
Date Sampled: 03/28/19 09:23
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	3.99 (0.745)		7471B		25	MKS	04/02/19 14:09	0.67	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1078
Date Sampled: 03/28/19 12:48
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	19.6 (3.13)		7471B		100	MKS	04/02/19 14:11	0.64	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1080
Date Sampled: 03/28/19 13:07
Percent Solids: 98

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-06
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	84.1 (14.3)		7471B		500	MKS	04/02/19 16:08	0.71	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1082
Date Sampled: 03/28/19 09:58
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-07
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2000 (137)		7471B		5000	MKS	04/02/19 16:10	0.73	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1084
Date Sampled: 03/28/19 16:33
Percent Solids: 98

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-08
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	595 (54.6)		7471B		2000	MKS	04/02/19 16:25	0.74	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1086
Date Sampled: 03/28/19 12:55
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-09
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	36.1 (2.87)		7471B		100	MKS	04/02/19 14:19	0.7	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1088
Date Sampled: 03/28/19 15:34
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-10
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	11.8 (2.81)		7471B		100	MKS	04/02/19 14:21	0.71	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1069
Date Sampled: 03/28/19 10:55
Percent Solids: 96

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-11
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	15.9 (3.05)		7471B		100	MKS	04/02/19 14:35	0.68	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1071
Date Sampled: 03/28/19 11:04
Percent Solids: 98

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-12
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.377 (0.029)		7471B		1	MKS	04/02/19 11:33	0.69	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1073
Date Sampled: 03/28/19 12:40
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-13
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	9.77 (1.69)		7471B		50	MKS	04/02/19 14:37	0.59	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1079
Date Sampled: 03/28/19 09:35
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-14
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	4.91 (0.810)		7471B		25	MKS	04/02/19 14:39	0.62	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1081
Date Sampled: 03/28/19 09:49
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-15
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	9.45 (1.51)		7471B		50	MKS	04/02/19 14:41	0.66	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1083
Date Sampled: 03/28/19 16:41
Percent Solids: 98

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-16
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	133 (15.4)		7471B		500	MKS	04/02/19 14:43	0.66	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1085
Date Sampled: 03/28/19 13:02
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-17
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	32.0 (2.31)		7471B		100	MKS	04/02/19 14:45	0.87	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1087
Date Sampled: 03/28/19 12:31
Percent Solids: 99

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-18
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	9.70 (1.52)		7471B		50	MKS	04/02/19 14:47	0.66	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1089
Date Sampled: 03/28/19 15:29
Percent Solids: 94

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-19
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	24.0 (3.26)		7471B		100	MKS	04/02/19 14:49	0.65	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1090
Date Sampled: 03/28/19 15:22
Percent Solids: 98

ESS Laboratory Work Order: 1903825
ESS Laboratory Sample ID: 1903825-20
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	40.1 (2.40)		7471B		100	MKS	04/02/19 14:55	0.84	40	CD90125



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903825

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CD90125 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.58	0.341	mg/kg wet	4.850		74	50-103			
LCS Dup										
Mercury	3.49	0.325	mg/kg wet	4.850		72	50-103	3	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903825

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903825

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1903825
Shipped/Delivered Via: ESS Courier Date Received: 3/29/2019
Project Due Date: 4/4/2019
Days for Project: 4 Day

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? Yes

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 0.8 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? Yes

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes No
b. Does methanol cover soil completely? Yes / No / NA


13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	329016	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	329015	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	329014	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	329013	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	329012	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	329011	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	329010	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	329009	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	329008	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	329007	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	329006	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	329005	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	329004	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	329003	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
15	329002	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
16	329001	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
17	329000	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
18	328999	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
19	328998	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
20	328997	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
All containers scanned into storage/lab

Initials: 

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1903825
Date Received: 3/29/2019

Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: [Signature] Date & Time: 3/29/19 1751
Reviewed By: [Signature] Date & Time: 3/29/19 1823
Delivered By: [Signature] Date & Time: 3/29/19 1823



ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

Company Name
GZA Geo Environmental Inc.
Contact Person
Rebecca Cox
City
Bedford
Telephone Number
603-232-3600

Turn Time 4 Days
Regulatory State
Is this project for any of the following?:
 CT RCP MA MCP RGP
Project # 04.0190348.03
Project Name Schiller Station Boiler Demo
Address 5 Cambridge Park North, Suite 201
State NH **Zip Code** 03110 **PO #**
FAX Number
Email Address Rebecca.cox@gza.com

ESS Lab # 19035828
Reporting Limits
Electronic Deliverables Data Checker Excel
 Other (Please Specify --)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
1	3/28/19	0912	G	Solid	C-1067	Total H ₂
2		1047			C-1068	X
3		1224			C-1070	X
4		0923			C-1072	X
5		1248			C-1078	X
6		1307			C-1080	X
7		0958			C-1082	X
8		1033			C-1084	X
9		1255			C-1086	X
10		1534			C-1088	X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other

Laboratory Use Only
Cooler Present:
Seals Intact:
Cooler Temperature: °C re temp: 0.8
 Drop Off
 Pickup

Number of Containers per Sample: 1
Sampled by: C. Madison, K. Klevensteuber
Comments: Please specify "Other" preservative and containers types in this space.

Relinquished by: (Signature, Date & Time) <i>[Signature]</i> 3-29-19 11:51	Received By: (Signature, Date & Time) <i>[Signature]</i> 3/29/19 11:51	Relinquished By: (Signature, Date & Time) <i>[Signature]</i> 3/29/19 16:15	Received By: (Signature, Date & Time) <i>[Signature]</i> 3/29/19 16:50
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

1 of 8

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

Company Name: GZA Geo Environmental Inc.
Contact Person: Rebecca Cox
City: Bedford
Telephone Number: 603-232-3600

CHAIN OF CUSTODY

Turn Time: 8.4 Days
Regulatory State: _____
Is this project for any of the following?:
 CT RCP MA MCP RGP
Project #: 04.0190348.03 Project Name: Schiller Station
Address: 5 Commerce Park North, Suite 201
State: NH Zip Code: 03110 PO #: _____
FAX Number: _____
Email Address: Rebecca.cox@gza.com

ESS Lab #: 1903825
Reporting Limits: _____
Electronic Deliverables: Data Checker Excel
 Other (Please Specify -->)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total Hg
11	3/28/19	1055	G	Solid	C-1069		
12		1107			C-1071	X	
13		1240			C-1073	X	
14		0935			C-1079	X	
15		0949			C-1081	X	
16		1641			C-1083	X	
17		1302			C-1085	X	
18		1231			C-1087	X	
19		1529			C-1089	X	
20		1522			C-1090	X	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other

Laboratory Use Only
Cooler Present:
Seals Intact: NA Drop Off Pickup
Cooler Temperature: 2°C @ temp: 0.8

Number of Containers per Sample: 1
Sampled by: C. Madison, K. Klevenstuber
Comments: _____
Please specify "Other" preservative and containers types in this space: _____

Relinquished by: (Signature, Date & Time) <u>Mar [Signature] 3-29-19 11:51</u>	Received By: (Signature, Date & Time) <u>[Signature] 3/29/19 11:51</u>	Relinquished by: (Signature, Date & Time) <u>[Signature] 3/29/19 16:15</u>	Received By: (Signature, Date & Time) <u>[Signature] 3/29/19 16:50</u>
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903826

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 3:23 pm, Apr 04, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903826

SAMPLE RECEIPT

The following samples were received on March 29, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903826-01	C-1091	Solid	7471B
1903826-02	C-1093	Solid	7471B
1903826-03	C-1095	Solid	7471B
1903826-04	C-1100	Solid	7471B
1903826-05	C-1104	Solid	7471B
1903826-06	C-1109	Solid	7471B
1903826-07	C-1115	Solid	7471B
1903826-08	C-1118	Solid	7471B
1903826-09	C-1120	Solid	7471B
1903826-10	C-1121	Solid	7471B
1903826-11	C-1092	Solid	7471B
1903826-12	C-1094	Solid	7471B
1903826-13	C-1096	Solid	7471B
1903826-14	C-1097	Solid	7471B
1903826-15	C-1099	Solid	7471B
1903826-16	C-1101	Solid	7471B
1903826-17	C-1105	Solid	7471B
1903826-18	C-1110	Solid	7471B
1903826-19	C-1113	Solid	7471B
1903826-20	C-1117	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903826

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903826

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1091
Date Sampled: 03/28/19 14:44
Percent Solids: 98

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	35.2 (2.74)		7471B		100	MKS	04/02/19 14:57	0.74	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1093
Date Sampled: 03/28/19 14:33
Percent Solids: 98

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	21.9 (2.85)		7471B		100	MKS	04/02/19 14:59	0.71	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1095
Date Sampled: 03/28/19 14:07
Percent Solids: 100

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	40.0 (3.48)		7471B		100	MKS	04/02/19 15:01	0.57	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1100
Date Sampled: 03/28/19 15:09
Percent Solids: 99

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	228 (16.5)		7471B		500	MKS	04/02/19 15:03	0.61	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1104
Date Sampled: 03/28/19 16:52
Percent Solids: 99

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	26.3 (3.14)		7471B		100	MKS	04/02/19 15:05	0.64	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1109
Date Sampled: 03/28/19 17:17
Percent Solids: 98

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-06
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	67.1 (11.9)		7471B		500	MKS	04/02/19 16:14	0.85	40	CD90129



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1115
Date Sampled: 03/28/19 17:50
Percent Solids: 98

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-07
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.734 (0.141)		7471B		5	MKS	04/02/19 15:09	0.72	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1118
Date Sampled: 03/28/19 18:08
Percent Solids: 99

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-08
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	13.6 (2.56)		7471B		100	MKS	04/02/19 15:21	0.78	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1120
Date Sampled: 03/28/19 18:02
Percent Solids: 99

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-09
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	45.1 (2.74)		7471B		100	MKS	04/02/19 15:23	0.73	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1121
Date Sampled: 03/28/19 17:48
Percent Solids: 97

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-10
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	11.1 (3.03)		7471B		100	MKS	04/02/19 15:25	0.67	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1092
Date Sampled: 03/28/19 14:37
Percent Solids: 99

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-11
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	69.8 (11.2)		7471B		500	MKS	04/02/19 16:16	0.9	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1094
Date Sampled: 03/28/19 14:19
Percent Solids: 99

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-12
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	47.2 (3.50)		7471B		100	MKS	04/02/19 15:30	0.57	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1096
Date Sampled: 03/28/19 14:13
Percent Solids: 97

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-13
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	5.87 (1.27)		7471B		50	MKS	04/02/19 15:32	0.8	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1097
Date Sampled: 03/28/19 14:56
Percent Solids: 97

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-14
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	6.02 (1.49)		7471B		50	MKS	04/02/19 15:34	0.68	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1099
Date Sampled: 03/28/19 15:02
Percent Solids: 98

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-15
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	68.9 (13.0)		7471B		500	MKS	04/02/19 16:18	0.78	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1101
Date Sampled: 03/28/19 15:16
Percent Solids: 94

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-16
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	10.7 (1.70)		7471B		50	MKS	04/02/19 15:38	0.62	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1105
Date Sampled: 03/28/19 17:00
Percent Solids: 97

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-17
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	109 (14.8)		7471B		500	MKS	04/02/19 16:20	0.69	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1110
Date Sampled: 03/28/19 17:09
Percent Solids: 88

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-18
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	130 (11.9)		7471B		500	MKS	04/02/19 15:46	0.95	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1113
Date Sampled: 03/28/19 17:44
Percent Solids: 97

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-19
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	142 (15.8)		7471B		500	MKS	04/02/19 15:48	0.65	40	CD90129



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1117
Date Sampled: 03/28/19 17:57
Percent Solids: 98

ESS Laboratory Work Order: 1903826
ESS Laboratory Sample ID: 1903826-20
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	327 (26.0)		7471B		1000	MKS	04/02/19 16:22	0.78	40	CD90129



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory
*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903826

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CD90129 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.38	0.305	mg/kg wet	4.850		70	50-103			
LCS Dup										
Mercury	3.78	0.354	mg/kg wet	4.850		78	50-103	11	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903826

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903826

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903826
Shipped/Delivered Via: ESS Courier Date Received: 3/29/2019
Project Due Date: 4/4/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? Yes No

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 0.8 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes No NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes No
b. Does methanol cover soil completely? Yes No NA

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	329036	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	329035	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	329034	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	329033	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	329032	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	329031	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	329030	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	329029	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	329028	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	329027	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	329026	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	329025	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	329024	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	329023	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
15	329022	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
16	329021	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
17	329020	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
18	329019	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
19	329018	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
20	329017	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS

ESS Project ID: 1903826
Date Received: 3/29/2019

All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: QA
Yes / No
Yes / No

Completed By: [Signature] Date & Time: 3/29/19 1812
Reviewed By: [Signature] Date & Time: 3/29/19 1818
Delivered By: [Signature] Date & Time: 3/29/19 1818

CUSTODY SEAL **QF**
DATE 3/29/19
SIGNATURE [Signature]

EC
Quality Environmental Containers
800-255-3950 • 304-255-3900

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903826

Company Name: GZA Geoenvironmental Inc.
Contact Person: Rebecca Cox
City: Bedford
State: NH
Project #: 04.0190348.03
Project Name: Schiller Station Boiler Demo
Address: 5 Commerce Park North, Suite 201
City: Bedford
State: NH
Zip Code: 03110
PO #:
Telephone Number: 603-232-3600
FAX Number:
Email Address: Rebecca.Cox@GZA.COM

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total Hg
1	3/28/19	1444	G	Solid	C-1091	X	
2		1433			C-1093	X	
3		1407			C-1095	X	
4		1509			C-1100	X	
5		1652			C-1104	X	
6		1717			C-1109	X	
7		1750			C-1115	X	
8		1808			C-1118	X	
9		1802			C-1120	X	
10		1748			C-1121	X	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: NA Pickup
Cooler Temperature: 0.8
Sampled by: C. Madison, K. Kleyenstenker
Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <u>[Signature]</u> 3-29-19 11:51	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/29/19 11:51	Relinquished By: (Signature, Date & Time) <u>[Signature]</u> 3/29/19 16:15	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/29/19 1650
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1905826

Company Name
GZA Geo environmental Inc.
Contact Person
Rebecca Cox
City
Bedford
Telephone Number
603-232-3600

Turn Time 4 Days
Regulatory State
Is this project for any of the following?:
 CT RCP MA MCP RGP
Project # 04.0190348.03 Project Name Schiller Station Boiler Demo
Address Commerce Park North, Suite 201
State NH Zip Code 03110 PO #
Email Address Rebecca.Cox@gza.com

Reporting Limits
Electronic Deliverables Data Checker Excel Other (Please Specify --)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Total Hg
11	3/28/19	1437	G	Solid	C-1092	X
12		1419			C-1094	X
13		1413			C-1096	X
14		1456			C-1097	X
15		1502			C-1099	X
16		1516			C-1101	X
17		1700			C-1105	X
18		1709			C-1110	X
19		1744			C-1113	X
20		1757			C-1117	X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial Ag
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other 9
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: NA Pickup
Cooler Temperature: 10.8 °C (temp) 10.8

Sampled by: C. Madison, K. Klewe, Steuber
Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <u>3/29/19 11:51</u>	Received By: (Signature, Date & Time) <u>3/29/19 11:51</u>	Relinquished By: (Signature, Date & Time) <u>3/29/19 16:15</u>	Received By: (Signature, Date & Time) <u>3/29/19 18:50</u>
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)



ESS Laboratory
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BAL Laboratory

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of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903834

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in blue ink that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 3:35 pm, Apr 04, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903834

SAMPLE RECEIPT

The following samples were received on March 29, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903834-01	C-1122	Solid	7471B
1903834-02	C-1123	Solid	7471B
1903834-03	C-1125	Solid	7471B
1903834-04	C-1126	Solid	7471B
1903834-05	C-1134	Solid	7471B
1903834-06	C-1136	Solid	7471B
1903834-07	C-1137	Solid	7471B
1903834-08	C-1133	Solid	7471B
1903834-09	C-1139	Solid	7471B
1903834-10	C-1138	Solid	7471B
1903834-11	C-1135	Solid	7471B
1903834-12	C-1074	Solid	7471B
1903834-13	C-1075	Solid	7471B
1903834-14	C-1076	Solid	7471B
1903834-15	C-1077	Solid	7471B
1903834-16	C-1098	Solid	7471B
1903834-17	C-1102	Solid	7471B
1903834-18	C-1103	Solid	7471B
1903834-19	C-1106	Solid	7471B
1903834-20	C-1107	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903834

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903834

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1122
Date Sampled: 03/28/19 17:38
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	25.4 (3.17)		7471B		100	MKS	04/03/19 18:52	0.64	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1123
Date Sampled: 03/28/19 17:22
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	26.2 (3.37)		7471B		100	MKS	04/03/19 18:54	0.6	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1125
Date Sampled: 03/28/19 17:29
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	8.35 (1.71)		7471B		50	MKS	04/03/19 18:56	0.59	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1126
Date Sampled: 03/28/19 17:31
Percent Solids: 97

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	7.35 (1.61)		7471B		50	MKS	04/03/19 19:06	0.63	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1134
Date Sampled: 03/28/19 18:20
Percent Solids: 99

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	8.74 (1.52)		7471B		50	MKS	04/03/19 19:08	0.66	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1136
Date Sampled: 03/28/19 18:17
Percent Solids: 99

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-06
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	9.95 (2.73)		7471B		100	MKS	04/03/19 19:23	0.73	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1137
Date Sampled: 03/28/19 18:12
Percent Solids: 99

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-07
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	9.21 (1.41)		7471B		50	MKS	04/03/19 19:25	0.71	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1133
Date Sampled: 03/29/19 10:13
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-08
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	22.6 (2.88)		7471B		100	MKS	04/03/19 19:27	0.7	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1139
Date Sampled: 03/29/19 10:21
Percent Solids: 99

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-09
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	35.7 (3.04)		7471B		100	MKS	04/03/19 19:29	0.66	40	CD90241



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1138
Date Sampled: 03/29/19 10:24
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-10
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	35.3 (3.06)		7471B		100	MKS	04/03/19 19:31	0.66	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1135
Date Sampled: 03/29/19 10:29
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-11
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	22.0 (3.16)		7471B		100	MKS	04/03/19 19:33	0.64	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1074
Date Sampled: 03/29/19 07:53
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-12
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	5.35 (1.46)		7471B		50	MKS	04/03/19 19:39	0.69	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1075
Date Sampled: 03/29/19 07:58
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-13
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.16 (0.803)		7471B		25	MKS	04/03/19 19:41	0.63	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1076
Date Sampled: 03/29/19 08:03
Percent Solids: 97

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-14
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	3130 (278)		7471B		10000	MKS	04/03/19 21:11	0.73	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1077
Date Sampled: 03/29/19 08:07
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-15
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.75 (0.786)		7471B		25	MKS	04/03/19 19:45	0.64	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1098
Date Sampled: 03/29/19 08:18
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-16
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	69.8 (6.22)		7471B		200	MKS	04/03/19 21:17	0.65	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1102
Date Sampled: 03/29/19 08:24
Percent Solids: 99

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-17
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	19.3 (3.27)		7471B		100	MKS	04/03/19 19:49	0.61	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1103
Date Sampled: 03/29/19 08:28
Percent Solids: 98

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-18
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	8.69 (1.65)		7471B		50	MKS	04/03/19 19:51	0.61	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1106
Date Sampled: 03/29/19 08:46
Percent Solids: 99

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-19
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	48.6 (3.12)		7471B		100	MKS	04/03/19 19:53	0.64	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1107
Date Sampled: 03/29/19 08:51
Percent Solids: 99

ESS Laboratory Work Order: 1903834
ESS Laboratory Sample ID: 1903834-20
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	15.8 (2.74)		7471B		100	MKS	04/03/19 19:55	0.73	40	CD90241



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903834

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CD90241 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	4.05	0.314	mg/kg wet	4.850		84	50-103			
LCS Dup										
Mercury	4.25	0.336	mg/kg wet	4.850		88	50-103	5	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903834

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903834

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903834
Shipped/Delivered Via: ESS Courier Date Received: 3/29/2019
Project Due Date: 4/4/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? Yes No

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 0.8 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes No NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes No
b. Does methanol cover soil completely? Yes No NA

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:
COC = C-1121 collected @ 1021 Rec'd = C-1139 collected @ 1021 3/29

14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	329096	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	329095	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	329094	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	329093	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	329092	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	329091	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	329090	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	329089	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	329088	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	329087	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	329086	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	329085	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	329084	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	329083	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
15	329082	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
16	329081	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
17	329080	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
18	329079	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
19	329078	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
20	329077	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS

ESS Project ID: 1903834
Date Received: 3/29/2019

All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: JA
Yes / No
Yes / No

Completed

By: [Signature]

Date & Time: 3/29/19 1741

Reviewed

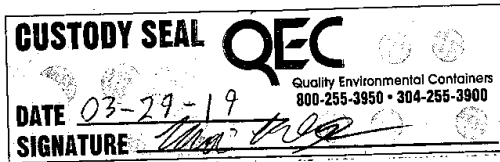
By: [Signature]

Date & Time: 3/29/19 1829

Delivered

By: [Signature]

Date & Time: 3/29/19 1829



ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab #

1903834

Turn Time 7.4 Days

Reporting Limits

Regulatory State

Is this project for any of the following?:

CT RCP MA MCP RGP

Electronic Data Checker

Excel

Deliverables Other (Please Specify -->)

Company Name
GZA Geo Environmental Inc.

Project #

04.0190348.03 Schiller Station Boiler Demo

Contact Person
Rebecca Cox

Address
5 Commerce Park North, Suite 201

City
Bedford

State
NH

Zip Code
03110

Telephone Number
603-232-3600

FAX Number

Email Address
Rebecca.cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total Hg
1	3/28/19	1738	G	Solid	C-1122	X	
2		1722			C-1123	X	
3		1729			C-1125	X	
4		1731			C-1126	X	
5		1820			C-1134	X	
6		1817			C-1136	X	
7	✓	1812			C-1137	X	
8	3/29/19	1013			C-1133	X	
9	✓	1021			C-1121 C-	X	
10	✓	1024			C-1138	X	

Container Type: AG-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers per Sample: 1

Laboratory Use Only

Cooler Present: Drop Off

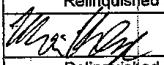
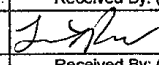
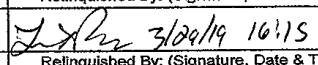
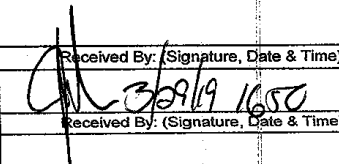
Seals Intact: NA Pickup

Cooler Temperature: °C (Return) 0.8

Sampled by: L. Madison, K. Kleinstuber

Comments: Please specify "Other" preservative and containers types in this space

Sample ID changed

Relinquished by: (Signature, Date & Time)  3-29-19 11:51	Received By: (Signature, Date & Time)  3/29/19 11:51	Relinquished By: (Signature, Date & Time)  3/29/19 10:15	Received By: (Signature, Date & Time)  3/29/19 10:50
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

5 of 8

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **1903834**

Regulatory State: **RI** Days: _____
Is this project for any of the following?:
 CT RCP MA MCP RGP
Project # **04.0190348.03** Project Name **Schiller Station**
Address **Commerce Park North, Suite 201**
City **Bedford** State **NH** Zip Code **03110** PO # _____
Company Name **GZA Geo Environmental Inc.**
Contact Person **Rebecca Cox** Email Address **Rebecca.Cox@gza.com**
Telephone Number **603-232-3600** FAX Number _____

Reporting Limits
Electronic Deliverables Data Checker Excel
 Other (Please Specify →)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Total Hg
11	3/29/19	1029	G	Solid	C-1135	X
12		0753			C-1074	X
13		0758			C-1075	X
14		0803			C-1076	X
15		0807			C-1077	X
16		0818			C-1098	X
17		0824			C-1102	X
18		0828			C-1103	X
19		0846			C-1106	X
20		0851			C-1107	X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubtainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other
Number of Containers per Sample: _____

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: N/A Pickup
Cooler Temperature: _____ °C (10°C) **0.8**

Sampled by: **C. Madison, K. Kleysterker**
Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <i>[Signature]</i> 3-29-19 11:51	Received By: (Signature, Date & Time) <i>[Signature]</i> 3/29/19 11:51	Relinquished By: (Signature, Date & Time) <i>[Signature]</i> 3/29/19 16:15	Received By: (Signature, Date & Time) <i>[Signature]</i> 3/29/19 16:15
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

6 of 8

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab #

1903834

Turn Time 7.4 Days

Reporting Limits

Regulatory State

Is this project for any of the following?:

CT RCP MA MCP RGP

Electronic Data Checker

Excel

Deliverables Other (Please Specify -->)

Company Name
GZA Geo Environmental Inc.

Project #

04.0190348.03

Project Name
Schiller Station Boiler Demo

Contact Person
Rebecca Cox

Address
5 Commerce Park North, Suite 201

City
Bedford

State
NH

Zip Code
03110

PO #

Telephone Number
603-232-3600

FAX Number

Email Address
Rebecca.cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total Hg
1	3/28/19	1738	G	Solid	C-1122	X	
2		1722			C-1123	X	
3		1729			C-1125	X	
4		1731			C-1126	X	
5		1820			C-1134	X	
6		1817			C-1136	X	
7	✓	1812			C-1137	X	
8	3/29/19	1013			C-1133	X	
9	✓	1021			C-1121	X	
10	✓	1024			C-1138	X	

Container Type: AG-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other

Number of Containers per Sample: 1

Laboratory Use Only

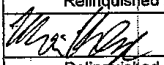
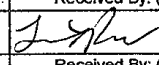
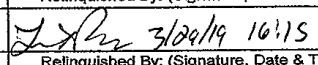
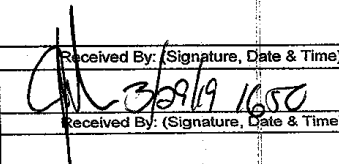
Cooler Present: Drop Off

Seals Intact: NA Pickup

Cooler Temperature: °C (Return) 0.8

Sampled by: C. Madison, K. Kleinstuber

Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time)  3-29-19 11:51	Received By: (Signature, Date & Time)  3/29/19 11:51	Relinquished By: (Signature, Date & Time)  3/29/19 10:15	Received By: (Signature, Date & Time)  3/29/19 10:50
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

5 of 8

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903834

Regulatory State: RI Days: _____
Is this project for any of the following?:
 CT RCP MA MCP RGP
Company Name: GZA Geo Environmental Inc.
Project #: 04.0190348.03 Project Name: Schiller Station
Contact Person: Rebecca Cox Address: Commerce Park North, Suite 201
City: Bedford State: NH Zip Code: 03110 PO #: _____
Telephone Number: 603-232-3600 FAX Number: _____ Email Address: Rebecca.Cox@gza.com

Reporting Limits: _____
Electronic Deliverables: Data Checker Excel
 Other (Please Specify ->)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total Hg
11	3/29/19	1029	G	Solid	C-1135	X	
12		0753			C-1074	X	
13		0758			C-1075	X	
14		0803			C-1076	X	
15		0807			C-1077	X	
16		0818			C-1098	X	
17		0824			C-1102	X	
18		0828			C-1103	X	
19		0846			C-1106	X	
20		0851			C-1107	X	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubtainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other
Number of Containers per Sample: _____

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: N/A Pickup
Cooler Temperature: _____ °C (10°C) 0.8

Sampled by: C. Madison, K. Kleysterker
Comments: _____ Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <u>[Signature]</u> 3-29-19 11:51	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/29/19 11:51	Relinquished By: (Signature, Date & Time) <u>[Signature]</u> 3/29/19 16:15	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/29/19 16:15
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

6 of 8



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1903835

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in cursive script that reads 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 3:24 pm, Apr 04, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903835

SAMPLE RECEIPT

The following samples were received on March 29, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1903835-01	C-1108	Solid	7471B
1903835-02	C-1111	Solid	7471B
1903835-03	C-1112	Solid	7471B
1903835-04	C-1114	Solid	7471B
1903835-05	C-1116	Solid	7471B
1903835-06	C-1119	Solid	7471B
1903835-07	C-1124	Solid	7471B
1903835-08	C-1127	Solid	7471B
1903835-09	C-1128	Solid	7471B
1903835-10	C-1129	Solid	7471B
1903835-11	C-1130	Solid	7471B
1903835-12	C-1131	Solid	7471B
1903835-13	C-1141	Solid	7471B
1903835-14	C-1140	Solid	7471B
1903835-15	C-1132	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903835

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903835

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1108
Date Sampled: 03/29/19 08:40
Percent Solids: 100

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	26.8 (3.05)		7471B		100	MKS	04/03/19 20:14	0.65	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1111
Date Sampled: 03/29/19 08:32
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	682 (43.1)		7471B		1500	MKS	04/03/19 21:19	0.7	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1112
Date Sampled: 03/29/19 08:55
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-03
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	18.6 (2.79)		7471B		100	MKS	04/03/19 20:18	0.72	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1114
Date Sampled: 03/29/19 09:01
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-04
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	11.5 (2.94)		7471B		100	MKS	04/03/19 20:20	0.68	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1116
Date Sampled: 03/29/19 09:10
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-05
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	6.57 (1.69)		7471B		50	MKS	04/03/19 20:22	0.59	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1119
Date Sampled: 03/29/19 09:15
Percent Solids: 100

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-06
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	10.8 (2.80)		7471B		100	MKS	04/03/19 20:29	0.71	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1124
Date Sampled: 03/29/19 07:21
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-07
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	6.07 (1.25)		7471B		50	MKS	04/03/19 20:31	0.8	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1127
Date Sampled: 03/29/19 09:57
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-08
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	27.5 (3.13)		7471B		100	MKS	04/03/19 20:33	0.64	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1128
Date Sampled: 03/29/19 07:42
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-09
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	47.0 (3.08)		7471B		100	MKS	04/03/19 20:35	0.65	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1129
Date Sampled: 03/29/19 10:06
Percent Solids: 98

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-10
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	26.1 (2.77)		7471B		100	MKS	04/03/19 20:37	0.73	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1130
Date Sampled: 03/29/19 10:01
Percent Solids: 97

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-11
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	8.06 (1.63)		7471B		50	MKS	04/03/19 20:47	0.63	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1131
Date Sampled: 03/29/19 07:31
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-12
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	15.6 (2.66)		7471B		100	MKS	04/03/19 20:53	0.75	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1141
Date Sampled: 03/29/19 09:26
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-13
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	13.8 (2.79)		7471B		100	MKS	04/03/19 21:03	0.72	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1140
Date Sampled: 03/29/19 09:21
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-14
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	8.59 (1.62)		7471B		50	MKS	04/03/19 21:05	0.62	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1132
Date Sampled: 03/29/19 10:10
Percent Solids: 99

ESS Laboratory Work Order: 1903835
ESS Laboratory Sample ID: 1903835-15
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	12.1 (3.09)		7471B		100	MKS	04/03/19 21:07	0.65	40	CD90305



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CD90305 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	4.22	0.314	mg/kg wet	4.850		87	50-103			
LCS Dup										
Mercury	3.74	0.305	mg/kg wet	4.850		77	50-103	12	20	



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903835

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1903835

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1903835
Shipped/Delivered Via: ESS Courier Date Received: 3/29/2019
Project Due Date: 4/4/2019
Days for Project: 4 Day

1. Air bill manifest present? No
Air No.: NA

2. Were custody seals present? Yes

3. Is radiation count <100 CPM? Yes

4. Is a Cooler Present? Yes
Temp: 0.8 Iced with: Ice

5. Was COC signed and dated by client? Yes

6. Does COC match bottles? Yes

7. Is COC complete and correct? Yes

8. Were samples received intact? Yes

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	329116	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	329115	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	329114	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	329113	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	329112	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	329111	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	329110	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	329109	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	329108	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	329107	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	329106	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	329105	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	329104	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	329103	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
15	329102	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

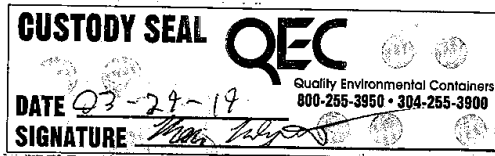
2nd Review
All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: GA
 Yes / No
 Yes / No

Completed

ESS Laboratory Sample and Cooler Receipt Checklist

Client:	<u>GZA Bedford, NH - GZA/DS</u>	ESS Project ID:	<u>1903835</u>
		Date Received:	<u>3/29/2019</u>
By:	<u>[Signature]</u>	Date & Time:	<u>3/29/19 1702</u>
Reviewed			
By:	<u>[Signature]</u>	Date & Time:	<u>3/29/19 1815</u>
Delivered			
By:	<u>[Signature]</u>	Date & Time:	<u>3/29/19 1815</u>



ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **1903835**

Company Name
GZA Geo Environmental Inc.
Contact Person
Rebecca Cox
City
Burlington
Telephone Number
603-232-3600

Turn Time **84** Days
Regulatory State
Is this project for any of the following?:
 CT RCP MA MCP RGP
Project # **04.0190348.03** Project Name **Schiller Station**
Address
~~5 Commerce Park North, Suite 201~~
5 Commerce Park North, Suite 201
State **NH** Zip Code **03110** PO #
FAX Number
Email Address
Rebecca.Cox@gza.com

Reporting Limits
Electronic Deliverables Data Checker Excel
 Other (Please Specify ->)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
1	3/29/14	0840	G	Solid	C-1108	X Total Hg
2		0832			C-1111	X
3		0855			C-1112	X
4		0901			C-1114	X
5		0910			C-1116	X
6		0915			C-1119	X
7		0721			C-1124	X
8		0957			C-1127	X
9		0742			C-1128	X
10		1006			C-1129	X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: Pickup
Cooler Temperature: °C Ice Temp: **0.8**
Sampled by: **C. Madison, K. Kleyenstuber**
Comments: Please specify "Other" preservative and containers types in this space

Relinquished By: (Signature, Date & Time) [Signature] 3-29-14 11:51	Received By: (Signature, Date & Time) [Signature] 3/29/14 11:51	Relinquished By: (Signature, Date & Time) [Signature] 3/29/14 16:15	Received By: (Signature, Date & Time) [Signature] 3/29/14 16:15
Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

7 of 8

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1903835

Company Name
GZA Geoenvironmental Inc.
Contact Person
Rebecca Cox
City
Bellford
Telephone Number
603-232-3600

Turn Time 54 Days
Regulatory State
Is this project for any of the following?:
 CT RCP MA MCP RGP
Project # 04.0190348.03 Project Name Schiller Station
Address
Commerce Park North, Suite 201
State NH Zip Code 03110 PO #
Email Address
Rebecca.Cox@gza.com

Reporting Limits
Electronic Deliverables Data Checker Excel
 Other (Please Specify -->)

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis
11	3/29/19	1001	G	Solid	C-1130	X Total Hg
12		0731			C-1131	X
13		0926			C-1141	X
14		0921			C-1140	X
15		1010			C-1132	X
						X
						X
						X
						X
						X
						X

Container Type: AG-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: NA Pickup
Cooler Temperature: 0.8 °C re temp

Sampled by: C. Madison, K. Kleyenstember
Comments: Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <u>[Signature]</u> 3-29-19 11:51	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/29/19 11:51	Relinquished By: (Signature, Date & Time) <u>[Signature]</u> 3/29/19 16:15	Received By: (Signature, Date & Time) <u>[Signature]</u> 3/29/19 16:50
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190348.03)
ESS Laboratory Work Order Number: 1904020

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:42 pm, Apr 08, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904020

SAMPLE RECEIPT

The following samples were received on April 01, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1904020-01	W-1198	Wipe	7471B
1904020-02	W-1199	Wipe	7471B
1904020-03	W-1200	Wipe	7471B
1904020-04	W-1201	Wipe	7471B
1904020-05	W-1202	Wipe	7471B
1904020-06	W-1203	Wipe	7471B
1904020-07	W-1204	Wipe	7471B
1904020-08	W-1205	Wipe	7471B
1904020-09	W-1206	Wipe	7471B
1904020-10	W-1207	Wipe	7471B
1904020-11	W-1208	Wipe	7471B
1904020-12	W-1209	Wipe	7471B
1904020-13	W-1210	Wipe	7471B
1904020-14	Blank 01-03-29-19	Wipe	7471B
1904020-15	Blank 02-03-29-19	Wipe	7471B
1904020-16	C-1047	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904020

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904020

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1198
Date Sampled: 03/29/19 13:10
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.382 (0.020)		7471B		1	MKS	04/04/19 10:41	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1199
Date Sampled: 03/29/19 13:14
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.716 (0.200)		7471B		10	MKS	04/04/19 12:15	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1200
Date Sampled: 03/29/19 13:16
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.08 (0.200)		7471B		10	MKS	04/04/19 12:17	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1201
Date Sampled: 03/29/19 13:21
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	78.4 (10.0)		7471B		500	MKS	04/04/19 12:19	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1202
Date Sampled: 03/29/19 13:24
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.248 (0.020)		7471B		1	MKS	04/04/19 10:53	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1203
Date Sampled: 03/29/19 13:30
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.095 (0.020)		7471B		1	MKS	04/04/19 10:55	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1204
Date Sampled: 03/29/19 13:33
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.68 (0.500)		7471B		25	MKS	04/04/19 12:25	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1205
Date Sampled: 03/29/19 13:38
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.08 (0.200)		7471B		10	MKS	04/04/19 12:27	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1206
Date Sampled: 03/29/19 13:41
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.172 (0.020)		7471B		1	MKS	04/04/19 11:01	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1207
Date Sampled: 03/29/19 13:43
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.565 (0.200)		7471B		10	MKS	04/04/19 12:29	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1208
Date Sampled: 03/29/19 13:35
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.386 (0.020)		7471B		1	MKS	04/04/19 11:05	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1209
Date Sampled: 03/29/19 13:47
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.762 (0.200)		7471B		10	MKS	04/04/19 12:31	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1210
Date Sampled: 03/29/19 13:49
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.682 (0.200)		7471B		10	MKS	04/04/19 12:33	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: Blank 01-03-29-19
Date Sampled: 03/29/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	04/04/19 11:15	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: Blank 02-03-29-19
Date Sampled: 03/29/19 00:00
Percent Solids: N/A

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	ND (0.020)		7471B		1	MKS	04/04/19 11:17	1	40	CD90343



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1047
Date Sampled: 03/29/19 14:36
Percent Solids: 97

ESS Laboratory Work Order: 1904020
ESS Laboratory Sample ID: 1904020-16
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	3.00 (0.852)		7471B		25	MKS	04/03/19 21:09	0.6	40	CD90305



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory
*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904020

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CD90305 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	4.22	0.314	mg/kg wet	4.850		87	50-103			
LCS Dup										
Mercury	3.74	0.305	mg/kg wet	4.850		77	50-103	12	20	
Batch CD90343 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.125	0.020	ug/100cm ²	0.1208		104	85-115			
LCS Dup										
Mercury	0.127	0.020	ug/100cm ²	0.1208		105	85-115	1	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904020

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904020

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/DS ESS Project ID: 1904020
Shipped/Delivered Via: ESS Courier Date Received: 4/1/2019
Project Due Date: 4/8/2019
Days for Project: 5 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? No Yes

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 0.4 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about **short holds & rushes**? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____


Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	329799	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
02	329798	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
03	329797	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
04	329796	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
05	329795	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
06	329794	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
07	329793	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
08	329792	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
09	329791	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
10	329790	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
11	329789	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
12	329788	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
13	329787	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
14	329786	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
15	329785	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
16	329784	Yes	NA	Yes	4 oz. Jar - Unpres	Other	

2nd Review

All containers scanned into storage/lab
Are barcode labels on correct containers?
Are all necessary stickers attached?

Initials: 
 Yes / No
 Yes / No

Completed

ESS Laboratory Sample and Cooler Receipt Checklist

Client:	<u>GZA - Bedford, NH - GZA/DS</u>	ESS Project ID:	<u>1904020</u>
By:	<u>[Signature]</u>	Date Received:	<u>4/1/2019</u>
Reviewed		Date & Time:	<u>4/1/19 1623</u>
By:	<u>[Signature]</u>	Date & Time:	<u>4/1/19 1623</u>
Delivered		Date & Time:	<u>4/1/19 1623</u>
By:	<u>[Signature]</u>	Date & Time:	<u>4/1/19 1623</u>

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1904020

Turn Time 5 Days
Regulatory State

Reporting Limits

Is this project for any of the following?:
 CT RCP MA MCP RGP

Electronic Deliverables Data Checker Excel
 Other (Please Specify -->)

Company Name
GZA Geo Environmental Inc.

Project # 04.0190348.03 Project Name
Schiller Station Boiler Devm

Contact Person
Rebecca Cox

Address
5 Commerce Park North, Suite 201

City
Belfast

State
NH Zip Code 03110 PO #

Telephone Number
603-315-7520

FAX Number Email Address
Rebecca.Cox@GZA.COM

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total Hg
1	3-29-19	1310	Wipe	Wipe	W-1198	X	
2		1314			W-1199	X	
3		1316			W-1200	X	
4		1321			W-1201	X	
5		1324			W-1202	X	
6		1330			W-1203	X	
7		1333			W-1204	X	
8		1338			W-1205	X	
9		1341			W-1206	X	
10		1343			W-1207	X	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitalner J-Jar O-Other P-Poly S-Sterile V-Vial AG
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other 4
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other 1
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: NA Pickup
Cooler Temperature: °C (ice temp) -0.4

Sampled by: C. Madison, K. Kleyenstamper
Comments: DI Wipe 100cm² Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <u>AW 4/1/19 @ 11:20</u>	Received By: (Signature, Date & Time) <u>[Signature] 4/1/19 11:27</u>	Relinquished By: (Signature, Date & Time) <u>[Signature] 4/1/19 14:37</u>	Received By: (Signature, Date & Time) <u>[Signature] 4/1/19 15:49</u>
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

ESS Laboratory

Division of Thiele Engineering, Inc.
85 Frances Avenue, Cranston RI 02910
tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab #

1904020

Turn Time 5 Days
Regulatory State
Is this project for any of the following?:
 CT RCP MA MCP RGP

Reporting Limits
Electronic Deliverables Data Checker Excel
 Other (Please Specify -->)

Company Name: GZA Geo Environmental Inc.
Project #: 04.0140348.03
Project Name: Schiller Station Trailer Demo
Contact Person: Rebecca Cox
Address: 5 Commerce Park North, Suite 201
City: Bedford State: NH Zip Code: 03110 PO #:
Telephone Number: 603-315-7520 FAX Number: Email Address: rebecca.cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Total Hg
11	3-29-19	1335	Wipe	Wipe	W-1208	X
12	3-29-19	1347	Wipe	Wipe	W-1209	X
13	3-29-19	1349	Wipe	Wipe	W-1210	X
14	3-29-19	—	Wipe	Wipe	Blank 01 - 03-29-19	X
15	3-29-19	—	Wipe	Wipe	Blank 02 - 03-29-19	X
16	3-29-19	1436	G	Solid	C-1047	X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial KG
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other 9
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc2, NaOH 9-NH4Cl 10-DI H2O 11-Other 1
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present Drop Off
Seals Intact NA Pickup
Cooler Temperature: °C Refrigerator -0.4
Sampled by: C. Madison, K. Kilgus-Stuber
Comments: DI Wipe 100cm²
Please specify "Other" preservative and containers types in this space:

Relinquished by: (Signature, Date & Time) <u>[Signature]</u> 4/1/19 @ 11:20	Received By: (Signature, Date & Time) <u>[Signature]</u> 4/1/19 11:27	Relinquished By: (Signature, Date & Time) <u>[Signature]</u> 4/1/19 14:37	Received By: (Signature, Date & Time) <u>[Signature]</u> 4/1/19 15:49
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CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1904021

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 1:06 pm, Apr 05, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904021

SAMPLE RECEIPT

The following samples were received on April 01, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1904021-01	W-1188	Wipe	7471B
1904021-02	W-1189	Wipe	7471B
1904021-03	W-1190	Wipe	7471B
1904021-04	W-1191	Wipe	7471B
1904021-05	W-1192	Wipe	7471B
1904021-06	W-1193	Wipe	7471B
1904021-07	W-1194	Wipe	7471B
1904021-08	W-1195	Wipe	7471B
1904021-09	W-1196	Wipe	7471B
1904021-10	W-1197	Wipe	7471B
1904021-11	W-1178	Wipe	7471B
1904021-12	W-1179	Wipe	7471B
1904021-13	W-1180	Wipe	7471B
1904021-14	W-1181	Wipe	7471B
1904021-15	W-1182	Wipe	7471B
1904021-16	W-1183	Wipe	7471B
1904021-17	W-1184	Wipe	7471B
1904021-18	W-1185	Wipe	7471B
1904021-19	W-1186	Wipe	7471B
1904021-20	W-1187	Wipe	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904021

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904021

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1188
Date Sampled: 03/29/19 12:46
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-01
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.079 (0.020)		7471B		1	MKS	04/04/19 11:25	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1189
Date Sampled: 03/29/19 12:48
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-02
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.116 (0.020)		7471B		1	MKS	04/04/19 11:27	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1190
Date Sampled: 03/29/19 12:49
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-03
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.275 (0.020)		7471B		1	MKS	04/04/19 11:29	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1191
Date Sampled: 03/29/19 12:51
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-04
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.61 (0.500)		7471B		25	MKS	04/04/19 12:35	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1192
Date Sampled: 03/29/19 12:54
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-05
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.769 (0.200)		7471B		10	MKS	04/04/19 12:37	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1193
Date Sampled: 03/29/19 12:58
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-06
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.712 (0.200)		7471B		10	MKS	04/04/19 12:39	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1194
Date Sampled: 03/29/19 13:02
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-07
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.404 (0.100)		7471B		5	MKS	04/04/19 12:41	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1195
Date Sampled: 03/29/19 13:04
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-08
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	2.56 (0.500)		7471B		25	MKS	04/04/19 12:43	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1196
Date Sampled: 03/29/19 13:06
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-09
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	17.3 (2.00)		7471B		100	MKS	04/04/19 12:49	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1197
Date Sampled: 03/29/19 13:07
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-10
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.549 (0.200)		7471B		10	MKS	04/04/19 12:51	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1178
Date Sampled: 03/29/19 11:27
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-11
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	6.04 (1.00)		7471B		50	MKS	04/04/19 12:53	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1179
Date Sampled: 03/29/19 11:36
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-12
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.465 (0.100)		7471B		5	MKS	04/04/19 12:55	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1180
Date Sampled: 03/29/19 11:38
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-13
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.820 (0.200)		7471B		10	MKS	04/04/19 12:57	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1181
Date Sampled: 03/29/19 12:27
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-14
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.166 (0.020)		7471B		1	MKS	04/04/19 11:55	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1182
Date Sampled: 03/29/19 12:31
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-15
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.218 (0.020)		7471B		1	MKS	04/04/19 12:01	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1183
Date Sampled: 03/29/19 12:34
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-16
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.06 (0.200)		7471B		10	MKS	04/04/19 12:59	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1184
Date Sampled: 03/29/19 12:36
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-17
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	1.35 (0.400)		7471B		20	MKS	04/04/19 13:01	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1185
Date Sampled: 03/29/19 12:39
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-18
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.525 (0.100)		7471B		5	MKS	04/04/19 13:03	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1186
Date Sampled: 03/29/19 12:41
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-19
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.438 (0.100)		7471B		5	MKS	04/04/19 13:05	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: W-1187
Date Sampled: 03/29/19 12:44
Percent Solids: N/A

ESS Laboratory Work Order: 1904021
ESS Laboratory Sample ID: 1904021-20
Sample Matrix: Wipe
Units: ug/100cm²

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	0.318 (0.020)		7471B		1	MKS	04/04/19 12:11	1	40	CD90345



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904021

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CD90345 - 7471B										
Blank										
Mercury	ND	0.020	ug/100cm ²							
LCS										
Mercury	0.127	0.020	ug/100cm ²	0.1208		105	85-115			
LCS Dup										
Mercury	0.133	0.020	ug/100cm ²	0.1208		110	85-115	4	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904021

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904021

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1904021
Date Received: 4/1/2019
Shipped/Delivered Via: ESS Courier Project Due Date: 4/5/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? Yes No

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 0.4 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes No NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes No
b. Does methanol cover soil completely? Yes No NA

13. Are the samples properly preserved? Yes No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	329783	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
02	329782	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
03	329781	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
04	329780	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
05	329779	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
06	329778	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
07	329777	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
08	329776	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
09	329775	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
10	329774	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
11	329773	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
12	329772	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
13	329771	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
14	329770	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
15	329769	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
16	329768	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
17	329767	Yes	NA	Yes	4 oz. Jar - Unpres	Other	
18	329766	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
19	329765	Yes	NA	Yes	2 oz. Jar - Unpres	Other	
20	329764	Yes	NA	Yes	2 oz. Jar - Unpres	Other	

2nd Review
All containers scanned into storage/lab

Initials: [Signature]

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1904021
Date Received: 4/1/2019

Are barcode labels on correct containers? Yes No
Are all necessary stickers attached? Yes No

Completed By: [Signature] Date & Time: 4/1/19 1613
Reviewed By: [Signature] Date & Time: 4/1/19 1622
Delivered By: [Signature] Date & Time: 4/1/19 1624



ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab #

P04021

Turn Time 84 Days

Reporting Limits

Regulatory State

Electronic Deliverables

Data Checker Excel
 Other (Please Specify --)

Is this project for any of the following?:
 CT RCP MA MCP RGP

Company Name

GZA Geo Environmental Inc.

Project #

04.0190348.03

Project Name

Schiller Station Boiler Demo

Contact Person

Rebecca Cox

Address

5 Commerce Park North, Suite 201

City

Bedford

State

NH

Zip Code

03110

PO #

Telephone Number

603-315-7520

FAX Number

Email Address

Rebecca.cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total Hg
1	3-29-19	1246	Wipe	Wipe	W-1188	X	
2		1248			W-1189	X	
3		1249			W-1190	X	
4		1251			W-1191	X	
5		1254			W-1192	X	
6		1258			W-1193	X	
7		1302			W-1194	X	
8		1304			W-1195	X	
9		1306			W-1196	X	
10		1307			W-1197	X	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubittainer J-Jar O-Other P-Poly S-Sterile V-Vial AG
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* 7
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other* ?
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: NA Pickup
Cooler Temperature: 0.4 °C ref temp
Sampled by: C. Madison, K. Kleyersteinbar
Comments: DI Wipe 100cm²
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) RA 4/1/19 @ 120
Received By: (Signature, Date & Time) [Signature] 4/1/19 11:27
Relinquished by: (Signature, Date & Time) [Signature] 4/1/19 14:37
Received By: (Signature, Date & Time) [Signature] 4/1/19 1509

ESS Laboratory

Division of Thielsch Engineering, Inc.
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www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1904021

Turn Time 84 Days
Regulatory State
Is this project for any of the following?:
 CT RCP MA MCP RGP

Reporting Limits
Electronic Deliverables Data Checker Excel Other (Please Specify →)

Company Name
GZA Geo Environmental Inc.
Contact Person
Rebecca Cox
City
Belford
Telephone Number
603-315-7520

Project #
04.0190348.03
Project Name
Schiller Station Boiler Demo
Address
Commerce Park North, Suite 201
State
NH
Zip Code
03110
PO #

Email Address
Rebecca.Cox@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	Total Hg
11	3-29-19	1127	Wipe	Wipe	W-1178	X	
12		1136			W-1179	X	
13		1138			W-1180	X	
14		1227			W-1181	X	
15		1231			W-1182	X	
16		1234			W-1183	X	
17		1236			W-1184	X	
18		1239			W-1185	X	
19		1241			W-1186	X	
20		1244			W-1187	X	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitalner J-Jar O-Other P-Poly S-Sterile V-Vial
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAc, NaOH 9-NH4Cl 10-DI H2O 11-Other
Number of Containers per Sample: 1

Laboratory Use Only
Cooler Present: Drop Off
Seals Intact: NA Pickup
Cooler Temperature: 0°C temp -0.4
Sampled by: C. Madison, K. Kloverstember
Comments: DI wipe 100cm²
Please specify "Other" preservative and containers types in this space

Relinquished by: (Signature, Date & Time) <u>[Signature]</u> 4/1/19 @ 1120	Received By: (Signature, Date & Time) <u>[Signature]</u> 4/1/19 11:27	Relinquished By: (Signature, Date & Time) <u>[Signature]</u> 4/1/19 14:37	Received By: (Signature, Date & Time) <u>[Signature]</u> 4/1/19 1549
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Rebecca Cox
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Schiller Boiler Demo (04.0190318.03)
ESS Laboratory Work Order Number: 1904201

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

A handwritten signature in cursive script, appearing to read 'Laurel Stoddard'.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 11:24 am, Apr 11, 2019

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904201

SAMPLE RECEIPT

The following samples were received on April 05, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1904201-01	C-1142	Solid	7471B
1904201-02	C-1143	Solid	7471B



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904201

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904201

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1142
Date Sampled: 04/05/19 07:30
Percent Solids: 99

ESS Laboratory Work Order: 1904201
ESS Laboratory Sample ID: 1904201-01
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	16.4 (2.53)		7471B		100	MKS	04/08/19 16:23	0.79	40	CD90557



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo
Client Sample ID: C-1143
Date Sampled: 04/05/19 08:14
Percent Solids: 99

ESS Laboratory Work Order: 1904201
ESS Laboratory Sample ID: 1904201-02
Sample Matrix: Solid
Units: mg/kg dry

Extraction Method: 7471B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Mercury	48.1 (3.19)		7471B		100	MKS	04/08/19 16:25	0.63	40	CD90557



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Schiller Boiler Demo

ESS Laboratory Work Order: 1904201

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CD90557 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	3.74	0.341	mg/kg wet	4.850		77	50-103			
LCS Dup										
Mercury	4.03	0.341	mg/kg wet	4.850		83	50-103	7	20	



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Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



CERTIFICATE OF ANALYSIS

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ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM ESS Project ID: 1904201
Shipped/Delivered Via: ESS Courier Date Received: 4/5/2019
Project Due Date: 4/11/2019
Days for Project: 4 Day

1. Air bill manifest present? No Yes
Air No.: NA

2. Were custody seals present? Yes No

3. Is radiation count <100 CPM? Yes No

4. Is a Cooler Present? Yes No
Temp: 0.1 Iced with: Ice

5. Was COC signed and dated by client? Yes No

6. Does COC match bottles? Yes No

7. Is COC complete and correct? Yes No

8. Were samples received intact? Yes No

9. Were labs informed about short holds & rushes? Yes / No / NA

10. Were any analyses received outside of hold time? Yes No

11. Any Subcontracting needed? Yes No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. If metals preserved upon receipt: Date: _____ Time: _____ By: _____
b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
01	331521	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	331520	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
All containers scanned into storage/lab
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Initials: W

Completed By: [Signature] Date & Time: 4/5/19 1734
Reviewed By: [Signature] Date & Time: 4/5/19 1800
Delivered By: [Signature] Date & Time: 4/5/19 1800



